Syllabus
Advanced Quantitative Methods:
Causal Inference, Spring 2020

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Time & Place
Wednesdays 8-11AM on Zoom

Contact:
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Short Description

This course presents a modern approach to studying causal questions in political science. In the first half of the course we discuss the concept of causality, reintroduce the linear regression model in a causal framework, and learn how to analyze experiments. In the second part of the course we look at different strategies for designing a causal identification strategy using observational data and discuss the potential pitfalls of doing causal inference.

The overall goal of the course is to become a critical consumer of causal claims in the social sciences and to give you the tools needed to do causal inference in practice.

Exam

30 minute oral exam with no assistance. You will draw an assignment and get 30 minutes to prepare an answer which you will then have to present. Following the presentation the examiner will question you on the content of the presentation as well as on different parts of the course.

Class Activities

In the first class you will be split into study groups. Each study group will have to give two presentations based on an assignment given in class. The assignment will entail a replication of an existing study (which will have to be uploaded to Blackboard) as well as a discussion of the study which will be presented in class.

Software

We will use `Stata 15` and, in some cases, the statistical programming language `R`. License to Stata can be bought online via the department's website. `R studio` can be downloaded for free online. You are free to use whatever software you want.

Books

The following books have been ordered for the course and can be bought at *Politologisk Bogformidling*.

- Angrist, J. & J.S. Pischke, *Mastering 'Metrics: The Path from Cause to Effect*, Princeton University Press, 2014.
- Angrist, J. and J.S. Pischke, Mostly Harmless Econometrics, Princeton University Press, 2009.
- Stock J. H. & Watson, M. W. Introduction to Econometrics. 3rd edition. Pearson, 2015 (SW).

We will also read a good part of...

- Wooldridge, J. M. (2013). *Introductory econometrics: a modern approach* (5th international ed.).
- Gerber, A. S., & Green, D. P. (2012). Field experiments: Design, analysis, and interpretation. WW Norton.

We will talk about how to get access to these books in Class 1.

Class Overview

Texts marked by a ($\star$) are in the curriculum. Extra, supplemental readings are marked by a ($\triangleright$).

Please note that the syllabus is preliminary and that additional texts (mostly political science applications of the methods) will be added as soon as possible.

Class 1: What is a causal effect?
(MVL, Time: February 3)

- ⋆ Holland, Paul W. (1986) Statistics and Causal Inference. *Journal of the American Statistical Association*: 81(396), 945-960.
- ⋆ Rohrer, J. M. (2018). Thinking clearly about correlations and causation: Graphical causal models for observational data. *Advances in Methods and Practices in Psychological Science*, 1(1), 27-42.
- ⋆ Angrist, J. and J.S. Pischke, *Mostly Harmless Econometrics*, Princeton University Press, 2009 (MHE). Chapters 1-2
- ▷ Hariri, J. G. (2012). Kausal inferens i statskundskaben. *Politica*, 44(2), 184-201.

Class 2: Re-introducing Linear Regression I: Simple and Multiple
(MVL, Time: February 10)

- ⋆ Wooldridge, J. M. (2013). Introductory econometrics: a modern approach (5th international ed.). Publisher South-Western Cengage Learning (pp. 70-113). Chapters 2-3
- ▷ Wooldridge, J. M. (2013). Introductory econometrics: a modern approach (5th international ed.). Publisher South-Western Cengage Learning (pp. 70-113). Chapter 1.

Class 3: Re-introducing Linear Regression II: Inference
(MVL, Time: February 17)

- ⋆ Wooldridge, J. M. (2013). Introductory econometrics: a modern approach (5th international ed.). Publisher South-Western Cengage Learning (pp. 70-113). Chapter 4-5
- ▷ Wooldridge, J. M. (2013). Introductory econometrics: a modern approach (5th international ed.). Publisher South-Western Cengage Learning (pp. 70-113). Appendix A-C.

Class 4: Re-introducing Linear Regression III: Advanced Topics
(MVL, Time: February 24)

- ⋆ Wooldridge, J. M. (2013). Introductory econometrics: a modern approach (5th international ed.). Publisher South-Western Cengage Learning (pp. 70-113). Chapter 6-7
- ⋆ Hainmueller, J., Mummolo, J., & Xu, Y. (2019). How much should we trust estimates from multiplicative interaction models? Simple tools to improve empirical practice. Political Analysis, 27(2), 163-192.

Class 5: Experiments I
(MVL, Time: March 2)

- ⋆ Gerber, A. S., & Green, D. P. (2012). Field experiments: Design, analysis, and interpretation. WW Norton. (s. 82-98) Chapters 2, 4 and 7
- ⋆ Bullock, J. G., Green, D. P., & Ha, S. E. (2010). Yes, but what's the mechanism?(don't expect an easy answer). *Journal of personality and social psychology*, 98(4), 550.
- ⋆ Enos, R. D. (2014). Causal effect of intergroup contact on exclusionary attitudes. Proceedings of the National Academy of Sciences, 111(10), 3699-3704.
- ▷ Gerber, A. S., & Green, D. P. (2012). Field experiments: Design, analysis, and interpretation. WW Norton. (s. 82-98) Chapter 1

Class 6: Experiments II
(MB, Time: March 16)

- ⋆ McDermott, R. (2002). Experimental methods in political science. Annual Review of Political Science, 5(1), 31-61.
- ⋆ Slothuus, R. (2016). Assessing the influence of political parties on public opinion: The challenge from pretreatment effects. Political Communication, 33(2), 302-327.
- ⋆ Dafoe, A., Zhang, B. & Caughey, D. (2018) Information Equivalence in Survey Experiments. Political Analysis 26: 399-416.
- ⋆ Deaton, A., & Cartwright, N. (2018). Understanding and misunderstanding randomized controlled trials. Social Science & Medicine, 210, 2-21.
- ▷ Sniderman, P. M., & Grob, D. B. (1996). Innovations in experimental design in attitude surveys. Annual review of Sociology, 22(1), 377-399.
- ▷ Imbens, G. W. (2018). Comments On: Understanding and Misunderstanding Randomized Controlled Trails by Cartwright and Deaton. Stanford University, Graduate School of Business.

Class 7: Some Practical Issues
(MB, Time: March 23)

- ⋆ Simmons, J., Nelson, L., and Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allow presenting anything as significant. *Psychological Science*. 22, 1359–1366.

- ⋆ Duflo, Esther, Abhijit Banerjee, Rachel Glennerster, and Michael Kremer. 2006. Section 4.1 "Sample size, design, and the power of experiments. Basic Principle" Using Randomization in Development Economics: A Toolkit. *Handbook of Development Economics.*

- ⋆ Gelman, A., & Carlin, J. (2014). Beyond power calculations: Assessing type S (sign) and type M (magnitude) errors. Perspectives on Psychological Science, 9, 641– 65

- ▷ Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. Science, 349(6251)

- ▷ Lenz, G., & Sahn, A. (2017). Achieving statistical significance with covariates and without transparency. Working paper.

- ▷ John P. A. Ioannidis, T. D. Stanley, Hristos Doucouliagos, The Power of Bias in Economics Research, The Economic Journal, Volume 127, Issue 605, October 2017, Pages F236–F265

Class 8: Natural Experiments & Auxiliary Analyses
(MB, Time: March 30)

- ⋆ Dunning, Thad (2008). Improving Causal Inference: Strengths and Limitations of Natural Experiments. *Political Research Quarterly* 61 (2): 282-293

- ⋆ Susan Athey and Guido W. Imbens. 2017. The State of Applied Econometrics: Causality and Policy Evaluation *Journal of Economic Perspectives*—Volume 31, Number 2—Spring 2017. NB: only read "Supplementary Analyses" pp. 17-21.

- ⋆ 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.

- ⋆ Healy, A. J., Malhotra, N., & Mo, C. H. (2010). Irrelevant events affect voters' evaluations of government performance. *Proceedings of the National Academy of Sciences*, 107(29), 12804-12809.

- ▷ Mutz, D. C. 2011. pp. 131-154. Population-based survey experiments. *Princeton University Press.* (Blackboard)

Class 9: Difference-in-Differences
(MB, Time: April 15, 8-11 AM)

- ⋆ Angrist, J. & J.S. Pischke, *Mastering 'Metrics: The Path from Cause to Effect*, Princeton University Press, 2014. Chapter 5 incl. Appendices.

- ⋆ Stock J. H. & Watson, M. W. Introduction to Econometrics. 3rd edition. Pearson, 2015 (SW). 1.3 (re-read part on types of data)
- ⋆ Stock J. H. & Watson, M. W. Introduction to Econometrics. 3rd edition. Pearson, 2015 (SW). 13.4 (pp. 539-545)
- ⋆ Bechtel, M. M., & Hainmueller, J. (2011). How lasting is voter gratitude? An analysis of the short-and long-term electoral returns to beneficial policy. American Journal of Political Science, 55(4), 852-868.

Class 10: Panel Data & Fixed Effects
(MB, Time: April 22, 8-11 AM)

- ⋆ Stock J. H. & Watson, M. W. Introduction to Econometrics. 3rd edition. Pearson, 2015 (SW). chapter 10
- ⋆ Finkel, S. E., & Smith, A. E. (2011). "Civic education, political discussion, and the social transmission of democratic knowledge and values in a new democracy: Kenya 2002". *American Journal of Political Science*, 55(2), 417-435.
- ▷ Rabe-Hesketh, S. & A. Skrondal (2012) "Multilevel and Longitudinal Modeling Using Stata. 3rd edition." College Station: Stata Press. (s. 73-97 + 123-147) (Blackboard).
- ▷ Angrist, J. and J.S. Pischke, *Mostly Harmless Econometrics*, Princeton University Press, 2009 (MHE). Chapter 5

Class 11: Interrupted Time Series & Synthetic Control
(MB, Time: April 29, 8-11 AM)

- ⋆ Shadish, W.R., Cook, T.D., & Campbell, D.T (2002) "Interrupted Time Series" Kapitel 6 fra *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton-Mifflin. (blackboard)
- ⋆ Abadie, A., A. Diamond and J. Hainmueller (2015) Comparative Politics and the Synthetic Control Method *American Journal of Political Science*, April 2015, 59(2), 495–510.
- ⋆ Abadie, A., A. Diamond and J. Hainmueller (2010), Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program," *Journal of the American Statistical Association*, vol. 105, 493-505.
- ⋆ Hansen, B. T., Østergaard, S. D., Sønderskov, K. M., & Dinesen, P. T. (2016). Increased incidence rate of trauma-and stressor-related disorders in Denmark after the September 11, 2001, terrorist attacks in the United States. *American Journal of Epidemiology*, 184(7), 494-500.

Class 12: Matching
(MB, Time: May 6, 8-11 AM)

- ⋆ Elizabeth A. Stuart 2010 Matching Methods for Causal Inference: A Review and a Look Forward *Statistical Science*, Vol. 25, No. 1, 1–29. **Following sections are not part of the curriculum: 3.2.3 Weighting adjustments, 4.1 Numerical diagnostics, 6 Discussion**
- ⋆ Kam, C. D., & Palmer, C. L. (2008). Reconsidering the effects of education on political participation. The Journal of Politics, 70(3), 612-631.
- ▷ Imbens, Guido. 2014. Matching Methods in Practice: Three Examples. NBER Working Paper 19959.
- ▷ Daniel Ho, Kosuke Imai, Gary King, and Elizabeth Stuart. 2007. "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference." *Political Analysis*, 15: 199–236.

Class 13: Instrumental Variables
(MVL, Time: May 13, 8-11 AM)

- ⋆ Stock J. H. & Watson, M. W. Introduction to Econometrics. 3rd edition. Pearson, 2015 (SW). chapter 12
- ⋆ Hariri, J. G. (2012). The autocratic legacy of early statehood. *American Political Science Review*, 106(3), 471-494.

Class 14: Regression Discontinuity Design
(MVL, Time: May 20, 8-11 AM)

- ⋆ Titiunik, R. & Skovron, C. (2017) A Practical Guide to Regression Discontinuity Designs in Political Science. Pages 1–47. *Unpublished Manuscript.*
- ⋆ Hall, A. B. (2015). What happens when extremists win primaries? *American Political Science Review*, 109(1), 18-42.

Class 15: Review and Exam Preparation
(MVL & MB, Time: TBA)

- ⋆ No readings.