MODELLING CAUSAL PATHWAYS -
STRUCTURAL EQUATIONS AND MEDIATION OF CAUSAL EFFECTS

Leonce Röth
University of Cologne

24 March 2017
Computer Lab, h. 9:00-12:15 and 13:30-18:00
NASP Graduate School in Social and Political Sciences
via Pace 10 - Milan

Program & Background Readings

Part I – Causality in Directed (Acyclic) Graphs
Time 9:00 to 10:30

Recommended Literature
Pearl, Judea. (1995). "Causal Diagrams for Empirical Research." Biometrika 82 (4): 669- 710.
An important founding document for causal diagrams. However, it is very technically written.
Morgan, Stephen L. and Christopher Winship. (2007). Counterfactuals and Causal Inference: Methods and Principles of Social Research. Cambridge: Cambridge University Press.
Chapter 3 (p. 77-95) is a more applied discussion of directed graphs embedded in examples from sociology.
Robins, James M. (2001). "Data, Design, and Background Knowledge in Etiologic Inference," Epidemiology 11 (3): 313 -320.
Another less technical description of directed graphs.

Part II – Necessary and Unnecessary Controls or Closing the Backdoor
Time: 10:45-12:15

Recommended Literature
Morgan, Stephen L. and Christopher Winship. (2007). Counterfactuals and Causal Inference: Methods and Principles of Social Research. Cambridge: Cambridge University Press.
Chapter 3 (p. 95-130) is an applied discussion of the back-door criteria.
Pearl, J., Glymour, M., & Jewell, N. P. (2016). *Causal inference in statistics: a primer*. John Wiley & Sons.
Chapter 3 (p. 53-75).

Lunch Break 12:15-13:30

Part III – Effect Heterogeneity and the Average Treatment Effect
Time 13:30-15:00

Recommended Literature
Elwert, F., & Winship, C. (2010). Effect heterogeneity and bias in main-effects-only regression models. Heuristics, probability and causality: A tribute to Judea Pearl, 327-36.
Falleti, T. G., & Lynch, J. F. (2009). Context and causal mechanisms in political analysis. *Comparative political studies, 9*(42), 1143-1166.

Part IV – Interactions versus Structural Equations with Mediation Effects
Time 15:15-17:15

Recommended Literature
Pearl, J., Glymour, M., & Jewell, N. P. (2016). *Causal inference in statistics: a primer*. John Wiley & Sons.
Chapter 3 (p. 75-87).
Brambor, T., Clark, W. R., & Golder, M. (2006). Understanding interaction models: Improving empirical analyses. *Political analysis, 14*(1), 63-82.
Imai, K., Keele, L., & Yamamoto, T. (2010). Identification, inference and sensitivity analysis for causal mediation effects. *Statistical Science, 1*(25), 51-71.

Part V – Discussion
Time 17:30-18:00