

Graphical Causal Models

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Monday, June 29, 2015; 10:00 - 16:00 h

Tuesday, June 30, 2015; 09:30 - 16:00 h

Room 1010 (Patrizia-Tower, Venloer Str. 151-153)

Seminar Description

This seminar offers an applied introduction to directed acyclic graphs (DAGs) for causal inference.

The four primary uses of DAGs are

1. Notating the causal assumptions of the assumed data-generating process
2. Deriving all testable implications of the causal model
3. Deriving non-parametric identification results
4. Informing statistical techniques

We will use DAGs to inform causal inference in the social sciences. We will discuss formal semantics of syntax, translate key concepts into social-science language, and discuss numerous examples from sociology, economics, and organizational behavior.

Topics include: conditions for the identification of causal effects; d-separation; the difference between confounding, over-control, and selection bias; identification by adjustment; backdoor identification; what variables to control for in observational research; what variables not to control for in observational research; structural assumptions in regression and matching; and recent work on causal mediation analysis.

Please note that this seminar will empower participants to recognize and understand problems and to spot fresh opportunities for causal inference. This seminar does not introduce new estimators and has no software component.

Seminar Outline

1. Counterfactual causality
2. Directed Acyclic Graphs (DAGs)
3. Associational implications of a causal model
4. Graphical Identification Criteria
5. Endogenous Selection Bias
6. Graphical insights for Regression and Matching
8. Mediation analysis

Preparatory Readings

Elwert, Felix, and Christopher Winship. 2014. "Endogenous Selection Bias: The Problem of Conditioning on a Collider Variable." *Annual Review of Sociology* 40:31-50.

Elwert, Felix. 2013. "Graphical Causal Models." Pp. 245-273 in S. Morgan (ed.), *Handbook of Causal Analysis for Social Research*. Dodrecht: Springer.

Both papers are available online at www.causal-dags.org.