Draft syllabus
Sociology 598:
Introduction to causal inference
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Spring 2008
Tuesday 2:30-5:30
190 Wallace Hall

Introduction

This mini-seminar will offer students a six-week introduction into the problems of causality and causal inference. Prominent approaches in the literature will be discussed and illustrated with examples. Limitations, as well as strengths, will be emphasized. Throughout the course we will attempt to balance philosophical, statistical, and practical considerations. Each class will consist of a general discussion of a specific approach followed by student presented examples. Students are expected to come to class prepared for discussion as well as present a few articles during the course of the semester. There will be no exam, but students will be expected to complete a final paper or project.

There will be one required text for this class:


We will also draw from Paul Rosenbaum’s 2002 book Observational Studies, but this book will not be required. The remaining articles will be available either online or on blackboard.

Lecture schedule

1 Introduction and overview (March 25)

In this first class we will cover a broad overview of questions concerning causal inference emphasizing the counterfactual framework. The relationship between smoking and cancer will be a useful case study.

For general discussion

- Rosenbaum (Chapter 1)
- Morgan and Winship (Chapters 1 & 2)

• Rosenbaum (Chapters 11 & 12)

**Case study: Smoking and cancer**


**Further reading**


2 **Field experiments and social experiments (April 1)**

Experiments are generally the best way to make causal statements, but the their implementation often introduces practical problems such as noncompliance. In this class we will consider the strengths and weaknesses of real-world experiments for making causal claims in the social sciences. We will make a qualitative distinction between field experiments, that can generally be conducted by individual researchers, and social experiments, that generally require the involvement of the government or other large institution.

**For general discussion**


**For presentation**


### Further reading


### 3 Conditioning on observables (April 8)

One approach to making causal claims from observational data is to condition on observable information so as to avoid “omitted variable bias.” The two most common ways to do this are “controlling” in linear regression and propensity score matching. We will conclude by discussing sensitivity analysis that can strengthen the claims made with these methods.

#### For general discussion

- Rosenbaum (Chapters 3.1) (posted on blackboard)
- Rosenbaum (Chapters 4.1 & 6.1) (posted on blackboard)
- Morgan and Winship (Chapters 4 & 5)

#### For presentation

  


• Booher-Jennings, J. and Beveridge, A. A. (2007). Does gaming the system affect students’ academic achievement? *ISERP Working Paper 07-06*

**Further reading**


4 Cross-sectional methods: Regression discontinuity and instrumental variables (April 15)

We can condition for things that we have measured, but sometimes we can’t or haven’t measured everything that we might like. In this case, we can attempt to rely on some process to create plausibly exogenous variation. Two approaches within this framework are regression discontinuity designs and instrumental variables.

**For general discussion**

• Morgan and Winship (Chapter 7)


For presentation


Further reading


5 Longitudinal methods: Difference-in-differences and fixed effects (April 22)

When data over time are available additional approaches can be employed to deal with unobservables. Two common approaches are difference-in-differences and fixed-effects models.

For general discussion

- Morgan and Winship (Chapter 9)


For presentation


6 Putting it all together: peer and neighborhood effects (April 29)

The estimation of peer and neighborhood effects on individual outcomes has been plagued by many of the problems we described so far in this class. In the final week we review a number of approaches to address this question using a variety of methods.

For general discussion


For presentation


**Further reading**