

# Causal Mechanisms and Process Tracing

Department of Government  
London School of Economics and Political Science

1 Review

2 Mechanisms

3 Process Tracing

4 Preview

# 1 Review

## 2 Mechanisms

## 3 Process Tracing

## 4 Preview

# Review Case Studies

- Many uses of case studies
- In case comparisons (last week), we focused on scoring cases on variables to test theories *between cases*
- Now we focus on *within-case* comparisons

# Causal Process Observations

- Definition: “An insight or piece of data that provides information about the context, process, or mechanism, and that contributes distinctive leverage in causal inference”<sup>1</sup>
- Might be used to:
  - Inductively generate hypotheses
  - Deductively test a chain of causal relationships

---

<sup>1</sup>Brady and Collier 2004, p.277



1 Review

**2 Mechanisms**

3 Process Tracing

4 Preview

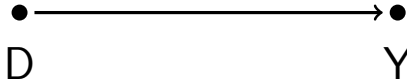
# Four (or five) principles of causality<sup>2</sup>

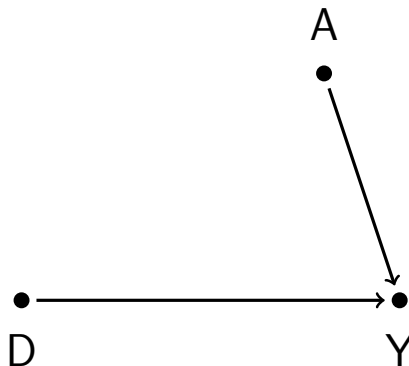
- 1 Correlation
- 2 Nonconfounding
- 3 Direction (“temporal precedence”)
- 4 Mechanism
- 5 (Appropriate level of analysis)

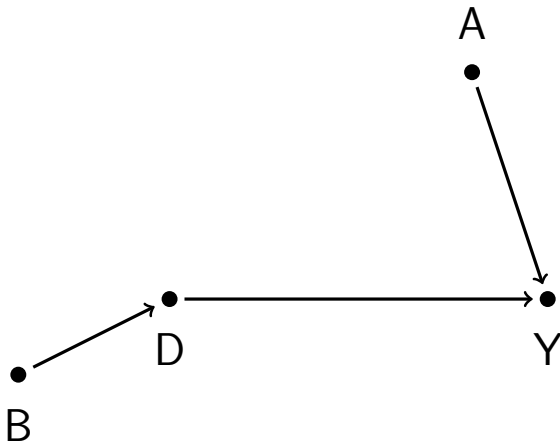
---

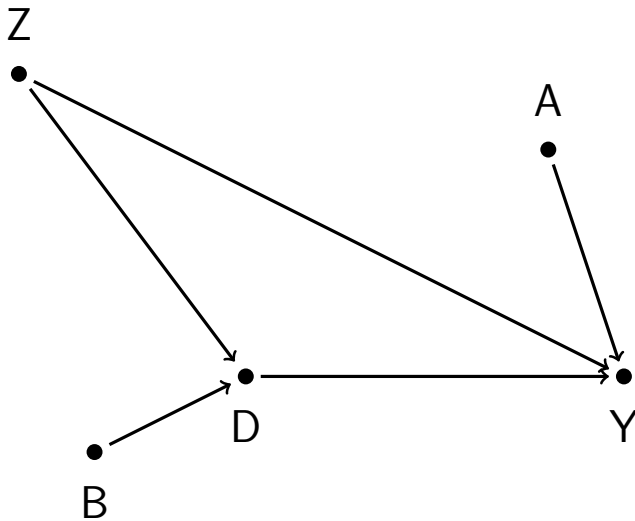
<sup>2</sup>From Kellstedt and Whitten

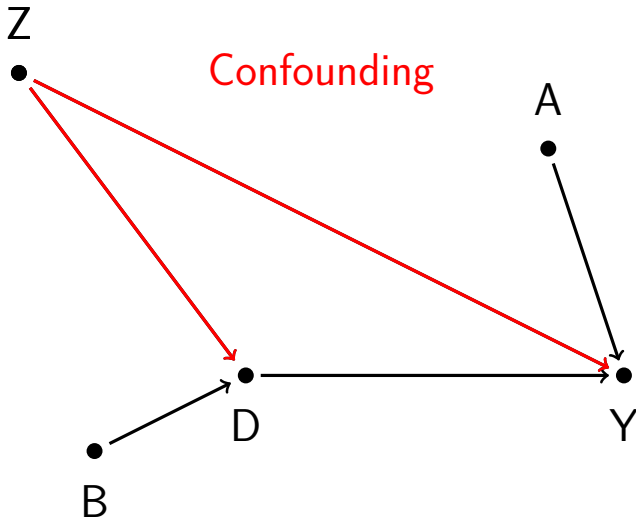


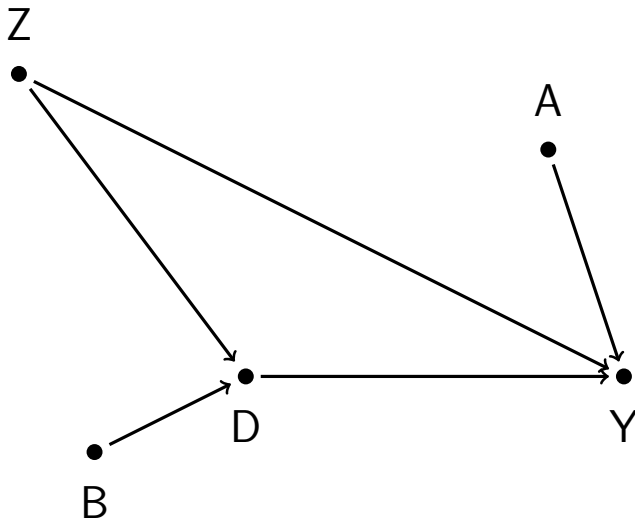












# Four (or five) principles of causality<sup>2</sup>

- 1 Correlation
- 2 Nonconfounding
- 3 Direction (“temporal precedence”)
- 4 Mechanism
- 5 (Appropriate level of analysis)

---

<sup>2</sup>From Kellstedt and Whitten

# Four (or five) principles of causality<sup>2</sup>

- 1 Correlation
- 2 Nonconfounding
- 3 Direction (“temporal precedence”)
- 4 **Mechanism**
- 5 (Appropriate level of analysis)

---

<sup>2</sup>From Kellstedt and Whitten

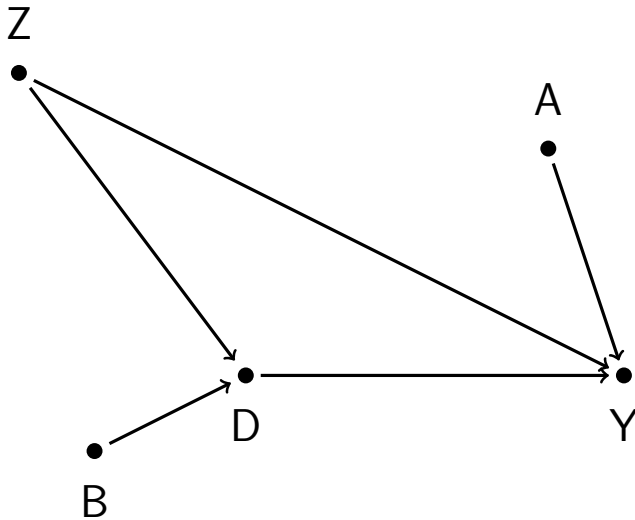


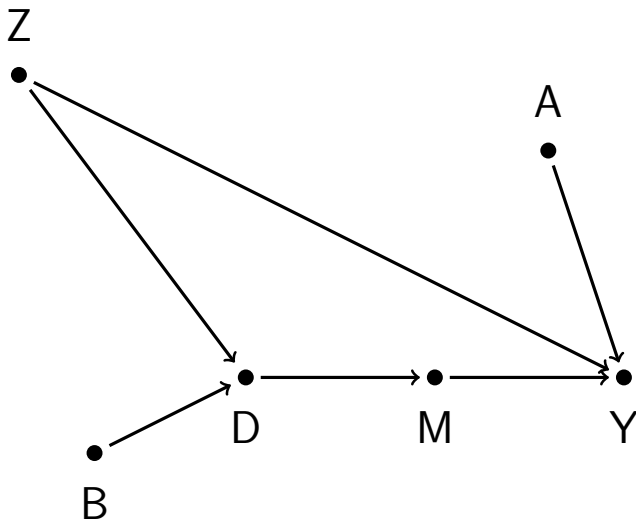
# Mediators/Mechanisms

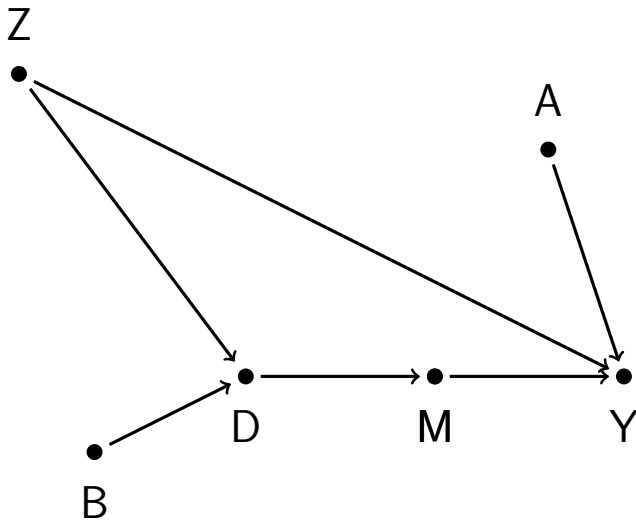
- Definition: “the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest”<sup>3</sup>
- Dropping the tautology, “the pathway(s) or process(es) by which an effect is produced”
- Allows us to distinguish:
  - *Direct* effects
  - *Indirect* effects

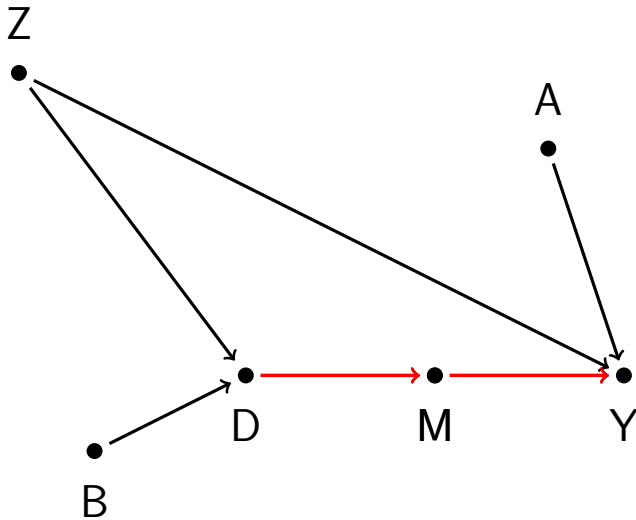
---

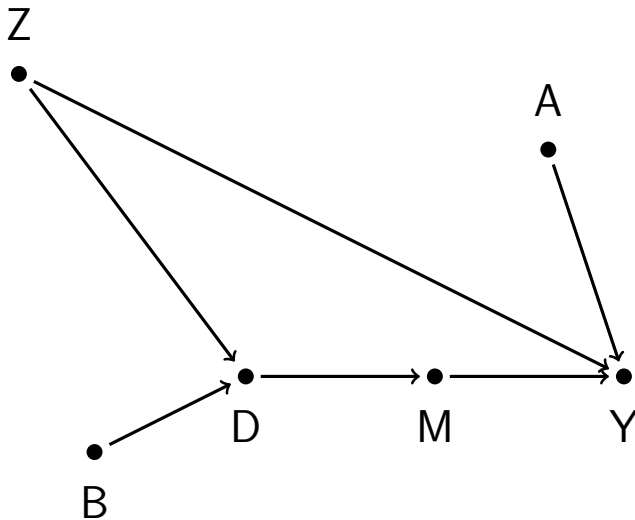
<sup>3</sup>p. 1173 from Baron, R.M., and Kenny, D.A. 1986. “The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations.” *Journal of Personality and Social Psychology* 51(6): 1173–1182.











# Two Uses of Studying Mechanisms

- 1 Determine *how* a causal effect comes about
- 2 Establish seemingly disconnected cause and outcome through a chain of smaller causal effects

# 1. The *how* of the *why*

- A causal effect is an explanation of *why* something occurs
- Mechanisms explain how that affect occurs



# Example: Smoking

We know that  
smoking kills.

*How* does this  
effect occur?



## 2. Sum of small effects

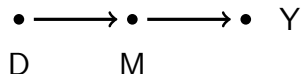
- We may be able to establish a number of small linkages
- The product (multiplication) of these effects is the *total effect*

## 2. Sum of small effects

- We may be able to establish a number of small linkages
- The product (multiplication) of these effects is the *total effect*
- Two ways to conceptualize this:
  - Deterministic causality
  - Probabilistic causality

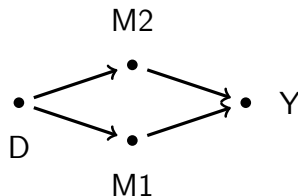
# Pearl's Front Door Criterion

- Same rules for understanding mechanisms as causes generally
- Mechanisms must be:
  - exhaustive
  - isolated



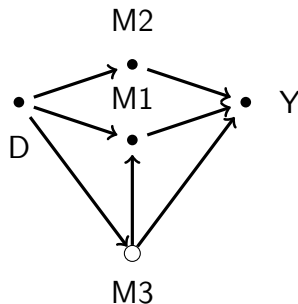
# Pearl's Front Door Criterion

- Same rules for understanding mechanisms as causes generally
- Mechanisms must be:
  - exhaustive
  - isolated



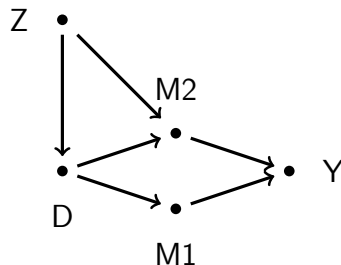
# Pearl's Front Door Criterion

- Same rules for understanding mechanisms as causes generally
- Mechanisms must be:
  - **exhaustive**
  - isolated



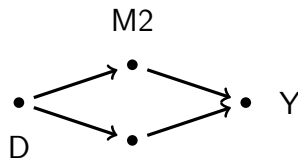
# Pearl's Front Door Criterion

- Same rules for understanding mechanisms as causes generally
- Mechanisms must be:
  - exhaustive
  - **isolated**



# Pearl's Front Door Criterion

- Same rules for understanding mechanisms as causes generally
- Mechanisms must be:
  - exhaustive
  - isolated







# Do We Care About Mechanisms?

Write for two minutes

- Is understanding a mechanism necessary for causal inference?
- When should we be satisfied that we have “bottomed out” a causal process?

1 Review

2 Mechanisms

3 Process Tracing

4 Preview

# Process Tracing

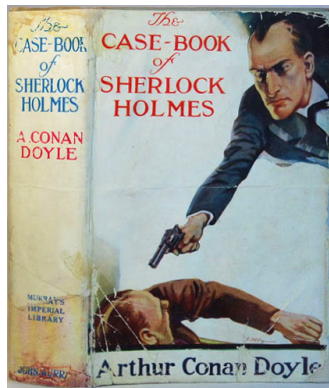
- Definition: “analysis of processes of change that seeks to uncover causal mechanisms and causal sequences”<sup>4</sup>
- Single-case method
- Focused on gathering CPOs
- Sequence of counterfactuals

---

<sup>4</sup>p.300 from Brady, H.E., and Collier, D. 2004. *Rethinking Social Inquiry*. Rowman & Littlefield.

# Inductive Process Tracing

- Broad search for sequential steps necessary for an event to occur
- No *a priori* expectations to test
- Analogous to detective work



Source: Public Domain

# Deductive Process Tracing

- Sequence of within-case hypothesis tests
- Theory or extant evidence guide chosen comparisons
  - May iterate if there is no or very weak evidence for one's hypothesis(es)

# Four Process Tracing Tests<sup>5</sup>

Broadly consistent with Neyman-Pearson hypothesis testing.

- 1 Straw-in-the-wind test
- 2 Hoop test
- 3 Smoking gun test
- 4 Doubly decisive test

---

<sup>5</sup>Note: I am not a fan of this typology.

# Major Caveat: Uncertainty

- Our certainty about a causal relationship is a direct function of sample size
- Case studies methods have small sample sizes
- Process-tracing is generally a single-case design
  - Reduce uncertainty by finding within-case variation
  - Accept only high certainty about specific case





1 Review

2 Mechanisms

3 Process Tracing

4 Preview

# Research Design Proposal

- Instructions posted on Moodle
- Use class sessions to discuss topics
- Don't worry about design now
- Focus instead on topics, questions, and theories
- Should not be same as dissertation topic

# Coming weeks (MT and LT)

- Methods of data collection
  - 1 Text
  - 2 Interviews/Surveys
  - 3 Observation
- Problem Set 4 (due in December)
- Shift to methods of quantitative data analysis

