PLSC 308: Introduction to Political Research

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Validity

Internal Validity

"...whether the...treatment is, in fact, responsible for any measured changes in a dependent variable."

– Gray et al. (2007)

External Validity

"...the degree to which we we can be confident that the results of our analysis apply not only to the participants in the study, but also to the population more broadly construed."

– Kellstedt and Witten (2009)

Validity: Tradeoffs

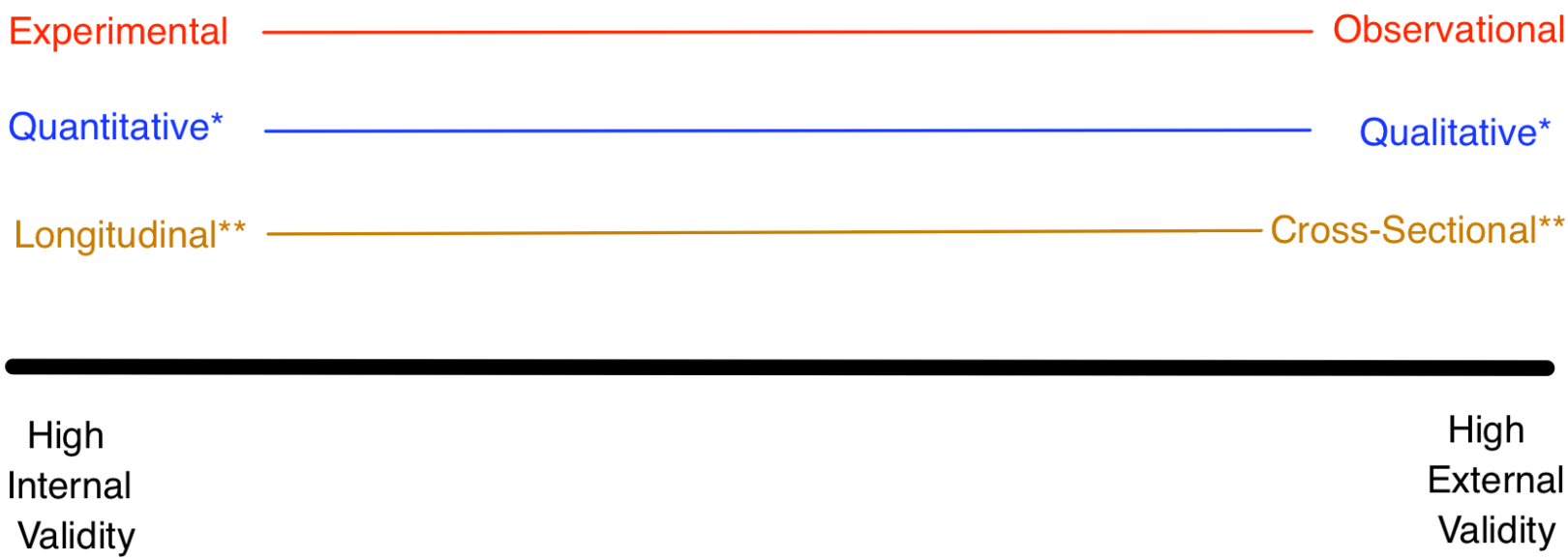
An unfortunate fact:

Social phenomena are complex and multi-causal.

Implications:

1. *All* our models are "wrong" (cf. Box 1976).
2. Internal and external validity often *trade off*.

Some Tradeoffs



* Loosely speaking...

** VERY loosely speaking...

What Social Scientists Do

The ideal:

$$\{\text{Describe, Explain, Predict}\}$$

The reality:

$$\{\text{Describe, } \textbf{Explain,}_{\text{Predict}}\}$$

Causality

Simple Causal / Recursive Relationship:

$$X \longrightarrow Y$$

Reverse Causal Relationship:

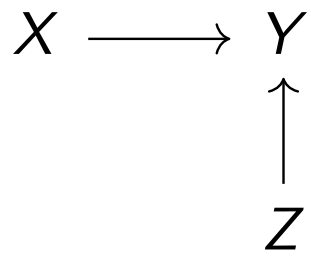
$$X \longleftarrow Y$$

Reciprocal / Nonrecursive Relationship

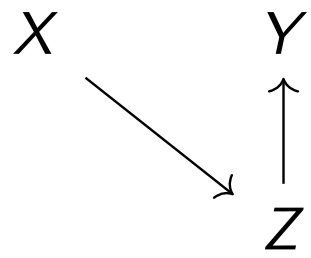
$$X \longleftrightarrow Y$$

A Third Factor (Z)

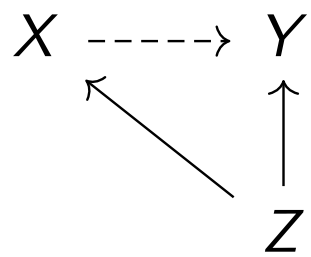
Orthogonal:



Mediating:



Confounding / Spurious:



Causality: Requirements

- Plausible causal mechanism
- Covariation (a/k/a, "correlation")
- Temporal order
- Absence of reverse causality / reciprocity
- Absence of confounding

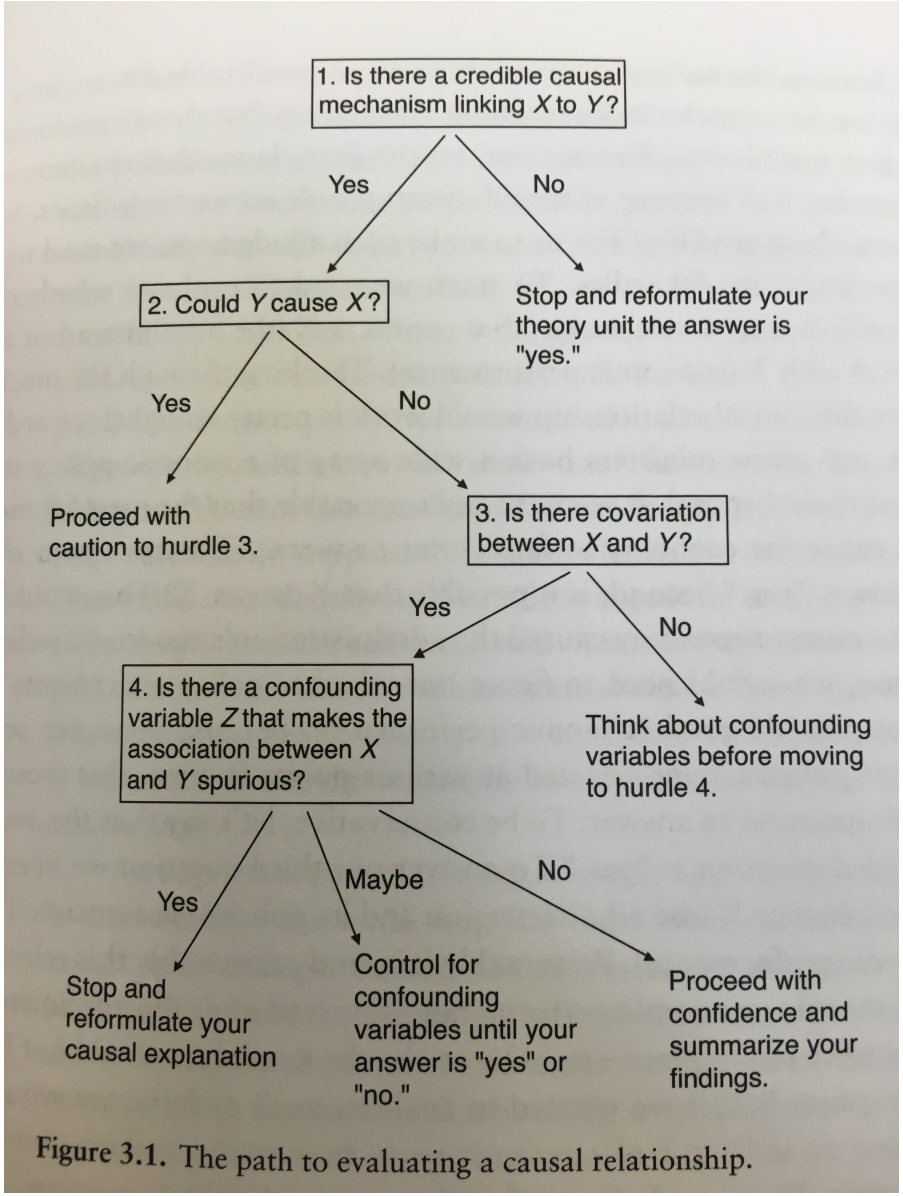


Figure 3.1. The path to evaluating a causal relationship.

– Kellstedt and Witten (2009, p. 51)

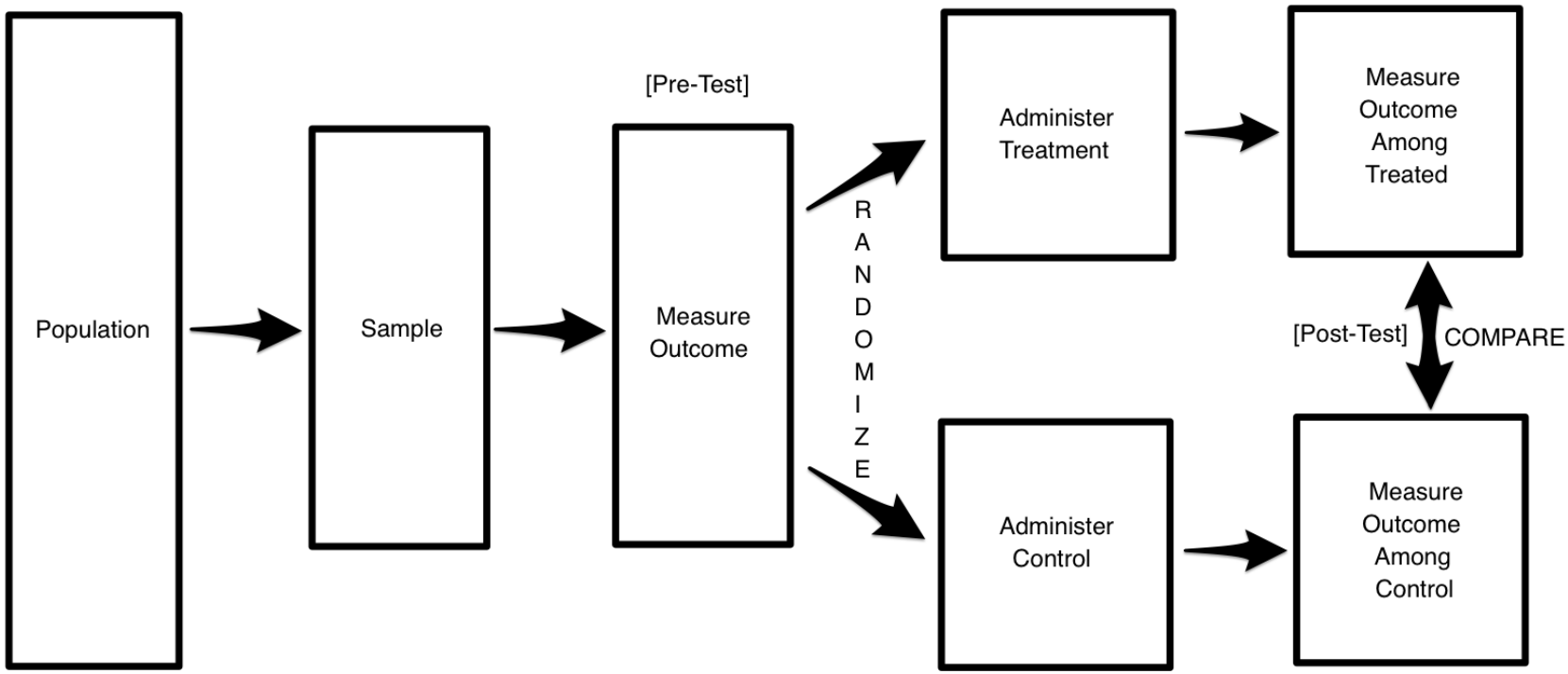
Experiments: The Gold Standard

Key factor: control.

- X is administered by the researcher ("stimulus" / treatment vs. "control" / placebo)
  - Creates a plausible causal mechanism
  - Ensures temporal ordering
  - Prevents reverse/reciprocal causality

- Treatment / control are randomized
  - Ensures that potential confounders are *orthogonal*

Classic Two-Group Experimental Design



Experiments: Threats to Internal Validity

- History
- Maturation
- Mortality
- Selection
- Regression to the Mean
- Test-Subject Interaction
- Demand Characteristics

Two-Handed Experimentalists

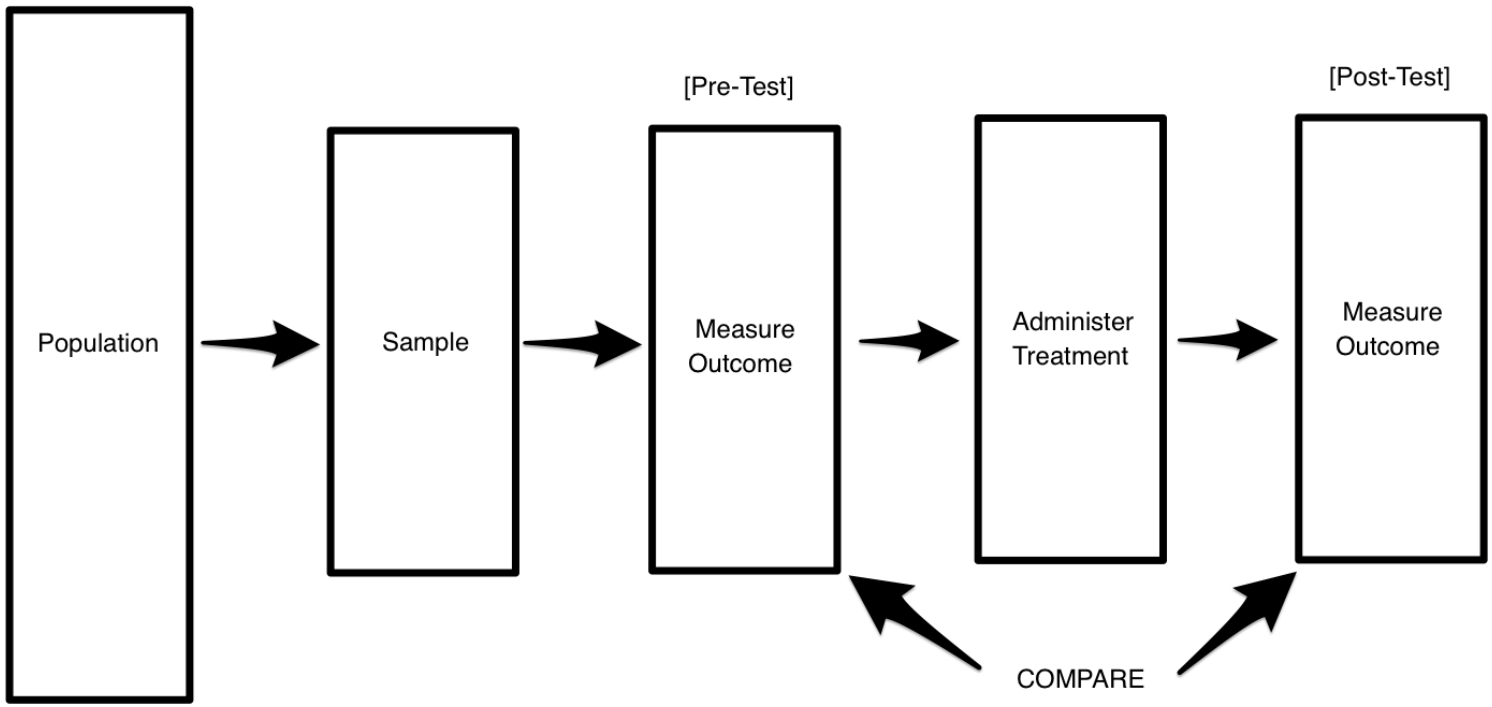
We love experiments because:

- High level of control
- Strong internal validity

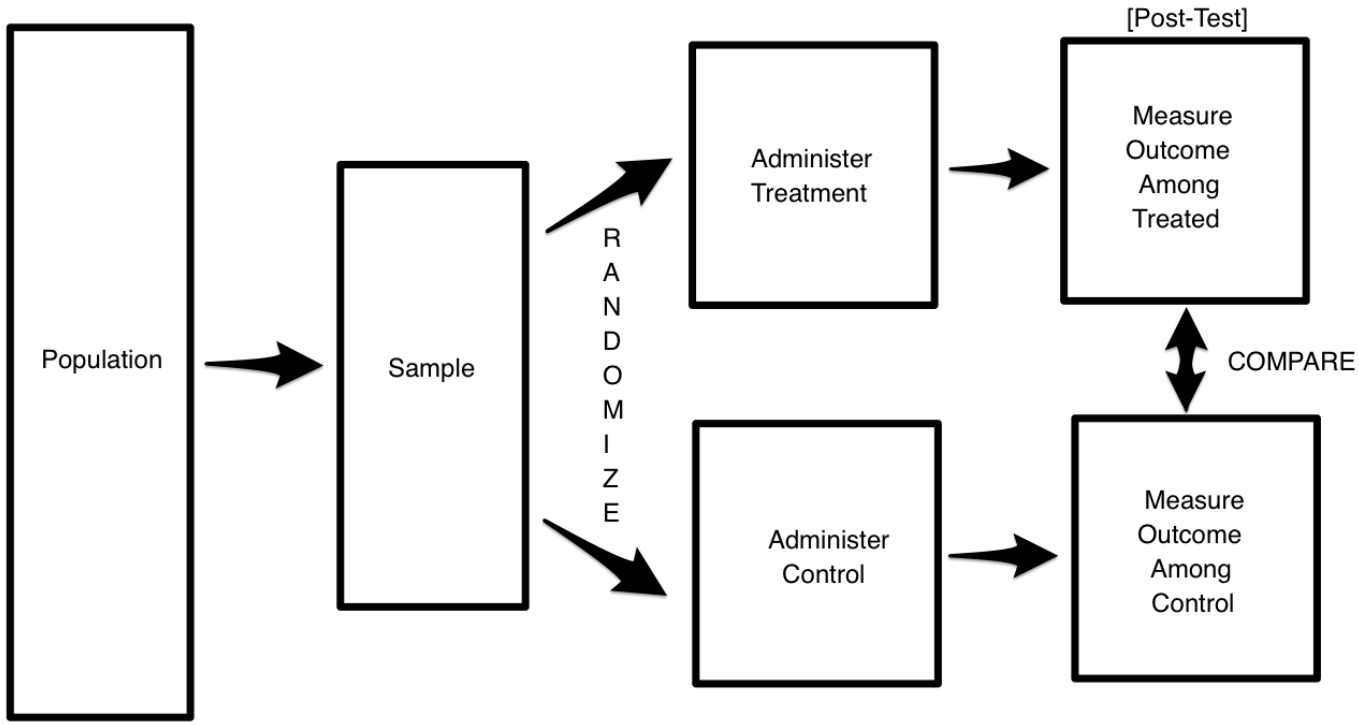
We dislike experiments because:

- High costs
- Low external validity

One-Group Quasi-Experimental Design



Two-Group Posttest Design



Other Experimental Approaches

- "Repeated Measurement" Design
- Multiple Group Design (generalizing treatment)
- Field Experiments
- Natural Experiments
- Intervention Analysis / Interrupted Time Series