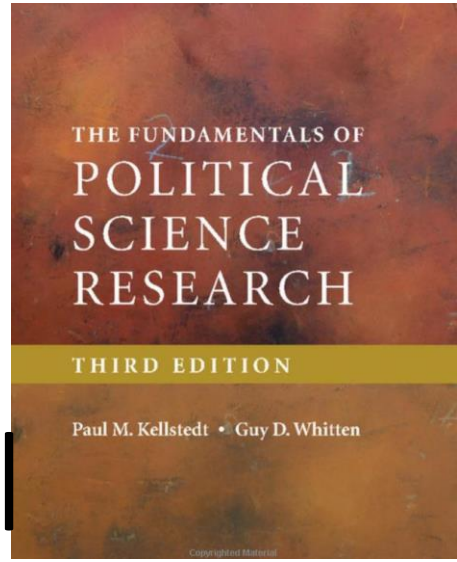

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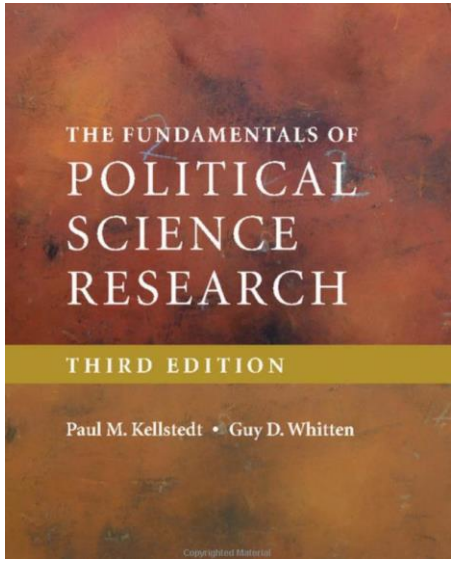
Chapter 3: Evaluating Causal Relationships

Chapter 3 Outline



- Causality and everyday language
- Four hurdles in establishing causal relationships
- Why is studying causality so important? Some examples from political science

Bivariate theories in a multivariate world

- Social reality is multivariate
- But scientific research focuses on a single independent variable to explain a single dependent variable.
- Ceteris paribus: all other things being equal (control for other factors)
- If we don't control for Z, the other possible causes of Y , then our conclusions about whether X causes Y might very well be mistaken.

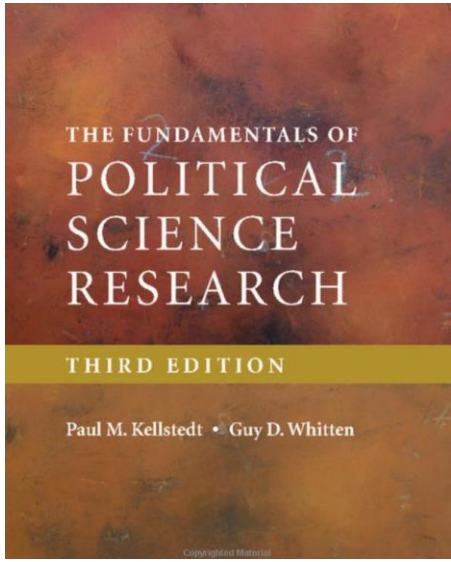
A note on the word "causality"

- Causality: deterministic relationship?
  - The law of gravity (E = mc^2)
  - Daily conversation: Parent's political attitude "affects" children's political attitude
- In social science research, causation is normally understood as probabilistic.
  - Poverty is likely a cause of recurrent civil war
  - Democracies less likely to fight each other

The four causal hurdles

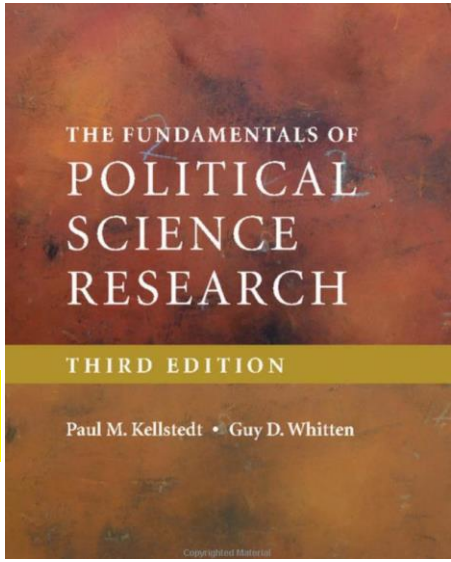
- What is a “best practice” for trying to establish whether X causes Y?

Hurdle 1 (mechanism)



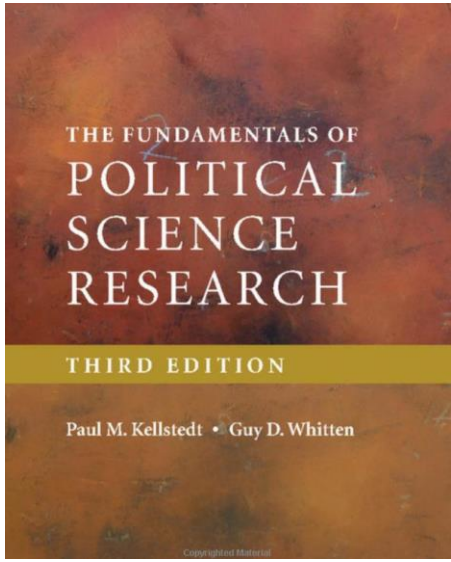
- What do we mean “Is there a credible causal mechanism that connects X to Y ?”
- Can you answer the “how” and “why” questions?
  - E.g., Ice cream sales and crime rate. Why?
  - Simple: “the more outlandish these mechanisms would be, the less confident we are at the theory”
  - But not too obvious: Parent’s political attitude affects children’s
    - Okay, I already know it. So?

Hurdle 2 (reverse causality)



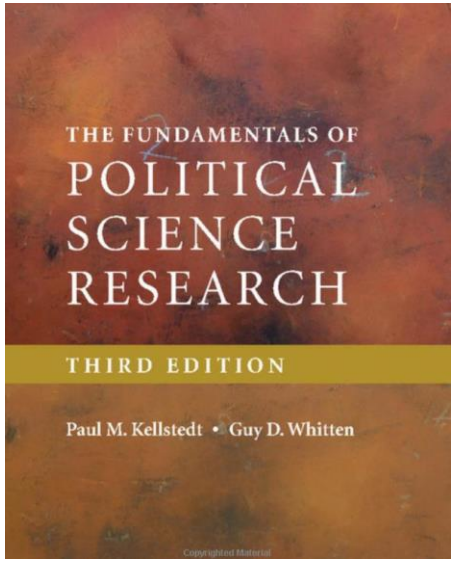
- Can we rule out the possibility that Y could cause X? Thoughts?
  - E.g., Protest violence (X) increases police violence (Y)
  - E.g., War-torn countries (X) will receive more foreign aid (Y)
- Hard to rule out in observational studies
- Need clever research design

Hurdle 2 (reverse causality)



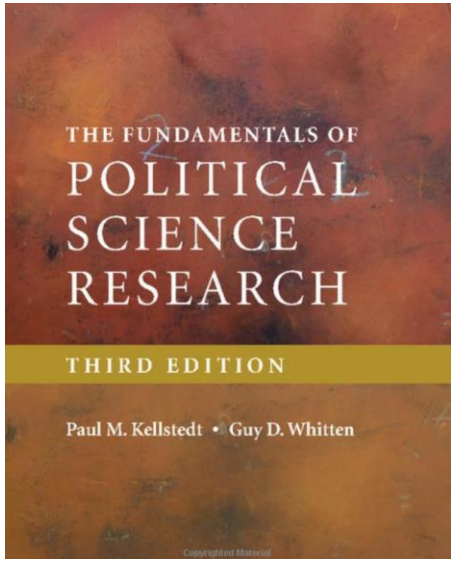
- Can we rule out the possibility that Y could cause X?
  - E.g., Protest violence (X) increases police violence (Y)
    - Police violence increases protest violence
  - E.g., War-torn unstable countries (X) will receive more foreign aid (Y)
    - Foreign aids motivate political groups to compete for resources and thus create more instability.
- Hard to rule out in observational studies
- Need clever research design

Hurdle 3 (correlation)



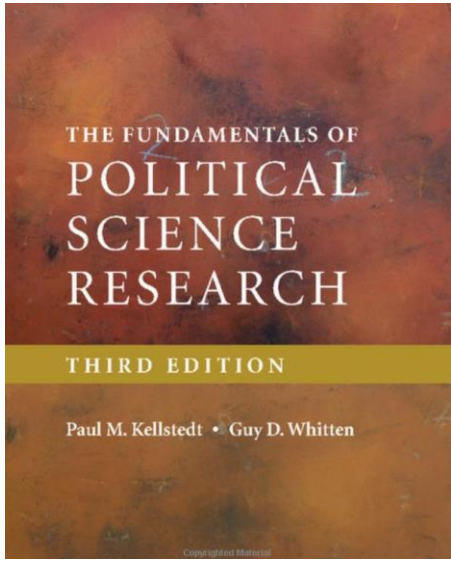
- Is there covariation between X and Y ?
- This is the easiest one
- No, correlation is not causation, but it's normally a key component of causation
  - Statistically significant relationship

Hurdle 4 (omitted variable Z)



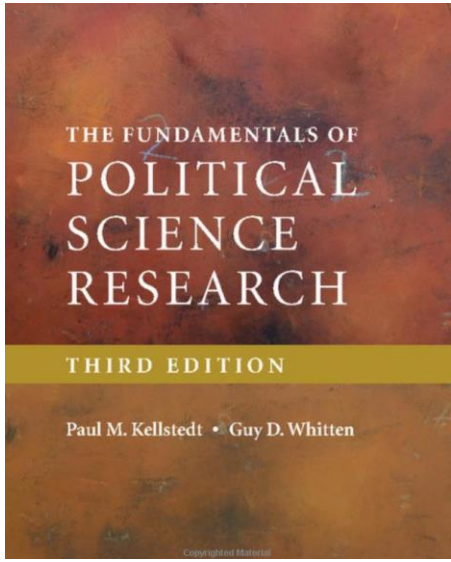
- Have we controlled for all confounding variables Z that might make the association between X and Y spurious?
- This is the toughest hurdle to cross in most social sciences
- Relatively easy for experimental studies

Life satisfaction and democratic stability



- What is the relationship between life satisfaction in the mass public and the stability of democratic institutions?
- Inglehart (1988) finds that life satisfaction (X) is correlated with democratic stability (Y), and argues it is because people in a democratic nation are more satisfied with their lives, they will be less likely to want to overthrow their government.
- Causal hurdles?
  - Reasonable explanation
  - Reverse causality
  - Correlation
  - Confounders

Life satisfaction and democratic stability



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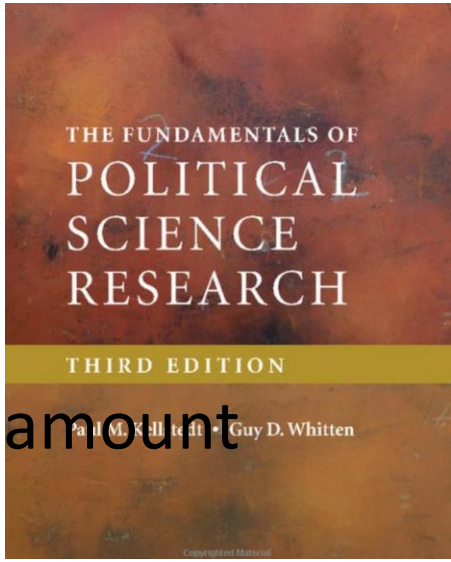
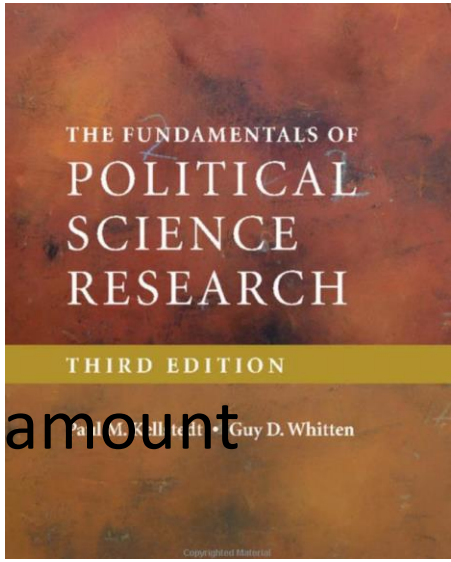
- Inglehart (1988) finds that life satisfaction (X) is correlated with democratic stability (Y), and argues it is because people in a democratic nation are more satisfied with their lives, they will be less likely to want to overthrow their government.
- Causal hurdles:
  - Reasonable explanation: yes
  - Reverse causality: nope (stability creates satisfaction)
  - Correlation: yes
  - Confounders: not sure?

Race and political participation in the U.S.

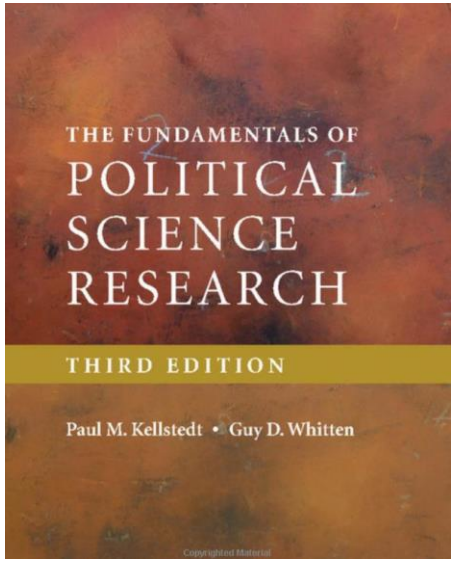


- What is the relationship between an individual's race and the amount of political participation that an individual engages in?
- Many scholars have noticed that Anglos participate more in politics than African Americans do. But is that relationship causal?
- Causal hurdles?
  - Reasonable explanation
  - Reverse causality
  - Correlation
  - Confounders

Race and political participation in the U.S.



- What is the relationship between an individual's race and the amount of political participation that individual engages in?
- Many scholars have noticed that Anglos participate more in politics than do African Americans. But is that relationship causal?
- Causal hurdles:
  - Reasonable explanation: yes (vote suppressing mechanisms)
  - Reverse causality: yes (race can't be changed)
  - Correlation: yes
  - Confounders: nope. not yet control for socio-economic status



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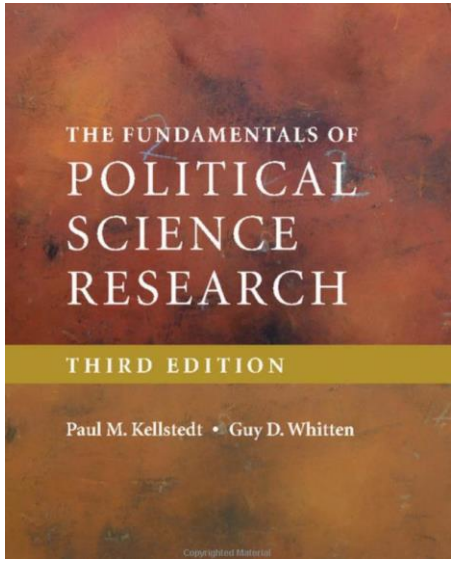
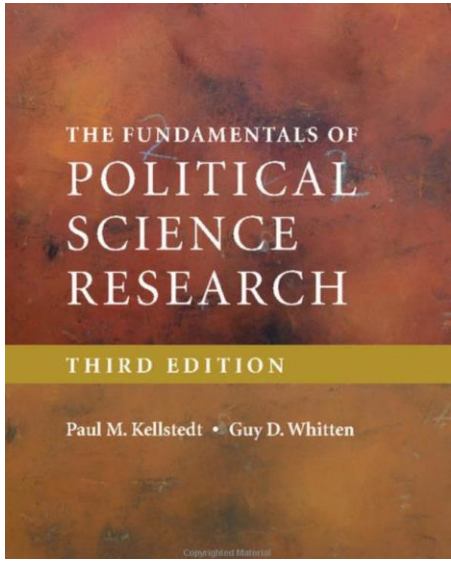
Chapter 4: Research Design

Chapter 4 Outline



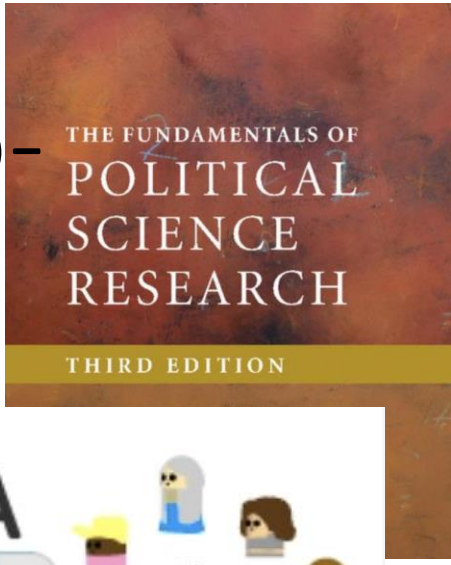
- **<u>Comparison</u>** as the key to establishing causal relationships
- Experimental research designs
- Observational studies

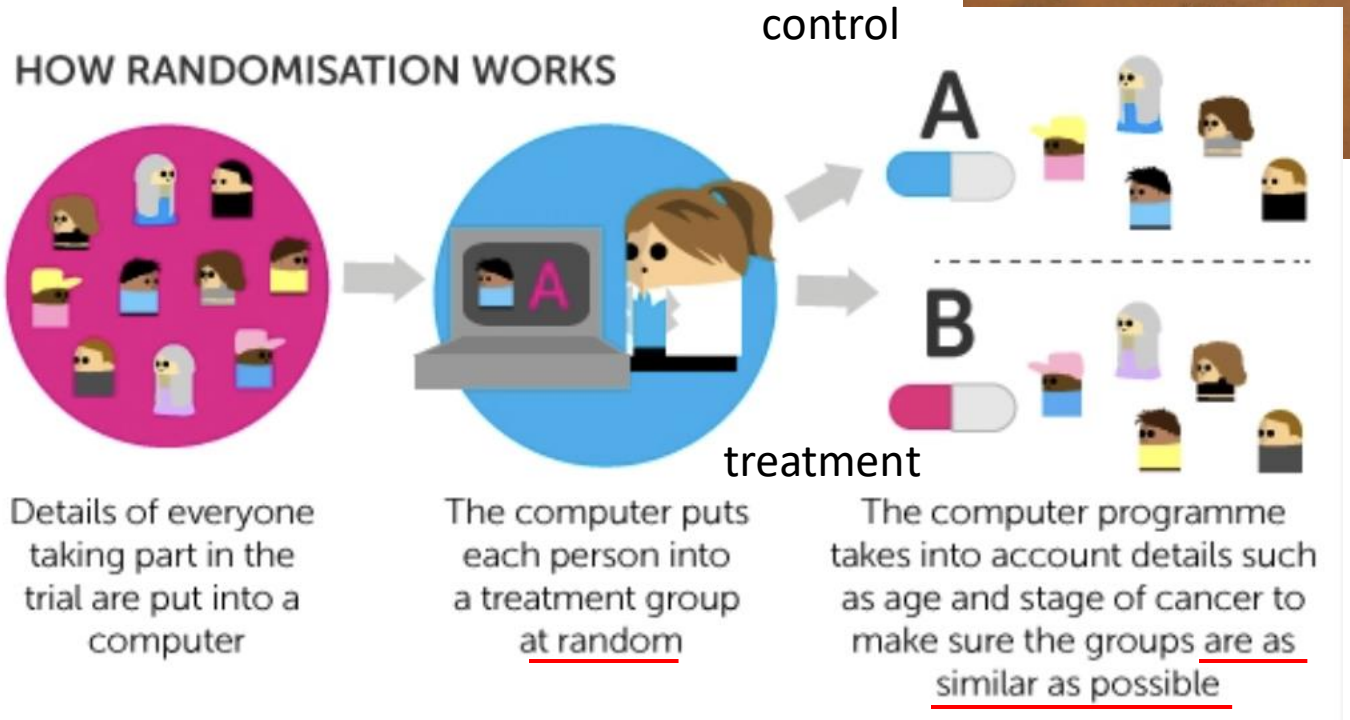
What is being compared to what?



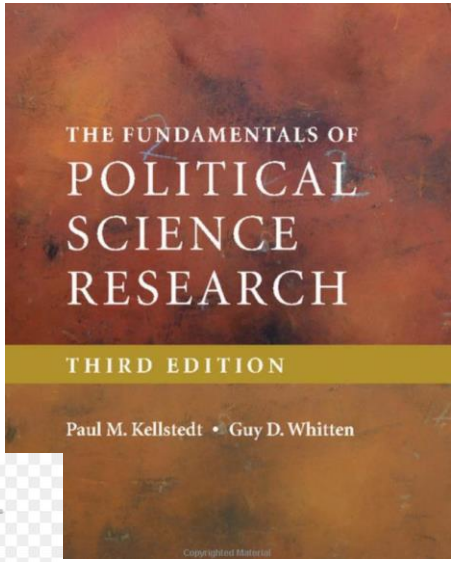
- Making good comparisons is one of the keys of social science.
- Show that:
  - the change in your outcome variable (dep. variable) is a result of the introduction of your treatment variable (indep. variable), compared to the non-treated group.
- What to do?

An experiment: randomized placebo-controlled trial

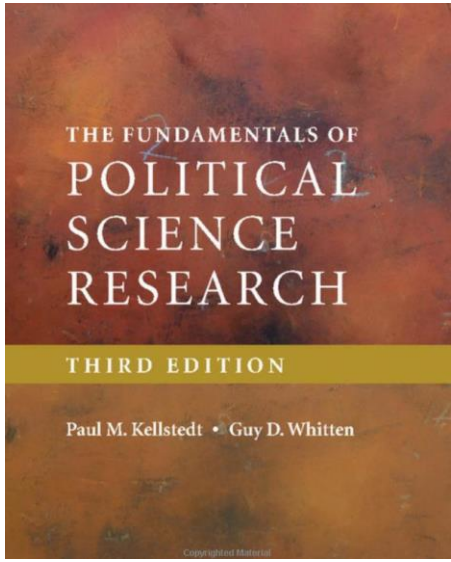




An experiment: randomized placebo-controlled trial

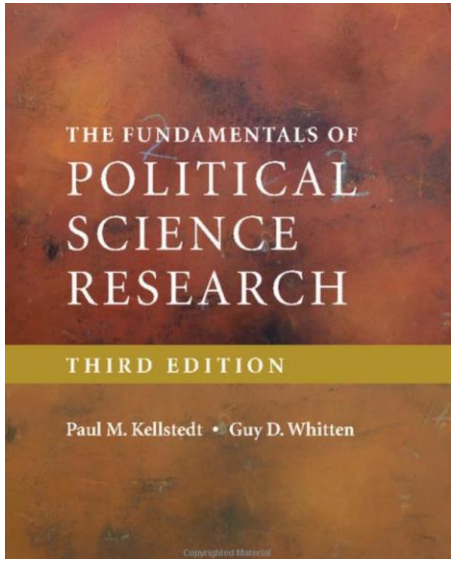


An experiment



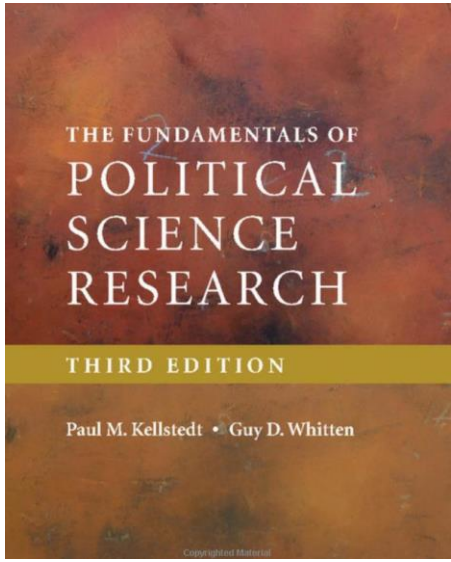
- An **experiment** is a research design in which the researcher both "*controls*" and "*randomly assigns*" values of the independent variable to the subjects.
  - The researcher controls who get the treatment, not the subjects
  - The value of the treatment is randomly assigned to subjects
- These two components--control and random assignment--form a necessary and sufficient definition of an experiment
  - Randomized Controlled Trial: A study design that randomly assigns participants into an experimental group or a control group. As the study is conducted, the only expected difference between the control and experimental groups in a randomized controlled trial (RCT) is the outcome variable being studied.

Experiments and Internal Validity



- How do experiments help us cross the four hurdles?
  - 1. Is there a credible causal mechanism that connects X to Y ?
  - 2. Can we rule out the possibility that Y could cause X?
  - 3. Is there covariation between X and Y ?
  - 4. Omitted variables

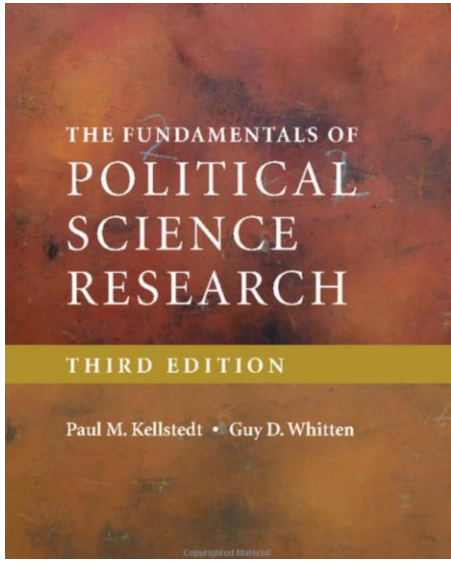
Experiments and Internal Validity



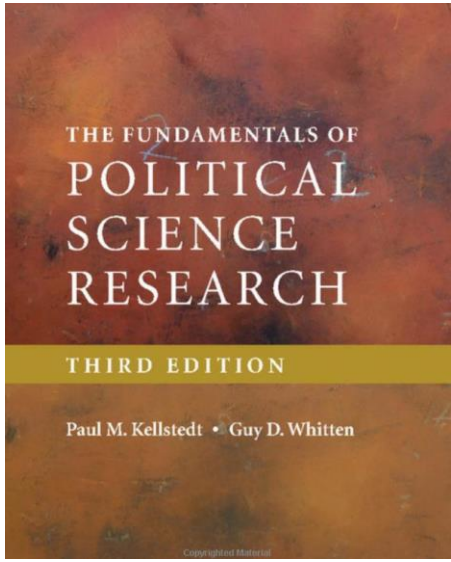
- How do experiments help us cross the four hurdles?
  - 1. Is there a credible causal mechanism that connects X to Y ?
    - **The question of "how"— Not so much powerful**
  - 2. Can we rule out the possibility that Y could cause X?
    - **Powerful**
  - 3. Is there covariation between X and Y ?
  - 4. Omitted variables
    - **Powerful**
- Because experiments deal with the fourth hurdle so effectively, they are said to have high degrees of **internal validity --** that is, the inferences we make about whether X causes Y or not are likely to be correct.
- But suffers from **external validity**: can sample in one country, like Kenya, but hard to do globally

Experiments and Near-Experiments in PS

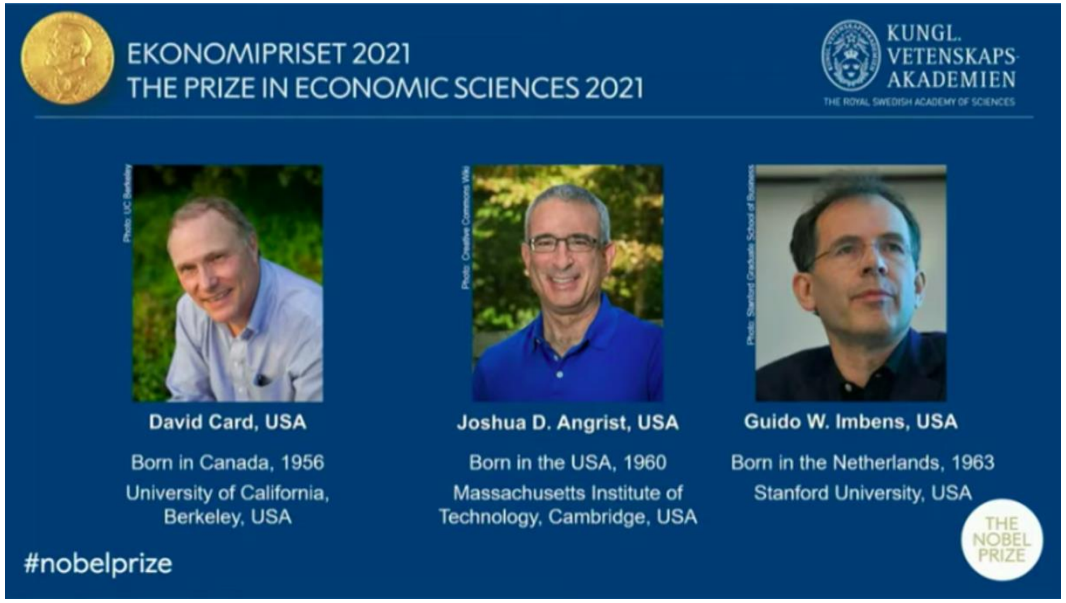
- Survey experiments: in a computer lab or online
- Field experiments: in the real world (like in Pakistan)

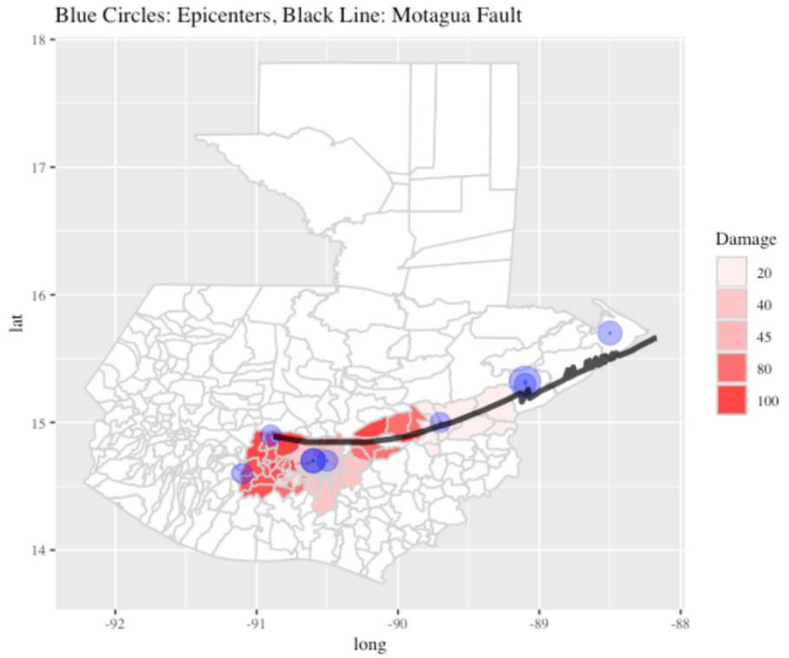


Experiments and Near-Experiments in PS

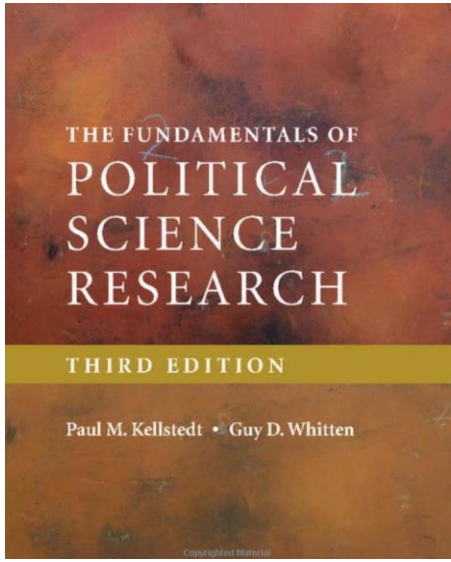


- Survey experiments: in a computer lab or online
- Field experiments: in the real world (like in Pakistan)
- Natural experiments: as if true random assignment (unintended experiments), like a natural disaster



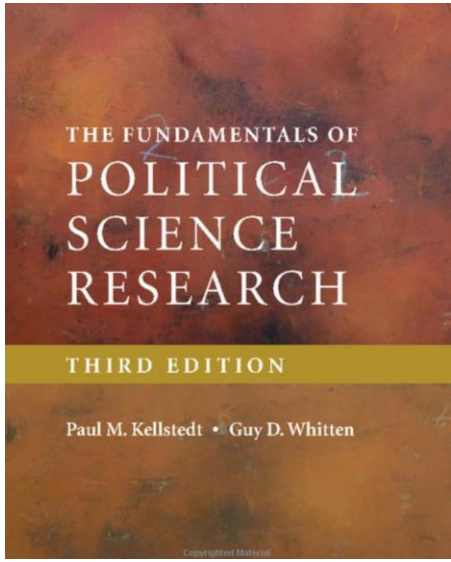


Caveats to experiments



- 1. Can we really assign X to subjects?
  - Can't assign gender; can't assign violence as treatment
  - Topic restricted
- 2. What about **external validity**?
  - Samples of convenience and replication
  - External validity of the stimulus: behavior in a computer lab vs. at home
  - Generalizability
- 3. Are there ethical considerations?
  - E.g. The subjects were asked to press fake shocks until they refuse to do so
  - E.g. Ask Chinese students what are main ways that they participate in protests
  - IRB: Institutional review board

If not an experiment, then what?



- Observational studies: Take the world as it already is and use data analysis to draw inference
- Some say that we cannot demonstrate causality with any degree of confidence, but only correlation → not really
- But be careful in your causal claim
- Use a lot of statistical tools
  - Hurdles 2 (reverse causality) and 4 (omitted variables)