Quasi-Experiments

Volunteers Needed
For a scientific study
Investigating whether people can distinguish between scientific studies and kidney-harvesting scams.
(Healthy type-O adults only)
Take one
Today’s reading concerned what method?
A. Randomized control trials.
B. **Regression discontinuity.**
C. Latent variable analysis.
D. Distribution plotting.
What visual cue on a graph indicates that the treatment had an effect?

A. A break in the plotted line.
B. Widely scattered points.
C. A logarithmic y-axis.
D. A narrow confidence interval.
Today’s Plan

• Quasi-Experiments
• Clicker Review
• Group work
Quasi-Experiments

• When you do not have random assignment
  • Causal inference is always weaker than in an experiment

• Pre-test, post-test designs
• Synthetic controls & Matching (a bit on Friday)
Single-Group Pre-test & Post-test designs

• Pre-test (measure the dependent variable)
  • Then Treatment (all cases)
  • Then Post-Test (measure the dependent variable again)
• Each case is its own control
  • Pre-test score is the “control” condition
  • Post-test score is the “treated” condition
  • The difference between the two is the estimated effect of the treatment.

• What are the weaknesses here?

• Maturation effects & history effects are big problems
Multiple-Group Pre-test & Post-test designs

• Pre-test (measure the dependent variable)
  • Then Treatment (some cases, not others)
    • No random assignment
  • Then Post-Test (measure the dependent variable again)

• To see the treatment effect, we compare change in treated cases to change in untreated (control) cases

• What are the weaknesses here? How does this improve over a 1-group design?
One-Group Pre-test & Post-test Examples

• SAT prep class
  • Pre-test = practice SAT
  • Treatment = everyone takes a class
  • Post-test = take another practice SAT
• Can we think of a multiple group version of this?

• Event studies
• Effect of terrorist attacks on nationalism
  • Pre-test = measure of nationalism before attack
  • Treatment = 9/11
  • Post-test = measure of nationalism after attack
• Could we think about a multiple-group version of this?
Multiple Group Examples

• Theory: Drought -> economic distress -> eases rebel recruiting -> higher risk of conflict

• Hypothesis: Droughts increase the likelihood of civil conflict in agriculture-dependent developing countries.

• What is the best unit of analysis for a test of this hypothesis?
  • A. The world
  • B. Countries
  • C. Individuals
  • D. Rebel groups
  • E. Rebellions
Multiple Group Examples

• Theory: Drought -> economic distress -> eases rebel recruiting -> higher risk of conflict

• Hypothesis: Droughts increase the likelihood of civil conflict in agriculture-dependent developing countries.

• What is the population of interest in this study?
  • A. All countries in the world
  • B. All developing countries
  • C. All agriculture-dependent developing countries
  • D. All developing countries that experience civil conflict
  • E. All countries that experience civil conflict
Multiple Group Examples

• Theory: Drought -> economic distress -> eases rebel recruiting -> higher risk of conflict

• Hypothesis: Droughts increase the likelihood of civil conflict in agriculture-dependent developing countries.

• What is the dependent variable in this study?
  • A. Drought
  • B. Risk of conflict
  • C. Agricultural productivity
  • D. GDP per capita
Multiple Group Examples

• Theory: Drought -> economic distress -> eases rebel recruiting -> higher risk of conflict

• Hypothesis: Droughts increase the likelihood of civil conflict in agriculture-dependent developing countries.

• What is the treatment variable in this study?
  • A. Drought
  • B. Risk of conflict
  • C. Agricultural productivity
  • D. GDP per capita
Multiple Group Examples

• Theory: Drought -> economic distress -> eases rebel recruiting -> higher risk of conflict

• Hypothesis: Droughts increase the likelihood of civil conflict in agriculture-dependent developing countries.

• What does the pre-test in this study measure?
  • A. Drought level in the first time period
  • B. Level of conflict in the first time period
  • C. GDP per capita in the first time period (economic distress)
  • D. Size of rebel forces in time period 1
Multiple Group Examples

- Theory: Autocracies are more likely than democracies to compete over natural resources militarily.
  - Problem: Availability of natural resources $\rightarrow$ regime time
    - This is called the resource curse.

- In 2008, artic ice receded, revealing lots of resources.
  - So 2007 regime type is not caused by these resources.

- Let’s work through this design…
Group Work

- Groups of 2-3, 1 paper per group. Put each student name on the paper.
- My theory is that, for families in Haiti, having a parent migrate to the US increases educational attainment by the children left back home.
  - IV = Parent migrated to US or not (dummy variable)
  - DV = Years of schooling completed by child
1. Describe (in 1-3 sentences) a causal mechanism that would cause a **positive** effect of parental migration on child educational attainment.
2. Describe (in 1-3 sentences) a causal mechanism that would cause a **negative** effect of parental migration on child educational attainment.
3. Name at least two extraneous variables that might confound our results if we used a cross-sectional design with observational data:
   a) One must be observable and measurable
   b) One must be unobservable
4. Imagine we were able to run a true experiment with 2 years between treatment and post-test.
   1. How would we draw our sample and assign our groups?
   2. What is the treatment condition and what is the control condition?
   3. Discuss the possibility for selection bias, differential attrition, and endogenous change.
5. Can you think of any as-if randomization we might exploit to approximate a randomized control trial?