POLS201 Spring 2019

Pearl and the Ladder of Causation

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January 23 and 25

Good Afternoon and Welcome!

- Welcome to Research Methods in Political Science
    - Let's start the semester with easy questions.
    - Answer them on the worksheet.

The Warmup for this Class

- The real challenge of this class: It's two classes in one.
    - You'll discover some ideas and vocabulary of research and inference.
    - You'll *do* the work of original research.
    - The work: think of many small tasks, spread out.
    - AND IT'S DOABLE! See my comments on your worksheet. . .

Two New Wrinkles for this Semester

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- You will do the computer work in R and RStudio, not Stata.
    - R is free, open source.
    - If you have a laptop, you can do all of your computer work on it.
- Slides will be a documentation aid. We'll use judiciously.

For Friday:

- Read Kellstedt and Whitten Section 1.3 (just a few pages)
- Optional: Imai chapter 1 for an R confidence boost
- We'll look at RStudio, finish these slides, talk about the schedule.

The Deliverables

- A term paper and various building assignments
    - An extensive guide to the paper sits on Moodle
- Concept and vocab mastery with two exams
- Some quizzes, some labs, some homework
- All of the stuff appears in Moodle and you'll get an email from me each Friday afternoon
- No schedule on the syllabus; Moodle is the system of record

Classtime Will Combine in roughly equal parts. . .

- Lectures and Class Discussion
- Exercises
- Lab Work
- A personal computer will be an important asset
- If that's a bad assumption, let me know offline
- Two books and Moodle readings. Kellstedt and Whitten is the important one.

All set?

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■ Let's introduce some vocabulary

Let's Start with Some Basic Ideas

- Empirical vs. Normative Research Questions
- Quantitative vs. Qualitative Research
- Methods Forward vs. Reverse Causal Inferences
- Probabilistic vs. Deterministic Models
- Research Questions vs. Hypothesis vs. Theories

Empirical Claims

- A claim about how the World *is* or *could be*
- Empirical claims can be answered by observation
- "Raising taxes will reduce the GNP"
- "Partisan polarization reduces voter turnout"
- "Democracies are more likely to fight a war"

Empirical Claims

- The terms may be vague, the claims may be hard to observe, but observable in theory.
- Does this bumper sticker make an empirical claim?

Normative Claims

- How the world *ought to be*
- Normative questions are answered by values
- "The richest people should pay more taxes"
- "Partisan polarization should be eradicated""
- "War is bad and democracy is good"
- "The person who invented kale should be imprisoned"

Normative Claims

- Normative claims may be defensible, but they not testable by observation, even if everyone believes them.
- IMPORTANT: "Normative" does not just mean "hard to observe"

Qualitative vs. Quantitative Research

- Both strategies share a lot:
    - They can answer the same (big picture) research questions
    - Both are ways to answer empirical questions
    - Both involve the analysis of data (information)
    - Both are associated with methodologies
    - Data can be anything you observe: text, behavior, responses, and much more.

Forward vs. Reverse Causal Inference

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- **Forward inference:** "What happens to Y if we do X"
    - What are the effects of causes?
- **Reverse inference:** "What causes Y"
    - What are the causes of an effect?

Forward and and Reverse Causal Inference

- Both could answer the same ("big picture") research question
    - e.g., "What Causes War?"
- Forward: "What is the effect of capitalism on war"
- Reverse: "What caused the Vietnam War"

Probabalistic vs. Deterministic Reasoning

- Probabilistic: A cause increases the probability of effect.
- Deterministic: A cause necessarily produces an effect.
- Important point: Demonstrating a probablistic relationship is suggestive, but not proof positive.
- As you will see: "Cause" is a slippery word and complicated idea.

The Building Blocks of Research

- Research Question
    - The general motivation of your research.
- Theory
    - Statements that explain a phenomenon
- Hypothesis
    - A prediction that can be empirically verified.

What is a *Theory*?

- A theory is a body of statements that systematize knowledge of and explain phenomenon
    - Inductive: "X could mean Y"
        - "The ground is wet, therefore it **could** be raining"
    - Deductive: "X necessarily means Y"
        - "It is raining, therefore the ground **must** be wet"

Are theories always true? Nope.

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- Deductively valid theories are based on assumptions.
- Theories can only be proven wrong, not categorically right.
  - Ask Isaac Newton, whose theory of gravity was trumped by Einstein.
- Did Newton *invent* gravity? Actually, yes... because gravity is a theory.

Most Common Mistake

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- Confusing the *hypothesis* and the *theory* is incredibly common.
- Here is one distinction:
    - A hypothesis is WHAT you are predicting.
    - A theory is WHY you are predicting it.

Example 1

- **Research Question:**
  - What factors affect support for gun control legislation?
- **Theory:**
  - Fear causes individuals to seek out ways to fortify themselves and gain power in their environment.
  - Gun ownership is one way to satisfy this desire.

Example 1

- **Hypothesis:**
  - Negative perceptions of personal safety are associated with opposition for gun control legislation.

Example 2

- **Research Question:**
  - What affects voter turnout in developing democracies?

- **Theory:**
  - Power-sharing governance structures allow many political parties to simultaneously take the reigns in governance.
  - Consequently, voter apathy shrinks because all voters know that their preferred party will play a role in governance.

Example 2

- **Hypothesis:**:
  - Comparing nations, power sharing governance structures will increase voter participation

What Makes for a Good Theory?

- It can generate testable hypotheses that are consistent with relevant evidence.
- It is general and simple.
- It is *falsifiable*.

More examples of theories

- Majoritarian political systems sustain fewer parties than systems based on proportional representation.
- Behavior of legislators is motivated by the desire for re-election.
- Party leaders in Congress are stronger when partisan polarization is greater.

Independent Variables v. Depdendent Variables

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- The important idea from Kellstedt and Whitten 1.3
- Essentially:
    - Independent variables (IV) are *causes*
    - Dependent variables (DV) are *effects*
    - e.g., Economic performance (IV) —>
    - The performance of an incumbent seeking re-election (DV)

Mantra: Explain more with less

For Monday:

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- Read the Judea Pearl chapter
- Confirm you have set up your RStudio Cloud account
- Start thinking about your research question