Lecture 5: Scientific Method, Wicked Problems

Joey Huddleston (for Benjamin Graham)
Some Housekeeping

• For some of you, today is the first day of sections
  • VKC 252, 12pm and 1pm
  • We’re going over empirical questions
  • We’re discussing the homework
• Clickers
  • Get them registered already
Reading Quiz

According to the listening and the article, what is the best predictor of terrorist attacks?

a) Separatist movement involvement.

b) Religion.

c) Psychological state.

d) Secular beliefs.
Reading Quiz

How does Professor Pape define terrorism in the video?

a) The use of terror as a government policy.
b) The willful destruction of public property.
c) The killing of innocents for a political cause.
d) Any act that causes the death or destruction of state officials or property.
Reading Quiz

According to the video, which organization does not currently have a clear definition of terrorism?

a) The US government  
b) The UN  
c) The University of Chicago  
d) Amnesty International
An Outline for Today

• Continuing with the scientific method
• How the scientific method helps us tackle wicked problems
  • Terrorism as a case study
The Terrorism Pieces

• What do you think?
• Have you ever heard this angle before?
Why we test repeatedly

- **Make Observations**
  What do I see in nature? This can be from one's own experiences, thoughts, or reading.

- **Think of Interesting Questions**
  Why does that pattern occur?

- **Refine, Alter, Expand, or Reject Hypotheses**

- **Formulate Hypotheses**
  What are the general causes of the phenomenon I am wondering about?

- **Gather Data to Test Predictions**
  Relevant data can come from the literature, new observations, or formal experiments. Thorough testing requires replication to verify results.

- **Develop Testable Predictions**
  If my hypothesis is correct, then I expect a, b, c, ...

- **Develop General Theories**
  General theories must be consistent with most or all available data and with other current theories.
Gather Data: The Experiment

• Ideal data is from controlled experiment
  • Control and treatment groups
  • Random assignment
  • Pre-test and post-test measurement
  • Compare DV
• With great control, you can more easily identify causal relationships
  • Use experimental design as target
Gather Data: The Survey

- Ask people for information
  - Demographics
  - Opinion
  - Life events
  - Economic information
- Randomly sample chosen population
  - Sometimes, “overrepresent” certain groups
- Datapoints have to be simplified
Gather Data: Data from Nature

- Lots of processes in the social world generate data
  - Anything with money
  - Government data
  - News media
- Collect and aggregate, use statistical tools to test relationships
Gather Data: Observe and Record

• Qualitative data gathering
  • In depth knowledge of cases
  • You are the origin of the data
• Very good for developing theories about specific workings of known phenomena
• Ethical issues
• Case selection is key
  • Why?
Develop General Theories

• Because we seek general theories.
• Realism and constructivism
  • When would states intervene in other states’ conflicts?
Develop General Theories

• General theories inform all of the literature
  • What is “the literature?”
• Specifics of our hypotheses, tests, and results are what sharpen our general theories
  • Chalk another one up
  • Find new conditions
Develop General Theories

- Morgan’s Sphinx Moth
Exploratory and Deductive Studies

1. Make Observations
   What do I see in nature?
   This can be from one's own experiences, thoughts, or reading.

2. Think of Interesting Questions
   Why does that pattern occur?

3. Formulate Hypotheses
   What are the general causes of the phenomenon I am wondering about?

4. Develop Testable Predictions
   If my hypothesis is correct, then I expect a, b, c, ...

5. Gather Data to Test Predictions
   Relevant data can come from the literature, new observations, or formal experiments. Thorough testing requires replication to verify results.

6. Refine, Alter, Expand, or Reject Hypotheses

7. Develop General Theories
   General theories must be consistent with most or all available data and with other current theories.
Wicked Problems: Terrorism

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Terrorism: Observations

• Common observations you hear about terrorism

• Easy to spot one pattern
  • But is it causal?
Terrorism: Interesting Questions

- Descriptive questions
- Why questions
Terrorism: Formulate Hypotheses

• Look for clues
  • If we take media story, we might say
  • H1: Religious extremism causes terrorism.
Definitions

• For these steps, how you define is very important

• Definitions
  • Clear and specific
  • Avoid open to interpretation
  • Clear about use and purpose

• May vary between theory and test
  • Link is clear and well defended
Testable Predictions

• General concepts yield measureable variables
  • What does Pape use to measure “terrorism”?
  • What about “religious extremism”?
Terrorism: Test Predictions

• Hypothesis wrong. Reject and alter.
  • H2: Occupation causes terrorism.
• Operationalize.
  • Try it with “occupation”.

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Refine, Alter, Expand, or Reject Hypotheses

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Terrorism: General Theories

• What kind of general theory could this finding support?
  • Doesn’t have to be IR

• What general theory does this finding fail to support?
  • What null hypothesis does this “fail to reject”?
Terrorism: Summing Up

• First observations are biased
• So questions and hypotheses are biased
  • But with clear definitions and tests, we can move away from biased idea and towards knowing true relationship
• General theories are improved
• Future observations are improved
Cyclical

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