PSCI2300 The Study of Politics
Research Questions, Hypotheses, and Variables

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How a Typical Scientific Paper is Structured

1. Introduction: specify a research question
2. Literature review: review previous research and identify relevant theories
3. Hypotheses: derive specific hypotheses from each of the theories
4. Research Design and Data: discuss how you test your hypothesis and look for data
5. Analysis and Findings: examine your data to test your hypothesis
6. Conclusion: discuss whether your hypothesis is supported by the data and draw implications

1. Specify a question or problem
2. Propose a suitable explanation for the phenomena under study
3. Formulate a testable hypothesis
4. Define the concepts identified in the hypothesis

Specifying a Research Question

- Specifying significant (that would advance our understanding of politics), observable research questions
- Translate a general topic into a research question
- A poorly specified question leads to wasted time and energy
  - Good: Why is voter turnout for local elections higher in some cities than others?
  - Bad: What percentage of registered voters voted in the most recent local elections?
  - Good: Why does the amount spent per pupil by school districts in Texas vary?
  - Bad: How much money does each school districts in Texas spend?

Types of Wrong Questions

1. Questions dwelling on narrow factual issues
   - Facts alone are not enough to yield scientific explanations
   - What is missing is a relationship – the association, dependence, or covariance of the values of one variable with the values of another
   - Remember that we are interested in how to advance and test generalizations relating one phenomenon to another
   - Factual information often leads a researcher to ask "why" questions

2. Questions calling for a normative conclusion
   - "Should states spend more for education?"
   - Normative questions may lead a researcher to develop an empirical research question

Good Research Questions Require:

1. Pay attention to current political events
2. Investment of some time to familiarize oneself with the scope and substance of previous research
3. Submit your research question to the "so what" test:
   - Will the answer to it make a significant contribution to the accumulation of our understanding?
   - Will it be useful for policymakers?
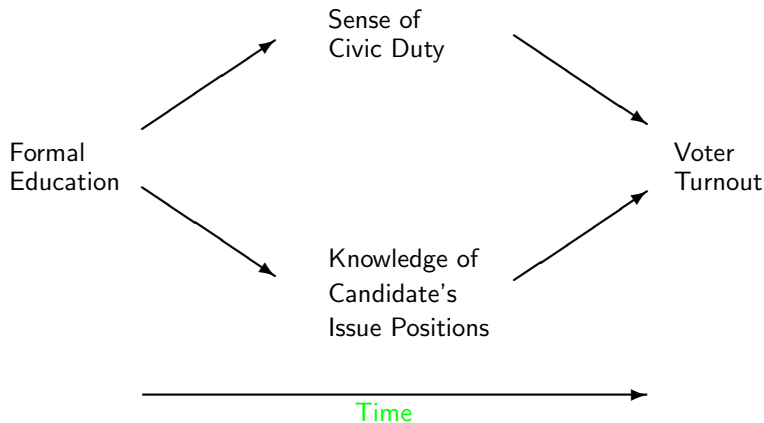   - Will it provide an interesting test of a theory?

Proposing Explanations

- Once a research question has been specified, the next step is to *propose an explanation*.
- Proposing an explanation involves identifying other phenomena that we think will help us account for the object of our research and then specifying how and why these two (or more) phenomena are related
- Example
    - Research question: "Why are divorce rates low in some countries than others?"
    - Look at cross-national data on divorce rates: http://www.oecd.org/dataoecd/4/19/40321815.pdf
    - Proposing an explanation: Identify a phenomenon that you think will help explain the variations in divorce rates across countries

Proposing Explanations

- Variables:
    - Independent variables – the measurements of the phenomena that are thought to influence, affect, or cause divorce rates
    - Dependent variables – to be caused, to depend on, or to be a function of an independent variable
    - Intervening variables – a variable that occurs closer in time to the dependent variable and is itself affected by other independent variables
- More than one independent variable is usually needed to account adequately for a dependent variable.
- An arrow diagram is useful for presenting your explanations.
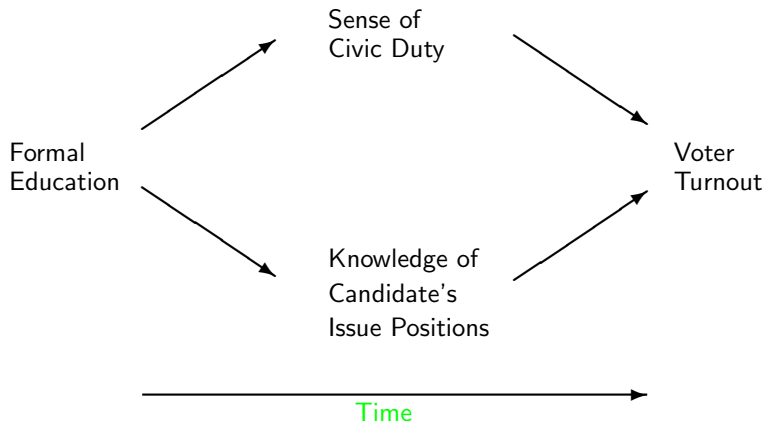
Example: Education and Turnout

Example: Education and Turnout

Independent
Variable

Intervening
Variables

Dependent
Variable

Sense of
Civic Duty

Formal
Education

Voter
Turnout

Knowledge of
Candidate's
Issue Positions

Time

Characteristics of Good Hypotheses

Hypothesis: An explicit statement that indicates how a researcher thinks the phenomena of interest are related.

Hypotheses should be empirical statements

- Should be educated guesses about relationships that exist in the real world, not statements about what ought to be true.
- "Democracy is the best form of government."
- "Democracy is more likely to be found in countries with economic development than in poor countries."

Characteristics of Good Hypotheses

Generality

- A hypothesis should explain a general phenomenon rather than one particular occurrence of the phenomenon.
- Explanation: People tend to adopt political viewpoints similar to those of their parents.
- Hypothesis 1: "Joe is liberal because his mother is one too"
- Hypothesis 2: "People tend to be liberal if their parents are liberal, while people tend to be conservative if their parents are conservative."

Characteristics of Good Hypotheses

A hypothesis should be plausible.

- There should be some logical reason for thinking that it might be confirmed.
- Explanation: "Your choice of breakfast affects your political ideology."
- Hypothesis: "People who eat dry cereal for breakfast are more likely to be liberal than people who eat eggs."
- Deductive thinking may help us find a plausible hypothesis.
- To formulate plausible hypotheses, literature reviews (Chapter 6) help researchers find both general theories and specific hypotheses advanced by others.
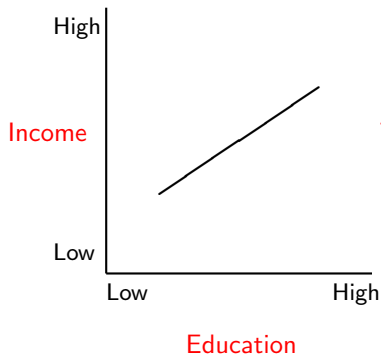
Characteristics of Good Hypotheses

Good hypotheses make a specific prediction.

- Specify a directional hypothesis – expected relationship between two or more variables
- Positive relationship: if the concepts are predicted to increase in size together or decrease in size together
  - "The more education a person has, the higher her income"
- Negative relationship: as one concept increases in size, another one will decrease in size
  - "Older people are less tolerant of social protest than younger people"
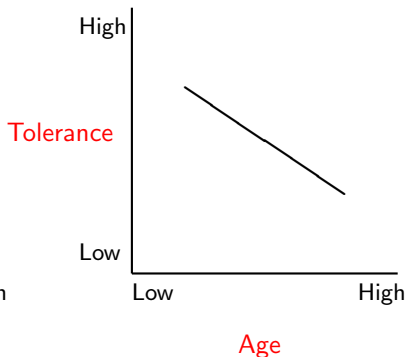
Characteristics of Good Hypotheses

Income and Attitudes toward Military Spending

	Poor	Middle	Rich	Total
Decrease	60%	40	20	40
Same	30	40	50	40
Increase	10	20	30	20
Total	100	100	100	100
		N=600		

Income and Attitudes toward Welfare Spending

	Poor	Middle	Rich	Total
Decrease	20%	40	60	40
Same	50	40	30	40
Increase	30	20	10	20
Total	100	100	100	100
		N=600		

Characteristics of Good Hypotheses

Hypotheses should be consistent with a research design.

- A hypothesis should be stated in a manner that corresponds to the way in which the research intends to test it.

- "As the proportion of a country's population that is literate increases, the country's political process becomes more democratic."

- "Countries with higher literacy rates tend to be more democratic than countries with lower literacy rates."

Characteristics of Good Hypotheses

A good hypothesis is testable.

- It must be possible and feasible to obtain data that will indicate whether the hypothesis is defensible.
- "The more supportive of political authorities a child is, the less likely that child will be to engage in political dissent as an adult."
- Hypotheses stated in tautological form are untestable.
- "The less support there is for a country's political institutions, the less stable that country's political system is."

Specifying Units of Analysis

We are interested in understanding the behavior or properties of individuals, groups, states, organizations, regions, and nations.

The particular type of actor whose political behavior is named in a hypothesis is the unit of analysis.

Some examples are shown below.

- Individuals: "The more educated a person is, the more likely she is to vote"
- Legislators: "Members of the House who belong to the same party as the president are more likely to vote for legislation desired by the president than are members who belong to a different party."

Specifying Units of Analysis

Examples continued.

- Wars: "Civil wars that are halted by negotiated peace arrangements are less likely to re-erupt than are those that cease due to the military superiority of one of the parties to the conflict."

- Elections: "Elections in which the contestants spend the same amount of money tend to be decided by closer margins of victory than elections in which one candidate spends a lot more than the other candidate."

- States: "Utility costs are less expensive in states where the commissioner is elected than in states where the Commissioner is appointed by the Governor"

- Countries: "The more affluent countries are, the more likely they are to have democracy"

Specifying Units of Analysis

Cross-level analysis – use data collected for one unit of analysis to make inferences about another unit of analysis.

- Hypothesized Linkage: "The more educated a person is, the more likely she is to vote"
- Observable Linkage: "The greater the percentage of college graduates in the state population, the greater the rate of voter turnout"

% College Graduates $\longrightarrow$ % Voter Turnout

Ecological Inference

Ecological inference: the use of aggregate data to study the behavior of individuals

Underlying Hypothesis

Subsidized lunches $\longrightarrow$ Standardized test score

Children   Children

Hypothesis to be Tested

# of subsidized lunches $\longrightarrow$ Average standardized test score

Schools   Schools

Ecological fallacy: Using information that shows a relationship for groups to infer that there is the same relationship for individuals when in fact there is no such relationship at the individual level.

- Example 1: "Brooklyn shows higher crime rates than other cities in the US. Therefore, a person who comes from Brooklyn is more likely to commit a crime than persons from other cities."

- Example 2: "African Americans are more likely to support female candidates than are Italian Americans."

Ecological Fallacy

Ethnicity	#	For Male Candidate	For Female Candidate
District 1			
African Americans	50		
Italian Americans	20		
Others	30		
Total	100	33	67
District 2			
African Americans	40		
Italian Americans	50		
Others	10		
Total	100	47	53

Ecological Fallacy

Ethnicity	#	For Male Candidate	For Female Candidate
District 1			
African Americans	50	25	25
Italian Americans	20	2	18
Others	30	6	24
Total	100	33	67
District 2			
African Americans	40	24	16
Italian Americans	50	20	30
Others	10	3	7
Total	100	47	53
Voting of Individuals			
African Americans	90	49 (54.4)	41 (45.6)
Italian Americans	70	22 (31.4)	48 (68.6)
Others	40	9	31
Total	200	80	120

Defining Concepts

- The words that we choose to describe behaviors or attributes
  $\rightarrow$ concepts

- A researcher must explain what is meant by the concept, so
  that a measurement strategy may be developed and so that
  those reading and evaluating the research can decide if the
  meaning accords with understanding of the term.

- Example: Democracy
  - "Competing political parties, operating in free elections, with
    some reasonable level of popular participation in the process."
  - "Legal guarantees protecting free speech, the press, religion
    and the like."
  - "Economic equality among citizens."

Defining Concepts

- Example: Political participation
  - "Those activities by private citizens that are more or less directly aimed at influencing the selection of government personnel, the actions they take, or both."