PSCI2300 The Study of Politics
Measurement

Tetsuya Matsubayashi

University of North Texas

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Initial Steps in an Empirical Research Project

Out goal: Exploring relationships between political phenomena

1. **Specify** the question or problem
2. **Propose** a suitable explanation for the phenomena under study
3. **Formulate** testable hypotheses
4. **Identify** the most appropriate research design
5. **Define** the concepts identified in the hypotheses. Then **operationalize** and **measure** the concepts in the hypotheses
You ask whether the rate of voter turnout in the presidential election has declined over fifty years.

If it has declined, you want to find an explanation for the decline. How do we compute voter turnout rates?

1. \# of votes casted / Voting Age Population (VAP)
2. \# of votes casted / Voting Eligible Population (VEP)
Decline in Voter Turnout

Presidential Turnout Rates, 1948–2004

Turnout Rate (%)

Year


VEP

VAP
How you measure voter turnout can change your conclusion!

Once you specify your hypothesis and research design, we need to decide how to measure variables carefully.
Operational definition of the variable – deciding what kinds of empirical observations should be made to measure the occurrence of an attribute or behavior = Find an appropriate scale or ruler to measure the concept.

- Democracy = competitive elections (conceptual definition)
- Competitive elections = at least two parties compete for government (operational definition)

The measure is supposed to provide systematic observation and representation by scores or number of the variable.

The process of measurement is important because it provides the bridge between our hypotheses and the empirical world they are supposed to explain.
Example of Political Measurement

- Research question: “Explaining the existence of democracy in different countries.”
- Hypothesis: “More education makes democracy more likely.”
- Operational definition of concepts:
  - **Education**: the percentage of population completing 6 years of formal education or completing college education
  - **Democracy**: a system of government in which (1) public officials are selected in competitive elections or (2) freedom of speech is guaranteed or (3) both of them
- The presence and amount of the concept in question can be measured in various ways!
Example of Political Measurement

- Research questions: “Why some individuals are more politically liberal than others?”
- What is ideology?
- Definition of the concept: “Believing that government ought to pursue policies that provide benefits for the less well off”
- Operational definition of the concept: “Do you agree with the idea that the federal government should increase the amount of money spent on food stamp and free lunch programs?”
Accuracy and Precision

- The accuracy of measurements is evaluated by the following criteria:
  1. Reliability
  2. Validity

- The precision of measurements is evaluated by the amount of information:
  - The more information, the better.
  - Measurements can be grouped into four levels.
  - Higher levels of measurements provide more information.
Reliability

- Consistency by repeated measurements.
- A measure is reliable to the extent that it gives the same result again and again if the measurement is repeated.

Example:
- A reliable and unreliable ruler
- A reliable and unreliable survey question

The less consistent the results are, the less reliable the measure is.
Validity

- The correspondence between the measure and the concept it is thought to measure.
- A measure is valid if it actually measures what it purports to measure.
- Example: Measuring voter turnout
  - One way to measure voter turnout is to ask people if they voted in the last election.
  - Overreport?
  - Official record.

Make sure that “validity” here means different things from “internal and external validity.”
“Please tell me the letter of income group that includes the income of all members of family living with you in 1979 before taxes. This figure includes salaries, wages, pensions, dividends, interests, and all other income”

Income categories
- A: Less than $ 10,000
- B: $ 10,000 - $ 29,999
- C: $ 30,000 - $ 49,999
- D: $ 50,000 - $ 69,999
- E: $ 70,000 - $ 89,000
- F: $ 90,000 - $ 100,999
- G: More than $ 110,000

Both the reliability and the validity of this method of measuring income are questionable. How so?
Problems of Reliability and Validity

- **Threats to the reliability**
  1. People may not know how much money other family members make.
  2. People may not know which family members to include.
  3. Dishonest interviewers may incorrectly guess the income of a respondent who does not complete the interview.
  4. People whose income is on the border line.

- **Threats to the validity**
  1. People may have illegal income they do not want to reveal – Underestimate their income.
  2. People may overestimate their income to impress the interviewers.
The Precision of Measurements

- Measurements should be not only accurate but also precise.
- Measurements should contain as much information as possible about the attribute or behavior being measured.
- The more precise our measures, the more complete and informative can be our test of the relationships between two or more variables.
- Example: “Taller candidates usually win election”
- How to measure the height of political candidates?
  - Tall vs short (above-average vs below-average)
  - Tallest vs the next tallest vs ... vs shortest
  - Each candidate’s height in inches
The Precision of Measurements

Level of measurement involves the type of information that we think our measurements contain and the type of comparisons that can be made across a number of observations on the same variable.

- Nominal (lowest)
- Ordinal
- Interval
- Ratio (highest)
Diferent categories of classification
- Exhaustive and mutually exclusive
- “Religion”: Protestant; Catholic; Jewish; Something else
- “Political systems”: Democratic; Socialist; Authoritarian; Undeveloped; Capitalist
Ordinal Measurement

- “More or less” of a variable can be measured
- Education: (1) Some high school; (2) High school graduate; (3) Some college; (4) College degree or more
- Social status: (1) lower; (2) working; (3) middle; (4) upper.
- Satisfaction with democracy: “On the whole, are you (1) very satisfied, (2) fairly satisfied, (3) not very satisfied, or (4) not at all satisfied with the way democracy works in your country?”
- Intervals between the numbers have no meaning!
Interval Measurement

- The intervals between the categories or values have meaning
- How much larger or smaller
- A value of zero is assigned arbitrary
- Temperature; year
Ratio Measurement

- A value of zero means the absence of the attribute being measured
- Unemployment rates; Welfare spending; Years in school
Identifying the level of measurement of variables is important, since it affects the data analysis technique that can be used.

You can transform a higher-level measurement to a lower-level measurement, but not vice versa.