

Political Science 104

Lecture 8: Measurement (Part 2)

Topics in Measurement

- Unit of analysis
- Operational definitions
- Accuracy (validity and reliability)
- Precision and levels of measurement
- Data sources
- Missing data
- Coding data and preparation for analysis

Reliability

- To what extent would our measure yield the same results if we went out and collected more data?
- The more consistent the results, the higher the reliability.
- Example: “Will you vote for GWB in 2004?” versus “on a scale from 0 (negative) to 100 (positive), what is your opinion of GWB?” Second question is likely to be less reliable.

Evaluating Reliability

- **Test-retest method:** Measure some concept in a population at time 1, and then go back and measure the same concept in the same population at time 2.
- **Alternative form method:** Measure the same concept with two different methods at 2 different times.
- **Split-halves method:** Measure the same concept with two different methods at the same time.
- **Inter-coder reliability:** Have two different people measure the same concept, compare their answers.

Example of Reliability Concerns

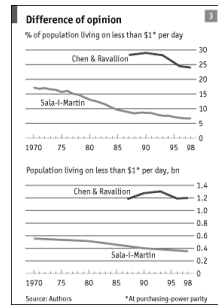
- Converse (1964) found that most people’s opinions on issues as measured by survey questions appeared to vary randomly over time. His conclusion: people have “non-attitudes,” are ignorant of even basic political issues.
- Achen (1975) argued this was actually a reliability problem – the apparent attitude instability was due to unreliable measures of political attitudes.
- Debate is still unresolved today.

Precision

- How much information do our measures contain?
- **Levels of measurement:**
 - Nominal (unordered categories)
 - Ordinal (ordered categories)
 - Interval (numerical values)
 - Ratio (numerical values with a true 0 point)

Methods of Data Collection

- Data should be collected on the proper unit of analysis.
- Different data sources can lead to different conclusions about the same thing.
- Most observations in the social sciences are direct, but sometimes indirect methods are used.



Methods of Data Collection (Survey Research)

- Standardized interviews with many people.
- Perhaps the most common type of data in the social sciences.
- **Survey modes:** face-to-face, phone, mail, internet.
- These modes vary in: representativeness, response rate, response quality, cost.
- Survey design can affect the reliability and validity of our measures.

Survey Design Example #1

- Roper survey in the 1990s asks question “Does it seem possible or does it seem impossible to you that the Nazi extermination of the Jews never happened?”
- About 20% of people give answer that Holocaust might not have happened.
- New question dropping double negative has only 1% apparently denying Holocaust.
- Unclear questions damage validity.

Survey Design Example #2

- Survey on Fox News in 2003 asks question “Are you proud to be an American?”
- Most Republicans say “yes,” most Democrats say “no.” Are Democrats less patriotic than Republicans?
- Are there alternative ways to interpret this question?
- Again, unclear questions damage validity.

Survey Design Example #3

- “Approximately 1 million legal and huge numbers of illegal immigrants come to our country each year. Some studies indicate that we can absorb only about 300,000 per year in total without causing a dramatic impact and structural changes on population levels and social institutions. In your view, how many immigrants do you feel should be allowed into America each year?”
- None • 300,000 or fewer • 500,000 • 500,000-1 million
- 1½ million • more than 1½ million
- Bias and “push polling”

Methods of Data Collection (Content Analysis)

- Measuring concepts through records of some type (written, audio, video, etc.).
- A coder observes the record, codes it for the relevant concepts. This coder is usually a person, although automated coding is becoming more common.
- Examples: Negative TV ads, hostility in speeches, the Comparative Manifesto Project.

Methods of Data Collection (Other Common Methods)

- Official statistics (Census data, FEC data, etc.)
- Elite interviews
- Focus groups
- Experiments

Missing Data Problems

- In some cases we can't get all the information we want to test our hypothesis.
- *Unit non-response*: no information on some units (countries, individuals, etc.)
- *Item non-response*: incomplete information on some units (refuse to answer survey question, country didn't release some statistics, etc.)
- Watch out for *selection effects* with missing data.
- Examples of problems: survey on Proposition 187, exit polls in 2004 Presidential election.

Data Coding

- Coding is the process of assigning numerical values to the values of your variable.
- The meaning of these codes will depend on the level of measurement of the variable:
 - Nominal: codes are just indications of the category
 - Ordinal: codes are indications of ordering
 - Interval/Ratio: codes are the actual numerical value

Preparing Data for Hypothesis Testing

- Gather measurements on all of the concepts important for your hypothesis (dependent, independent, and control variables). Enter them into a spreadsheet.
- We will use SPSS in this class.
- Each row is an observation (unit), each column is a variable.

Example of Data Ready for Hypothesis Testing

Interview #	Religion	Income	Ideology
1	1	35000	4
2	1	46000	3
3	3	82000	5
4	2	19000	6
5	1	67000	2

We use a *codebook* to find out what these numbers mean.

Example of Measurement Concerns

- Consider the hypothesis "Wealthy countries are less likely to experience political unrest than poor countries."
- How do we operationalize "political unrest"?
- Any threats to validity?
- Any threats to reliability?
- What is the level of measurement?
- Any missing data concerns?