Announcement

- Homework #2 is due Friday, February 7\textsuperscript{th}, by 5pm.
- (I mistakenly wrote January 31\textsuperscript{st} on the slide on Tuesday).
Political Science 15

Lecture 6:
Measurement (Part 1)
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
Unit of Analysis

- The unit of analysis in a hypothesis specifies what type of actor the hypothesis applies to (individuals, countries, etc.).

- Example: “Countries with IMF loans are more likely to experience political instability than countries without IMF loans.” The unit of analysis is the country.

- Generally you should collect data on the unit of analysis in your hypothesis.
Cross-Level Inference

- In some cases collecting data on the proper unit of analysis is not possible.

- Attempting to make inferences about one unit of analysis with data from another unit of analysis is known as cross-level inference.

- This can often lead us astray.

- One example is the ecological fallacy - making a mistaken conclusion about individual-level behavior based on group-level data.
An Example of the Ecological Fallacy

- In the 2012 presidential election the wealthiest states tended to vote Democrat, while the poorest states tended to vote Republican.

- However, most surveys show that in the past wealthier individuals tended to vote Republican.

- Does this mean that wealthier people now vote Democratic (“latte liberals”) and poorer people now vote Republican (“NASCAR Republicans”) or is this an ecological fallacy?
This is an Ecological Fallacy

- Wealthier people tend to vote Republican and poorer people tend to vote Democrat, but this is obscured by the average wealth of each state.

- % for McCain

```
Mississippi
Connecticut
```

```
Line through average income and vote
```

```
Income
```
Unit of Analysis Matters:

- Global economic inequality appears to be increasing if our unit of analysis is countries.
- But it is decreasing if our unit of analysis is individuals (mostly because China and India are growing so fast).
Operational Definitions

- Before we can test our hypotheses we need to establish *operational definitions* for our variables.
- This is the next step after defining concepts in our hypotheses.
- Operational definitions are very specific.
- There can be disagreement over these operational definitions between researchers. This is permissible as long as the definitions are clear.
Operational Definition
Example #1

- Hypothesis: “Countries with IMF loans will experience more political instability than countries without IMF loans.”

- What is meant by “political instability”?

- **Defining the concept**: Political instability means riots or mass demonstrations related to national politics.

- **Operational definition**: Any event with more than 1000 participants and a publicly stated goal related to national politics.
Operational Definition
Example #2

- **Hypothesis:** “Higher rates of literacy make democracy more likely.”

- **Defining concepts:** Literacy: “the completion of enough education to be expected to read.” Democracy: “a system of government in which public officials are selected in competitive elections.”

- **Operational definitions:** Literacy: “the % of people in a country that have completed at least 6 years of formal education.” Democracy: “a country where the 2nd place finisher for the most powerful political office received at least 25% of the vote.”
Operational Definition
Example #3

- Hypothesis: “Highly educated people tend to be liberal.”

- **Defining concepts:** Highly educated: “at least some college education.” Liberal: “believing the government should help those who are less well-off.”

- **Operational definitions:** Highly educated: “has completed at least 2 years of education at a college or university.” Liberal: “answers ‘yes’ to the question ‘Should the government subsidize low income housing for poor citizens?’”
The Accuracy of Measurements

- **Validity**: Is the measure capturing the concept it is meant to capture?

- **Reliability**: How “noisy” is the measure? That is, if I measured the same thing again with the same technique, would I come up with the same answer?
Validity: An Example
(IQ scores, race, and socio-economic status)
Types of Validity

- **Face validity**: Does our measure capture the concept we care about?

- **Content validity**: Does our measure capture all aspects of the concept we care about?

- We often combine different measures in an effort to increase content validity through an index.
Example of an Index: Freedom House Democracy Scores

- A single measure of democracy for each country in the world based on:
  - Electoral process
  - Civil society
  - Independent media
  - National democratic governance
  - Local democratic governance
  - Judicial framework and independence
  - Corruption
Evaluating Validity

- **Construct validity:** Check to see if the measure is related to other measures thought to capture the same concept. Example: Freedom House democracy scores should be related to POLITY democracy scores.

- **Inter-item association:** If we are combining measures thought to capture the same concept, all of these measures should be related. Example: a set of survey questions on issues though to capture liberalism should all be related.
Example of Validity Concerns

- Hypothesis: “People most concerned about NAFTA in 1992 were more likely to vote for Perot.”

- No survey question on NAFTA available. Instead, we have “Do you believe immigration from Mexico will damage the economy?”

- Could this be a valid measure of concern over NAFTA? What would we need to do to test validity (and rule out alternative explanations)?