Homework #5 is due Friday by 5pm
Political Science 15

Lecture 18:
Review
Major Course Topics

- Hypotheses
- Research Design
- Measurement
- Descriptive Statistics
- Hypothesis Testing
- Advanced Specification Issues
- Small-N Methods
Hypotheses

- Of the form “X changes Y”, where X is an independent variable and Y is a dependent variable.
- Must be empirical, testable, falsifiable.
- Unit of analysis is the type of thing being studied.
Research Design

- Four Major Research Designs
  - True Experiments
  - Natural Experiments
  - Quasi-Experiments
  - Observational Studies

- Causality and spurious relationships

- Internal versus external validity
Measurement

- **Validity** (don’t confuse this with validity in research designs!)
  - Face Validity
  - Content Validity

- **Reliability**

- **Levels of Measurement**
  - Nominal
  - Ordinal
  - Interval
Descriptive Statistics

- Single Variable Statistics
- Correlation
  - Ranges between -1 and 1.
  - No relationship = 0, but 0 not necessarily no relationship.
- Regression
  - Intercept is expected value on DV when IVs = 0.
  - Slope coefficients tell you expected change in DV when IV increased by 1 unit.
  - $R^2$ is the proportion of variance in the dependent variable explained by the regression line.
Hypothesis Testing

- Need large, representative sample.
- Test whether we should accept or reject null hypothesis.
- Measure SDs in sampling distribution from null hypothesis – if too far, reject.
- Null for t-test is number you pick, null for regression is 0.
- Statistical significance.
- P-values/significance
Advanced Specification Issues

- If we want to include a nominal level variable in a regression, we create a dummy variable (1 if in category, 0 if not).
  - Slope coefficient tells us change in DV if in category.

- If we have a conditional hypothesis, we create an interaction term. We only looked at dummy variable interacted with another variable.
  - Slope coefficient tells us how much stronger/weaker effect is for group coded 1.
Small-N Research

- Comparative Method
  - Most-similar method
  - Most-different method
- Qualitative Comparative Analysis (QCA)
- Case studies
Practice Question