Political Science Research Methods – Practicum Study Guide

Equations for the Exam (you'll be given these on the exam itself)

Chi-Square

$$X^2 = \sum \frac{(O-E)^2}{E}$$

For each of these hypotheses:
1. "There is a difference between men and women on how positively they feel about Barack Obama."
2. "There is a difference amongst Democrats, Independents and Republicans on how much money they donate to political campaigns."
3. "The categories of race/ethnicity are significantly related to categories of income."
4. "The GDP of a country is negatively correlated with the country's mortality rate."
5. "As the tax rate of a country increases by 1%, the GDP of the country will decrease."
   A) Identify the independent variable.
   B) Identify the dependent variable.
   C) Determine the levels of measurement for each variable.
   D) Identify if the hypothesis is directional or non-directional.
   E) State the null hypothesis.
   F) Specify the causal mechanism.
   G) Identify the appropriate test statistic we would use for each hypothesis.

Consider the following dataset:

Respondent	Bob	Ernesto	Frank	Jamila	Laura	Teresa
Gender (0 = Male; 1 = Female)	0	0	0	1	1	1
Political Party (1 = Democrat; 2 = Republican)	2	2	1	2	1	1

For this dataset (you should be able to do the math by hand):
   1. What are your variables? How many variables do you have?
   2. What are your observations?
   3. What is the level of measurement for each of your variables?
   4. Draw a 2x2 crosstabulation for this dataset.
   5. Calculate the expected values for the 2x2 crosstabulation.
   6. Calculate the chi-square for relationship between gender and political party.

	Proposition 8 *Same-sex marriage*	Proposition 13 *Property Tax*	Proposition 19 *Marijuana*	Proposition 187 *Undocumented immigrants*	Proposition 215 *Medicinal Marijuana*
Party of Governor (1 = Democrat; 2 = Republican)	2	1	2	1	2
Voter turnout	64%	58%	44%	52%	57%
Presidential election year (0 = No; 1 = Yes)	1	1	0	0	1
Economic conditions (1 = Weak; 2 = Moderate; 3 = Strong)	1	2	2	1	3
Percentage voting YES	52%	62%	47%	59%	55%

For this dataset (you should be able to do the math by hand):
1. What are your variables? How many variables do you have?
2. What are your observations?
3. What is the level of measurement for each of your variables?

Using this same data on propositions, consider these hypotheses:
A. "There is a difference between when Democratic governors and Republican governors when it comes to the percentage of people voting yes on a proposition."
B. "There is a difference amongst the three levels of economic conditions when it comes to the percentage of people voting yes on a proposition."
C. "The categories of Governor Party ID are significantly related to the categories of economic conditions."
D. "Voter turnout is significantly correlated with the percentage of people voting yes on these propositions."
E. "As economic conditions go from weak to strong, there is a corresponding increase in the percentage of people voting yes on these propositions."

Answer these questions about the hypotheses:
A) Identify the independent variable.
B) Identify the dependent variable.
C) Identify if the hypothesis is directional or non-directional.
D) State the null hypothesis.
E) Specify the causal mechanism.
F) Identify the appropriate test statistic we would use for each hypothesis.

SPSS Review (know how to do the following things in SPSS):
• Identify your observations
• Identify your variables
• Determine the level of measurement for variables in the dataset
• Look up the values of your categorical variables in your dataset
• Calculate and read frequency distributions for your variables

- Write your own hypotheses from the variables available in a SPSS dataset
- Transform interval-ratio variables to categorical variables
- Recode variables to remove missing data from variables
- Calculate the appropriate descriptive statistics (both central tendency and variability) of your variables, dependent on level of measurement
- Be able to draw the appropriate graph of your variables, dependent on level of measurement
- Be able to identify the **appropriate times** to use the following tests:
  - T-Tests for Dependent Samples
  - One-way ANOVAs
  - Chi-square
  - Correlations
  - Regression

Reading
- Neil Salkind, 2017. Statistics for People (Who Think They) Hate Statistics
  - Chapter 5
  - Chapter 7
  - Chapter 11
  - Chapter 12
  - Chapter 13
  - Chapter 14
  - Chapter 15
  - Chapter 16
  - Chapter 17
- Dave Keiger, 2007. The Number.

Key Terms

Research design	Survey research	Expected value
Quantitative methodology	Measurement error	Chi-square
Qualitative methodology	Experiments	Scattlerplot
Small n	Treatment groups	Correlations
Large n	Control groups	Regression
Internal validity	T-Tests	Best Line of Fit
External validity	One-tailed tests	Error in Prediction
Probability sampling	Two-tailed tests	Slope
Non-probability sampling	Directional hypotheses	Y-Intercept
Single random sample	Non-directional	Goodness of Fit
Case studies	hypotheses	R-square
Interviews	Statistical significance	Multiple regression
Fieldwork	One-Way ANOVA	Control variables
Theoretical research	F-statistic	
Content analysis	Observed value	