

Political Methodology Comprehensive Examination

Department of Political Science
The George Washington University
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Instructions: You have five hours to complete the exam

Part I

1. During a well-covered crime spree, some of the tips the police received turned out to be false. Assuming about 1 in 45 calls gives false tips. If 100 calls were received by the police on a given day, what is the probability that at least one call would be giving false tips?

2. Following are the means and standard deviations of normally distributed national scores on four standardized tests:

Test	μ	σ
A	50	10
B	50	20
C	100	15
D	100	10

- Relative to which test is a score of 70 the highest?
- Relative to which test is a score of 85 the lowest?
- What percentage of students will score higher than 55 on test A?
- Out of 100 students, how many will score between 45 and 55 on test B?
- George Washington University claims that its students on average do better on test A than the national average. The assertion is based on a sample of 26 students, who had a mean score of 54.51 and a standard deviation of 7.0. Test the validity of the University's assertion.

3. The number of hours per week a political science student devotes to study is normally distributed with a mean of 30 hours and a standard deviation of 8 hours.

- what percentage of students will study less than 20 hours?
- What percentage will study more than 35 hours?
- Out of a class of 200 students, how many will study between 25 and 35 hours?

4. Using data from a group of middle-income and low-income nations, a World Bank study analyzes relationship between Y =economic growth (in %), and X_1 =amount of foreign aid (in millions of US dollars) and X_2 =soundness of economic policy (binary, "good" policy=1.) After running a regression model the researchers obtain the prediction equation $Y = 3 + .03X_1 + .2X_2 + .5X_1X_2$. The p -values for the coefficients of X_1 , X_2 , and X_1X_2 are .11, .04, .001, respectively.

Interpret the regression result. In particular, what is the substantive meaning/significance? What does it say about the marginal effects of X_1 and X_2 on Y ?

5. You are interested in explaining variation in the level of casualties in international conflicts. You acquire a dataset with variables that allow you to test your hypotheses of interest. One feature of the data, however, is that the dependent variable of battle deaths is truncated at 1,000. That is, you do not have any observations with fewer than 1,000 battle deaths despite the fact that many conflicts have fewer than 1,000 deaths. What are the implications of the truncated dependent variable for estimating the effects of variables of interest? If the truncation causes a problem, what possible remedies are available and advisable?

6. You are evaluating the effectiveness of a federal program wherein the federal government gives grants to cities to improve some outcome of interest. You have reason to believe, however, that grants are made on the basis of whether the federal agency believes the city will be successful when using the money. What problem does this cause for estimating the effectiveness of the program? What solutions are available to ameliorate the problem? If grants were made solely on the basis of need, would that pose any difficulties? Why or why not?

Part II

Either submit an empirical research paper along with the exam or schedule an oral exam after the written exam.

Good luck!