Doctoral Qualifying Examination
Methods and Data Analysis
Department of Criminology

Fall 2018

Exam Rules:

The student's personal items will be kept in the office of the graduate director during the exam. The student will be provided with a writing pad, computer, pen, and exam.

During the examination period of 8 a.m. to 5 p.m., the student must not utilize any outside resources. The student may not confer with any people or refer to any books, articles, etc. Students are on their honor to produce their own work on their exams. The University subscribes to a document-checking service that can be used to assess plagiarism; the Department of Criminology reserves the right to submit any examination to this service for evaluation.

Responses to exam questions may be typed; student should double-space and use a 12-point font. Students who use computers will save their exam as a single MS Word document to the notebook computer provided by the Graduate Director.[1]

Students may not withdraw from the exam after receiving it; if the student does not complete and turn in the exam, it will be recorded as a failure. Exam responses must be submitted to the Exam Proctor by 5 p.m.

Security: The computers have been stripped. After the fact, the computers will be checked to determine if any flash drive has been inserted or if the internet has been accessed. DO NOT ACCESS THE INTERNET FOR ANY REASON. The Graduate Director will have visual/audio contact with the room for the exam period.

There is a single Word file on the desktop with the exam. Write your answers IN that document (which includes the exam questions). You, your computer and your exam have a number that identifies you. Do not change the name of the file; do not include your name IN the exam file. You may print to the printer in SOC 351.

When you are finished, submit your completed exam to the Graduate Director.

[1] The exam computers are checked before the exam. All non-program files are removed, Internet access is blocked, and the computers are locked up until exam time. After the exam, software is used to detect use of USB ports.

Exam Instructions: You must pick at least one question from section one (questions 1-3). (This is to ensure that you answer a question that requires a research design.) **Then pick any three of the remaining questions (1-9).** In total, you will answer 4 questions. For each, write an essay the scientific style of which resembles that found in scholarly peer-reviewed journal articles. Students should provide in-text citations to the best of their abilities; a reference list is not required. There are no minimum or maximum page limits.

Section 1: Design a Study

1) Design a methodologically sound, quantitative study to identify the individual- and agency-level factors linked to police misconduct. For the individual-level factors, include measures for at least two criminological theories that might explain police deviance. Describe all aspects of your study including the overall design, how you will measure both the independent and dependent variables, subjects, data collection methods, and analytical plan. Describe the strengths and limitations of your study.

2) The modern science of bias indicates that implicit biases can impact on the perceptions and behavior of even well-meaning people. Clarion County has implemented implicit bias training for all prosecutors to reduce the impact of biases on prosecutorial charging decisions. Design a high-quality evaluation of the impact of the training on prosecutorial charging decisions. You have generous resources and the full cooperation of county officials and employees.

3) You are designing an intervention study to impact the effect of a particular individual-level crime correlate on violent crime. You may pick from the following known correlates of violent crime: delinquent peers, poverty, or subcultural influences. First, design a study to answer your research question that relies mostly on quantitative data. Second, explain how you would answer this research question using qualitative data. For both designs, include a data analysis plan. Finally, explain the strengths and weaknesses of each design relative to the other.

Section 2: Methodological Issues

4) Missing data constitute a major statistical concern, particularly in longitudinal studies. Describe the major types of missing data patterns. Describe how you would address these different missing data issues, and estimate missing data values, in the context of specific research studies (described very generally) that could produce each of the missing data patterns.

5) Discuss the strengths and weaknesses of simple random sampling, stratified random sampling, cluster sampling, and snowball sampling. Discuss a research scenario for when each of these would be the most appropriate.

6) Researchers often place great emphasis on whether their results are statistically significant. Thoroughly describe the concept of statistical significance with regard to an OLS regression coefficient. What does it mean to say an effect is statistically significant, and what are some of the factors that influence significance tests? Your answer should include, but not be limited to, a discussion of concepts such as the sampling distribution, the t-statistic, standard errors, and Type I and Type II errors.

7) Heteroskedasticity, autocorrelation, outliers, and multicollinearity are always concerns when conducting ordinary least squares regression. Thoroughly describe each of these concepts. What impact do they have on our parameter estimates and hypothesis tests? What methods might we use to detect each of them, and how might we correct or account for them?

8) Explain in exactly what way research is strengthened as a result of each of the aspects of a research design.

- The researcher has a control group
- The researcher can control which subjects are exposed to the treatment and which are not
- The researcher randomly assigns subjects to experimental and control groups and has both pre-test and post-test measurements
- Although the study question is not conducive to random assignment, the researcher is able to produce matched groups.

9) Choose 6 of the following 10 pairs of terms. Define each term in the pair and discuss their relevance to methodological quality. Be sure to compare and contrast the terms within each pair.

a. internal validity vs. external validity
b. reliability vs. validity
c. experimental group vs. control group
d. mediation vs. moderation
e. normal vs. Poisson distribution
f. experimental design vs. quasi-experimental design
g. random sampling vs. cluster sampling
h. correlation vs. causation
i. exploratory factor analysis vs. confirmatory factor analysis
j. random effects vs. fixed effects