

**Doctoral Qualifying Examination  
Methods and Data Analysis  
Department of Criminology**

**Fall 2017**

**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.<sup>1</sup>

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.

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<sup>1</sup> 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) You are writing a grant proposal to study the effectiveness of a prisoner re-entry program that exists in Florida. Explain the methodological approach you would take to conduct this study, the variables you would measure, and the population you would study. Note that the funding agency requires that characteristics of the individuals as well as the contextual characteristic of the location to which inmates are released be considered in the evaluation. Explain how you would approach these requirements from a conceptual, measurement, and analytic perspective.

2) You are designing a study to determine the effect of a particular individual-level crime correlate on violent crime. You may pick your own known correlate of violent crime, such as drug use, gang membership, poverty, to name just a few. First, explain how you would approach this study using a longitudinal design in order to examine the utility of this known correlate for explaining variation in violent crime. Second, assume you do not have the time or resources to collect data over time and must conduct your study using a cross-sectional approach. Describe how you would approach this using a cross-sectional design. Third, explain what limitations your longitudinal and cross-sectional designs have. And, finally, for each of your designs (longitudinal and cross-sectional), indicate the data analysis techniques you will use in order to estimate the effect of your selected known correlate on violent crime. Explain why you chose those techniques.

3) Select a research topic based on your knowledge of the literature in criminology and criminal justice. Identify a research question that needs to be addressed and hypotheses that need to be tested. Develop a research design that addresses the research question and tests the hypotheses. Describe your design in a way that can be understood by those with a thorough understanding of research methodology, but who may not have a specialized knowledge of the particular area of research you have chosen. Be sure to discuss and justify the methods of data collection and operationalization of variables. What are the strengths and limitations in the research design you have proposed relative to previous studies in the literature?

### **Section 2: Methodological Issues**

4) Researchers often place great emphasis on whether their results are statistically significant. Thoroughly describe the concept of statistical significance with regard to an ordinary least squares 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, Type I and Type II errors, and R-squared.

5) Please provide an overview of the problem of differential selection/sample selection bias and how the problem bears on the credibility of estimated effects. Use a criminological or criminal justice example to illustrate your discussion. Also, provide recommendations about how one may overcome this problem. Finally, indicate what method(s) you think the field should adopt to address it.

6) Choose 6 of the following 10 pairs of terms. Define each term in the pair. 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. structural equation modeling vs. path analysis
- 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. Type I error vs. Type II error

7) Nearly all of the concepts central to the study of criminology are difficult to measure (e.g., crime, illegal immigration, recidivism). Take a concept related to criminology and discuss:

- Why is it difficult to measure?
- What types of data do researchers use to measure the phenomenon?
- How have researchers overcome some of the problems with these data?
- Which data sources are more or less suited to studying research questions involving your chosen concept?
- Discuss the implications for data analysis of the various ways to measure this concept.
- How successful are these various approaches for measuring the concept? If the solutions are not perfectly valid, how much does that affect the conclusion(s) we wish to draw?

Cite the literature throughout your response to illustrate your discussion.

8) Explain in exactly what way research is weakened as a result of each of the following flaws in a research design.

- The researcher does not have a control group
- The researcher cannot control which subjects are exposed to the treatment and which are not
- The researcher randomly assigns subjects to experimental and control groups, but has post-test (after the intervention) measurements only, no pre-test measurements
- The researcher cannot do random assignment of subjects to experimental (treatment) and control groups, and must do matching instead.

9) Discuss the strengths and limitations of longitudinal research designs and cross-sectional research designs. Discuss a situation when a longitudinal research design would be preferred over a cross-sectional research design. Discuss a situation when a cross-sectional research design would be preferred over a longitudinal research design.