

**Doctoral Qualifying Examination  
Department of Criminology  
Spring 2013**

**Methods and Data Analysis**

**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, grading information 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 hand write their exams; the student will type up his/her own exam after the fact and a staff person will do a side-by-side check to make sure the typed version matches the handwritten one. The committee will receive both the typed and hand-written copy. 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 graduate director by 5 p.m.

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 done. Bring the computer and cord to me in my office.

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.

**You must pick at least one question from the first three questions (questions 1-3). (This is to ensure that you answer a question that requires a research design.) Then pick any three of the remaining 7 (questions 1 – 8). 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. Be sure to consider the grading rubric as you write your responses.

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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.

1. You are designing a study to determine the effect drug use has on violent crime in order to derive causal statements about the link between these two behaviors. First, explain how you would approach this study using a longitudinal design including discussing limitations of this approach. 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 this approach and explain what limitations your cross-sectional design has in terms of approximating any causal link between drug use and violent crime.
2. You are designing a study to determine 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 each other.
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. Develop a data analysis plan. Indicate the strengths and limitations in the research design you have proposed relative to previous studies in the literature. [If you are ALSO answering 1 or 2 above, do not select the same research topic you used before.]
4. Choose 6 of the following 11 pairs of terms; select at least **two** from List B. Define each term in the pair and compare and contrast the terms within each pair.  
LIST A
  - a. internal validity vs. external validity
  - b. reliability vs. validity
  - c. experimental group vs. control group
  - d. experimental design vs. quasi-experimental design
  - e. random sampling vs. cluster sampling
  - f. Type I error vs. Type II error  
LIST B
  - a. mediation vs. moderation
  - b. structural equation modeling vs. path analysis
  - c. correlation vs. causation
  - d. exploratory factor analysis vs. confirmatory factor analysis
  - e. ordinary least squares vs. logistic regression
5. 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, and Type I and Type II errors.

6. Recidivism research is an important component of criminological research, especially when determining the effectiveness of educational, vocational, and substance abuse programs. Researchers commonly use logistic regression or survival analysis to build multivariate models to measure the predictors of recidivism. This question requires you to compare and contrast logistic regression and Cox proportional hazards survival analysis. For each technique, explain the kinds of research questions addressed, its key concepts (e.g., odds ratio, hazard ratio), model testing methods (e.g., statistical significance of full model and individual variables), and resulting statistics. Be sure to point out in your discussion the differences and similarities between these two analytic techniques.
7. There are three primary sources of data about the nature and distribution of crime in the US: official statistics, victimization surveys and self report studies. Discuss the strengths and weaknesses of each source. For example, what can each source tell you about how much crime occurs, where it occurs and characteristics of offenders and victims, etc.? What are the implications for data analysis of the various measures? Also, select a particular research question and cite examples from the literature showing how that question has been addressed with the various crime data sources.
8. Research rarely involves simple random sampling, due to various practical considerations. Explain the other type of sampling and sampling strategies that should be used to deal with each of the problems listed below. Discuss the data analysis implications of your strategies as they relate to weighting. Discuss the empirical literature and cite relevant articles/research to the extent possible.
  - a. You need to obtain more cases to analyze that fall into a fairly rare subset of the population, such as elderly African-American females.
  - b. You want a sample representative of the national population, but it would be impossible, too difficult, or too expensive to compile a list of all individuals in the U.S.
  - c. You need a sample representative of a national population and have to do in-person interviews, but need to reduce interviewer travel expenses because it is too costly for interviewers to contact respondents scattered across different areas.
  - d. You are doing a national survey, but need to reduce the random sampling error that is due to the heterogeneous nature of the national population.