Doctoral Qualifying Examination
Methods and Data Analysis
Department of Criminology

Spring 2019, Version 1

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. You are writing a grant proposal to study the effectiveness of a prisoner re-entry program that exists in Florida. Describe your program, and how you would measure fidelity and adherence. Explain the methodological approach you would take to conduct this study; the population(s) you would study; the independent, dependent and control variables (if relevant) you would measure. 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, so that you can determine for whom the program is most effective. Explain how you would approach these requirements from a conceptual, measurement, and analytic perspective. Justify all aspects of your proposed study and identify strengths and weaknesses.

2. Design a quantitative study to determine the effect of a neighborhood-level crime correlate on violent crime. You may pick from the following known neighborhood-level correlates of violent crime: poverty, social disorganization, or collective efficacy. Describe very clearly the design of your study, the units under study, how the data will be collected, and how you will operationalize constructs. Develop an analytical plan. Justify all aspects of your study and identify strengths and weaknesses.

3. Criminologists often lament the lack of experimental control in testing the impact of policies and programs. Instead, the argument goes, they have to depend on statistical controls often made by comparing groups not randomly assigned to control and experimental conditions. Such concerns ignore the often robust controls found in naturally occurring experiments. Supreme Court decisions, changes in criminal law, and new policy directives often provide methodologically defensible opportunities for assessing the impact of policy changes. Choose two of the policies/interventions below and for each identify a naturally occurring experiment (of the past two decades (1998-2018)) and explain how you could conduct a research project to test the effectiveness of the policy change/intervention. Be sure to discuss how a natural experiment is similar to or deviates from a traditional experimental design.

    a. Harm reduction in drug use
    b. The impact of prison over-crowding on recidivism
    c. The impact of police staffing (office/citizen ratios) on crime
    d. Police transparency and citizen attitudes toward the police

Section 2: Methodological Issues

4. When analyzing data quantitatively, scholars must consider statistical significance of parameter estimates as well as effect size. Describe in detail what 'statistical significance' means (be sure to discuss p-value, alpha level, null hypothesis, and power). What factors would affect statistical significance of the same estimated parameter (e.g., means, mean differences, regressions coefficients) from the same population? Next discuss in detail the following effect sizes and explain what constitutes small, medium, or large effects for each one: z-score, Cohen's d, Pearson's product moment correlation coefficient, odds ratios. Finally, discuss what steps should criminologists take to ensure they provide the appropriate interpretation of statistical significance and effect sizes to lay audiences? **(Regarding the Rubric: This question does NOT have a "Research Methods" knowledge component)**

5. 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. **(Re Rubric: This question does NOT have a "Data Analysis" knowledge component)**

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. 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

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? **(Re Rubric: This question does NOT have a "Research Methods" knowledge component)**

8. You want to conduct a qualitative field study of gang members, their gang activities and their own perceptions about their gang-related activities. Explain how you could address the following challenges to conduct such a study: **(Re Rubric: This question does NOT have a "Data Analysis" knowledge component)**

    a. Gaining access to the population and making contact with potential subjects
    b. Gaining the confidence of informants
    c. Gaining information about specific topics without appearing to "interrogate" your informants
    d. Recording what your informants tell you, but without using technological aids such as audio or videotape that might jeopardize your relationship with informants.
    e. Analyzing data collected in such a study.

9. Discuss the assumptions, similarities and differences among principal components analysis, exploratory factor analysis, and confirmatory factor analysis for continuous and categorical variables. **(Re Rubric: This question does NOT have a "Research Methods" knowledge component)**