

Assigned Number _____

Federation Methods and Statistics Qualifying Exam

Federated Graduate Sociology Program
Texas Woman's University
University of North Texas

Spring 2010

General Information and Instructions

- Please type or write your **assigned number** on every page of your answers, and **do not** include your name or any other identifying information on your exam.
- If you are **typing** your answers, please double-space them, use 12-point font, and insert page numbers on every page.
- If you are **hand-writing** your answers, please write as neatly as possible on every other line, use one side of the paper, and number your pages.
- Please answer each question thoroughly and write in complete sentences.
- You will receive a flash drive or other device on which to save your answers. Please **save your answers early and often!**
- It is advisable for you to read through all the questions first, then plan your time accordingly. You have until 5:00 pm to complete the exam. You may structure your time as you see fit, and you may take breaks and eat lunch as needed.
- You are **not** allowed to have books, notes, calculators, cell phones, or other electronic devices in or near the exam room. Also, access to the internet will be blocked. A proctor will be in the room at all times, and faculty members will monitor you throughout the day and will be available to answer any questions that you might have.

Section I: Federation Methods Qualifying Exam

Please answer all three questions

1. **Define** and provide an **example** for **three** of the following pairs of concepts.
 - (a) Open coding of qualitative data **and** axial coding of qualitative data
 - (b) Ecological fallacy **and** reductionist fallacy (a.k.a. “reductionism” or “error of reductionism”)
 - (c) Experimental design **and** quasi-experimental design
 - (d) Reliability **and** validity
 - (e) Stratified sampling **and** quota sampling
 - (f) Cross-sectional study **and** panel study

2. Select **one** of the following topics for designing a **qualitative** research project:
 - African Americans’ perceptions of treatment received by medical doctors
 - The experience of women raising children on their own
 - Family background of homeless adolescents
 - College students’ attitudes toward same-sex marriage

Address **all** of the following issues in designing your chosen project:

- (a) Identify the role of theory in qualitative research
- (b) Based on the topic you selected, explain your specific research project and the qualitative approach you will use
- (c) Discuss ethical issues as they relate to your research project
- (d) Describe your sampling design and how you would recruit participants
- (e) Explain how you would collect data from participants
- (f) Discuss how you would analyze your data

3. Select **one** of the following topics for a **quantitative** research project:

- A cross-national study of factors related to literacy rates
- Correlates of depression among college students
- Predictors of house foreclosure rates in major U.S. cities
- Variables associated with the decision of adolescents to join a gang

Address **all** of the following issues in designing your chosen project:

- (a) Identify and define the dependent variable and one important independent variable; also list control variables to be included in the analyses
- (b) State **one** testable hypothesis and provide justification for your hypothesis
- (c) Discuss how you would measure the dependent and independent variable in your hypothesis
- (d) Develop a comprehensive data collection plan assuming that you have unlimited money for your project (you are **not** allowed to use existing secondary datasets such as the GSS)
- (e) Based on **all** of the variables listed in part (a) and your responses to parts (b) and (c), describe appropriate technique(s) for analysing your data.

Section II: Federation Statistics Qualifying Exam

Please answer all three questions

1. For **five** of the following pairs of statistical techniques, **discuss** when it is most appropriate to use each technique in the analysis of data.
 - (a) Gamma **and** lambda
 - (b) T-test for two independent groups **and** paired-difference t-test
 - (c) Confidence interval **and** hypothesis test
 - (d) Measures of central tendency **and** measures of variability
 - (e) Ordinary least squares regression **and** logistic regression
 - (f) Bar chart (bar graph) **and** histogram
 - (g) F-statistic in one-way ANOVA **and** Chi-square statistic
 - (h) Mediating effect **and** moderating effect
 - (i) Pearson's correlation coefficient (r) **and** Spearman's rho (ρ)
 - (j) Z-score (standardized value) **and** natural logarithm transformation

2. Write a brief essay substantively interpreting Tables 1a, 1b, and 1c. The data are from a study of negative academic self-concept and depressive symptoms among 44 boys and 42 girls in grades 3-6 from elementary schools in Canada.

3. Answer **all** parts of this question.
 - (a) **List** and **briefly explain** the assumptions for ordinary least squares (OLS) regression analysis.

 - (b) Describe each of the following as they relate to OLS regression analysis:
 - (i) Unstandardized regression coefficient estimate (b)

 - (ii) Standardized regression coefficient estimate (β or beta)

 - (iii) Level of significance (α or alpha)

 - (iv) Coefficient of determination (R^2)

 - (c) Write a brief essay substantively interpreting the OLS regression analysis results presented in Table 2. The data are from a study of affiliation with peers who engaged in software piracy among 337 college students at an eastern university in the U.S. in fall 2004.

Table 1a. Gender Differences in Negative Academic Self-Concept and Depressive Symptoms

Variable	Boys (N = 44)		Girls (N = 42)		Statistical Test ^f		
	Mean	Standard Deviation	Mean	Standard Deviation	t	df	P
Negative Self-Concept in Math ^a	1.48	1.75	2.43	1.15	2.97	84	0.004
Negative Self-Concept in Reading ^b	2.18	1.30	1.36	1.50	2.73	84	0.008
Negative Self-Concept in Writing ^c	0.98	1.52	1.02	1.47	0.124	84	0.101
Negative Self-Concept in Physical Education ^d	1.77	1.80	1.88	1.69	0.292	84	0.229
Depressive Symptoms ^e	7.34	5.97	7.48	5.21	-.110	84	0.911

^aScores range from 0 to 7, with higher values indicating more negative self-concept in math.

^bScores range from 0 to 6, with higher values indicating more negative self-concept in reading.

^cScores range from 0 to 6, with higher values indicating more negative self-concept in writing.

^dScores range from 0 to 8, with higher values indicating more negative self-concept in physical education.

^eScores range from 0 to 23, with higher values indicating higher depressive symptoms.

^ft = two-sample t-statistic, df = degrees of freedom, and p = p-value (two-tailed test).

Adapted From: Berg, D.H. & Klinger, D.A. (2009). Gender differences in the relationship between academic self-concept and self-reported depressed mood in school children. *Sex Roles*, 61, 501-509.

Table 1b. Pearson Correlations of Negative Academic Self-Concept and Depressive Symptoms Variables Among Elementary School Boys (N = 44)

	Negative Self-Concept in Math	Negative Self-Concept in Reading	Negative Self-Concept in Writing	Negative Self-Concept in Physical Education	Depressive Symptoms
Negative Self-Concept in Math	1.00				
Negative Self-Concept in Reading	0.32*	1.00			
Negative Self-Concept in Writing	0.42**	0.19	1.00		
Negative Self-Concept in Physical Education	0.52**	0.28	0.50**	1.00	
Depressive Symptoms	0.71**	0.21	0.45**	0.72**	1.00

* $p \leq 0.05$. ** $p \leq 0.01$. (two-tailed test).

Table 1c. Pearson Correlations of Negative Academic Self-Concept and Depressive Symptoms Variables Among Elementary School Girls (N = 42)

	Negative Self-Concept in Math	Negative Self-Concept in Reading	Negative Self-Concept in Writing	Negative Self-Concept in Physical Education	Depressive Symptoms
Negative Self-Concept in Math	1.00				
Negative Self-Concept in Reading	0.52**	1.00			
Negative Self-Concept in Writing	0.25	0.52**	1.00		
Negative Self-Concept in Physical Education	0.29	0.53**	0.36*	1.00	
Depressive Symptoms	0.32*	0.72**	0.40**	0.66**	1.00

* $p \leq 0.05$. ** $p \leq 0.01$. (two-tailed test).

Table 2. OLS Regression Results Predicting Affiliation With Software-Pirating Peers^a

Independent Variable	Model 1		Model 2	
	B	β	B	β
Age ^b	-.33**	-.16**	-.28*	-.14*
Sex (0 = Female, 1 = Male)	0.88*	0.09*	0.67	0.07
Race (0 = Non-White, 1 = White)	-.61	-.05	-.30	-0.02
Previous Software Piracy (Number of Times) ^c	0.22***	0.25***	0.17***	0.20***
Low Self-Control ^d	0.07*	0.13*	0.05	0.08
Ethical Predisposition ^e	0.29*	0.11*	0.20	0.08
Attitudes Toward Software Pirating ^f	-----	-----	0.21***	0.26***
R ²	0.15		0.20	
N	337		337	

* $p \leq 0.05$. ** $p \leq 0.01$. *** $p \leq 0.001$. (two-tailed test)

^aSum of 6 items (e.g., how many of your best male friends copies software in the last 12 months without paying for it?) each rated on a scale from 1 = none to 5 = all or almost all. The summed scale ranges from 6 to 30, and higher values indicate higher affiliation with software-pirating peers.

^bOrdinal variable ranging from 1 = 18 years to 9 = over 25 years.

^cNumber of times in the past month that the respondent engaged in software piracy.

^dSum of 24 items (e.g., I often act on the spur of the moment) each rated on a scale from 1 = strongly disagree to 4 = strongly agree. The summed scale ranges from 24 to 96, and higher values indicate lower self-control.

^eSum of 4 items (e.g., all individuals deserve equal treatment before the law) each rated on a scale from 1 = strongly disagree to 4 = strongly agree. The summed scale ranges from 4 to 16, and higher values higher ethical predisposition.

^fSum of 11 questions (e.g., I think it is okay to use copied software if it improves my knowledge) each rated on a scale from 1 = strongly disagree to 4 = strongly agree. The summed scale ranges from 11 to 44, and higher values indicate more positive definitions in favor of software piracy.

Adapted From: Wolfe, S.E. & Higgins, G.E. (2009). Explaining deviant peer associations: An examination of low self-control, ethical predispositions, definitions, and digital piracy. *Western Criminology Review*, 10, 43-55.