

FEDERATION METHODS AND STATISTICS COMPREHENSIVE EXAM

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

Spring, 2003

GENERAL INSTRUCTIONS FOR TAKING THE EXAM

Before you begin the exam, it is advisable that you read through all the questions. Plan your time wisely. You have until 5:00 p.m. to complete the exam.

Please **WRITE ONLY ON EVERY OTHER LINE on ONE SIDE OF THE PAPER**. Please answer each question thoroughly. Answer in complete sentences. Write as neatly as possible—you will not get credit for what cannot be read!

DO NOT PUT YOUR NAME ON THE PAPER

PUT ONLY YOUR ASSIGNED NUMBER _____

(Remember: WRITE ONLY ON EVERY OTHER LINE on ONE SIDE OF THE PAPER).

A. Discuss three of the following problems encountered in doing research and indicate ways of minimizing each problem selected.

1. Accidental/availability/convenience sample
2. Ecological fallacy
3. Hawthorne effect
4. Non-response to items on questionnaire/survey instrument
5. Researcher bias
6. Sampling attrition/mortality

B. Answer question 1 **OR** question 2.

1. a. Describe three threats to internal validity and three threats to external validity.
b. How should these threats be addressed in an experimental design?
c. Are these threats to validity a concern for researchers of non-experimental studies? If so, how are these threats dealt with in non-experimental research?

OR

2. Compare and contrast the strengths and weaknesses of cross-sectional versus longitudinal research. When is it appropriate to use one versus the other? For each research method, describe how it is used in a real or hypothetical study.

C. List and describe the steps in either a qualitative or quantitative study of racial or gender discrimination in the workplace. Be as specific as possible in demonstrating your knowledge of the qualitative or quantitative research process.

(Remember: WRITE ONLY ON EVERY OTHER LINE on ONE SIDE OF THE PAPER).

A. For six of the following pairs discuss what factor(s) must be taken into consideration in choosing between these two statistical techniques for use in the analyses of data.

1. chi-square test and lambda
2. correlation and causation
3. eta and r
4. interaction effect and curvilinear effect
5. lambda and gamma
6. path analysis and multiple regression
7. Pearson's r and Spearman's rho
8. PRE and non-PRE measures of association
9. r and partial r
10. standard deviation and interquartile range
11. t and Z test

B. Answer question 1 **OR** question 2.

1.
 - a. State a hypothesis that could be tested using Table 1a. What is the independent variable? What is the dependent variable? Is your hypothesis confirmed or rejected? Explain. Cite appropriate percentages and interpret relevant statistics to support your answer.
 - b. State a hypothesis that could be tested using Table 1b, assuming that the control variable is an intervening variable. Is your hypothesis confirmed or rejected? Explain. Cite appropriate percentages and interpret relevant statistics to support your answer.
 - c. State a hypothesis that could be tested using Table 1b, assuming that the control variable is a specification variable. Is your hypothesis confirmed or rejected? Explain. Cite appropriate percentages and interpret relevant statistics to support your answer.

OR

2. Write a brief essay substantively interpreting Table 2. Pay particular attention to the interpretation of logistic regression coefficients and/or odds ratios for each of the variables, as well as model fit statistics.

C. Answer the following questions about Table 3.

1. What assumptions must be made to use regression analysis?
2. What does each of the following tell us?
 - a. unstandardized regression coefficient (b)
 - b. standardized regression coefficient (Beta)
 - c. level of significance (p)
 - d. coefficient of determination (R^2)
3. Write a brief essay substantively interpreting the table.

Table 1a. Trust by Race.

Race	Can People Be Trusted?		
	No	Depends, Yes	Total
White	52.1	47.9	100.0% (922)
Black	75.3	24.7	100.0% (170)

$\chi^2 = 31.396, df = 1, p < .001; \phi$ or Phi = .170

Table 1b. Trust by Race and Subjective Class Identification.

Race	Lower/Working Class		
	Can People Be Trusted?		
	No	Depends, Yes	Total
White	59.7	40.3	100.0% (442)
Black	77.2	22.8	100.0% (114)

$\chi^2 = 11.900, df = 1, p < .01; \phi$ or Phi = .146

Middle/Upper Class

Can People Be Trusted?

Race	No	Depends, Yes	Total
White	31.2	68.8	100.0% (480)
Black	71.4	28.6	100.0% (56)

$\chi^2 = 35.379, df = 1, p < .001; \phi$ or Phi = .257

Table 2. Results from logistic regressions of opposition to the death penalty (1=oppose; 0=favor) on selected variables for a sample of U.S. adults.

Independent Variables	b	odds ratio	b	odds ratio
<i>Race-gender</i>				
Black female	1.415***	4.118	1.357***	3.885
Black male	1.928***	6.877	1.819***	6.165
White female	0.732***	2.079	0.611***	1.843
White male (omitted or reference category)				
<i>Religious preference</i>				
Catholic			0.276*	1.318
Protestant (omitted or reference category)				
<i>Frequency of attendance at religious services</i>				
			0.145***	1.157
<i>Degree of political conservatism</i>				
			-0.188***	0.829
<i>Region of residence</i>				
South			-0.134	0.875
Non-South (omitted or reference category)				
Constant	-1.779***	0.169	-1.591***	0.204
-2 Log likelihood	1943.218		1,883.535	
Model χ^2	123.744***		183.427***	
N	1,832		1,832	

* p < .05 ** p < .01 *** p < .001 (two-tailed tests)

NOTE: *Race-gender* is a four-category variable measured by three dummy variables representing black females, black males, and white females, respectively, with white males serving as the omitted or reference group. *Religious preference* is a two-category variable measured by a dummy variable coded 1 for Catholics and coded 0 for Protestants. *Frequency of attendance at religious services* is coded from 0 for “never” to 8 for “more than once a week.” *Degree of political conservatism* is coded from 1 for “extremely liberal” to 7 for “extremely conservative.” *Region of residence* is a two-category variable measured by a dummy variable coded 1 if the respondent lives in the southern United States and coded 0 otherwise.

Table 3. Results from regressions of self-rated physical health on selected variables for a sample of 543 elderly members of a large health maintenance organization.

Independent Variables	b	Beta	b	Beta
<i>Age</i>				
65 – 74 years (omitted or reference category)				
75- 84 years	-0.177	-0.055	0.030	0.014
85 years or older	0.003	0.000	0.338**	0.093
<i>Chronic disease</i>	-0.115***	-0.380	-0.057***	-0.189
<i>Number of depression symptoms</i>				
None (omitted or reference category)				
1-3	-0.282**	-0.136	-0.114	-0.055
4 or more	-0.542***	-0.170	-0.267*	-0.084
<i>Freedom from pain</i>			0.008***	0.217
<i>Physical functioning</i>			0.010***	0.388
Adjusted R ²	0.19		0.42	

* p < .05 ** p < .01 *** p < .001 (two-tailed tests)

NOTE: *Self-rated physical health*, is coded 1=unhealthy, 2=somewhat unhealthy, 3=average, 4=healthy, and 5=very healthy. *Age* is a three-category variable measured by two dummy variables representing 75 to 84 years of age and 85 years of age or more, respectively, with 65 to 74 years of age serving as the omitted category or reference group. *Chronic disease* is measured by an index ranging from 0 to 35, with higher scores indicating severe or multiple chronic diseases. *Number of depression symptoms* is a three-category variable measured by two dummy variables representing 1-3 symptoms and 4 or more symptoms, respectively, with 0 symptoms serving as the omitted or reference category. *Freedom from pain* is measured by an index, with higher scores indicating freedom from pain. *Physical functioning* is also measured by an index, with higher scores indicating increased functioning.