

FEDERATION METHODS AND STATISTICS COMPREHENSIVE EXAM

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

Spring, 2004

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 _____

Part 1: FEDERATION METHODS COMPREHENSIVE EXAM**Spring, 2004**

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

A. Answer question 1 **OR** question 2.

1. Select three of the following populations and, for each, discuss an appropriate sampling procedure and problems you would expect to encounter.
 - a. churches in the Dallas-Fort Worth metroplex
 - b. heads of households in the United States
 - c. multi-racial married couples
 - d. teachers employed by private and public schools in Denton County
 - e. television commercials
 - f. undocumented workers

OR

2. Choose one concept from the list below and: [1] define the concept and discuss how you would measure the variable; [2] discuss relevant testing techniques of validation and reliability you would employ; and [3] tell what level of measurement you would obtain.
 - a. community attachment
 - b. job commitment
 - c. political participation
 - d. racial prejudice
 - e. social class
 - f. urbanization

B. For one of the following, list and describe the steps in both a quantitative and a qualitative study. Be as specific as possible in demonstrating your knowledge of the quantitative and qualitative research processes.

1. Design studies to determine the effects of parental divorce on children.
2. Design studies to compare and contrast the experiences of women who work in male-dominated occupations or jobs with those of men who work in female-dominated occupations or jobs.
3. Design studies to examine the effects of traumatic life events on psychological and physical health among a population.
4. For your university's administration, design studies to evaluate the effectiveness and feasibility of distance-learning, web-based versions of a course versus more traditional classroom-based versions.

Part 2: FEDERATION STATISTICS COMPREHENSIVE EXAM**Spring, 2004**

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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 analysis of data.

1. test of significance and measure of association
2. standard deviation and interquartile range
3. lambda and gamma
4. interaction term and squared term in a multiple regression analysis
5. Pearson's r and Spearman's rho
6. PRE and non- PRE measures of association
7. Chi-square test and one-way analysis of variance
8. t and Z test
9. path analysis and multiple regression

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. Table 1b is an example of elaboration analysis. In elaboration analysis, the relationship between an independent variable and a dependent variable is examined, holding another variable, the "control" variable constant. The roles that the control variable can take in this type of analysis include "suppressor" variable, "specification" (or interacting) variable, and "intervening" variable. Briefly describe each of these three potential roles. What is the control variable in Table 1b? Which, if any, of the three roles (i.e., suppressor, specification, intervening) does it play in Table 1b? Explain, citing appropriate percentages from Table 1b and interpreting the accompanying relevant statistics.

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. List and briefly explain the assumptions that must be made to use ordinary least squares 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 (?or alpha)
 - d. coefficient of determination (R^2)
3. Write a brief essay substantively interpreting the table.

Table 1a. Change in support for a candidate for the U.S. House of Representatives by level of exposure to negative campaign advertisements (ads) sponsored by the candidate in a sample of potential voters in a Midwestern state.

Number of Negative Campaign Ads Seen	Change in Support for the Ad-Sponsoring Candidate			Total
	Less Support	No Change	More Support	
None or a Few	35.0%	47.2	17.8	100.0% (180)
Some	35.6%	48.3	16.1	100.0% (230)
Many	35.5%	47.1	17.4	100.0% (155)

$\chi^2 = .240, df = 4, p > .05; \text{Gamma} = -0.008$

Table 1b. Change in support for a candidate for the U.S. House of Representatives by level of exposure to negative campaign advertisements (ads) sponsored by the candidate among males and females in a sample of potential voters in a Midwestern state.

Number of Negative Campaign Ads Seen	Males			Total
	Less Support	No Change	More Support	
None or a Few	47.7%	35.2	17.1	100.0% (88)
Some	34.8%	48.2	17.0	100.0% (112)
Many	14.1%	56.3	29.6	100.0% (71)

$$\chi^2 = 21.395, df = 4, p < .005; \text{Gamma} = 0.336$$

Number of Negative Campaign Ads Seen	Females			Total
	Less Support	No Change	More Support	
None or a Few	22.8%	58.7	18.5	100.0% (92)
Some	36.4%	48.3	15.3	100.0% (118)
Many	53.6%	39.3	7.1	100.0% (84)

$$\chi^2 = 18.900, df = 4, p < .005; \text{Gamma} = -0.346$$

Table 2. Results from logistic regressions of opposition to the Texas lottery (1=opposed; 0=not opposed) on selected variables for a sample of Texans polled in February 1997.

<u>Independent Variables</u>	<u>b</u>	<u>odds ratio</u>	<u>b</u>	<u>odds ratio</u>
<i>Gender</i>				
Female	-0.094	0.910	-0.244	0.783
Male (omitted or reference category)	-----	-----	-----	-----
<i>Age in Years</i>				
	0.022**	1.023	0.018**	1.018
<i>Race/Ethnicity</i>				
Hispanic	-1.091***	0.336	-0.915**	0.400
Black	-0.063	0.939	-0.342	0.710
Non-Hispanic White (omitted or reference category)	-----	-----	-----	-----
<i>Education</i>				
	0.138	1.148	0.092	1.096
<i>Income</i>				
	-0.103	0.902	-0.062	0.940
<i>Strong Political Conservative</i>				
Yes	0.831***	2.274	0.585**	1.796
No (omitted or reference category)	-----	-----	-----	-----
<i>Religious Preference</i>				
Baptist	-----	-----	0.642*	1.900
Other Conservative Protestant	-----	-----	0.926***	2.523
Nonconservative (omitted or reference category)	-----	-----	-----	-----
<i>Frequency of Attendance at Religious Services</i>				
More Than Once Per Week	-----	-----	1.464***	4.316
Weekly or Near Weekly	-----	-----	0.707**	2.028
Less Often (omitted or reference category)	-----	-----	-----	-----
<i>Bible is Inerrant Word of God</i>				
Strongly Agree	-----	-----	0.653**	1.922
Strongly Disagree	-----	-----	1.251***	3.494
No Strong Opinion One Way or the Other (omitted or reference category)	-----	-----	-----	-----
Constant	-2.747		-3.654	
N	823		823	
Model Chi-Square	62.33		136.39	
Degrees of Freedom	8		13	

*p < .05, **p < .01, ***p < .001, two-tailed tests

Table 3. Results from an ordinary least squares regression of perceived risk of nuclear waste on gender/field and attitudes for a sample of members of the American Association for the Advancement of Science in 1990.

<u>Independent Variables</u>	<u>b or Unstandardized Estimate</u>	<u>Beta or Standardized Estimate</u>
<i>Gender/Field</i>		
Female physical scientist	-0.123	-0.026
Female life scientist	-0.373**	-0.136
Male life scientist	-0.170*	-0.100
Male physical scientist (omitted or reference category)	-----	-----
<u>Attitudes toward Environment, Technology, and the Acceptability of Risk</u>		
<i>Dominion over nature</i>	0.175**	0.200
<i>Lifestyle changes unnecessary</i>	-0.129**	-0.134
<i>If small risk, OK to impose it</i>	-0.198**	-0.215
<i>Technology dangerous</i>	0.276**	0.232
Constant	2.580**	
N or number of respondents	940	
R ²	0.315	

*p < .01, **p < .0001, two-tailed tests

Note: The four attitudes toward environment, technology, and the acceptability of risk are measured by level of agreement with the following statements: *dominion over nature* – Mankind has dominion over nature; *lifestyle changes unnecessary* – The environment can be kept clean and safe without making drastic changes in our lifestyle; *if small risk, Ok to impose it* – When the risk is very small, it is okay for society to impose that risk on individuals without their consent; *technology dangerous* – Technology has become dangerous and unmanageable.