

FEDERATION METHODS AND STATISTICS QUALIFYING EXAM

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

Fall, 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 QUALIFYING EXAM

Fall, 2004

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

A. Answer question 1 or question 2.

1. You have been asked by the health department in your county to help design a survey of drug and alcohol use among adults living in the area. Departmental officials do not know which one of the three major types of surveys—[1] mail questionnaires, [2] telephone interviews, and [3] face-to-face interviews—to use. Which type of survey would you suggest that they use? Why? In your answer, discuss the advantages and disadvantages of using the type of survey you recommend compared to one of the other two types of surveys.

OR

2. Choose a sociological concept 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] indicate what level of measurement you would obtain.
- B. Select a research problem of your choice and then use this research problem as an example to illustrate how quantitative research and qualitative research differ in conceptualization and data analysis.

Part 2: FEDERATION STATISTICS QUALIFYING EXAM

Fall, 2004

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A. Answer both questions.

1. Distinguish between measures of association and tests of statistical significance.
2. For three of the following seven pairs of variables, assuming random sampling, indicate clearly the most appropriate measure of association and test of statistical significance. (The categories of each variable are given in parentheses). Justify your choices.
 - a. percentage of county population that is Black (00.0 to 100.0) and percentage of total families in county falling below the poverty level (00.0 to 100.0)
 - b. race (White, Black, Other) and political party preference (Democrat, Republican, Independent, Other)
 - c. frequency of attendance at religious services at age 12 (Less than once a month, 1-3 times a month, Every week or more) and frequency of attendance at religious services currently as an adult (Less than once a month, 1-3 times a month, Every week or more)
 - d. region of the United States (Northeast, Midwest, South, West) and percentage of civilian labor force in county that is unemployed (00.0 to 100.0)
 - e. rank in high school graduating class (1, 2, 3, etc.) and post-high-school educational plans (No post-high-school educational plans, Some post-high-school education planned but less than four years of college, Plan to receive four-year college education only, Plan to complete college and study for an advanced degree)
 - f. religious preference (Catholic, Protestant, Other, None) and level of agreement with the statement “people convicted of murder should be subject to the death penalty” (Disagree, Neither disagree nor agree, Agree)
 - g. time spent feeling nervous in past 30 days (None of the time, Little of the time, Some of the time, Most of the time, All of the time) and time spent feeling restless in past 30 days (None of the time, Little of the time, Some of the time, Most of the time, All of the time)

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? How are the two variables related? 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” (or mediating) 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 Tables 2a and 2b.

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 estimate (b)
 - b. standardized regression coefficient estimate (Beta or b^*)
 - c. level of significance (α or alpha)
 - d. coefficient of determination (R^2)
3. Write a brief essay substantively interpreting the table.

Table 1a. Living arrangement in 1980 and transition to sexual intercourse in a panel study of 501 White virgin adolescents first interviewed in 1980 as junior high school students in a medium-sized city in the United States South.

<u>Living Arrangement in 1980</u>	Engaged in Sexual Intercourse between 1980-1982 for First Time		Total
	No	Yes	
<i>Living with ...</i>			
Both Biological Parents	79.2%	20.8	100.0% (389)
One Biological Parent and a Step-parent	74.5%	25.5	100.0% (51)
<u>Biological Mother Only</u>	<u>60.7%</u>	<u>39.3</u>	<u>100.0% (61)</u>

$\chi^2 = 10.165, df = 2, p < .01; \text{Cramér's } V = 0.142$

Table 1b. Living arrangement in 1980 and transition to sexual intercourse among boys and girls in a panel study of 501 White virgin adolescents first interviewed in 1980 as junior high schools in a medium-sized city in the United States South.

Boys

<u>Living Arrangement in 1980</u>	Engaged in Sexual Intercourse between 1980-1982 for First Time		<u>Total</u>
	<u>No</u>	<u>Yes</u>	
<i>Living with ...</i>			
Both Biological Parents	74.3%	25.7	100.0% (167)
One Biological Parent and a Step-parent	73.9%	26.1	100.0% (23)
<u>Biological Mother Only</u>	<u>76.0%</u>	<u>24.0</u>	<u>100.0% (25)</u>

² = 0.038, *df* = 2, *p* > .05; Cramér's *V* = 0.013

Girls

<u>Living Arrangement in 1980</u>	Engaged in Sexual Intercourse between 1980-1982 for First Time		<u>Total</u>
	<u>No</u>	<u>Yes</u>	
<i>Living With...</i>			
Both Biological Parents	82.9%	17.1	100.0% (222)
One Biological Parent and a Step-parent	75.0%	25.0	100.0% (28)
<u>Biological Mother Only</u>	<u>50.0%</u>	<u>50.0</u>	<u>100.0% (36)</u>

² = 19.661, *df* = 2, *p* < .001; Cramér's *V* = 0.262

Table 2a. Differences between a sample of Israeli veterans of the 1973 Yom Kippur War who experienced combat stress reaction (CSR) during the war and a control sample of veterans from the same combat units who did not experience CSR during the war on selected variables.

Variable	CSR		Test Statistic ^a <i>t</i> (df) or χ^2 (df)
	Casualties (N=112)	Controls (N=184)	
Mean Age in years	25.27	22.30	$t(294) = 43.08, p < 0.001$
% Non-European	58.0	65.8	$\chi^2(1) = 1.78, p = 0.180$
% With <u>less</u> than a high school education	41.4	25.7	$\chi^2(1) = 7.93, p = 0.005$
% Officers	11.0	25.1	$\chi^2(1) = 8.52, p = 0.004$
% Single	39.3	73.6	$\chi^2(1) = 34.23, p < 0.001$
Mean Level of combat exposure during the war	1.37	1.34	$t(261.26) = -0.38, p = 0.700$
Mean Level of PTSD ^b symptoms two decades later	3.41	1.83	$t(175.02) = -3.58, p < 0.001$
Mean Number of physical health symptoms (0 to 27) two decades later	5.02	4.14	$t(294) = -1.98, p = 0.050$
Mean Number of adverse health practices (0 to 3) two decades later	0.65	0.43	$t(187.51) = -2.63, p = 0.009$

^adf = degrees of freedom. *t* tests are two-tailed independent sample *t* tests.

^bPTSD = post-traumatic stress disorder.

Table 2b. Correlations (Pearson's *r*) between selected independent variables and each of the two dependent variables for a sample of Israeli veterans of the 1973 Yom Kippur War (N = 296).

Variable	Number of physical health symptoms ^a (0-27) two decades later	Number of adverse health practices ^b (0-3) two decades later
Age in years	0.09	0.03
Non-European ^c	0.05	0.24 ^{***}
With <u>less</u> than a high school education ^c	0.17 ^{**}	0.10
Officer ^c	-0.16 [*]	-0.16 ^{**}
Single ^c	0.09 [*]	0.06
Level of combat exposure during the war	0.11	0.02
Level of PTSD ^d symptoms two decades later	0.47 ^{***}	0.21 ^{***}

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

^aIncluding high blood pressure, rapid pulse, excess perspiration, weakness/fatigue, headaches, and poor appetite, etc.

^bSmoking, alcohol usage, and self-medication.

^cDummy variable, coded 1 for a veteran having the characteristic listed and coded 0 for a veteran not having the characteristic listed.

^dPTSD = post-traumatic stress disorder.

Table 3. Results of ordinary least squares regressions predicting number of adverse health practices^a (0-3) two decades after the war from selected variables for a sample of Israeli veterans of the 1973 Yom Kippur War (N = 296).

Variable	Model 1		Model 2	
	Unstandardized estimate (b)	Standardized estimate (or b [*])	Unstandardized estimate (b)	Standardized estimate (or b [*])
Combat stress reaction or CSR during the war ^b	0.18 ^{**}	0.13	0.08	0.06
Age in years			-0.03 [*]	-0.17
Non-European ^b			-0.33 ^{***}	-0.23
With <u>less</u> than a high school education ^b			0.03	0.02
Officer ^b			-0.05	-0.03
Single ^b			-0.27 ^{**}	-0.20
Level of combat exposure during the war			-0.02	-0.02
Level of PTSD ^c symptoms two decades later			0.02 ^{**}	0.14
Adjusted R ²	0.013		0.096	

* p < 0.10; ** p < 0.05; *** p < 0.01; **** p < 0.001.

^aSmoking, alcohol usage, and self-medication.

^bDummy variable, coded 1 for a veteran having the characteristic listed and coded 0 for a veteran not having the characteristic listed.

^cPTSD = post-traumatic stress disorder.