

**FEDERATION METHODS AND STATISTICS QUALIFYING EXAM**

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

Fall 2008

**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, 2008**

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

Please answer **A, B, and C**.

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

1. Sampling error in multistage cluster sampling
2. Ecological fallacy
3. Non-response to items on questionnaire/survey instrument
4. Researcher bias
5. Internal invalidity in experiment

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

1. Who Is More Likely to Support Universal Health Care Plan?
2. Predicting Home Foreclosure Rate in Major U.S. Cities
3. Factors Influencing Total Fertility Rate: A Cross-National Study

Address the following issues in designing your chosen project:

- a. Identify the dependent variable and one important predictor variable (Note: Define your key concepts and list important control variables).
- b. State **one** testable hypothesis and justify it.
- c. Describe how you measure the dependent variable and independent variable in your hypothesis.
- d. Develop a data collection plan appropriate to the responses you have given in a, b, and c. It should include all appropriate steps in the data collection process. In the case of secondary data, please describe how the data were collected.
- e. Discuss the appropriate technique(s) of data analysis (Note: You should consider all variables you have listed in a).

C. Select **one** of the following three topics for a qualitative research project:

1. Understanding Support for Universal Health Care: Race, Class, Gender, and Age Differences
2. Do Internet Classes Provide Adequate Education for College Students in North Texas?
3. Differential Impacts of Katrina on Blacks and Whites in New Orleans

Address the following issues in designing your chosen project:

- a. Identify the role of theory in qualitative research.
- b. Discuss issues of ethics in your research project.
- c. Describe the sampling design and recruitment of participants.
- d. Discuss data collection.
- e. Discuss appropriate technique(s) of data analysis.

**Part 2. FEDERATION STATISTICS QUALIFYING EXAM****Fall, 2008**

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A. For **five** of the following seven pairs, discuss when it is most appropriate to use which technique in the analysis of data.

1. PRE and non-PRE measures of association
2. Chi-square test and Lambda
3. Pearson's  $r$  and Gamma
4. T test for two independent groups and one-way ANOVA
5. Regression with interaction term and regression with quadratic (nonlinear) term
6. Ordinary least squares regression and hierarchical linear model
7. Factor analysis and structural equation model with latent variables

B. Answer **one** of the following questions: question 1 **or** question 2.

1.
  - a. State the research hypothesis that could be tested using Table 1a. What is the dependent variable? What is the independent variable? How does the independent variable affect 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. What is the control variable in Table 1b? How does the initial relationship between the independent variable and the dependent variable in Table 1a change after the introduction of this control variable into the analysis? Explain, citing appropriate percentages from Table 1b and interpreting the accompanying relevant statistics. What role does the control variable play?
2. Write a brief essay substantively interpreting the logistic regression analysis presented in Table 2.

C. Answer **all** of the questions below.

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 Beta)
  - c. Level of significance ( $\alpha$ , or alpha)
  - d. Coefficient of determination ( $R^2$ )
3. Write a brief essay substantively interpreting Table 3.

**Table 1a. Percentage Distribution of Attitudes toward Premarital Sex by Gender**

Attitudes toward premarital sex	Gender	
	Male	Female
Approve	36%	39%
Disapprove	64%	61%
Total	100%	100%
N	(520)	(480)
$\chi^2 = 5.6, p = .01;$		
Phi = .20, p = .01		

**Table 1b. Percentage Distributions of Attitudes toward Premarital Sex by Gender and Religiosity**

Attitudes toward premarital sex	Gender	
	Male	Female
<u>Not Highly Religious</u>		
Approve	76%	75%
Disapprove	24%	25%
Total	100%	100%
N	(200)	(280)
$\chi^2 = 0.01, p = .91;$		
Phi = .02, p = .91		
<u>Highly Religious</u>		
Approve	10%	15%
Disapprove	90%	85%
Total	100%	100%
N	(320)	(200)
$\chi^2 = 9.6, p = .01;$		
Phi = .25, p = .01		

**Table 2. Logistic Regression Estimates Predicting Breast-Feeding<sup>a</sup> of Young Mothers Under Age 30, U.S., 1979-1985**

Predictor	b	Odds ratio
Mother's age (Ref.=20-29)		
≤ 15	-.67	.512
16-17	-.11	.896
18-19	-.10	.905
Race/Ethnicity (Ref.=White)		
Black	-.94 <sup>***</sup>	.391
Hispanic	-.09	.914
Region (Ref.=South)		
West	1.26 <sup>***</sup>	3.525
East	.26	1.297
Midwest	.23	1.259
Mother's education (Ref. = 12 years)		
< 12 years	-.21	.811
> 12 years	.54	1.716
Mother married (=1)	.44 <sup>***</sup>	1.553
Household income (ln 1979 \$)	.16 <sup>***</sup>	1.174
Mother's mother's education (years)	.06 <sup>**</sup>	1.062
Mother's father's education (years)	.04 <sup>*</sup>	1.041
Mother's mother living in household (=1)	-.33 <sup>**</sup>	.719
Score of traditional attitudes (6-point scale)	.12 <sup>***</sup>	1.127
Child in hospital longer than mother (=1)	-.44 <sup>**</sup>	.644
Constant	-10.21 <sup>**</sup>	3.680
-2 Log likelihood	1604.5	
Model $\chi^2$	687.4 <sup>***</sup>	
Degrees of freedom	17	
N	2,960	

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

<sup>a</sup> Coded 1 for "breast-feed" and coded 0 otherwise.

Source: Adapted from Table 3 of Christine Peterson and Julie DaVanzo (1992), "Why Are Teenagers in the United States Less Likely to Breast-Feed Than Older Women." *Demography* 29(3): 431-450.

**Table 3. Ordinary Least Squares Regression Estimates Predicting Editor's Final Decision<sup>a</sup> on Manuscripts Submitted to ASR, 1977-1981**

Predictor	b	$\beta$
<i>Author's/1<sup>st</sup> Author's Characteristics</i>		
Rank	.146*	.082*
Male (=1)	-.134	-.018
Years of professional employment	-.044**	-.114**
Prestige of institution trained	-.049	-.017
Prestige of institution employed	.181**	.141**
Prior participation as ASR reviewer (=1)	.370	.055
<i>Manuscript's Characteristics</i>		
Submission rate of substantive area (3-point scale)	-.052	-.013
Method of data collection (ref.=archival data)		
No data	-.088	-.013
Primary data	-.249	-.031
Combination of primary and archival data	.343	.044
Method of data analysis (ref.=advanced statistical analysis)		
No analysis	-.192	-.030
Qualitative analysis	-.501	-.045
Descriptive analysis	-.290	-.031
Number of authors	.178	.048
<i>Editors Assigning Manuscripts to Referees (Ref.=Not assigned)</i>		
Editor 1	.034	.003
Editor 2	-.148	-.001
Editor 3	-.908	-.026
Editor 4	-.075	-.010
<i>Review Procedure</i>		
Number of reviewers	.313*	.102*
Number of days to decision	.003*	.093*
<i>Number of Revisions</i>	1.620***	.737***
<i>Averaged recommendation score (4-point scale)<sup>b</sup></i>	4.700***	.547***
Constant	.511*	
Adjusted R <sup>2</sup>	.581	
N	2,337	

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

<sup>a</sup> 7-point ordinal scale with a higher score indicating a more favorable decision.

<sup>b</sup> A higher score indicates a more favorable recommendation.

Source: Adapted from Table 1 of Von Bakanic, Clark McPhail, and Rita Simon (1987), "The Manuscript Review and Process." *American Sociological Review* 52(5): 631-642.