

FEDERATION METHODS AND STATISTICS COMPREHENSIVE EXAM

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

Fall, 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 _____

Part 1: FEDERATION METHODS COMPREHENSIVE EXAM**Fall, 2003**

(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. newspaper editorials
 - b. non-institutionalized adults in the United States
 - c. prostitutes
 - d. students in private elementary and secondary schools in Denton County
 - e. 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. attitude toward a current public issue
 - b. competition
 - c. degree of professionalization
 - d. prejudice
 - e. social class
 - f. values

B. For one of the following, develop two separate research designs—one quantitative and one qualitative. Describe each research design in detail.

1. Design a study to determine the level of job satisfaction among employees in a university setting.
2. Design a study to determine the tendencies of a labor union toward oligarchy or democracy.
3. A zoo asks you to evaluate the popularity of its various exhibits and the characteristics of persons attracted to each exhibit in order to begin a fund raising campaign.
4. Design a study to determine the effects of aging among a population including men and women. Chose three areas of concern, such as attitudes, social participation, health, intergenerational support, etc.

Part 2: FEDERATION STATISTICS COMPREHENSIVE EXAM**Fall, 2003**

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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 ρ
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. 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. Opinion about water-quality standards by level of distrust in announcements from a chemical plant that contaminated the water supply for a sample of residents of a town in Massachusetts.

| Level of Distrust in Announcements from Chemical Plant | Water Standards Should Be: | | Total |
|---|------------------------------|-------------|--------------|
| | Less Strict or Kept the Same | More Strict | |
| Low | 75.0% | 25.0 | 100.0% (96) |
| High | 46.2% | 53.8 | 100.0% (104) |
| $\chi^2 = 17.308, df = 1, p < .001; \phi$ or Phi = .294; Gamma = .556 | | | |

Table 1b. Opinion about water-quality standards by level of distrust in announcements from a chemical plant that contaminated the water supply by frequency of drinking bottled water for a sample of residents of a town in Massachusetts.

Drink Bottled Water "Never" or "Occasionally"

| Level of Distrust in Announcements from Chemical Plant | Water Standards Should Be: | | Total |
|---|------------------------------|-------------|-------------|
| | Less Strict or Kept the Same | More Strict | |
| Low | 75.0% | 25.0 | 100.0% (80) |
| High | 64.3% | 35.7 | 100.0% (56) |
| $\chi^2 = 1.821, df = 1, p > .05; \phi$ or Phi = .116; Gamma = .250 | | | |

Drink Bottled Water "Often" or "Always"

| Level of Distrust in Announcements from Chemical Plant | Water Standards Should Be: | | Total |
|---|------------------------------|-------------|-------------|
| | Less Strict or Kept the Same | More Strict | |
| Low | 75.0% | 25.0 | 100.0% (16) |
| High | 25.0% | 75.0 | 100.0% (48) |
| $\chi^2 = 12.800, df = 1, p > .001; \phi$ or Phi = .447; Gamma = .800 | | | |

Table 2. Results from a logistic regression of election of a woman to open county office (1=woman elected; 0=man elected) on type of office, constituency (i.e., county population) characteristics, and temporal and state controls in the U.S. South.

| Independent Variables | b | odds ratio |
|---|----------|------------|
| <i>Type of Open County Office</i> | | |
| Clerkship-type offices (omitted or reference category) | ----- | ----- |
| Attorney | -2.02** | 0.133 |
| Coroner | -2.60** | 0.074 |
| Executive office | -3.51** | 0.030 |
| Sheriff | -4.21** | 0.015 |
| <u>Constituency (i.e., County Population) Characteristics</u> | | |
| <i>Population size (in 10,000s)</i> | -0.18** | 0.835 |
| <i>Proportion 65 or older</i> | 3.30* | 27.113 |
| <i>Proportion college graduate</i> | -1.35 | 0.259 |
| <i>Mean household income (in \$1,000)</i> | 0.03** | 1.030 |
| <i>Proportion African American</i> | 1.60** | 4.953 |
| <u>Temporal and State Controls</u> | | |
| <i>Year (1978=0, 1979=1, ... 1999=21)</i> | 0.06** | 1.062 |
| <u>State</u> | | |
| Florida, Mississippi, or Virginia (omitted or reference category) | ----- | ----- |
| Arkansas | 0.68** | 1.974 |
| Georgia | 0.35** | 1.419 |
| Louisiana | -0.91** | 0.403 |
| North Carolina | 1.12** | 3.065 |
| South Carolina | 0.40** | 1.492 |
| Texas | 1.26** | 3.525 |
| Constant | -2.13*** | 0.119 |
| N or number of open county offices in sample | 3,454 | |
| -2 Log likelihood | 3,031.60 | |
| Pseudo R ² | .30 | |

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

Adapted from Lublin, David and Sarah E. Brewer. 2003. "The Continuing Dominance of Traditional Gender Roles in Southern Elections." *Social Science Quarterly* 84(2): 379-396.

Table 3. Unstandardized coefficient estimates from regressions of happiness on gender and other selected variables for a sample of U.S. adults in 1990.

| Independent Variables | Model 1 | Model 2 |
|--|----------|-----------|
| <i>Gender</i> | | |
| Male (omitted or reference category) | ----- | ----- |
| Female | 0.048 | -0.188** |
| <i>Age in years</i> | 0.009*** | 0.006*** |
| <i>Minority status</i> | | |
| Non-Hispanic White (omitted or reference category) | ----- | ----- |
| Other | 0.069 | -0.018 |
| <i>Marital status</i> | | |
| Other (omitted or reference category) | ----- | ----- |
| Married or living together | 0.446*** | 0.452*** |
| <i>Education in years</i> | 0.059*** | 0.061*** |
| <i>Emotional expressiveness</i> | ----- | 1.221*** |
| <i>Emotional reserve</i> | ----- | -0.539*** |
| Constant | 4.328 | 0.582 |
| N or number of respondents | 2,031 | 2,031 |
| R ² | 0.032 | 0.398 |

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

NOTE: Respondents were asked, "On how many of the past 7 days have you [felt happy, felt hopeful about the future, enjoyed life]?" Responses for each of the three questions were coded from 0 to 7, from never experiencing the happiness "symptom" to experiencing it every day. A respondent's *happiness* score is the average of the frequencies reported for the three happiness "symptoms." *Emotional expressiveness* is measured by an index, with higher scores indicating greater willingness of respondents to express their emotions. *Emotional reserve* is measured by level of agreement with the statement, "I keep my emotions to myself." The response categories for this variable were "strongly disagree" (coded -2), "disagree" (coded -1), "don't know" (coded 0), "agree" (coded 1), and "strongly agree" (coded 2).

Adapted from Mirowsky, John and Catherine E. Ross. 1995. "Sex Differences in Distress: Real or Artifact?" *American Sociological Review* 60:449-468.