

FEDERATION METHODS AND STATISTICS EXAM

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

Spring 2001

January 9, 2001

GENERAL INSTRUCTIONS FOR TAKING 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 pm to complete the exam.

Please **WRITE ONLY ON EVERY OTHER LINE or DOUBLE SPACE. WRITE OR PRINT ON ONLY 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

(Spring 2001)

(Remember: WRITE ONLY ON EVERY OTHER LINE or DOUBLE SPACE and PRINT OR WRITE on ONE SIDE OF THE PAPER)

A. Choose one of the following

1. Why do social scientists take random samples? Discuss the advantages of random sampling relative to non-random sampling. When is it preferable to do non-probability sampling?

OR

2. For three of the following populations select and discuss an appropriate sampling procedure, including type of sample, sampling frame, sampling units.

- a. alcoholics
- b. marijuana users (pot smokers)
- c. political editorials
- d. HIV-infected children (under 18 years of age)
- e. voters of Harris County

B. List and describe the steps in either a qualitative or a quantitative research process. Then, select a specific research question of interest to you to illustrate these steps. Be as specific as possible in demonstrating your knowledge of the research process.

C. Define and provide an example of three of the following:

1. Ecological fallacy
2. Guttman scaling
3. Validity of measurement
4. External validity in experimental design
5. Panel study

Part II: FEDERATION STATISTICS

(Spring 2001)

A. Define and relate each of the following to one another as they apply to conducting a test of statistical significance. It must be shown how they relate to one another in order to answer the question correctly.

1. Research and null hypothesis
2. Simple random sample
3. Sampling distribution and standard error
4. Level of significance and critical region
5. One-tail and two-tail test
6. Type I and type II error (be sure to address why we are concerned with these)

B. What are the four basic levels of measurement and what are their mathematical characteristics? Give an example of each level. What measure of central tendency and what measure of dispersion is most appropriate for each?

Give an example of a measure of association and a test of significance that would be appropriate with four of the following combinations of independent and dependent variables and justify your choice:

Level of Measurement of
Independent Variable

Level of Measurement of
Dependent Variable

1. Nominal
2. Nominal
3. Ordinal
4. Interval/ratio
5. Nominal

- Nominal
- Interval/ratio
- Ordinal
- Interval/ratio
- Ordinal

C. Answer the following questions and, where possible, relate your answers to Table 1 (see attached).

1. What assumptions must be made in order to use regression analysis appropriately? Provide a brief description of each.
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 1: Effects of education, income, and age on the number of pieces assembled per hour.

	<u>Equation 1</u>			<u>Equation 2</u>		
	<i>Beta</i>	<i>b</i>	<i>p</i>	<i>Beta</i>	<i>b</i>	<i>p</i>
Education	.47	1.23	<.001	.42	1.19	<.001
Income	.64	276	<.001	.69	272	<.01
Age				.12	.20	Ns
R ²	.45			.47		