FEDERATION METHODS AND STATISTICS COMPREHENSIVE EXAM

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

Fall, 2005

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, 2005

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

A. Discuss **four** of the following six problems encountered in doing research and discuss ways of minimizing each problem selected.
   1. Ecological fallacy
   2. Hawthorne effect
   3. Item non-response
   4. Measurement error
   5. Researcher bias
   6. Unethical treatment of human subjects

B. Select **three** of the following five populations and, for each, discuss an appropriate sampling procedure and problems you would expect to encounter.
   1. Domestic films in the last decade
   2. Homeless persons
   3. Non-institutionalized adults in the United States
   4. Residents of profit and non-profit nursing homes in the Dallas-Fort Worth metropolitan area
   5. "Swinging" (i.e., spouse-swapping) couples

C. 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, operationalization, data collection, and data analysis.

Part 2: FEDERATION STATISTICS COMPREHENSIVE EXAM Fall, 2005

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A. For **six** of the following eleven pairs discuss what factor(s) must be taken into consideration in choosing between the two techniques for use in the analyses of data.

1. standard deviation and interquartile range
2. chi-squared test and gamma
3. Pearson's r and Spearman's rho
4. interaction term and squared term in an ordinary least squares multiple regression analysis
5. pie chart and scatterplot
6. t and F test
7. lambda and gamma
8. PRE and non-PRE measures of association
9. r and partial r
10. frequency and percentage
11. ordinary least squares regression and logistic regression

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

1.

a. State a null 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 null hypothesis 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 both panels of Table 1b and interpreting the accompanying relevant statistics.

OR

2. Write a brief essay substantively interpreting the path analyses presented in Figures 2a and 2b.

3. Answer the following questions about Table 3.

    a. List and briefly explain the assumptions that must be made to use ordinary least squares multiple regression analysis.

    b. What does each of the following tell us?
        i. unstandardized regression coefficient estimate (b)
        ii. standardized regression coefficient estimate (Beta or β or b^*)
        iii. level of significance (α or alpha)
        iv. coefficient of determination (R^2)

    c. Write a brief essay substantively interpreting the table.

Table 1a. Occupation and Place of Residence in Metropolitan New York among Employed Chinese in 1960 (*n*=10,869).

	Place of Residence	
Occupation	**Chinatown**	**Non-Chinatown**
White Collar	18.2%	46.3%
Service	40.0	19.6
Manual	29.6	27.2
Not Reported	12.3	7.0
Total	100.1%[a]	100.1%[a]
(*n*)	(5,654)	(5,215)

χ^2 = 1,137.122, *df* = 3, p < .001; lambda = 0.166.
[a]Does not total 100.0 due to rounding.

Table 1b. Gender, Occupation, and Place of Residence in Metropolitan New York among Employed Chinese in 1960 (*n*=10,869).

Males

	Place of Residence	
Occupation	**Chinatown**	**Non-Chinatown**
White Collar	16.4%	37.9%
Service	46.7	32.5
Manual	24.1	22.3
Not Reported	12.8	7.3
Total	100.0%	100.0%
(*n*)	(4,601)	(2,668)

χ^2 = 453.441, *df* = 3, p < .001; lambda = 0.034.

Females

	Place of Residence	
Occupation	**Chinatown**	**Non-Chinatown**
White Collar	25.9%	55.1%
Service	10.6	6.0
Manual	53.5	32.3
Not Reported	10.0	6.6
Total	100.0%	100.0%
(*n*)	(1,053)	(2,547)

χ^2 = 255.527, *df* = 3, p < .001; lambda = 0.151.

Note: Adapted from Yuan, D. Y. 1966. "Chinatown and Beyond: The Chinese Population in Metropolitan New York." *Phylon* 27(4):321-32

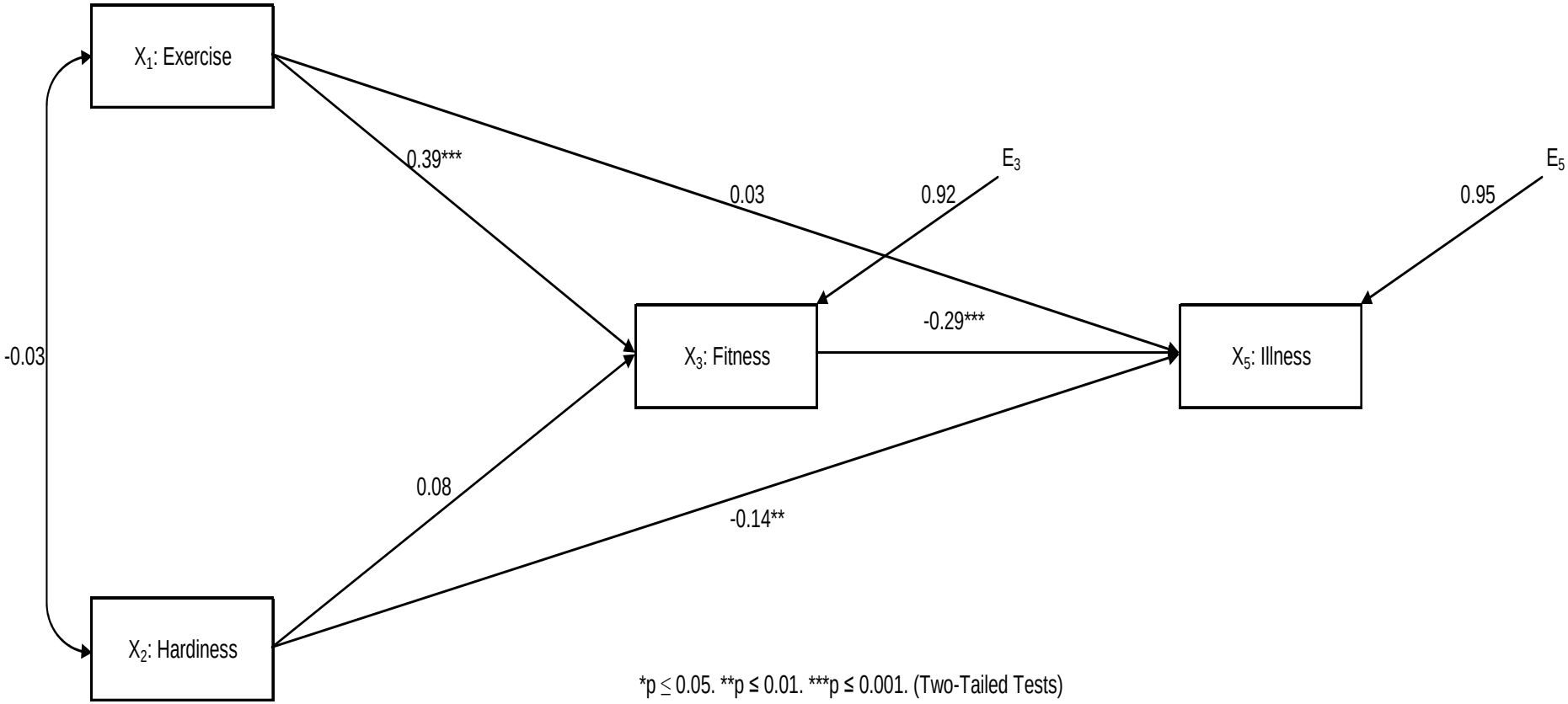

Figure 2a. Standardized coefficient estimates for path model linking the number of symptoms of physical illness experienced in the past month (X_5: Illness) to self-perceived level of physical fitness (X_3: Fitness), personal hardiness such as feelings of control over one's life and commitment (X_2: Hardiness), and the extent of participation in various exercises (X_1: Exercise). Each variable is measured at the interval-ratio level, and the variables are scaled so that higher values represent more of the measured characteristic.

Note: Adapted from Kline, Rex B. 2005. *Principles and Practice of Structural Equation Modeling*, 2nd ed. New York: Guliford Press, pp. 124-5.

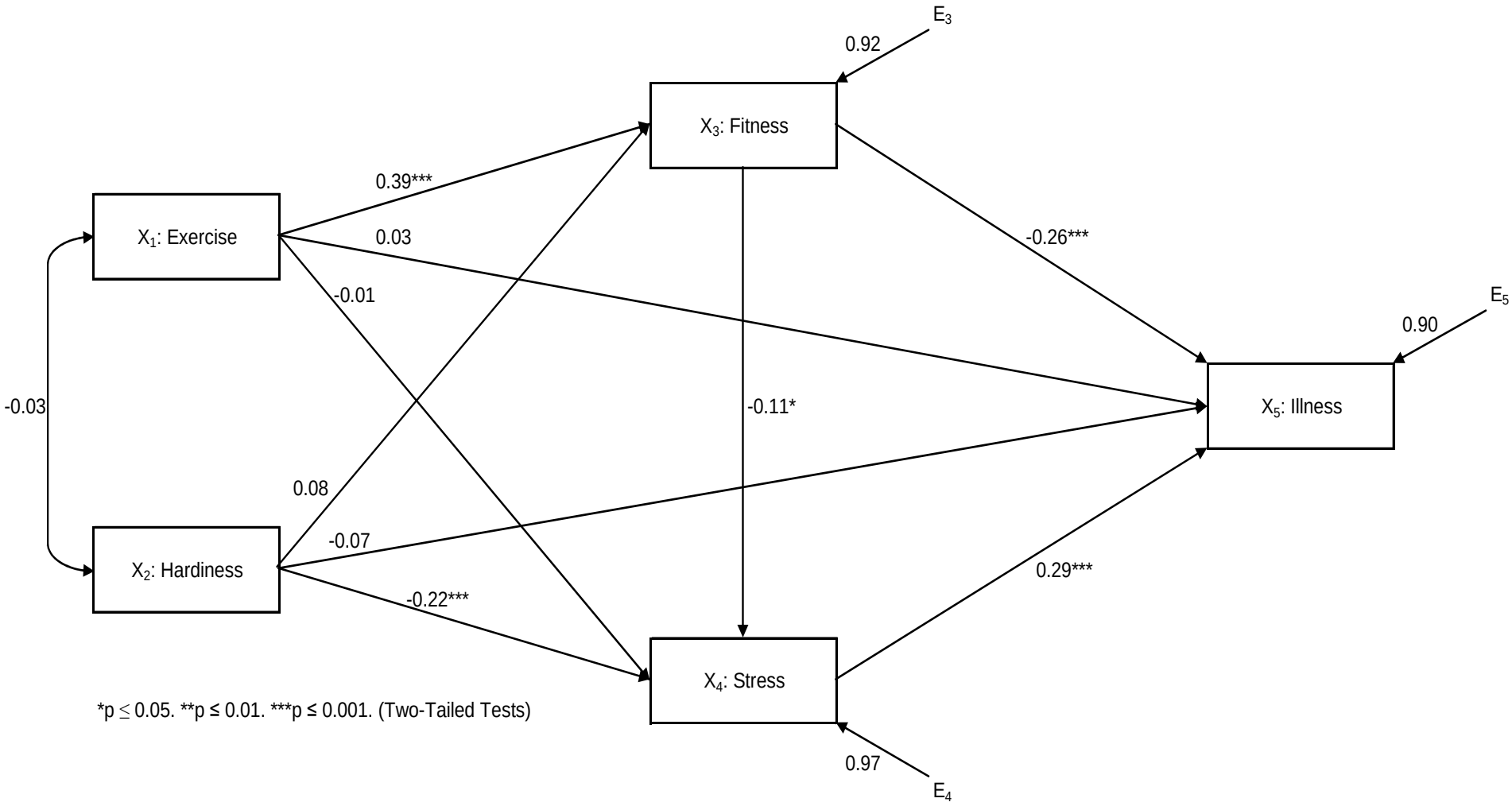

Figure 2b. Standardized coefficient estimates for path model linking the number of symptoms of physical illness experienced in the past month (X_5: Illness) to severity of negative life stress experienced in the past month (X_4: Stress), self-perceived level of physical fitness (X_3: Fitness), personal hardiness such as feelings of control over one's life and commitment (X_2: Hardiness), and the extent of participation in various exercises (X_1: Exercise). Each variable is measured at the interval-ratio level, and the variables are scaled so that higher values represent more of the measured characteristic.

Note: Adapted from Kline, Rex B. 2005. *Principles and Practice of Structural Equation Modeling*, 2nd ed. New York: Guliford Press, pp. 124-5.

Table 3. Results of ordinary least squares regressions of "feelings of closeness to/level of identification with" other Blacks[a] on military background and other personal characteristics among Black adult males in 1979-80 (*n*=761).

	Model 1		Model 2		Model 3	
Variable	b	β or b*	b	β or b*	b	β or b*
Military Background						
No Military Experience (omitted or reference category)						
Non-Combat Military Experience	-0.11*	-0.09	-0.08	-0.07	-0.07	-0.06
Combat Military Experience	-0.13*	-0.09	-0.09	-0.07	-0.07	-0.05
Age in Years			0.01***	0.25	0.01***	0.19
Education[b]			-0.05***	-0.18	-0.05***	-0.21
Family Income[c]			0.01	0.04	0.003	0.02
Missing Family Income[c]						
Provided Family Income (omitted or reference category)						
Did Not Provide Family Income			0.03	0.02	0.04	0.02
Region of Residence						
Non-Southern State (omitted or reference category)						
Southern State			0.13**	0.12	0.10*	0.09
Urbanicity of Residence						
Non-Urban Area (omitted or reference category)						
Urban Area			-0.19***	-0.18	-0.17***	-0.16
Frequency of Public Religious Participation[d]					0.10***	0.20
Number of Neighborhood Groups Involved With[e]					0.03	0.03
Constant	3.41***		3.23***		3.15***	
R^2	0.013		0.224		0.260	
Model F	4.95**		27.10***		26.41***	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed tests).

[a]Measured by an index, with higher values indicating greater "closeness to/identification with" other Blacks.

[b]Measured by an 8-point summary scale, with higher values indicating higher levels of education.

[c]Measured by a 17-point summary scale, with higher values indicating higher levels of family income. Since a relatively high percentage of respondents did not provide information about their family's income, "missing values on this item [were] replaced with the sample mean, and a dummy variable [was] included in all equations to identify these missing cases" (Ellison, 1992, p. 367).

[d]Frequency of public religious participation was measured by the respondent's mean response to items asking about attendance at religious services/participation in other church-related activities. Response categories for each item ranged from 1="never or almost never" to 5="several times per week."

[e]Groups include social clubs, community associations, etc. This variable ranges from "0" to "3 or more."

Note: Adapted from Ellison, Christopher G. 1992. "Military Background, Racial Orientations, and Political Participation among Black Adult Males." *Social Science Quarterly* 73(2):360-78.