

CJ 793
Computer-Based Data Analysis
Spring 2008

I. General Information

Instructor: Hee-Jong Joo, Ph.D.

Phone: (936) 294-4773

Class Hours: W 12:00-2:50 p.m.

Class Room: CJC A181

Office: C-211

E-mail: hjjoo@shsu.edu

Office Hours: Tu 2:00-4:00, W 3:00-6:00,

and by appointment

II. Course Description

This course is designed to develop proficiency in data analysis using statistical package programs such as SPSS and HLM. Conceptual understanding of multivariate statistical methods and research design issues are combined with hands-on computer analyses. The course emphasizes the examination of the data, the applications of multivariate statistical methods, and diagnostics. Topics covered in this class include data management, advanced diagnostics, multivariate statistics such as factor analysis, logistic regression, and hierarchical linear modeling. (Desired prerequisites: CJ 685 and CJ 742 or equivalents in past years. Students who do not have this background are discouraged from taking this class.)

III. Goals and Objectives

Upon completing this course, you should be able to do the following:

1. Identify the major issues in data management and analysis (e.g., missing values, outliers, underlying assumptions, and diagnostic procedures to assess them) in the application of major multivariate statistics.
2. Provide remedies when violations occur and determine the best method of data transformation given a specific problem.
3. Conduct multivariate statistical tests by means of major statistical package programs, and demonstrate how to interpret the output generated and how to present the results.
4. Develop a technical competency in data analysis up to the level where students can replicate some of the previous empirical findings published in referred journals.
5. Design and conduct an empirical study of your own in your areas of academic interests and write a research paper of quality suitable for consideration for a publication in a referred journal.

IV. Text and Course Requirements

1. Textbooks and Materials

1) Required Text:

- (1) Mertler, Craig and Vannatta, Rachel. (2005). Advanced and Multivariate Statistical Methods. 3rd Ed. Pyrczak Publishing.
- (2) Hair, Joseph, Black, William, Babin, Barry, Anderson, Rolph, and Tatham, Ronald. (2006). Multivariate Data Analysis. 6th Ed. Prentice Hall.
- (3) Luke, Douglas. (2004). Multilevel Modeling. Sage Publications, Inc.
- (4) Raudenbush, Stephen and Bryk, Anthony. (2002). Hierarchical Linear Models: Applications and Data Analysis Methods. 2nd Ed.
- (5) Raudenbush, Stephen, Bryk, Anthony, Cheong, Yuk Fai, Congdon, Richard, and du Toit, Mathilda. (2004). HLM 6: Hierarchical Linear and Nonlinear Modeling. Scientific Software International, Inc.

2) Recommended Reading (optional)

- (1) Bickel, Robert. (2007). Multilevel Analysis for Applied Research: It's Just Regression! The Guilford Press.
- (2) Kohler, Ulrich and Kreuter, Frauke. (2005). Data Analysis Using Stata. Stata Press.

2. Course Requirements

This course will use a combination lecture, lab session, and seminar format. Class attendance, reading, writing, and class participation are mandatory.

- 1) Attendance and Class Participation: Attendance and Class participation will be 10% of the final grade, and it will be measured based on the following three areas:
 - (1) Class Attendance: Regular and punctual class attendance is required. Attendance will be recorded for each class session. The student should notify the instructor in advance when unable to attend class. A student will be penalized for more than three hours of absence.
 - (2) Class Preparation: To get the most out of the learning experience, students are expected to complete required readings and other assignments as outlined in the syllabus prior to each class, and be prepared to discuss them in class.

- (3) In-Class Discussion: Each student is expected to make a significant contribution to class discussions. Class discussion will be subjectively measured by, but not limited to, the quality and quantity of class discussion, willingness to listen and respond to questions of others, and participation in sharing relevant information or experience beyond assigned readings.
- 2) Four Assignments on Data Analysis: All assignments on data analysis using SPSS or HLM are to be submitted by the dates specified in the annotated course outline or otherwise discussed by the instructor. Late submissions will be downgraded (-10%) and will not be accepted after one week. All assignments handed in (except in-class or computer exercises) will be typed and double-spaced with 1-inch margins and size 11 font.
- 3) One Article Review Presentation: Students are required to locate one journal article utilizing at least one of the multivariate techniques covered in this course, and to prepare an article review presentation to the class on the primary topics assigned each week (20 minutes). Students are required to select an article published in one of the following major journals in criminal justice: *Criminology*, *Justice Quarterly*, *Crime and Delinquency*, *Journal of Research in Crime and Delinquency*, *Journal of Criminal Law and Criminology*, *Journal of Quantitative Criminology*, *Journal of Criminal Justice*, and *Criminal Justice and Behavior*. Students are expected to summarize the article for the class and lead a class discussion about the issue.

The review must address the following: 1) Research hypothesis tested in the article, with descriptions of data set and hypothesized variable relationships (dependent, independent, and control variables); 2) Data analyzed and relevant multivariate statistical method(s) used; 3) The results of data analyses; and 4) Appropriate interpretation of the results. In your presentation, the main focus should be given on how the authors apply any specific multivariate statistic to their research, how they interpret and present the results, and what kind of methodological procedure they used. If the paper does not clearly mention methodological details, you need to either figure out or identify them by contacting the authors.

Students are required to prepare PowerPoint slides for use in presenting these reviews to the class. Each presentation will be required to demonstrate an advanced knowledge of the material, to assist the student in articulating what they have read, and to lead a class discussion on the material covered. The presentations will be evaluated based on the following criteria: organization of presentation; substantive quality of information presented; ability to hold the audience's attention; and the relevance to primary foci of the class.

- 4) Research Paper: There will be one term paper with a presentation to the class

during the last two or three class days. The paper should be an individualized research project on a topic of professional interest related to the class. The student is expected to integrate theories, methodologies, and empirical findings into his/her project. A minimum of 25 refereed journal sources is required for the paper. The paper is expected to be an original empirical paper developed solely for this class consisting of approximately 20 word-processed and double-spaced pages. Late submissions for the completed paper will result in a one-letter grade reduction and will not be accepted after one class meeting.

► Procedure and Guidelines for the Research Project

(1) Data Selection and Paper Topic (Due: 4th week or February 6, 2008):

Students must choose their own data sets. Data are available from a variety of sources such as ICPSR (<http://www.icpsr.umich.edu>), a dataset you have already had or you are familiar with, or a course-related data set which may be provided by the professor.

Select a clear and specific topic, explain why it is significant, and identify some of the research questions to be examined. The instructor must approve all topics. They must be approved no later than the fourth class day. To obtain approval, please submit a one page abstract with 5 refereed journal references. The paper should be typed and double-spaced. Failure to have your topic approved on time will result in at least a one letter grade reduction on your assignment.

(2) Research Proposal (Due: 8th week or March 5, 2008):

The proposal should contain an introduction to your research topic, literature review, and data and methods sections, which briefly addresses the following questions:

- What are the major arguments or controversies related to your topic?
- Why is this issue significant to criminal justice researchers or practitioners?
- What are the findings of the previous studies on your topic?
- What are the major research questions you are going to examine (including the identification of the dependent, independent, and control variables)?
- What data and statistical methods will be used to analyze?

The proposal should be typed, double-spaced, and approximately 5 pages in length with at least 15 refereed journal references.

(3) In-Class Presentation: During the last two or three weeks of class, students will be required to make a formal presentation of their final paper to the class and lead a discussion of their findings. The format of this presentation will be in

PowerPoint. The oral presentation grade will be based on clarity, completeness, demonstrated understanding, and compelling delivery of the presentation.

(4) Final Paper (Due: 15th week or April 23, 2008):

Students will be required to submit a full written report of their term project. The paper should be typed, double-spaced, and approximately 20 pages in length. Provide the full text of SPSS output as an appendix at the end of the paper. The written paper grade will be based on content-completeness and demonstrated understanding of the topic (30%), clarity of writing (30%), organization (30%), and citation and reference style –APA style (10%).

V. Grading

1. Attendance and Class Participation: 10%
2. Four Assignments on Computer Exercise: 40% (10% each)
3. One Article Review Presentations: 10%
4. Topic and Research Proposal: 10%
5. Term Paper with Presentation: 30%
6. Final Exam: 10 % (extra)

VI. Other Course Information

1. Makeup Exams or Class Presentations/ Late Submissions:

Makeup exams or in-class presentations will be given only for the most serious circumstances and with prior approval. If you have serious circumstances that require you to miss the exam or class presentations, you will be required to provide documentation regarding your absence. Missing a makeup exam or presentation will result in a grade of zero for that exam or presentation. Late submissions for summaries, research proposal, or the paper will be downgraded (-10%) and will not be accepted after one class. All assignments handed in should be typed, double-spaced, and size 11 font.

2. Academic Dishonesty:

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. Any student engaged in academic dishonesty in this class will receive an “F” for the semester. For a complete listing of the university policy, see:

<http://www.shsu.edu/administrative/faculty/sectionb.html#dishonesty>

3. Classroom Rules of Conduct:

Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination. Students may tape record lectures provided they do not disturb other students in the process.

4. Student Absences on Religious Holy Day Policy:

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: “a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20...” A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

http://www.shsu.edu/~vaf_www/aps/documents/861001.pdf

5. Students with Disabilities Policy:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance are expected to visit with the Office of Services for Students with Disabilities located in the Counseling Center. They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may adversely affect your work in this class, then I encourage you to register with the SHSU Counseling Center and to talk with me about how I can best help

you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Counseling Center . For a complete listing of the university policy, see: http://www.shsu.edu/~vaf_www/aps/811006.html

6. Visitors in the Classroom:

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

7. Use of Blackboard:

The syllabus and other class-related materials will be placed on Blackboard in case a student requires an additional copy. Notices regarding the class will be posted on Blackboard as well.

VII. Course Outline

The tentative course outline indicates the approximate dates when selected topics will be discussed. The chapters listed for each lecture should be read before attending that class. If changes in the schedule and readings are necessary, students will be held responsible for such changes that will be announced in class.

Week	Dates	Topics Covered	Readings & Assignments Dues
1	Jan 16	Course Introduction	Syllabus
2	Jan 23	Overview of Multivariate Data Analysis & Data Management	Mertler ch.1&2; Hair, ch.1
3	Jan 30	Data Screening <ul style="list-style-type: none"> - Missing Data - Outliers - Illustrative Example(s) - Computer Exercise 	Mertler ch.3;

4	Feb 6	<p>Examination of the Data</p> <ul style="list-style-type: none"> - Testing the Underlying Assumptions of Multivariate Analyses (Normality, Linearity, Homoscedasticity, Multicollinearity etc.) - Data Transformations 	<p>Hair, ch.2</p> <ul style="list-style-type: none"> - Research Topic (due Feb. 6)
5	Feb 13	<p>Data Reduction: Factor Analysis</p> <ul style="list-style-type: none"> - Assumptions and Limitations - Process and Logic - Output and Interpretation of the Results 	<p>Mertler ch.9;</p> <ul style="list-style-type: none"> - Computer Exercise (1) for Mertler, ch.3, or Illustrative Examples (pp.62-72; 76-79; 88-95) of Hair, ch.2 (due Feb. 13)
6	Feb 20	<p>Factor Analysis</p> <ul style="list-style-type: none"> - Illustrative Example(s) - Computer Exercise - Article Review Presentation(s) 	<p>Hair, ch.3; Journal Article(s)</p>
7	Feb 27	<p>Logistic Regression</p> <ul style="list-style-type: none"> - Assumptions and Limitations - Process and Logic - Output and Interpretation of the Results 	<p>Mertler ch.11;</p> <ul style="list-style-type: none"> - Computer Exercise (2) for ch.9 of Mertler or Illustrative Examples (pp.140-162) of Hair, ch.3 (due Feb 27)
8	Mar 5	<p>Logistic Regression</p> <ul style="list-style-type: none"> - Illustrative Example(s) - Computer Exercise - Article Review Presentation(s) 	<p>Hair, ch.5 (pp. 355-382); Journal Article(s)</p> <ul style="list-style-type: none"> - Proposal for Term Project (due March 5)
9	Mar 12	<p>Spring Break ACJS Meetings</p>	-
10	Mar 19	<p>Multilevel Modeling or Hierarchical Linear Model</p> <ul style="list-style-type: none"> - Basic Multilevel Modeling 	<p>Luke, ch 1-2 (pp.1-53);</p> <ul style="list-style-type: none"> - Computer Exercise (3) for Mertler, ch.11 or Illustrative Examples (pp.368-378) of Hair, ch.5 (due Mar 19)

11	Mar 26	Multilevel Modeling - Article Review Presentation(s)	Raudenbush, ch 1-2; Journal Article(s)
12	Apr 2	Multilevel Modeling: An Illustration - Replication of Luke, ch.2 - Article Review Presentation(s)	Raudenbush, ch 4; Journal Article(s) -Computer Exercise (4) for Replication of Luke, ch.2 (due April 2)
13	Apr 9	HLM 6 Programming - Replication of Raudenbush, ch.4 - Article Review Presentation(s)	HLM 6; Journal Article(s)
14	Apr 16	Multilevel Modeling: Applications in Organizational Research - Article Review Presentation(s)	Raudenbush, ch 5; HLM 6; Journal Article(s)
15 -17	Apr 23- May 7	Term Project Presentations	- Term Paper (due April 23)
18	May 12	Final Exam	-