

Department of Criminal Justice and Criminology

**CRIJ7371.04
Multilevel Modeling
Fall 2017**

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Class Hours: Monday 1:00 pm – 3:50 pm

Class Room: CJA-205

Office Hours: Monday 9:00 am – 10: 00 am; Tuesday 1:30 pm – 2:30 pm; or by appointment

Required Text

Raudenbush, Stephen W., & Bryk, Anthony S. Hierarchical Linear Models. Applications and Data Analysis Methods. Sage, 2nd edition, 2002.

Raudenbush, Stephen W., Bryk, Anthony S., Cheong, Yuk Fai, & Congdon, Richard. HLM 7: Hierarchical Linear and Nonlinear Modeling. Scientific Software International, 2011.

Further required/recommended readings will be provided through the blackboard system.

Course Description:

This course focuses on the introduction of multilevel regression models. These models are used in studies with hierarchical data structures where individuals are nested within groups (e.g., communities, organizations) and/or individuals are measured repeatedly over time. We review the logic and basic principles of multilevel modeling, introduce fixed- and random-effects models, and discuss methodological issues including centering and interpreting cross-level interactions. We cover models for continuous as well as binary and count data. The course emphasizes the application of these methods and will introduce computer programming using software of SPSS and HLM.

Prerequisite: CRIJ 7442 or an equivalent course.

Course Objectives

Upon completion of the course, the student should be able to:

- Understand the basic concepts of multilevel modeling

- Identify the circumstances and conditions under which multilevel modeling is appropriate,
- Formulate multilevel research problems, pose and test multilevel hypotheses
- Understand two-level hierarchical model as well as growth curve analysis and draw substantive conclusions from HLM results
- Interpret the research literature and
- Apply multilevel analysis models in her/his own research appropriately

Course Requirements

Class lectures are not intended to be your only source of information for this course. It is very important that you read all the outlined chapters, review these chapters as necessary, and seek other materials that could supplement your knowledge or assist you in better understanding the materials we are covering in class. You are encouraged to form study groups with other members of the class, but you need to work independently on the assignments or research projects.

Students are expected to keep up with the readings and to complete assignments on time. Late assignments will not be accepted. If you cannot complete assignments on time due to an emergency, you must let me know before the assignment is due if this is humanly possible.

HLM Software and Data

This course relies on HLM software. You can access the software in the graduate computer lab. We will spend time in class going over programming, but students are expected to familiarize themselves with the software package.

Datasets for your assignments will be provided on blackboard. Dataset for your research project will be provided as needed. Please note that datasets used for your research projects (if the datasets are provided by the instructor) should not be used for any other purpose; and should not be shared or otherwise distributed to people outside of the course without permission from the instructor.

Your grade for this course will be comprised of two parts:

- Four Assignments (25 points each)

There will be four assignments based on different statistical techniques discussed in class. These assignments are intended to help you to understand the statistical methods and learn how to use HLM. While you are encouraged to work together and help each other in learning HLM and interpreting the results, you need to complete your assignments independently.

For each assignment, students will be required to conduct analysis of the dataset, and write a brief summary of the results. HLM output should be attached as an appendix.

Assignments must be turned in at the beginning of class on the day they are due or they will be considered late. For each day that an assignment is late (regardless of the reason), two points will be subtracted from the grade.

- Term Paper (100 points).

Each student (or a group of students, with maximum number of two students) will write a research paper utilizing the HLM modeling. Student needs to identify a research topic as well as datasets that allow the application of the appropriate statistical models by September 18th.

(In case that students do not have an appropriate topic and/or dataset, a list of research topics and relevant datasets will be provided by the instructor as needed.)

The components of the term paper should include:

1. Title of your research paper;
2. Introduction, which states the problems, purpose and objectives, and establishes the importance of your research;
3. Literature review, which reviews the relevant literature, formulates theoretical structure and/or conceptual scheme, and summarizes the research status of the questions;
4. Develop research questions and hypotheses;
5. Describe the methods, including dataset, measures of variables, and statistical models; conduct empirical analysis; and explain and interpret statistical results; and
6. Discuss the impact as well as the limitations and weaknesses of your research.

The data analysis and interpretation of your results should take up a greater proportion of your paper. You should fully explain what your statistics mean and what you can deduct from them as they relate back to your hypotheses and literature review.

The paper is expected to be an original work developed solely for this class. The final paper will be 20-25 pages in length (not including the required cover page, table of contents, references pages or appendix).

A minimum of 25 refereed journal sources is required for the paper. All papers must be referenced according to the APA format, with long quotes (3 or more lines) indented and double-spaced. Standard margins and fonts should be used.

The final paper should be suitable for presentation and subsequent publication.

Authorship: If the research topic and dataset are provided by the instructor, the instructor will hold the primary or secondary authorship on that paper.

Procedure and guidelines for your research project

1. Research topic (Due Sep 18th, 2017) –20 points

Identify a provisional research topic. Explain what the purpose of your study is, and what the research questions that will be examined are. Describe the dataset that will be used, including the original data collection procedure, sample size, and variables available measuring the major concepts of your research questions. Even if the topic is provided by the instructor, students still need to clarify these issues.

Please submit a short proposal (two pages, double spaced), with at least 5 refereed journal references.

2. Research proposal with finished literature review (Due Oct 23rd, 2017) –20 points

3. First formal draft (Due Nov 20th, 2017) –40 points

4. Peer review of draft (Due Nov 27th, 2017) –10 points

Each draft should be reviewed by one peer. Each reviewer should write a formal review of the assigned paper, with focus on the statistical analysis. Paper will be distributed to reviewers on Nov 20th, 2017.

5. Presentation and final paper: Dec 4th 2017 – 10 points

Grading:

89.5—above	A
79.5—89.4	B
69.6—79.4	C

Make-up Exam Policy: No make-up exams.

Student Academic Policies concerning Attendance, Academic Honesty, Disabled Student and Services for Disabled Students, and Absences on Religious Holy days may be found at:

<http://www.shsu.edu/dept/academic-affairs/aps/aps-students.html>.

Use of Telephones and Text Messages in Academic Classrooms and Facilities:

<http://www.shsu.edu/dept/academic-affairs/aps/aps-curriculum.html>

Course Schedule:

The reading material listed for each lecture should be read before attending that class.

Extra readings will be posted on blackboard. This schedule is subject to change over the course of the semester. Advance notice of changes will be announced during class.

Week 1 Aug 28	Introduction to multilevel analysis	R & B Ch. 1	
Week 2 Sep 4	Labor Day		
Week 3 Sep 11	The basic two-level model	R & B Ch. 2 HLM 7 Ch. 1	
Week 4 Sep 18	Estimation and hypothesis testing in multilevel modeling	R & B Ch. 3	Topic due
Week 5 Sep 25	Data considerations & creating data files in HLM7 Computer Lab	HLM 7 Ch. 2	
Week 6 Oct 2	Illustration of two-level model	R & B Ch. 4	Assignment 1 assigned
Week 7 Oct 9	Applications in organizational research & Methodological and statistical issues	R & B Ch. 5	Assignment 2 assigned
Week 8 Oct 16	Computer Lab	HLM 7 Ch. 2	
Week 9 Oct 23	Analyzing longitudinal data	R & B Ch. 6	Literature review due Assignment 3 assigned
Week 10 Oct 30	Computer Lab	HLM 7 Ch. 2	
Week 11 Nov 6	Hierarchical generalized linear models Two-level model for binary outcomes	R & B Ch. 10	Assignment 4 assigned
Week 12 Nov 13	Computer Lab	HLM 7 Ch. 7.1 & 7.2; Ch. 8.1 & 8.2	
Week 13 Nov 20	Hierarchical generalized linear models Two-level models for count data and other nonlinear models	R & B Ch. 10	Analysis due (first draft due)
Week 14 Nov 27	Computer Lab	HLM 7 Ch. 7.3-7.10; 8.3-8.9	Peer review due
Week 15 Dec 4	Final Exam 1:00 – 3:50 pm		Final draft due