GRADUATE SEMINAR IN MULTILEVEL MODELING
Florida State University
CCJ6741 • Spring 2020 • 214 / 415 Eppes Hall • R 1:00-3:30pm

Course Instructor: Dr. Sonja Siennick
Contact Information: 405 Eppes Hall, 850-645-9265, ssiennick@fsu.edu
Student Hours: R 11:30-12:30 and 3:30-4:30, and by appointment

Course Description

Multilevel data—hierarchical data where cases are nested within a smaller number of higher-order units—are everywhere in criminology. Criminal and other events are nested within offenders, those offenders are nested within places and agencies, and those places and agencies are nested within even larger places and organizations. These data structures pose problems for statistical analyses, but they also create opportunities for new research ideas and for more stringent tests of existing ideas.

This course introduces students to key issues in and strategies for the analysis of multilevel data. The course is intended for doctoral students who have completed our basic methods and statistics sequence (CCJ5705, 5706, and 5740) or who otherwise have gained familiarity with linear and logistic regression. A working knowledge of writing syntax in Stata or another similar program (e.g., SPSS, SAS) is assumed. Some class meetings will be held in the graduate computer lab, 415 Eppes Hall.

Upon successfully completing this course, you will be able to do the following:
• Determine whether you need a multilevel model
• Prepare data for multilevel analyses
• Estimate random intercept and means-as-outcomes models
• Isolate contextual effects and estimate cross-level interactions
• Conduct within-person analyses of panel data
• Interpret output from multilevel models

Required Materials

Readings. You will read two required books and several required articles. As you read the articles, focus on the methods and results. Required readings are starred (*). All other listed readings are recommended (†). Unless otherwise noted, please complete the readings before the class meeting for which they are assigned.

Books.
Software requirements. You will need access to Stata 15 and HLM 7. These programs are available in the graduate computer lab in Eppes Hall. (If you want to use Stata 16, you can do so through the virtual lab; the multilevel commands should be mostly the same.) All documentation is available online or through the programs’ electronic help files. If you need a Stata refresher, review Stata’s Data-Management Reference Manual (available on Canvas) or one of the many books and websites devoted to this topic. If you wish to use your personal copy of Stata, please note that older versions may not have the commands you will need. If the dataset you will be using is “small” (i.e., less than 8,000 observations within less than 350 higher-order clusters) and you will be running simple models, you can use the free student version of HLM 7 available at [http://www.ssicentral.com/index.php/products/hml/free-downloads-hlm](http://www.ssicentral.com/index.php/products/hml/free-downloads-hlm).

Course Requirements

Paper. The main course requirement is a 15-20 page research paper in which you apply multilevel modeling to the research question and dataset of your choice. The paper will make up 50% of your grade. Your question could involve either contextual data (e.g., people within places) or panel data (i.e., repeated measurements within people). It can be multilevel in the sense of testing effects at two levels (or across levels), or in the sense of capitalizing on nested data to isolate within-person effects. Your outcome should vary significantly across level-2 units. Your analyses should include descriptive statistics, a null model, and at least one fully specified multilevel model. Your results section should include both interpretations of the results shown in your tables and a discussion of how and why you made the analytical choices you made (e.g., decisions regarding random coefficients, centering, etc.). Show me that you applied, or at least tried, the relevant techniques that we covered in the course.

Your paper should resemble a journal article. That is, it should include an abstract, a (brief) background section, a method section, a results section, a (brief) discussion section, references, and tables of descriptive and multilevel regression results (please follow APA style). Twenty pages is not a lot of space, but your method and results sections should be thorough and polished. Your goal is to create a draft manuscript that could be revised and submitted for publication. If you intend to use data for research, please remember to gain approval from FSU’s Human Subjects Committee first ([https://www.research.fsu.edu/research-offices/ohsp/](https://www.research.fsu.edu/research-offices/ohsp/)).

Assignments. You will complete four assignments. Together they will make up 40% of your grade. Two of the assignments will involve choosing a research question and dataset for your paper and preparing that dataset for multilevel analysis. The others will require you to estimate and interpret various models. Detailed instructions for each assignment will be given in class. Missing or late assignments will receive 0s.
I strongly encourage you to use your own data for these assignments when you can. Not only will that make the assignments more relevant to your personal research agenda, but also it will give you a head start on analyses for your final paper and for your outside projects. If for some reason your data do not fit the requirements of a particular assignment, you can use the example data that I will teach from, which are publicly available survey data from Add Health.

**Presentation.** At our last class meeting, you will give a 10-minute ASC-style Powerpoint presentation on your research paper. The presentation will make up 10% of your grade. Try to gear it toward an audience of researchers who have heard of multilevel modeling but who are not familiar with all of the details of the technique. Your goal is to show off your thorough and sophisticated analyses in a way that is accessible to non-experts.

**Course Expectations**

Working with new software can be challenging and at times frustrating, but the best way to learn many of the things we will cover is to try them and to be persistent when they do not work the first time. I will teach and demonstrate important topics and techniques, but I cannot substitute for hands-on experience. I feel your pain (believe me, I really do), but I am going to be firm about this: I am happy to help you with the technical aspects of the assignments AFTER you have tried to resolve any issues on your own at least THREE times. If and when you reach that point, don’t be shy about bringing me your syntax, output, and anything else you would like me to review.

I strive to make my classroom a safe, respectful, and effective learning environment. I need you to help me do this. Please do not arrive late, sleep, eat, read outside material, hold side conversations, use your cell phone for anything, or use your laptop for purposes unrelated to the material. I also expect you to treat me and each other with respect.

Please check Canvas and email regularly for course announcements and changes.

**Grading scale**

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To protect your privacy I will not discuss grades over email. Come see me in person.

**Americans with Disabilities Act**

Students with disabilities needing academic accommodation should (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact:
Academic Honor Policy
The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “…be honest and truthful and…[to] strive for personal and institutional integrity at Florida State University” (see http://dof.fsu.edu/honorpolicy.htm). *All work that you submit for this course must be your own.* Do not cheat (use unauthorized material, information, or study aids in any exercise), plagiarize (knowingly represent someone else’s words or ideas as your own), fabricate (alter or invent the information you submit), or assist in anyone else’s academic dishonesty.

Syllabus Change Policy
Except for changes that substantially affect implementation of the grading statement, this syllabus is a guide for the course and is subject to change with advance notice.

COURSE SCHEDULE

* required reading
† recommended reading

**January 9  **Class 1: Course Introduction
Topics: Multilevel data and multilevel questions.
Readings: None
For next time: Assignment 1: Multilevel dataset description.

**January 16  **Class 2: Preparing Data for Multilevel Analysis
Topics: Levels and Ns; missing data.
Readings:
*  Raudenbush & Bryk, pp. 1-10
For next time: Begin preparing your dataset for analysis.
January 23  Data Management Office Hours
Topic: Preparing your class dataset. If you want assistance, please make an appointment.

January 30  Class 3: Lab Session
Topics: Data preparation; MLM in Stata and HLM.
Readings: Skim Stata and HLM documentation:
  Stata: pp. 504-518 of https://www.stata.com/manuals15/me.pdf
  HLM: pp. 15-35 of HLM7 Manual (under “Help” in the software package)
For next time: Finalize your dataset.

February 6  Class 4: Variance Basics
Topics: Dependence; null models; intraclass correlations; fixed effects.
Readings:
  * Luke, pp. 9-23
  * Raudenbush & Bryk, chapter 2, chapter 4 pp. 68-72
  † Kreft & de Leeuw, pp. 9-10
For next time: Assignment 2: Descriptive statistics, correlation matrices, and null model.

February 13  Class 5: Fixed Effects Models versus Random Effects Models
Topics: Approaches to addressing non-independence of residuals.
Readings:
  * Raudenbush & Bryk, chapter 3 pp. 38-42, 45-48
For next time: Review the class dataset.

February 20  Class 6: Lab Session
Topics: Fixed and random effects; mean-as-outcomes models.
Readings:
  * Raudenbush & Bryk, chapter 4 pp. 72-75, chapter 5 pp. 99-117
For next time: Identify in your dataset level 1 variables that may affect your outcome and whose effects may vary across level 2 units, and level 2 variables that may affect your outcome or that may interact with one or more level 1 variables in predicting your outcome.
February 27  Class 7: Context Effects
Topics: Within- versus between-group relationships.
Readings:
* Raudenbush & Bryk, pp. 134-142, 183
† Kreft & de Leeuw, pp. 106-114
For next time: Identify or create level 1 and 2 versions of the same variable(s) in your dataset.

March 5  Class 8: Centering and Random Coefficients
Topics: Centering; random coefficients.
Readings:
* Luke, pp. 48-53
* Raudenbush & Bryk, chapter 4 pp. 75-80, chapter 5 pp. 117-130, 143-152, chapter 6 pp. 164-167
† Kreft & de Leeuw, chapter 3
For next time: Find a published example of a cross-level interaction in your area of interest.

March 12  Class 9: Lab Session
Topics: Variance components for slopes.
Readings: None
For next time: Assignment 3: Context effects and centering.

March 19  Spring Break; no class

March 26  Class 10: Slopes-as-Outcomes Models
Topics: Cross-level interactions.
Readings:
* Raudenbush & Bryk, chapter 4 pp. 80-85, chapter 6 pp. 167-168
For next time: Prepare questions about the material we have covered.
April 2  Class 11: Special Topics in Multilevel Modeling
Topics: Three+ level models; measurement models; other variations.
Readings:
* Raudenbush & Bryk, chapter 8

For next time: Come prepared to work on your final paper.

April 9  Class 12: Lab Session
Topics: Growth curves; time trends; final papers.
Readings:

For next time: Assignment 4: Cross-level interaction. Prepare to give a 10-minute presentation on your paper.

April 16  Class 13: Data Analysis and Reporting; Student Presentations
Topics: Interpreting and presenting quantitative results; student presentations.
Readings: None
For next time: If you have not already done so, prepare to give a 10-minute presentation on your paper.

April 23  Class 14: Student Presentations
Topics: Student presentations.
Readings: None
For finals week (due 4/28): Submit final paper.