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CLASS MEETING SCHEDULE:
M &W, 9:00-11:50
112 Kimball Tower

REQUIRED TEXTBOOK

Course Packet Available at the BYU Bookstore

EXPECTED LEARNING OUTCOMES
As a result of successfully completing this course, students should be able to do the following:

1. Explain the similarities and differences between ordinary least squares regression and multilevel regression in terms of (a) the kinds of data structures that can be most appropriately be analyzed by each, (b) the kinds of research questions that can be addressed by each, (c) the main features that distinguish between single-level and multilevel models, and (d) the likely consequences of using each approach when the other would be more appropriate.

2. Understand the basic concepts and notational conventions used in multilevel modeling (e.g., nested units of analysis and within-level dependencies; estimated intercept and slope parameters and residuals; within-group versus between-group variance; intraclass correlation coefficients; conditional versus unconditional models; fixed versus random model components; within-level versus cross-level interactions; cross-sectional versus longitudinal designs; time-varying versus time invariant predictors; growth trajectories; etc).

3. Demonstrate proficiency in using multilevel software to analyze hierarchically structured data including (a) preparing the data files, (b) generating the input commands, (c) executing analyses, and (d) interpreting and evaluating the output.

4. Apply appropriate strategies to analyze hierarchically structured data sets by building and testing alternative models.

5. Summarize, interpret, and critique written reports of completed multilevel studies completed by other researchers.
SOFTWARE

The use of Multilevel/Hierarchical Modeling techniques is not feasible or practical without modern computers and software. General purpose statistics packages such as SAS, SPSS, and Stata each include specific procedures and routines that can be used to perform multilevel analyses. In addition, more specialized programs such as HLM, Mplus, and MLWin can also be used for this purpose. However, in this class we will focus on learning to use SPSS to conduct multilevel analyses. Each student is expected to become proficient in using SPSS. The course textbook includes relevant guidelines and examples. However, we will demonstrate and compare three different software packages.

The topics to be taught in this course include:

1. The nature of hierarchical data structures and the meaning of nesting
2. The disadvantages of using Ordinary Least Squares regression models to analyze hierarchical data and the advantages of multilevel modeling
3. Preparing data files for multilevel analysis
4. Basic concepts and notational symbols used in multilevel models with two levels
5. Analyzing two-level models using Stata
6. Checking assumptions and assessing model-data fit
7. Strategies for building and testing alternative models
8. Analyzing models with three levels
9. Issues to consider when designing multilevel studies
10. Using multilevel models to analyze longitudinal data
11. Alternative covariance structures
12.

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W Final Exam
GRADING POLICY

Grades will allocated based on students’ performance on the homework exercises (20%), the two examinations (40%), and the two projects (40%).

COURSE PROJECTS

Each student is expected to successfully complete two projects:

1. Prepare a written summary-review of a published journal article reporting the results of a research study that used MLM. The report should include a description of the purpose and context of the study plus your analysis and critique of how well multilevel modeling techniques were used in this study.
2. Analyze a multilevel data set and write a report describing the purpose for which the study was conducted, how the data were collected and analyzed, and the findings and results of the study.

BYU POLICIES

Academic Honesty

The first injunction of the BYU Honor Code is the call to be honest. Students come to the university not only to improve their minds, gain knowledge, and develop skills that will assist them in their life’s work, but also to build character. President David O. McKay taught that “character is the highest aim of education” (The Aims of a BYU Education, p. 6). It is the purpose of the BYU Academic Honesty Policy to assist in fulfilling that aim. BYU students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon that work. They should avoid academic dishonesty and misconduct in all its forms, including but not limited to plagiarism, fabrication or falsification, cheating, and other academic misconduct.

BYU Honor Code

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university’s expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

Preventing Sexual Harassment

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in
programs, admissions, activities, and student-to-student sexual harassment. BYU’s policy against sexual harassment extends not only to employees of the university, but to students as well. If you encounter unlawful sexual harassment or gender-based discrimination, please talk to your professor; contact the Equal Employment Office at 422-5895 or 367-5689 (24-hours); or contact the Honor Code Office at 422-2847.

Students with Disabilities

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability which may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (422-2767). Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. Services are coordinated with the student and instructor by the SSD Office. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D-285 ASB.

PUBLISHED TUTORIALS, PRIMERS, OVERVIEWS, AND OTHER INTRODUCTORY ARTICLES


SUPPLEMENTARY RESOURCE MATERIALS

The following books and articles are useful supplementary materials for students who desire to examine published applications of multilevel analysis or desire to gain a more in depth understanding of specific concepts or procedures used in multilevel/hierarchical linear modeling.


