PSYC 635
MULTILEVEL MODELING IN PSYCHOLOGICAL RESEARCH

Team taught by:

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Class meets Tuesdays, 2:30-5:00 P.M.
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Course Overview

Psychological data often have a nested structure (e.g., students within classrooms, time points within individuals). Multilevel modeling (MLM) of such data yields results that are more appropriate and interpretable than traditional statistical methods. Students will gain both practical and conceptual knowledge of this increasingly popular methodology.

By the end of the course you should (1) understand the nature of multilevel data and the substantive and statistical issues that surround them, (2) given this understanding, appreciate how multilevel modeling informs psychological and organizational theory, research questions and applications, (3) be able to conduct and interpret multilevel analyses in an appropriate manner.

Course Format

There are three components to the course: First, every class, with the exception of the last one, will have an associated assignment with it. These assignments, in total, will be worth 60% of your grade in the class. The assignments are intended to keep you engaged throughout the course (vs. cramming before exams). Assignments will be posted on OwlSpace at least one week in advance.

Aside from relaying important substantive information to you, our job is also to facilitate communication in the class. Usually this means getting students who are not talking to talk more, getting students who talk a lot to talk less, and getting students to be involved with each other in conversation and not just through us. It is, however, your job to make an effort to communicate your thoughts and questions throughout the course. As such, participation is worth 10% of your final grade.

Finally, at the end of the course, you will have a short in-class exam that will test you on fundamental concepts and analysis issues in multilevel modeling (worth 30% of your final grade). There are no 'stumpers' – if you attend (and attend to) class, do the assignments, and read the assigned papers, then you should make a satisfactory grade on the exam.

A Note About Class Attendance

Not attending class will affect your overall grade, not only your participation grade. Each unexcused absence will be 10% off your final grade. Multiple excused absences will be discussed with you and can also affect your grade, given that even missing one class can class can have a substantial impact on learning the material.

Grading Policy

Final grades in this course will be calculated based on the following components:

Final Exam – 30%
Weekly Assignments – 60%
Class Participation – 10%

Final Letter Grades will be distributed as follows:

100 – 98 % = A+	97% – 93% = A	92% – 90% = A-
89 – 87 % = B+	86% – 83% = B	82% – 80% = B-
79 – 77 % = C+	76% – 73% = C	72% – 70% = C-
69 – 67 % = D+	66% – 63% = D	62% – 60% = D-
59 – 0% = F		

Course Schedule

DATE	TOPIC	WHAT'S COVERED
8/25	*Introduction, conceptual rationale for MLM*	• Overview of the class • Software: HLM6 and R-code • Reminder and review of linear regression • Nestedness (Non-Independence) of psychological data
9/1	*Theoretical/conceptual issues in multilevel research*	Chan (1998a); Fleeson (2004); Mathieu & Kohler (1990); Ployhart, Weekly, & Baughman (2006)
9/8	*Knowing your data*	• Data cleaning • Descriptive statistics • Data visualization Anscombe (1973); Wilkinson et al. (1999); Tabachnick & Fidell (ch 4, 2007)
9/15	*Unconditional Models*	• Intraclass correlation (ICC) • Relationships with ANOVA • R-code - lme package Bliese (2000); selections from Raudenbush & Bryk (2002) and Snijders & Bosker (1999)
9/22	*Random Effects*	• Random intercepts • Random slopes • What is a level? Bliese (2002); HLM6 Manual, Ch 2

DATE	TOPIC	WHAT'S COVERED
9/29	*Centering and Plotting*	• Centering and other rescaling issues • Cross-level interactions (plotting/interpreting) Hox (pp. 49-63, 2002); Raudenbush & Bryk (Ch 5, 2002); Enders & Tofighi (2007)
10/6	*Model estimation, model comparison*	• REML vs. FIML • Model building and statistical significance Luke (2004); Singer (1998)
10/13	***Fall Break – No Class***	
10/20	*Model fit and diagnostics*	None (examples in HLM6)
10/27	*Study design considerations*	• Design and sampling plan • Statistical power and cost Scherbaum & Ferreter (2006); Raudenbush, Martinez, & Spybrook (2007); Raudenbush & Liu (2000); Raudenbush (1997)
11/3	*Longitudinal models (time points within individuals)*	• Error structures • Time structures (none, linear, polynomial) • Time-varying covariates Hox (pp. 73-102, 2002); Bliese & Ployhart (2002); West & Hepworth (1991)
11/10	*Latent growth curve models*	• HLM vs. LGM • LGM in longitudinal models Curran & Bollen (2001); Park & Schutz (2005); Zyphur, Chaturvedi, & Arvey (2008)
11/17	*Measurement error and measurement models*	• Incorporating factor models into LGM • Measurement error in HLM Chan (1998b); Woodhouse, Yang, Goldstein, & Rabash (1996) Recommended: Hertzog, von Oertzen, Ghisletta, & Lindenberger (2008); Hutchison (2003)
11/24	*Extensions: Part I*	• Moderation, Mediation, and Moderated Mediation in Multilevel Models Bauer, Preacher, & Gil (2006); Edwards & Lambert (2007)
12/1	*Extensions: Part II*	• Meta-analysis • Link functions for count data (Poisson) and proportions (logit) • 3-level models • Cross-classified random effects

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