

# Psychology 8033– Seminar on Multilevel Linear Models

Spring Semester 2021

Professor Josh Klugman

Class Meeting Time: W 9:00 – 10:30am

Zoom Location:

<https://temple.zoom.us/j/97535020230>

E-mail: [klugman@temple.edu](mailto:klugman@temple.edu)

Phone: 215-219-9107 (please also email to make sure I respond promptly)

Office Hours: F 9-11:30

## Course Goals and Learning Outcomes

Multilevel models (also known as hierarchical linear models or HLM) are a set of regression techniques for analyzing clustered data. In psychology, this usually takes the form of experimental or longitudinal designs where outcomes are measured repeatedly for the same subjects. This course will introduce students to multilevel models, with a focus on practical applications to longitudinal analysis (there will be a small amount on using the models to look at cross-sectional data on individuals nested in contexts). After a review of regression, we will cover random intercept models, random slope models, and the different ways to measure subjects' trajectories on their outcomes and to estimate the effects of subject- and observation-level predictors. At the end we will spend a little time on hierarchical generalized linear models which apply multilevel modeling to categorical outcomes. Students are expected to have their own data which they will use for assignments and a final paper.

## Prerequisites

This class assumes everyone has taken a graduate-level course that covers multiple regression analysis.

## How This Course Will Be Taught

Officially, this course meets WF 9-10:30. However, I plan to deliver didactic, lecture content through VoiceThreads and will meet with students on W 9-10:30 to answer questions, discuss readings and do exercises. Instead of holding class on F 9-10:30 I will hold office hours (although I may schedule class session on F if the need arises). I reserve the right to revert to the original schedule of meeting WF 9-10:30 if that turns out to better meet student needs.

## Texts & Materials

There is no required textbook for this course. We will be reading articles that are available online. I will post my lecture notes to Canvas. For people who want a text I recommend

[Multilevel Analysis](#) by Hox and colleagues for people who are working with individuals-nested-in-contexts and Singer and Willett's [Applied Longitudinal Data Analysis](#) for people who are working with observations-nested-in-contexts.

### ***Technology specifications for this course.***

We will be using open-source R and RStudio which are free to download.

This course requires the use of Canvas, including access to materials and assignment submission. Some videos posted via Canvas will require the use of speakers. The instructor may utilize web-conferencing tools to deliver synchronous material. In order to participate in synchronous sessions (should they exist), you should have a computer, a webcam, headphones, and microphone.

We will be using free software R (v 4.0.3) and RStudio (1.3) for data management and analyses.

This course requires the use of Microsoft Office (i.e., Word, Excel, PowerPoint). Students can gain access to these materials by visiting the [Computer Services Download Site](#).

Students should check their [Temple email](#) daily for course updates.

## **Communications Policy**

I will not answer questions regarding course content through e-mail. Instead, such questions should be directed at the discussion forum on Canvas. This will ensure students' equal access to information. Only questions specific to you (e.g. asking to arrange a meeting, or about your grades) should be sent through e-mail or phone.

If you call or text me please also send me an email to ensure I respond.

## **Requirements**

The breakdown for your grade for this course is as follows:

4 assignments (10% each):	40%
Final paper progress report:	1%
In-class presentation:	6%
Participation during presentations:	3%
Final paper:	50%

### *Final Grade Cutoffs*

A	94.0-100.0	C	74.0-76.9
A-	90.0-93.9	C-	70.0-73.9
B+	87.0-89.9	D+	67.0-69.9
B	84.0-86.9	D	64.0-66.9
B-	80.0-83.9	D-	60.0-63.9
C+	77.0-79.9	F	<60.0

*Assignments*—The assignments will cover basic HLM applications. Students will need to supply their own data for these assignments.

*Paper Progress Report*—This is a report telling me what your research questions is, what your data source is, how you are measuring concepts, and where you are in terms of completion. By the time it is due you should have your data on hand and you should be mostly done with data cleaning.

*Final paper*—The goal for the course is for you to complete a write-up of a multilevel analysis that could be the foundation for a journal-quality paper.

*Presentation*—The last three weeks of the semester will be presentations. Each week 7-9 participants will present their research via VoiceThread. Students will be expected to comment (using text, audio, or video) on at least 2 different presentations per week.

## **Attendance Policy**

This course does not have an attendance policy. You are adults, and if you miss a class session I will not penalize your grade. However, I encourage you to attend class. For most people, learning statistics is a challenge, and I have found that the most learning occurs in collective settings where one interacts with the instructor and fellow students. If you miss class, you are responsible for learning the content you missed as well as any other course materials/announcements. All class sessions will be recorded.

## **Incomplete Policy**

I do not grant incompletes except under the most extreme circumstances (having your final project not go well is NOT an extreme circumstance).

## Tentative Topic Schedule:

Week	Date	Topic / Deadline
1	1/20	<b>MEET ON BOTH W AND F</b> Introduction to Multilevel Models Introduction to R READING: Thijs, Joachem, and Verkuyten, Maykel. 2016. "Ethnic Attitudes and Social Projection in the Classroom." <i>Child Development</i> 87(5): 1452-1465. <a href="http://dx.doi.org/10.1111/cdev.12597">http://dx.doi.org/10.1111/cdev.12597</a>
2	1/27	Regression Review READINGS: Eddington, Kari M., Silvia, Paul J., Foxworth, Tamara E., Hoet, Ariana, and Kwapil, Thomas R. 2015. "Motivational Deficits Differentially Predict Improvement in a Randomized Trial of Self-System Therapy for Depression." <i>Journal of Consulting and Clinical Psychology</i> 83(3): 602-616. <a href="http://dx.doi.org/10.1037/a0039058">http://dx.doi.org/10.1037/a0039058</a>  Landers, Richard N., and Michael B. Armstrong. 2017. "Enhancing Instructional Outcomes With Gamification: An Empirical Test of the Technology-Enhanced Training Effectiveness Model." <i>Computers in Human Behavior</i> 71: 499-507. <a href="http://dx.doi.org/10.1016/j.chb.2015.07.031">http://dx.doi.org/10.1016/j.chb.2015.07.031</a>
3	2/3	Regression Review READING: McCormick, Ethan M., and Eva H. Telzer. 2017. "Adaptive Adolescent Flexibility: Neurodevelopment of Decision-making and Learning in a Risky Context." <i>Journal of Cognitive Neuroscience</i> 29(3): 413-423. <a href="http://dx.doi.org/10.1162/jocn_a_01061">http://dx.doi.org/10.1162/jocn_a_01061</a>
4	2/10	<b>LAB 1 DUE end of F 2/12</b> Random Intercept Models
5	2/17	Random Intercept Models READING: McNeish, Daniel, Stapleton, Laura M., and Silverman, Rebecca D. 2017. "On the Unnecessary Ubiquity of Hierarchical Linear Modeling." <i>Psychological Methods</i> 22(1): 114-140. <a href="http://dx.doi.org/10.1037/met0000078">http://dx.doi.org/10.1037/met0000078</a>
6	2/24	<b>LAB 2 DUE END OF F 2/26</b> Random Intercept Models
7	3/3	<b>PROGRESS REPORT DUE END OF F 3/5</b> Random Intercept & Slopes Models
8	3/10	Random Intercept & Slopes Models READING: Falkenstrom, Fredrik, Finkel, Steven, Sandell, Rolf, Rubel, Julian A., and Holmqvist, Rolf. 2017. "Dynamic Models of Individual Change in Psychotherapy Process Research." <i>Journal of Consulting and Clinical Psychology</i> 85(6): 537-549.
9	3/17	<b>LAB 3 DUE END OF F 3/19</b> Longitudinal Analyses READING: Arend, Matthias G. and Thomas Schäfer, 2019. "Statistical Power in Two-Level Models: A Tutorial Based on Monte Carlo Simulation." <i>Psychological Methods</i> 24(1): 1-19. <a href="http://dx.doi.org/10.1037/met0000195">http://dx.doi.org/10.1037/met0000195</a>
10	3/24	Assumptions of Multilevel Models

11	3 /31	<b>LAB 4 DUE END OF F 4/2</b> Hierarchical Generalized Linear Models
12	4/7	Presentations <b>(presenters upload their VoiceThreads by the end of T 4/6; everyone comment by the end of F 4/9)</b>
13	4/14	Presentations <b>(presenters upload their VoiceThreads by the end of T 4/13; everyone comment by the end of F 4/16)</b>
14	4/21	Presentations <b>(presenters upload their VoiceThreads by the end of T 4/20; everyone comment by the end of F 4/23)</b>
15	4/30 (F)	<b>FINAL PAPERS DUE 10AM</b>

## Disability Statement

This course is open to all students who met the academic requirements for participation. Any student who has a need for accommodation based on the impact of a disability should contact the instructor privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 to coordinate reasonable accommodations for students with documented disabilities. Please bear in mind that COVID-19 may result in a need for new or additional accommodations.

## Statement on Academic Freedom

Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed through the following link:

[http://policies.temple.edu/getdoc.asp?policy\\_no=03.70.02](http://policies.temple.edu/getdoc.asp?policy_no=03.70.02) .

## Policy on Academic Honesty

The section in italics is quoted verbatim from the Temple University Bulletin for 2020-2021.

*Temple University believes strongly in academic honesty and integrity. Essential to intellectual growth and the university's core educational mission is the development of independent thought and a respect for the thoughts of others. Academic honesty fosters this independence and respect. Academic dishonesty undermines the university's mission and purpose and devalues the work of all members of the Temple community. Every member of the university community is responsible for upholding the highest standards of honesty at all times. Students, as members of the community, are responsible for adhering to the principles of academic honesty and integrity.*

*Plagiarism includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling or distribution of term papers or other academic materials. Normally, all work done for courses — papers,*

*examinations, homework exercises, laboratory reports, oral presentations — is expected to be the individual effort of the student presenting the work. Any assistance must be reported to the instructor. If the work has entailed consulting other resources — journals, books, or other media — these resources must be cited in a manner appropriate to the course. It is the instructor's responsibility to indicate the appropriate manner of citation. Everything used from other sources — suggestions for organization of ideas, ideas themselves, or actual language — must be cited. Failure to cite borrowed material constitutes plagiarism. Undocumented use of materials from the World Wide Web is plagiarism.*

*Cheating includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations; (2) use of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the university faculty or staff; (4) engaging in any behavior specifically prohibited by a faculty member in the course syllabus, assignment, or class discussion; (5) or otherwise engaging in behavior that gives the student an unfair academic advantage including, but not limited to, fabrication of data or sources, resubmitting work already submitted for another academic requirement without prior authorization, or other similar behavior.*

*Refer to the [Student Conduct Code \(policy # 03.70.12\)](#) for more specific definitions of cheating and plagiarism.*

*The penalty for academic dishonesty can vary from receiving a reprimand and a failing grade for a particular assignment, to a failing grade in the course, to suspension or expulsion from the university. The penalty varies with the nature of the offense, the individual instructor, the department, the school or college, and the Office of Student Conduct and Community Standards.*

*Students who believe that they have been unfairly accused may appeal through the school or college's academic grievance procedure. For more information see [Grievances](#).*

While I encourage students to help each other on the lab assignments, I ask that you turn in your own work. **For students working with the same data source I ask that you do not look at each other's assignments.** Students who turn in similar work that reflect “sharing” will be in violation of the student conduct code.

### **Mandatory Reporting Statement.**

Please note that as a faculty member, I am required to report any information regarding sexual misconduct to the University Title IX Coordinator; as a student, however, you are **not** required to meet with or report anything to the Title IX office. Students may speak to someone **confidentially** by contacting Student Health Services (215-204-3284) or Women Organized Against Rape (24 hours confidential; 215-985-3333)