Multilevel Modeling PSYC 575

(Tentative) Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings	Activities and Homework
Week 1 8/17	• Overview of Multilevel Models • R Markdown	• SB ch 1, 2 • R Markdown Intro (https://vimeo.com/178485416) • Markdown Quick Reference (https://web.mit.edu/r/current/RStudio/resources/markdown_help.html)	• Exercise: R Markdown • HW 1
Week 2 8/24	• What are Statistical Models? • Review of Regression	• Gelman et al. ch 1.1, 1.2, 1.4 • Gelman et al. ch 4.1, 4.2, 4.4, 4.5 • 10 quick tips to improve your regression modeling (https://statmodeling.stat.columbia.edu/wp-content/uploads/2020/07/raos_tips.pdf)	• Exercise: Interpreting interactions • HW 2
Week 3 8/31	• The Random Intercept Model	• SB ch 3.1–3.4, 4.1–4.5, 4.8	• Exercise: Empirical Bayes estimates • HW 3
Week 4 9/7	• Effect Decomposition • Random Coefficient Model • Cross-level Interactions	• SB ch 4.6, 4.7, 5	• Exercise: Effect decomposition • HW 4
Week 5 9/14	• Model Estimation • Model Testing • Reporting Results	• SB ch 6	• Exercise: Maximum likelihood estimation (MLE) • HW 5
Week 6 9/21	• Bayesian MLM	• SB 12.1 • Supplemental materials	• Exercise: Comparing Bayesian and MLE
Week 7 9/28	• MLM for Experimental Designs • Cross-classified Models	• SB ch 13.1 • Hoffman & Rovine (2007) (https://link.springer.com/content/pdf/10.3758/BF03192848.pdf)	• Exercise: Identifying data structure • HW 6

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Week 8 10/5–10/9	Individual meeting on final research project (No class meeting		• Project Prospectus (10/5, 9 am PDT)
Week 9 10/12	• Longitudinal Data Analysis I	• SB ch 15	• Exercise: Autoregressive covariance structure • HW 7
Week 10 10/19	• Longitudinal Data Analysis II	• Hoffman ch 8	• Exercise: Time-varying covariates • HW 8
Week 11 10/26	• Exploratory analyses • Regularization and big data	• Supplemental reading	• Exercise: Model averaging • Post draft for peer review
Week 12 11/2	• Multilevel logistic regression • Discrete outcomes	• SB ch 17	• Exercise: Probability vs. odds ratio • HW 9 • Peer review (due 11/9)
Week 13 11/9	• Sample size planning	• SB ch 11	• Exercise: Required sample size
Week 14 11/17 & 11/19	Final presentation		• Final slides due 11/24
Week 15 11/24	Final paper (due **11/24, 10:00 am**)		