

Appendix A: Overview of Multilevel Modeling Texts and Suggested Readings

Textbooks for Multilevel Modeling

These texts cover multilevel modeling within the context of clustered (nested) observations primarily. They are ordered in terms of my opinion of their accessibility (most to least).

Kreft, I., & de Leeuw, J. (1998). *Introducing multilevel modeling*. Thousand Oaks, CA: Sage.

Heck, R. H., & Thomas, S. L. (2008). *An introduction to multilevel modeling techniques* (2nd ed.). New York: Routledge

Hox, J. J. (2010). *Multilevel analysis: Techniques and applications* (2nd ed.). New York: Routledge.

Snijders, T. A. B., & Bosker, R. (2011 2nd ed.). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Thousand Oaks, CA: Sage.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd Ed.). Thousand Oaks, CA: Sage.

These texts cover multilevel modeling within the context of longitudinal observations primarily. They are ordered in terms of my opinion of their accessibility (most to least).

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York: Oxford University Press.

Fitzmaurice, G., Laird, N. M., & Ware, J. H. (2004). *Applied longitudinal analysis*. New York: Wiley.

Hedeker, D., & Gibbons, R. D. (2006). *Longitudinal data analysis*. New York: Wiley.

Verbeke, G., & Molenberghs, G. (2001). *Linear mixed models for longitudinal data*. New York: Springer-Verlag.

Diggle, P. J., Heagerty, P. J., Liang, K. Y., & Zeger, S. L. (2002). *Analysis of longitudinal data* (2nd ed.). New York: Oxford University Press.

These texts cover longitudinal models within the context of structural equation modeling.

Preacher, K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (2008). *Latent growth curve modeling. Quantitative applications in the social sciences, #157*. Thousand Oaks, CA: Sage.

Bollen, K. A., & Curran, P. J. (2005). *Latent curve models: A structural equation perspective*. New York: Wiley.

Duncan, T. E., Duncan, S. C., Strycker, L. A., Li, F., & Alpert, A. (1999). *An introduction to latent variable growth curve modeling: Concepts, issues, and applications*. Mahwah, NJ: Erlbaum.

The latter chapters in this ANOVA text introduce MLM from the ANOVA perspective.

Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data*. Mahwah, NJ: Erlbaum.

Suggested Readings by Topic

Lectures 1. Introduction to MLM

- Snijders & Bosker ch. 1-2
- Singer & Willett ch. 1-2
- Raudenbush & Bryk ch. 2
- Hoffman ch. 1

Lecture 1. Review of General Linear Models and Repeated Measures ANOVA

- Hedeker & Gibbons ch. 1-3
- Fitzmaurice, Laird, & Ware ch. 5-6
- Maxwell & Delaney ch. 12-14
- Hoffman ch. 2-3

Lecture 2. Alternative Covariance Structure Models

- Singer & Willett ch. 7
- Snijders & Bosker ch. 15
- Fitzmaurice, Laird, & Ware ch. 7
- Hedeker & Gibbons ch. 6-7
- Maxwell & Delaney ch. 15
- Hoffman ch. 4

Lecture 3. Fixed vs. Random Effects of Time

- Singer & Willett ch. 3-4
- Hedeker & Gibbons ch. 4
- Fitzmaurice, Laird, & Ware ch. 7-8
- Willett, J.B. (1989). Some results on reliability for the longitudinal measurement of change: Implications for the design of studies of individual growth. *Educational and Psychological Measurement*, 49, 587-602.
- Snijders & Bosker ch. 12
- Hox ch. 5
- Raudenbush & Bryk ch. 6
- Hoffman ch. 5

Lecture 3. Fun with Model Comparisons and Likelihood Estimation

- Singer & Willett ch. 4
- Snijders & Bosker ch. 6-7
- Raudenbush & Bryk ch. 3
- Hox ch. 3
- Stoel, R. D., Garre, F. G., Dolan, C., & van den Wittenboer, G. (2006). On the likelihood ratio test in structural equation modeling when parameters are subject to boundary constraints. *Psychological Methods*, 11(4), 439-455.
- Verbeke & Molenberghs ch. 5-6
- Hoffman ch. 3 and 5

Lecture 3. Polynomial and Piecewise (Spline) Random Effects Models

- Singer & Willett ch. 6
- Hedeker & Gibbons ch. 5
- Raudenbush & Bryk ch. 6
- Hoffman ch. 6

Lecture 3. Negative Exponential (and other Nonlinear Models)

- Cudeck, R., & Harring, J. R. (2007). Analysis of nonlinear patterns of change with random coefficient models. *Annual Review of Psychology*, 58, 615-637.
- Grimm, K. J., & Ram, N. (2009). Nonlinear growth models in Mplus and SAS. *Structural Equation Modeling*, 16, 676-701.
- Hoffman ch. 6

Lecture 4. Time-Invariant Predictors***Lecture 7. Time-Varying Predictors and Centering Decisions***

- Hoffman, L., & Stawski, R. (2009). Persons as contexts: Evaluating between-person and within-person effects in longitudinal analysis. *Research in Human Development*, 6(2-3), 97-100. Available at: <http://digitalcommons.unl.edu/psychfacpub/415/>.
- Hofmann, D. A., & Gavin, M. B. (1998). Centering decisions in hierarchical linear models: Implications for research in organizations. *Journal of Management*, 24(5), 623-641.
- Kreft, I. G. G., de Leeuw, J., & Aiken, L. S. (1995). The effect of different forms of centering in hierarchical linear models. *Multivariate Behavioral Research*, 30(1), 1-21.
- Lüdtke, O., Marsh, H. W., Robitzsch, A., Trautwein, U., Asparouhov, T., & Muthén, B. (2008). The multilevel latent covariate model: A new, more reliable approach to group-level effects in contextual studies. *Psychological Methods*, 13(3), 203-229.
- Snijders & Bosker ch. 3-5
- Raudenbush & Bryk ch. 5
- Fitzmaurice, Laird, & Ware ch. 15
- Hedeker & Gibbons ch. 4
- Hoffman ch. 7-8

Lecture 5. Multilevel Models for Crossed Observations

- Raudenbush & Bryk ch. 12
- Snijders & Bosker ch. 13
- Hoffman ch. 12

Lecture 6. Generalized Multilevel Models

- Bauer, D. J. (2009). A note on comparing the estimates of models for cluster-correlated or longitudinal data with binary or ordinal outcomes. *Psychometrika*, 74, 97-105.
- Hox ch. 6-8
- Fitzmaurice, Laird, & Ware ch. 10, 12
- Hedeker & Gibbons ch. 9-12
- Snijders & Bosker ch. 17
- Raudenbush & Bryk ch. 10

Lecture 8. Multivariate Longitudinal Models

- Snijders & Bosker ch. 17
- Hox ch. 10
- MacCallum, R. C., Kim, C., Malarkey, W. B., & Kiecolt-Glaser, J. K. (1997). Studying multivariate change using multilevel models and latent curve models. *Multivariate Behavioral Research*, 32(3), 215-253.
- Raudenbush, S.W., Brennan, R.T., & Barnett, R.C. (1995). A multivariate hierarchical model for studying psychological change within married couples. *Journal of Family Psychology*, 9(2), 161-174.