

Applied Multilevel Models for Longitudinal Data

ICPSR Summer Workshop in Boulder, Colorado
7/8/2013 – 7/12/2013

Presented by:

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ICPSR Materials will be available for download at:
<http://psych.unl.edu/hoffman/Sheets/ICPSR.htm>

For further resources and online course materials, please visit:
<http://psych.unl.edu/hoffman/HomePage.htm>

COURSE OVERVIEW

Multilevel models are known by many synonyms (i.e., hierarchical linear models, general linear mixed models). The defining feature of these models is their capacity to provide quantification and prediction of random variance due to multiple sampling dimensions (across occasions, persons, or groups). Multilevel models offer many advantages for analyzing longitudinal data, such as flexible strategies for modeling change and individual differences in change, the examination of time-invariant or time-varying predictor effects, and the use of all available complete observations. This workshop will serve as an applied introduction to multilevel models for longitudinal data, including studies of individual change (i.e., growth curve models), individual fluctuation (i.e., daily diary designs), and other kinds of repeated measures designs (e.g., repeated measures consisting of stimuli or conditions in experimental designs).

The primary software package utilized for instruction will be SAS, but some reference examples using SPSS and STATA may also be provided. The course will also include daily opportunities for hands-on practice and individual consultation. Participants should be familiar with the general linear model (e.g., ANOVA and regression), but no prior experience with multilevel models or knowledge of advanced mathematics (e.g., matrix algebra) is assumed.

TENTATIVE SCHEDULE OF EVENTS*

Day	Time	Topic
Monday	9:00–10:15	Lecture 1: Introduction to Multilevel Models
	10:30–11:45	Example 1: Review of General Linear Models and Repeated Measures ANOVA
	1:15–2:30	Lecture 2: Describing Within-Person Fluctuation over Time
	2:45–4:00	Example 2: Alternative Covariance Structure Models for Fluctuation
	4:00–5:00	Lab Time 1: Introduction to Data Manipulation in SAS
Tuesday	9:00–10:15	Lecture 3: Describing Within-Person Change over Time
	10:30–11:45	Example 3: Random Effects Models for Change
	1:15–2:30	Lecture 3, continued
	2:45–4:00	Example 3, continued
	4:00–5:00	Lab Time 2: Fitting Unconditional Longitudinal Models
Wednesday	9:00–10:15	Lecture 4 : Time-Invariant Predictors in Longitudinal Models
	10:30–11:45	Example 4: Time-Invariant Predictors of Change
	1:15–2:30	Lecture 5: Crossed Random Effects for Other Repeated Measures Designs
	2:45–4:00	Example 5: Crossed Subjects and Items
	4:00–5:00	Lab Time 3: Fitting Conditional Models with Level-2 Predictors
Thursday	9:00–10:15	Lecture 6: Generalized Models for Non-Normal Longitudinal Data
	10:30–11:45	Example 6: Models for Binary Longitudinal Data
	1:15–2:30	Lecture 7: Time-Varying Predictors for Fluctuation
	2:45–4:00	Example 7: Time-Varying Predictors for Fluctuation
	4:00–5:00	Lab Time 4: Fitting Conditional Models with Level-1 Predictors
Friday	9:00–10:15	Lecture 7 and Example 7, continued
	10:30–11:45	Lecture 8: Multivariate Longitudinal Models
	1:15–2:30	Example 8: Multivariate Longitudinal Models
	2:45–5:00	Open Lab Time

*A more detailed listing of the topics within each lecture and recommended readings for each topic will be provided with the actual course materials. For a sampling, please visit the materials from last year's 1-week course online: <http://psych.unl.edu/hoffman/Sheets/ICPSR.htm>