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## **Advanced Longitudinal Data Analysis**

This workshop provides a complete overview of multilevel modeling applied to longitudinal data. The full day workshop is organized into five sections.

- **Section I: Introduction to multilevel modeling.** This section provides a conceptual introduction to multi-level data and introduces the basic statistical model (e.g. random intercept model, random slopes models, centering considerations).
- **Section II: Translating models into SAS.** This section translates the statistical models into the SAS statistical program. Attendants are given instructions to download a free downloadable university edition of SAS, and complete SAS scripts with example data to practice implementing the basic model on their own computers. Attendants are then given several examples of how to translate the SAS result output into a publishable results table, along with examples of how to write an effective method section based on the skills learned earlier.
- **Section III: Multilevel statistical interactions.** This section introduces multi-level statistical interactions with several examples of 2-way and 3-way interactions (including level-1 interactions, level-2 interactions, and cross-level interactions). Interactions are plotted using a provided excel spreadsheet and online supplement program to calculate simple slopes.
- **Section IV: Advanced topics.** This section includes a variety of advanced topics in multilevel modeling, including models with lagged data, dichotomous data, calculations of multilevel variability (e.g. within-person standard deviation, entropy), and growth curves (a special case of multilevel model where the focal predictor is time).
- **Section V: Consultation.** This section ends the course with opportunities for attendants to consult on data collection strategies and data management. Attendants who bring their own data are encouraged to implement the models, and the instructor will consult as problems arise.

By the end of the workshop, attendants will be well versed in the nuances of multilevel modeling with longitudinal data. This workshop is valuable for anyone interested in learning data analysis options for longitudinal data and/or journal reviewers who frequently encounter reviews with multilevel modeling.