Syllabus: CSSS 594 / SOC WL 590 – Fall 2015

APPLIED LONGITUDINAL DATA ANALYSIS

Instructor:
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Office hour: TBD

Teaching Assistant:
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Office hour: TBD

- Class time and place:
  - T,Th 10:30 - 11:50 (SAV 166)
  - W 2:00-:50 (SAV117)
- Web: follow the class link from my homepage at http://www.stat.washington.edu/elena
- Questions by e-mail are welcome. They will often be answered quite quickly, but this is not guaranteed. In particularly, I don't always check e-mail over weekends.

Course description

Understanding changes, including those that result from targeted interventions, is central to much empirical research in the social and behavioral sciences. This course is about a statistical framework -- longitudinal data analysis – that provides researchers with approaches for answering scientific questions about change. We will start by working through Part I of Singer and Willett's *Applied Longitudinal Data Analysis* to learn why study change, what are the minimum data requirements for investigating change over time, what techniques are available for exploratory analysis specific to longitudinal data, and what statistical models are appropriate. We will focus on fundamental models for longitudinal analysis that are known as individual growth models, random coefficient models, growth curve models, multilevel models, mixed effects models and hierarchical linear models. Time allowing, we will switch our attention to more specialized topics such as missing data in longitudinal analysis, growth mixture and group-based trajectory models, and curve registration models.

Course objectives

- To investigate how research questions about change can be addressed with longitudinal data.
- To gain statistical background necessary to understand formulation, estimation, and interpretation of results with multilevel, growth curve and hierarchical modeling in application to longitudinal data.
- To gain practical skills necessary to carry out longitudinal analysis studies, interpret results, and present findings.

Prerequisites

SOC 504-505-506 or equivalent. Solid knowledge of linear regression.

Course Text

Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence (2003) Singer, J.D. and Willett, J. B.

Computing

We will use R software environment for statistical computing and graphing. You are welcome to use another software package for homework assignments with the exception of the final exam, however, it will be your responsibility to make sure that your obtain results that are similar to those obtained with R, and, in case of differences, explain any discrepancies. If you are not sure what software to use for the course, please come see me.

The textbook has a companion web site that presents data sets and computer code in a wide variety of software packages that include R, Stata, SPSS and Mplus:

http://www.ats.ucla.edu/stat/examples/alda.htm

Homework assignments and grades

- Final grades:
  - Homework assignments (50%),
  - Lab quizzes (30%)
  - Project report **or** take-home final exam (20%).
- The take-home final exam will be a longitudinal data analysis of a data set selected by the instructor.
- Instead of the final exam, students will have an option to do an individual project to analyze a longitudinal data set of their choice. Assessment for individual projects will include in-class presentation and a written paper due at the same time as the final exam. Because time for individual project presentations is limited, we will use a lottery if more students would like to do individual projects than the class schedule can accommodate.
- I encourage you to work on homework assignments with each other in small groups, however, **each student is required to submit their own solution and write-up**.
- Please aim to resolve all technical questions or problems you might have with running software **at least 2 days before** an assignment is due.
- Instructions for asking computing questions: If you are having a problem getting some code to run, follow the question format as in "I did X. I expected Y to happen, but Z happened." In order to help you, one needs to be able to replicate the problem.
- Homework assignments that are not handed in on time will receive **zero** points (except in cases of documented emergency). Everyone receives **one grace day** for the entire quarter to be applied to a late homework.
- Please type up your homework assignments using a text editor (equations may be written in by hand, if necessary). Unless specifically requested, **never** submit raw computer output pages. Instead, insert **appropriate parts** of the output into your write-up (or cut

those parts out and neatly tape them onto your homework paper). Please label all axes, variables, etc., appropriately.

- Hand in a **hard copy** of your homework at the beginning of a class. Include your R code in the appendix unless requested otherwise.

Students with Disabilities

If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz, 543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to me so we can discuss the accommodations you might need for this class.
