Longitudinal Data Analysis

Course overview

Overview

Pre-requisites

- Graduate-level coursework covering ANOVA, linear regression, matrix algebra
- Basic skills in SPSS and/or R
- Knowledge of structural equation modeling (SEM) is **not required**

Course topics

- Introduction to longitudinal data
- Review of regression and SEM
- Models for 2 waves of data
- Mixed (multilevel) models of longitudinal data
- Mplus software
- Latent growth modeling in SEM
- Growth mixture models
- Statistical mediation
- Mixed (correlated residuals) models of longitudinal data

Course structure

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Online LIVE course

We meet via Zoom for 1 hour 15 minutes each week

- Work through code and output

All other course content is delivered asynchronously via Canvas

- Recorded lectures
- Homework
- Article discussions

Course schedule

Consult the syllabus and Canvas for details, but in general:

- **Monday by 5pm**: Materials for the week will be available
- **Wednesday by 8pm**: Watch the lecture video and complete the embedded quiz

- **Thursday at 9:30am**: Meet synchronously via Zoom
- **Sunday by midnight**: Assignment due

Assignments

Homework assignments

Four (4) homework assignments due throughout the semester

- I will give you some data, a research question, and some direction
- You will run the appropriate analyses and write up the results
- These should not take you a long time to do, but you will need to, for example, run a few different analyses, decide which should be presented, and explain why you decided that

Article discussions

You'll read an article related to the module's topic

- There will be discussion prompts / direction for each article
- You will annotate the article with questions and comments
- Write up a short (~250 word) reflection on the article

Final project on growth modeling

Select a dataset (your own or a public dataset)

Come up with research questions about *change over time*

The focus should be on using **latent growth models**

- Come up with some research questions that involve change over time
- Write a **proposal** outlining your planned set of analyses
- Run analyses corresponding to your research questions
- **Write up** your results, article-style
- **Present** the results

Presentation

15 to 20 minute presentation about your final project

- Record your presentation and post on Canvas
- Everyone will watch presentations and ask questions / comment
- The purpose of this presentation is to give you experience sharing your research with others

Great data analysis is meaningless if you can't communicate it!

Software

Statistical software

You should know how to do basic things in SPSS and/or R:

- Read in data
- Run analyses such as correlations or regression

- Make scatterplots

We will use SPSS and R for the first portion of the course

I will supply specific syntax for the topics we cover

SEM software

We will use Mplus for the growth modeling section of the course

www.statmodel.com

- You may have access through your lab or mentor
- If you don't have access to Mplus, there is a free demo version (with some limitations)
- You will be able to complete the growth modeling homework assignment with the demo version