Lab #4

Multilevel Linear Models (MLM)

Copy and paste any results and write out your answers in the space provided.

**Using “popular.sav”**

1. Fixed-Intercept Only Model
2. Random-Intercept Only Model
3. Random-Intercept and Fixed Level 1 Predictors (Extraversion and Female sequentially)
4. Random-Intercept and Random Level 1 Predictors (Extraversion and Female)
5. Adding Level 2 Predictors
6. Adding Cross-Level Interactions

**Using “nurses.sav”** - the data in this example are from a hypothetical study on stress in hospitals. The data are from nurses working in wards nested within hospitals. In each of 25 hospitals, four wards are selected and randomly assigned to an experimental and control condition. In the experimental condition, a training program is offered to all nurses to cope with job- related stress. After the program is completed, a sample of about 10 nurses from each ward is given a test that measures job-related stress. Additional variables are: nurse age (years), nurse experience (years), nurse gender (0 = male, 1 = female), type of ward (0 = general care, 1 = special care), and hospital size (0 = small, 1 = medium, 2 = large). This is an example of an experiment where the experimental intervention is carried out at the group level.

1. Conduct a 2-level model (e.g., nurses nested in hospitals) following the screening and modeling techniques from lecture. Include at least 2 level 1 predictors, 2 level 2 predictors and 1 cross-level interaction.

**Using “gpa2.sav” -** The GPA data are a longitudinal data set, where 200 college students have been followed 6 consecutive semesters. In this data set, there are GPA measures on 6 consecutive occasions, with a JOB status variable (how many hours worked) for the same 6 occasions. There are two student-level explanatory variables: the gender (1= male, 2= female) and the high school GPA. There is also a dichotomous student-level outcome variable, which indicates whether a student has been admitted to the university of their choice. Since not every student applies to a university, this variable has many missing values.

1. Using Data 🡪 Restructure in SPSS convert the gpa2 data from “wide” format to “long” format.
2. Conduct a 2-level model (i.e., responses nested within person) on this repeated measures data predicting GPA across semesters. Make sure to screen the data, center any predictors as needed and follow the steps discussed in lecture.

Follow the same steps for modeling as above (i.e., Model 0, Model 1, etc. before adding in fixed predictors of sex, high gpa, hours worked) except:

1. Model 0 should start with the “time” variable already in the model as a repeated variable.
2. Start by setting the repeated covariance to Compound Symmetry.
3. Fit the fixed variables first and then compare the compound symmetry assumption to other assumptions (try AR1(heterogeneous) and maybe Unstructured) but be aware that Unstructured will generate a ton of information.
4. Decide on the repeated covariance before adding in random slopes.