EPSY 8268 HLM Analysis Project

***Presenting an HLM Analysis***

To complete this assignment, identify a nested multilevel dataset. It should provide opportunities to estimate random intercepts and slopes, at some level. It can employ a 2-level or 3-level model, which may include longitudinal data (optional). It can also employ non-normal data for a generalized HLM. When building your models, consider following the guidance provided in the document *5.2-Other-Considerations* available at the class website.

**Project Tasks**

Report the following elements for your study. Be brief and direct. Provide results in publishable tables, not standard software output.

1. Describe the database and the study that produced it. Write a brief description of the units and their sample sizes at each level, the presence of missing data, and the variables used in your analysis.
2. Report a table of descriptive statistics for all variables in your analysis. Describe the statistical characteristics of the variables appropriately, noting which variables are continuous, normally distributed, ordinal or nominal, etc.

*Note:* For the following models, write out each model in hierarchical notation. Use APA style notation for these models. See the document at the class website: *APA Style for Statistical Notation*.

1. Estimate an unconditional (or base) model, appropriate for your data. Report the results. Report the ICC. Report the reliabilities of the estimated coefficients (this will be either the intercept for a cross-sectional model or the intercept and slope of a longitudinal model). Why estimate this model?
2. Fully develop the level-1 model. Report any decisions made about the inclusion of variables and considering random-effects, and a table of final results. Why estimate this model?
3. Build the level-2 randomly-varying intercepts model. Report any decisions about the inclusion of variables and a table of final results. Why estimate this model?
4. Estimate a full model, including a random intercept and at least one explanatory variable at each level. Report any decisions made about the inclusion of variables and a table of final results. For the final model, interpret each of the final fixed effects.
5. For the final model, estimate the variance explained for each level (each randomly varying coefficient).
6. Report the 95% plausible values for the final fixed effects and describe what these mean.
7. Report at least one graphical display of model results. If you are using longitudinal data, consider reporting a display of the change trajectories over time.
8. Assess the quality of the HLM final model by providing evidence regarding assumptions. Use one method for each of the five assumptions and report and interpret results.
9. Provide an overall summary of the study. Do the results make sense? Is there adequate power? Are there significant limitations? Did the estimation converge in a reasonable number of iterations – or where there thousands of iterations? Did you find any strange results or other limitations?