Conducting HLM Analyses EPSY 8268

*Examples of what can be tested, examined, and estimated from HLMs.*

1. Estimate unconditional model – One-way ANOVA
   1. Compute ICC
   2. May test H0: γ00 = 0
   3. Examine fixed effect, , estimate confidence interval:  ± 1.96 (SE)
   4. Estimate range of “plausible values” for the fixed effect:  ± 1.96 ()
   5. Test variance component, H0: τ00 = 0
   6. Examine reliability of 
2. Means-as-outcomes model (a level-2 explanatory variable associated with )
   1. Test fixed effect, H0: γ01 = 0
   2. Examine fixed effect, estimate confidence interval:  ± 1.96 (SE)
   3. Estimate variance explained at level-2:
   4. May examine conditional ICC (degree of dependence among observations within group conditioned on [with the same] explanatory variable)
   5. May examine conditional reliability of level-1 coefficients 
3. Slopes-as-outcomes model (a level-1 explanatory variable, introducing )
   1. Test fixed effect, H0: γ10 = 0
   2. Examine fixed effect, , estimate confidence interval:  ± 1.96 (SE)
   3. Estimate range of “plausible values” for the fixed effect:  ± 1.96 ()
   4. Test variance component, H0: τ11 = 0
   5. Examine reliabilities, 
   6. Estimate variance explained at level-1:
   7. Examine covariance (correlation) among 
   8. May examine conditional reliability of level-1 coefficients 
4. Model comparison testing (with multiple variance components, **T**)

A restricted model (fewer variance components) can be tested against an unrestricted model (all level-1 coefficients are randomly varying) using the difference in Deviance given a chi-square distribution with a degrees of freedom = the change in number of parameters. Is the more complex model justified, given the reduction in deviance. The models must be identical in the specification of fixed effects.