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 ($\sqrt{τ\_{00}}$)
	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: $\frac{\hat{τ}\_{00}\left(unconditional\right)-\hat{τ}\_{00}\left(conditional\right) }{\hat{τ}\_{00}\left(unconditional\right)}$
	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 ($\sqrt{τ\_{11}}$)
	4. Test variance component, H0: τ11 = 0
	5. Examine reliabilities, 
	6. Estimate variance explained at level-1: $\frac{σ^{2}\left(unconditional\right)-σ^{2}\left(conditional\right) }{σ^{2}\left(unconditional\right)}$
	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.