EPSY 8268 Assignment 3

1. Consider the following model.

 where *rij* ~ N(0, σ2)

 where *u*0*j* ~ N(0, τ00)



Mixed model: ****

Define each element:

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1. How many parameters are estimated in the mixed model in #1 above?
2. How many parameters would be estimated if the level-2 model was modified to allow the slopes in level-1 to randomly vary? In effect: 
3. What is the interpretation of  if the explanatory variable *X* is grand-mean centered?

Such as 

1. What is a misspecified model? What is the expected impact on inferences from such a model?
2. In a model with randomly varying slopes and intercepts, the total observed variance is τ00 + σ2. Why don’t we add τ11 to the observed variance to account for variance in the slopes?
3. Consider the following research design.

A research team is interesting in evaluating the effect of yoga on male prisoner systolic blood pressure (SBP). The team recruits 50 prisons to participate from across the country. There is no way to make each prisoner fully participate in yoga, if at all, and prisons vary in size. The research team decide to sample 30 prisoners from each prison to monitor their SBP before the yoga program begins and 6 months after yoga implementation. They will use the change in [cSBP] (which primarily ranges from 70 to 190, with ideal range from 90 to 120) over the six months, as the outcome variable of interest. The researchers have a number of hypotheses, but their primary expectation is to observe reductions in SBP due to higher frequency of yoga participation [YP] (measured continuously as the average number of days per week over six months]. They also are interested in the effect on prisoners with violent offenses [VO] (where VO = 1 for violent offender), whether the effect of YP depends on VO. Regarding overall cSBP, they believe prison size [PS] (measured continuously as the number of prisoners in the prison) will make a difference. Finally, they believe that the effect of YP might depend on the proportions of violent offenders [PVO] (measured continuously from 0.0 to 1.0) in the prison.

Write out a two-level model that captures each component of the research design. Use the variable names that appear in brackets [ ].