

PSYC 4330 – Seminar in Statistics

Exercise 8

In this exercise, we are interested in modeling math grades (*math*) of students who were nested within different schools (*schcode*). We are also interested in determining if the sex of the student (*female*, 0 = male; 1 = female) or the average socioeconomic status of the school (*ses_mean*) affects math grades. We are only going to focus on random intercept models, no random slope models.

This exercise will use the dataset 'heck2011.csv', which is available on eClass.

Use $\alpha = .05$ for all questions.

- 1) Run the null (intercept only) model (no predictors, but include *schcode* as the nesting variable). Interpret each of the parameters within the output. Also, calculate the proportion of variability attributable to the school variable (i.e., intraclass correlation coefficient, ICC).
- 2) Include *female* as a level 1 predictor, but only model the intercept as a random factor. Again, interpret all parameters (you can ignore the 'correlation of fixed effects').
- 3) Remove *female* as a level 1 predictor, and add *ses_mean* as a level 2 predictor. Again, interpret all parameters (you can ignore the 'correlation of fixed effects'). Recompute the ICC to see if adding the level 2 predictor *ses_mean* reduced the proportion of variance due to the between-subjects factor (i.e., did *ses_mean* explain a significant proportion of between school variance?).