EdPsych/Psych/Stat 587
Spring 2019
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SAS: Homework 5
Due Tuesday March 26, 2019

1. Report -2LnLike, number of parameters, AIC, HQIC, BIC, CAIC for all of the model fit in computer labs 1 and 2. Report $\hat{\tau}$s, $\hat{\sigma}^2$, R_1^2 and R_2^2 (a table of this information would be very nice).

   (a) Based on the information criteria, among the random intercept models, which is the "best" (or is there a unique one)?

   (b) Based on the information criteria, among ALL models (random intercept and random slopes models), which is the "best" (or is there a unique one)?

   (c) What is the value of the harmonic mean used to compute R_2^2?

   (d) Which is the "best" model based on R^2 measures? Are the models with the better R^2's the same as the better/best models according to the information criteria?

   (e) Interpret the values of R_1^2 and R_2^2 from model (s).

2. Consider model (s) from computer lab2/homework 4. Do you need a random slope? (Be sure to report the statistical test that you use for this question).

3. Compare and contrast the standard errors of parameters and results of significance tests for fixed effects when you use the model based versus the robust estimators of the standard errors. Which do you think is the best to use for testing fixed effects nd why?

   Note: For this problem, just look at model (s), the model in the lab instructions.

4. Report what contrasts you tested, the results of them, and any action you took based on the results for

   (a) Type of community

   (b) Hours watching TV or videos

   (c) Hours playing computer games

   Mention whether you are using Robust or model based standard errors.

5. Starting with model (s) from computer lab2/homework 2, refine this model to obtain a "best" model (i.e. simplify by dropping effects, re-coding a discrete variable, etc.). Summarize the steps that you and why you took them. This includes how you used the information from your contrasts, information criteria, tests of parameters, etc.

6. If your final model has a random slope, re-check to make sure that you need it. Report your results.

7. Give a full interpretation of the final model. Also give the HLM, linear mixed model and marginal model formulations using the parameter estimates.