In this assignment, you will analyze trial-level data using either linear mixed effects models or logistic mixed effect models, whichever you find appropriate for your purposes. You may conduct analyses on either one of your own data sets (option 1) or with the provided data set (option 2; data available in Canvas).

Option 1: Analyze your own data.

Option 2: Analyze a given data set. The data set consists of three files: lexical decision data for correct responses to real words (lexical decision cleaned.csv), word frequency data (frequency.CD.csv), and declarative memory data (declarative memory abilities.csv). Your goal is to analyze reaction times in the lexical decision data (logRT) as a function of word frequency (WF), and declarative memory abilities (DecMem). Each participant sees words of differing frequencies, meaning you can have a WF random effect by Subject. Do not include DecMem in the random effects for Word because it will cause the model to not converge.

Using R/RStudio, complete the following steps. When you are done, save the R code as a .Rmd file and submit that to the Canvas submission portal. If you analyze your own data, be sure to submit the data file, too!

1. Load the data to R and load the appropriate libraries.
2. Write the code necessary to complete the following:
   1. Compute descriptive statistics for the main variables in the data
   2. Create a histogram or density plot for any continuous/intervallic data
   3. Center predictor variables when appropriate (ideal for continuous/intervallic data; optional for categorical data)
   4. Compute the appropriate mixed effects model (linear or logistic—only do a GAMM if you feel confident in doing so), and be sure to specify in your code (in the text area between code chunks or by putting text after the “#” symbol) which kind of random effects structure decisions you made and why.
   5. Create at least 1 boxplot or violin plot or 1 scatter plot to visualize what you found in your model (even if it is a null result).

Remember, you will need several important packages to do these things, including dplyr(), tidyr(), ggplot2(), psych(), and lme4(). Also, be mindful of the long vs wide format requirements of the different functions in R.

If you are having trouble or have questions, don’t wait until the last minute! Seek my help. I’m happy to assist!