# Multiple and Hierarchical Linear Regression

**NOTE!** You are using this dataset twice essentially – so after the first analysis (and you’ve deleted people or not), be sure to start with the original dataset for the second analysis (or you’ll double delete people!).

**MLR Question:**

* We are trying to predict associative judgments (cassoc) using associative variables (fsg, bsg) and a semantic variable (cos). Which predictor is the strongest?

**Regression Assumptions:**

* Missing data (you can just say if you had any or not)
* Outliers
  + Mahalanobis – cut off score and how many?
  + Leverage – cut off score and how many?
  + Cooks – cut off score and how many?
  + Delete all outliers with two or more problems.
* Multicollinearity – insert box showing that the IVs are not too highly correlated.
* Normality – insert box showing IVs are normally distributed.
* Linearity – insert box showing that IVs are linearly related.
* Homogeneity/Homoscedasticity – insert box showing that these two assumptions have been met – talk about each one (i.e. say if they are good or bad).

**Regression test:**

Include the model box (make sure this has R2 change):

Include the ANOVA box:

Include the coefficients box (make sure this has pr and sr):

**Fill in the blanks (words in parenthesis are your options/what you need to list):**

* Overall, semantic and associative variables \_\_\_\_\_\_\_\_\_\_\_ (significantly, did not significantly) predicted judgments of association between word-pairs, *\_\_\_\_\_\_\_\_\_\_*(F, p, R2).
* Forward strength \_\_\_\_\_\_\_\_\_\_\_ (significantly, did not significantly) predicted associative judgments, \_\_\_\_\_\_\_\_\_\_\_(B, t, pr2).
* Backward strength \_\_\_\_\_\_\_\_\_\_\_ (significantly, did not significantly) predicted associative judgments, \_\_\_\_\_\_\_\_\_\_\_(B, t, pr2).
* Semantic strength \_\_\_\_\_\_\_\_\_\_\_ (significantly, did not significantly) predicted associative judgments, \_\_\_\_\_\_\_\_\_\_\_(B, t, pr2).
* \_\_\_\_\_\_\_\_ (FSG, BSG, COS) was the best predictor of associative judgments, showing that as \_\_\_\_\_\_\_\_ (FSG, BSG, COS) increased pairticipant judgments also \_\_\_\_\_\_\_\_\_\_ (increased, decreased – look at the sign of the B value).

**HMLR Question:**

* We are trying to predict semantic judgments (esem) but first controlling for other related variables. Enter the following in steps:
  + Association variables (FSG, BSG) – the strength of the word association between pairs
  + Frequency (QHAL, QSUBTL) – how frequent the words are in natural language
  + COS – semantic relationship between word pairs.
* Does the semantic relationship predict judgments after controlling for association and word frequency?

**Regression Assumptions:**

* Missing data (you can just say if you had any or not)
* Outliers
  + Mahalanobis – cut off score and how many?
  + Leverage – cut off score and how many?
  + Cooks – cut off score and how many?
  + Delete all outliers with two or more problems.
* Multicollinearity – insert box showing that the IVs are not too highly correlated.
* Normality – insert box showing IVs are normally distributed.
* Linearity – insert box showing that IVs are linearly related.
* Homogeneity/Homoscedasticity – insert box showing that these two assumptions have been met – talk about each one (i.e. say if they are good or bad).

**Regression test:**

Include the model box (make sure this has R2 change):

Include the ANOVA box:

Include the coefficients box (make sure this has pr and sr):

**IN A SEPARATE WORD DOCUMENT:**

Write up a results style section for this experiment.

1. Include a brief description of the experiment, variables, and order entered into steps.
2. Include a brief section on the data screening/assumptions.
3. Include the all F-values for each step of the model.
4. Include all the b or beta values for variables *in the step they were entered*. So, you will not have double b values for any predictor (5 total).
   1. You can put either model values or b values in a table (so you don’t have a paragraph full of numbers).
   2. Be sure that the model values and b values all have corresponding p and effect sizes.