**Statistics 8 – ANOVA**

This assignment is based on the following study:

MacKenzie, S. J., Rannelli, L. and Yurchevich, J. (2010). [Neuromuscular adaptations following antagonist resisted training](http://people.stfx.ca/smackenz/Publications/MacKenzie%202010%20Neuromuscular%20adaptations%20following%20antagonist%20resisted%20training.pdf). *Journal of Strength and Conditioning Research,* 24, 156-164.

If the level of resistive torque provided by the antagonist is sufficient, then dynamic cocontractions could form the basis of a resistance training program. The purpose was to assess a novel form of strength training, antagonist resisted training (ART), with potential use in microgravity and athletic rehabilitation settings. ART uses the force from antagonist muscles, during cocontractions, as the source of resistance for the agonists. Strength and EMG measurements were recorded before and after a six week training program during which participants trained the left arm while the right arm served as a control. Training was designed so that the elbow extensors (antagonists) served as resistance for the elbow flexors (agonists). Elbow flexor and extensor strengths were measured during maximal isometric contractions with the elbow fixed at 90°. EMG was recorded from the biceps brachii and lateral head of the triceps brachii during all strength tests.

Instructions

1. Download the Excel file “Statistics 8 – ANOVA.xlsx” from my webpage and save the file as “Last Name First Name Statistics 8” e.g. “MacKenzie Sasho Statistics 8”. Remember to change the file name when saving to your H: drive.
2. Follow the instructions in the spreadsheet and refer to the various readings and class notes to answer the following questions as instructed within the Excel worksheet.
   1. How many independent variables (IV's) are included in this study?
   2. Provide a suitable name for each IV.
   3. How many levels of each IV are there?
   4. Indicate which IV are considered "within subject" variables
   5. How many dependent variables (DV's) are included in this study?
   6. Perform an ANOVA to answer the question, “Did ART improve the strength of the elbow flexors?”
   7. Manipulate the raw data so that it is possible to perform a single t-test to answer the question, “Did ART improve the strength of the elbow flexors?”
   8. Provide an APA response to the question posed in #7 based on the result from #7.
3. Email your Excel file to the class Gmail account.
4. Type “Statistics #8” as your **Subject**.