**What is this test used for?**

A two factor ANOVA is used to determine if there is an interaction between two independent variables on a dependent variable. Meaning, the dependent variable varies as a result of BOTH independent variables.

H0: There is NOT a difference between the levels of IV1 on the dependent variable.

H1: There IS a difference between the levels of IV1 on the dependent variable.

H0: There is NOT a difference between the levels of IV2 on the dependent variable.

H2: There IS a difference between the levels of IV2 on the dependent variable.

H0: There is NOT an interaction between IV1 and IV2 on the dependent variable.

H3: The IS an interaction between IV1 and IV2 on the dependent variable.

**Assumptions**

1. You have a continuous dependent variable; meaning, the dependent variable is measured at either the interval or ratio level.
2. Your independent variables are categorical with two or more independent groups.
3. No significant outliers. Look at boxplot.
4. Each group's data (or residuals) is normally distributed.
5. Each group's data (or residuals) has equal variance (called homogeneity of variances).

**Interpretation**

1. Look at the *F* statistic and significance value (the *p* value) for IV1.
   1. If the *p* value is less than your alpha level (normally .05), then you reject your null hypothesis.
   2. If the *p* value is larger than your alpha level (normally .05), then you fail to reject (or you accept) your null hypothesis.
2. Look at the *F* statistic and significance value (the *p* value) for IV2.
   1. If the *p* value is less than your alpha level (normally .05), then you reject your null hypothesis.
   2. If the *p* value is larger than your alpha level (normally .05), then you fail to reject (or you accept) your null hypothesis.
3. Look at the *F* statistic and significance value (the *p* value) for the interaction.
   1. If the *p* value is less than your alpha level (normally .05), then you reject your null hypothesis.
   2. If the *p* value is larger than your alpha level (normally .05), then you fail to reject (or you accept) your null hypothesis.

**Reporting**

A two-factor ANOVA was used to determine whether there was a statistically significant interaction between IV1 and IV2 on DEPENDENT VARIABLES. There was a statistically significant interaction between IV1 and IV2 for DEPENDENT VARIABLE, *F*(df1, df2) = ??, *p* < .05. There was a main effect for IV1, *F*(df1, df2) = ??, *p* < .05. There was not a main effect for IV2, *F*(df1, df2) = ??, *p* > .05.

**Effect Size Test**

Partial ƞ2, Confidence intervals