**What is this test used for?**

A one-way ANOVA is used to determine whether the mean difference between three or more independent groups.

H0: There are no mean differences between GROUP1/GROUP2/GROUP3… on the dependent variable.

H1: There are mean differences between GROUP1/GROUP2/GROUP3… 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 variable is categorical with three or more independent groups.
3. Independence of observations. Participants are not in more than one group.
4. No significant outliers. Look at boxplot.
5. Dependent variable is normally distributed. Look at skewness and kurtosis statistics (are they less than 1-2?). Look at normality tests (Shapiro-Wilk and Kolmogorov-Smirnox tests. If they are significant (*p* < .05), then you do not meet this assumption.
6. Homogeneity of variances. Test this assumption by interpreting the Levene’s test. If not significant (*p* > .05), you meet this assumption. If significant (*p* < .05), you will need to run and interpret the Welch ANOVA and the Games Howell post hoc test.

**Interpretation**

1. Look at results of the omnibus test (the *F* statistic) and significance value (the *p* value).
   1. If the *p* value is less than your alpha level (normally .05), then you reject your null hypothesis. This gives you the ability to look at and interpret post hoc tests.
   2. If the *p* value is larger than your alpha level (normally .05), then you fail to reject (or you accept) your null hypothesis. If you fail to reject your null hypothesis, do not look at post hoc tests.
2. Look at the post hoc Tukey tests on the “Multiple Comparisons” results table. This table will tell you where there is a significant difference between the group means, if any exists.
   1. Look at the significance value comparing GROUP1 to GROUP2, GROUP1 to GROUP3, and GROUP2 to GROUP3. If the significance value is less than .05, there is a significant difference between those groups.
   2. Look at the confidence intervals for those comparisons as well. If the confidence interval includes zero, there is not a significant difference.

**Reporting**

A one-way ANOVA was used to determine whether there was a statistically significant mean difference between GROUP1, GROUP2, and GROUP3. No outliers were detected as assessed by boxplot. The assumption of normality was not violated, as assessed by Shapiro-Wilk's test (p > .05). There was homogeneity of variances, as assessed by Levene’s test of homogeneity of variances (*p* > .05). GROUP1 scores on the DEPENDENT VARIABLE were higher/lower (M = ??, SD = ??) compared to GROUP2 (M = ??, SD = ??) and GROUP 3 (M = ??, SD = ??). Post hoc Turkey tests revealed a statistically significant mean increase/decrease of ??, 95% CI [??, ??], p < .05.

**Effect Size Test**

Confidence Intervals