t-Test for Dependent Samples (Related Groups)

- A t-test for related groups (also called paired samples, matched pairs, and repeated measures) is used when an experiment involves the same group of individuals that are exposed to each level of the Independent Variable at different times. For example: a group of students are given a test, and then they read a study guide. The students are then given the same test again to see if their scores have improved due to the effectiveness of the study guide.
- Like the t-test for independent samples, it is used when the Independent Variable has two levels (usually it is before and after).
- In order to calculate this by hand, use the following formula.

\[ t = \frac{\overline{X}_A_1 - \overline{X}_A_2}{\sqrt{\frac{\sum D^2 - (\sum D)^2}{N(N-1)}}} \]

Note: D is the difference between means.

**t-Test for Dependent Samples (Related Groups) in SPSS**

1. In variable view, create columns for before and after.
2. Go into data view and enter the data into the columns.

3. Click on the Analyze drop down menu.
4. Highlight Compare Means.
5. Click on Paired Samples t – Test.
6. Move the two variables that you want to test into the variable fields. Use “before” for variable one, and “after” for variable two.

7. Click the options button. Make sure the confidence level is set at 95%. Click Continue.

Note: If you are using a different alpha level than .05, then change the 95% to reflect that. For example, if using an alpha of .01, change the confidence interval percentage to 99%.
8. Click on OK.
9. Analyze the output

a. The output will consist of three boxes. The first will contain descriptives only.
b. The second box contains information used to calculate the t value.
c. In the third box, look for the columns marked “t”, “df,” and “sig.”
d. “Sig” (in the lower right box) stands for “significance” and is your p-value. If it’s less than your predetermined alpha level (usually .05), your results are significant.