



DID WE MAKE A DIFFERENCE?

T-TEST FOR DEPENDENT SAMPLES

STEPS TO RUNNING A T-TEST

- **State the null hypothesis and the research hypothesis:**
 - The null hypothesis states that there is no difference between the means of the pretest and posttest scores
 - The research hypothesis states that there will be a difference in the pretest and posttest scores

STEPS TO RUNNING A T-TEST

- **Set the level of risk**
 - We are talking about type 1 error—i.e. the difference between the pretest and posttest scores can be explained by something other than chance
 - **We would use $p = .05$** which means that the probability is less than 5% on any one test of the null hypothesis that the average of the posttest scores is greater than the average of the pretest scores due to chance alone.
- **Determine the type of t-test to be used**
 - We will use the t-test for dependent samples since we are comparing the pretest and posttest scores of the same individuals. This allows us to measure if we made any real difference through our teaching doctrine for example.

STEPS TO RUNNING A T-TEST

- **Run the t -Test**

- Using Excel, click on the data tab in your worksheet, then click on data analysis tab, then click on t-Test: Paired Two Sample for Means and click OK.
- Fill in variable 1 range by highlighting the “before” column, fill in variable 2 range by highlighting the “after” column, insert zero in hypothesized mean difference, set Alpha at .05, click on new worksheet under output options (this will create a new worksheet tab and will display the results on that sheet).

[C:\Users\mwilder\Documents\Classes\8o6oo\SU13\T-Test for Dependent Sample EXAMPLE for 8o6oo.xlsx](#)

STEPS TO RUNNING A T-TEST

- **Analyze the Results**

- Looking at the results, begin by comparing the means of the before and after scores (did the mean increase?), then note the t Stat result and compare it to the t Critical two-tail value (is the absolute value of the t Stat larger than the t Critical value?), if so confirm that the p value is less than .05 (if so, then you know that the change in scores is NOT due to chance but that the intervention made a statistically significant difference). **YEAH—your intervention worked!**

STEPS TO RUNNING A T-TEST

- **Write up the Results**

- When you write up your results, you will want to state:
 - The teaching of doctrine to the select group of median adults made a statistically significant difference resulting in the increase of their doctrinal knowledge ($t_{(9)} = 3.338, p < .008$).