

Research Methods

Paired samples t-test

In this workshop you will practice the procedure for using SPSS to make a comparison between two sets of scores/data. Specifically, you will be running a paired samples t-test analysis, which is used when you have two sets of scores that were generated using the same participants in each condition. This type of data is produced when you use a within-subjects design for a study.

For a paired samples t-test, the data has to be entered in the format shown in the example data set below. Where there are two conditions, data must be entered in two columns – **each column represents scores in each condition**. Each row of data represents the scores of any one participant.

As this is 'paired' data, it is crucial that the data remains in the correct order in terms of each participant (i.e., row 1 should represent the scores for participant 1 in both conditions).

Step 1:

Create your variables and enter the data as shown below, which represents an example study in which participants are asked to react to 20 circular and 20 triangular warnings in a vehicle simulator.

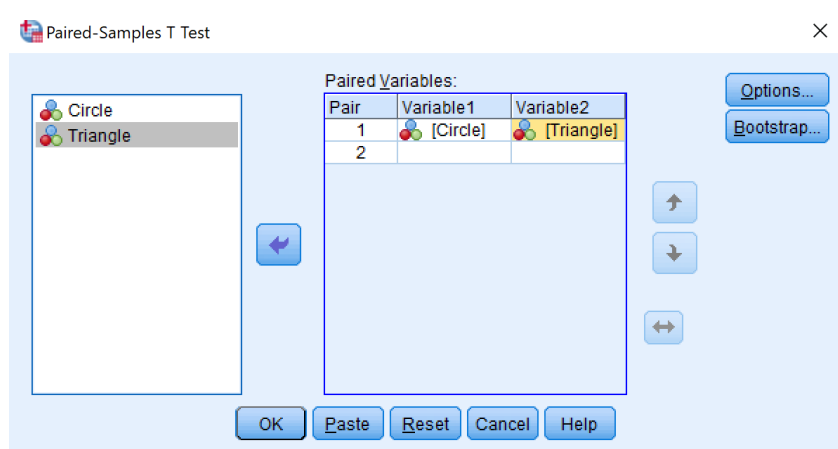
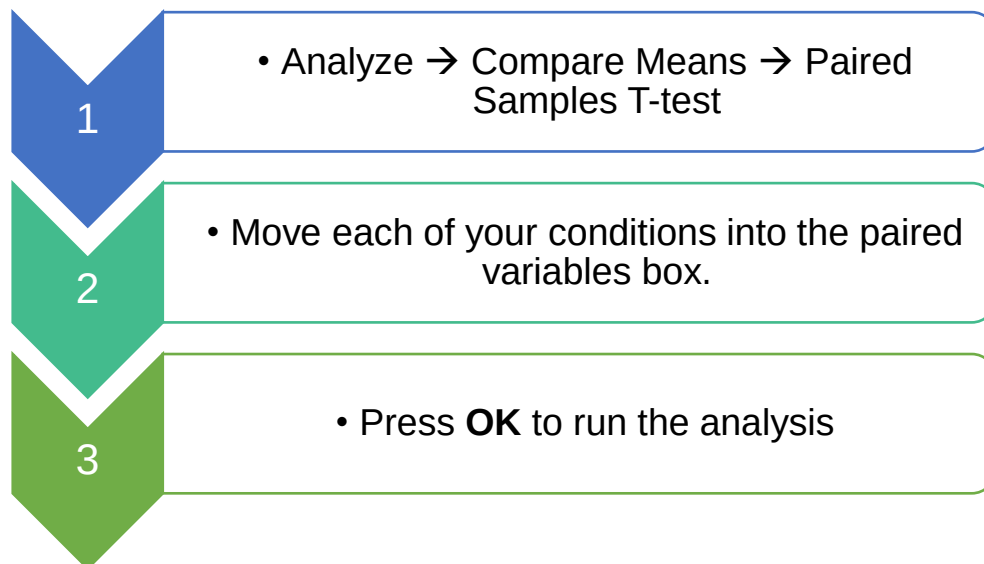
REMEMBER: you need to toggle between the tabs at the bottom of the screen to create your variables and input the data. Variable View is where you indicate the variable or condition names; Data View is where you input the data scores.

	 Circle	 Triangle
1	20.53	23.67
2	23.20	24.20
3	19.52	21.98
4	22.54	22.94
5	21.95	23.48
6	23.40	24.05
7	13.41	23.71
8	21.95	23.02
9	23.01	22.65
10	22.60	25.03
11	22.45	24.01
12	23.40	23.91
13	21.98	23.12
14	22.16	22.87
15	12.84	24.85
16	22.51	24.76
17	23.06	24.72
18	24.99	23.25
19	20.21	23.04
20	21.65	24.56
21		

Step 2:

With the data correctly entered we can now carry out a comparison between the two conditions' scores.

As this is paired data, we use the paired samples t-test. Follow the steps below to run the analysis.



Step 3:

Report and interpret results. SPSS will produce the following output tables:

Paired Samples Statistics: This shows you the descriptive statistics (mean, standard deviation) for each of the conditions.

Paired Samples Correlations: How correlated scores are between the conditions (don't worry about this table much at this point – consult your SPSS textbook for more detail on when this is relevant to report).

Paired Samples Test: This is the most important table in terms of the inferential statistics generated from the analysis as it reveals whether the test shows a significant difference between the scores in the two conditions.

The main statistics to assess and report from this table are:

- The t-value
- Degrees of freedom (df)
- The significant value / p-value (sig. value in SPSS)

If the p-value is below 0.05 then there is a significant comparison, or shows a significant difference.

The format for reporting the t-test in APA style is:

$$t(df) = t\text{-value}, p < \text{or} > 0.05 \text{ (or } p = __ \text{ if you prefer)}$$

For example: $t(10) = 1.43, p > 0.05$

Remember that if you have a significant difference you should use the descriptives (mean and SD) to interpret the direction of that difference (e.g., did participants react significantly quicker to circular or triangular warnings?)

Your task:

Write out the results you have obtained from the previous data in the correct format, and state whether there is a significant difference between the conditions or not. If there is, which condition did participants react significantly quicker to?