

Research Methods

Independent samples t-test

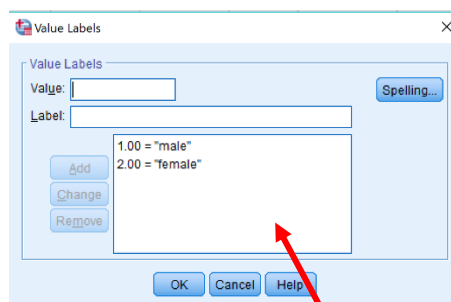
In this workshop you will practice the procedure for using SPSS to make a comparison between the mean scores of two different groups of participants. Specifically, you will be running an independent samples t-test analysis, which is used when you have two sets of scores that were generated using different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

For an independent samples t-test, the data has to be entered in the format shown in the example data set below. Where there are two separate groups of participants, data must be entered in just one column – **you then have to assign values to each group in this column**. Each row of data (in the data view) represents the scores of one participant.

Enter the data as shown below, which represents an example study in which males and females have completed a questionnaire to measure their levels of self-esteem. What you will have here is one categorical IV (gender: males/females) and one continuous DV (self-esteem levels scored out of 40).

Step 1:

Input the variables into the 'variable view' as shown below, making sure to give your **between-subjects** variable appropriate values.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	Gender	Numeric	8	2		{1.00, male}...	None	8	Right	Nominal
2	SelfEsteem	Numeric	8	2		None	None	8	Right	Scale

Step 2:

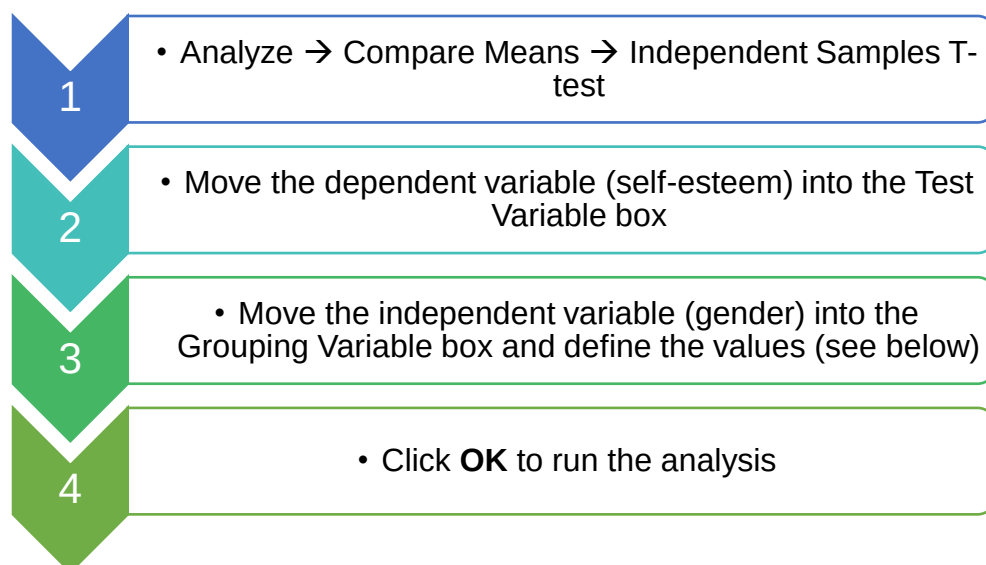
Click back to the 'Data view' tab and enter the data as shown below, which represents data collected from males and females (IV) and their levels of neuroticism (DV).

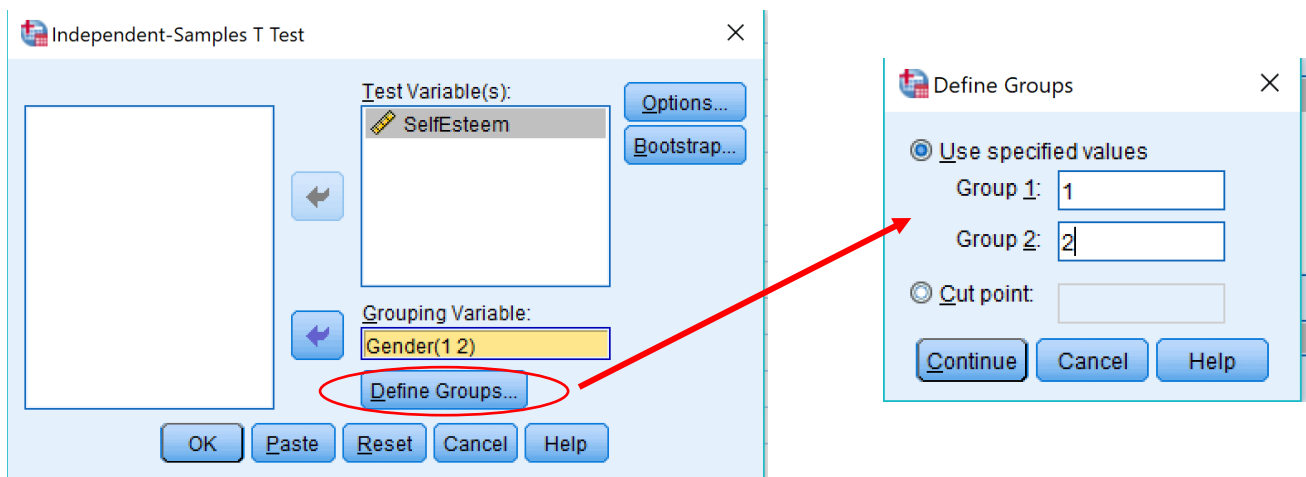
	 Gender	 SelfEsteem
1	1.00	37.00
2	1.00	29.00
3	1.00	35.00
4	1.00	21.00
5	1.00	22.00
6	1.00	24.00
7	1.00	36.00
8	1.00	25.00
9	1.00	24.00
10	1.00	22.00
11	2.00	16.00
12	2.00	27.00
13	2.00	30.00
14	2.00	29.00
15	2.00	17.00
16	2.00	28.00
17	2.00	14.00
18	2.00	12.00
19	2.00	20.00
20	2.00	19.00
21		

*Remember: One row of data = one participant.
You have ten male participants in this study and ten female participants.*

Step 3:

Now you can run the independent samples t-test analysis.





Step 4:

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

Group Statistics: This shows you the descriptive statistics (mean, standard deviation) for each of your groups, plus the number of people in each group. Always check to make sure they are correct.

Independent Samples Test: This is the most important table for your analysis as it reveals whether the test shows a significant difference between the scores in the two conditions.

First, you need to check the results of **Levene's Test for Equality of Variances**. If the value in the **Sig.** column is above .05, you have not violated this assumption and can use the data in the **Equal variances assumed row**. If the Sig. value is below .05, you have violated the assumption and must use the data in the **Equal variances not assumed row**.

Next you can determine whether you have a significant difference between the two groups. The main statistics to assess and report from the **Independent Samples Test** table are:

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

If the p-value is below 0.05 then there is a significant difference between the two levels of your independent variable.

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

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

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 males or females score significantly higher on their average levels of self-esteem?)

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 groups or not. If there is, which group's scores were significantly higher?

$t =$

$df =$

$p < \text{or} > .05?$

$t(\text{ }) = \text{ }, p \text{ } .05$

Results section: