

## Independent Groups t test

For this problem, a researcher was interested in finding out if subjects would agree with a message more if it was delivered to them by a **high** credible speaker than if it was delivered to them by a **low** credible speaker. The researcher felt that people would be **more** likely to agree with a message if it was delivered to them by a **high** credible speaker. Subjects were randomly assigned to one of two conditions. All subjects in the experiment read the exact same message. However for ½ of the subjects the message was purported to have been written by a noble prize winning doctor of medicine. For the other ½ of the subjects the message was purported to have been written by a man doing prison time for medical quackery. The message stressed the importance of exercise for lowering blood pressure. After reading the message, the subjects were then asked to indicate how much they agreed with the speaker on a 15 point scale by circling one of the numbers on a scale that looked like this.

Low agreement: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15: High agreement

The experimenter then recorded the data in a table which looked like this.

<u>Agreement with Low Credible Speaker</u>	<u>Agreement with High Credible Speaker</u>
5	8
4	10
4	12
1	10
1	10

1. Logon to system
2. **Click Start > Programs > SPSS for Windows > SPSS 10.1 for Windows.** At this point a window will appear asking you what you would like to do. Click on the circle next to Type in Data (2<sup>nd</sup> option in list) and then click **OK** at the bottom of the window.
3. A Data Editor will appear. Look in the lower left corner of the screen. You should see a **Data View** tab and to the right of it a **Variable View** tab. The **Variable View** tab will be used first for the **Data Definition** Phase of creating a data file. The **Data View** tab will be used to actually enter the raw numbers listed above. (See pages 1-3 for a more detailed explanation of creating data files.)

### DATA DEFINITION PHASE

4. Click on the **Variable View** tab in the lower left corner. A new screen will appear with the following words at the top of each column.

**Name** Type Width Decimals **Label** **Values** Missing Columns Align Measure

5. Click on the white cell in **Row 1** under the word **Name** and type in the word **Source** (for source credibility).
6. Click on the white cell in **Row 1** under the word **Label** and type in **Source Credibility**. (Doing this will provide you with a more expansive label for your independent variable in the results output).
7. Click on the white cell in **Row 1** under the word **Value**. The word none will appear along with a small grey box to the right.
  - a. Click on the small grey box and a Value Labels window will appear
  - b. In the white box next to the word **Value**, type in the number **1**
  - c. Click on the white box next to the word **Value Label** and type **Low** (for Low credible source).

- d. Click on the **Add** button. 1 = “Low” should now appear in the bottom white box.
- e. In the white box next to the word **Value** type in the number **2**
- f. Click on the white box next to the word **Value Label** and type **High** (for High credible source)
- g. Click on the **Add** button. 1 = “Low”  
2 = “High” should now appear in bottom white box
- h. Click on **OK** button (top right corner)
8. Click on the white cell in **Row 2** under the word **Name** and type in the word **Agree** (for the Agreement dependent variable).
9. Click on the white cell in **Row 2** under the word **Label** and type in **Agreement Response**. (Doing this will provide you with a more expansive label in the computer print out of the results of your analysis.)

## DATA ENTRY PHASE

10. Click on the **Data View** tab in the lower left corner. The data **view** screen will now appear with Column 1 named **Source** (for the source credibility independent variable) and Column 2 named **Agree** (for the agreement dependent variable).
11. Enter data for all ten subjects as follows. Click on the white cell at Row 1 Column 1 under Source and enter

- |                |   |
|----------------|---|
| 1 tab 5 enter. | Then mouse to the second row to enter the data for the second case. |
| 1 tab 4 enter. | Then mouse to the third row to enter the data for the third case.   |
| 1 tab 4 enter  |   |
| 1 tab 1 enter  |   |
| 1 tab 1 enter  |   |
| 2 tab 8 enter  |   |
| 2 tab 10 enter |   |
| 2 tab 12 enter |   |
| 2 tab 10 enter |   |
| 2 tab 10 enter |   |

The data may also be entered down one column at a time, entering the codes for source, where 1 means low and 2 means high credible source and then moving on to column 2 and entering the responses on the agreement scale.

## Data Analysis

1. Click on **Analyze** at top of screen then
  - a. Click on **compare means** then
  - b. Click on **Independent Samples t -test**
2. Highlight the word **Source** by **clicking on it** and then
  - a. Click on the **lower arrow** to transfer it to the **grouping** variable box. (This is your independent variable).
  - b. When the **source ? ?** shows up click on the **Define Groups** box
  - c. Type in 1 in Group 1 box
  - d. Type in 2 in Group 2 box
  - e. Click the **Continue** button
3. Highlight the word **agree** by **clicking on it** and then
  - a. Click on the **upper arrow** to transfer it to the **Test Variable Box** (since this is your dependent variable)
4. Click **OK** A few seconds later a new screen will appear called output 1
5. Your results will appear in a Window. Scroll up using the slide bar on the right to the top of the output. The results of this analysis are presented below.

**Group Statistics**

		source credibility	N	Mean	Std. Deviation	Std. Error Mean
agreement	low credibility		5	3.0000	1.8708	.8367
	high credibility		5	10.0000	1.4142	.6325

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
agreement	Equal variances assumed	2.133	.182	-6.674	8	.000	-7.0000	1.0488	-9.4186	-4.5814
	Equal variances not assumed			-6.674	7.446	.000	-7.0000	1.0488	-9.4502	-4.5498

6. For the problem above the null and alternative hypothesis are spelled out below:

$H_{null}$  The mean agreement score given to a low credible source will be greater than or equal to the mean agreement score given to a high credible source  
 $H_{alt}$  The mean agreement score given to a low credible source will be less than the mean agreement score given to a high credible source

7. **Interpretation and APA writing template for Results Above:**

Results indicate that the mean agreement score given to a low credible source was 3 ( $M = 3.00$ ,  $SD = 1.87$ ), while the mean agreement score given to a high credible source was 10 ( $M = 10.00$ ,  $SD = 1.41$ ). A one tailed independent groups  $t$  test indicated that the difference between these two means was significant  $t(8) = -6.67$ ,  $p < .05$ . These results indicate that the null hypothesis should be rejected and that one should conclude that high credible sources produce more agreement with a message than low credible sources.