

Oneway Analysis of Variance

The present problem is similar to that on page 4, which called for an independent groups t test. On page 1 the researcher was interested in finding out whether source credibility influenced agreement with the speaker. However, in that problem there were only **two** variations of source credibility (high and low). For the present problem there are **more than two** variations of source credibility. **When there are more than two variations of the independent variable the independent groups t test becomes inappropriate.** In the present problem, the researcher was interested in finding out if people would be more likely to agree to the content of a message when that message was delivered to them by a high credible source than when that same message was presented by either a low credible source or by a source whose credibility was left unspecified. The researcher first composed a message about some of the unintended negative side effects of brushing one's teeth after each and every meal. Then the researcher went into a classroom to distribute the message in written form to all of the students in class. There were, however, **three** variations of the sheet of paper that the researcher randomly distributed around the room. For one third of the students, at the top of the sheet of paper was some information that the author of the message was a former dentist who had been convicted of medical quackery (**low credible** source condition). For another one third of the students, the information at the top of the sheet of paper indicated that the author of the message was a dentist who was the current president of the American Dental Association, chairman of the department of a prominent dental school, and a scholar who had also published a number of research articles in scholarly journals (**high credible** source condition). For the remaining one third of the students, there was no information about the source of the message (**neutral** credible source condition). After reading the message the students were asked to circle a number on a twenty-point scale, which indicated the extent to which they agreed with the position being advocated by the author of the message. The scale looked like the following:

disagree with speaker: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20: agree with speaker

The responses of the students in each of the conditions of the experiment are listed in the table below:

<u>Low Credible Source</u>	<u>Neutral Credible Source</u>	<u>High Credible Source</u>
3	4	12
4	6	14
5	8	16

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 (2nd 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 Credibility** (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 **Neutral Credibility** (for Neutral credible source).
 - g. Click on the **Add** button. 2 = “neutral” should now also appear in the bottom white box.
 - h. In the white box next to the word **Value** type in the number **3**
 - i. Click on the white box next to the word **Value Label** and type **High Credibility** (for High credible source).
 - j. Click on the **Add** button. 3 = “High” should now also appear in the bottom white box.
 - k. Click **Ok**
 8. Click on the white cell in **Row 2** under the word **Name** and type in the word **Agree** (for Agreement)
 9. Click on the white cell in **Row 2** under the word **Label** and type in **Agreement** (for agreement) (Doing this will provide you with a more expansive label for your results output).

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 3 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 5 enter	
2 tab 4 enter	
2 tab 6 enter	
2 tab 8 enter	
3 tab 12 enter	
3 tab 14 enter	
3 tab 16 enter	

The data may also be entered down one column at a time, entering the codes for source, where 1 means low, 2 means neutral credible source and 3 mean high credible source. Then move on to column 2 and enter the responses on the agreement scale.

1. Click on **Analyze** at top of the screen then
 - a. Click on **Compare Means** then
 - b. Click on **One-way ANOVA**
2. Highlight **agree** by clicking on it and then
 - a. Click on **arrow >** to transfer this name to the **Dependent List Box**
3. Highlight **source** by clicking on it and then
 - a. Click the lower **arrow >** to transfer this name to the **Factor Box**
4. Click on the **Post Hoc** button then
 - a. Click on the white square next to **Tukey** (A check mark should appear)
 - b. Click on **Continue** button

5. Click on the **Options** button then
 - a. Click on white square next to **Descriptives** (A check mark should appear)
 - b. Click on **Continue** button
6. Click **OK**
7. 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.

Descriptives

Agreement									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
Low	3	4.0000	1.00000	.57735	1.5159	6.4841	3.00	5.00	
Neutral	3	6.0000	2.00000	1.15470	1.0317	10.9683	4.00	8.00	
High	3	14.0000	2.00000	1.15470	9.0317	18.9683	12.00	16.00	
Total	9	8.0000	4.82183	1.60728	4.2936	11.7064	3.00	16.00	

ANOVA

Agreement					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	168.000	2	84.000	28.000	.001
Within Groups	18.000	6	3.000		
Total	186.000	8			

Multiple Comparisons

Dependent Variable: Agreement
Tukey HSD

(I) Source Credibility	(J) Source Credibility	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Low	Neutral	-2.0000	1.41421	.392	-6.3392	2.3392
	High	-10.0000*	1.41421	.001	-14.3392	-5.6608
Neutral	Low	2.0000	1.41421	.392	-2.3392	6.3392
	High	-8.0000*	1.41421	.003	-12.3392	-3.6608
High	Low	10.0000*	1.41421	.001	5.6608	14.3392
	Neutral	8.0000*	1.41421	.003	3.6608	12.3392

*. The mean difference is significant at the .05 level.

Agreement

Tukey HSD ^a			
Source Credibility	N	Subset for alpha = .05	
		1	2
Low	3	4.0000	
Neutral	3	6.0000	
High	3		14.0000
Sig.		.392	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

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

H_{null} : Source credibility does not affect agreement.

H_{alt} : Source credibility does affect agreement.

9. **Interpretation and APA writing template for Result Above:**

A one-way analysis of variance was conducted to determine whether source credibility influenced the extent to which participants in the study agreed with the position being advocated by the author of the message. Results of that analysis indicated that the null hypothesis should be rejected and that source credibility had a significant effect on the extent to which participants agreed with the message, $F(2,6) = 28.00$, $p < .05$. A Tukey test was conducted to determine which specific groups differed from one another. Results of that analysis indicate that the low credible ($M = 4.00$, $SD = 1.00$) and neutral credible ($M = 6.00$, $SD = 2.00$) source conditions did not differ from one another. However, the high credible source produced significantly more agreement ($M = 14.00$, $SD = 2.00$) than either the neutral or low credible source conditions, $p < .05$.