

Chi-Square

The present research problem is **conceptually** similar to the independent groups t test problem described on page 4, however, the present researcher differs by measuring the participant's responses on a dependent variable measured by a nominal scale. In the present problem the researcher was interested in finding out if participants would be more likely to agree to a message if it was presented to them by a **high** credible source than if it was presented to them by a **low** credible source. The researcher felt that people would be more likely to agree to a message if it was delivered to them by a high credible speaker. Participants were randomly assigned to one of two conditions. All participants in the experiment read the exact same message. However for 30 of the participants the message was purported to have been written by a noble prize winning doctor of medicine. For the other 50 of the participants the message was purported to have been written by a man doing time for medical quackery. The message stressed the importance of exercise for lowering blood pressure. After reading the message, the participants were then simply asked to check a box indicating whether they agreed with the speaker or disagreed with the speaker. (This is **unlike** the problem on page 1 where the participants indicated the **degree** to which they agreed with the speaker). In the present study, the participants are giving a categorical response (nominal scale).

The researcher then recorded the number (frequency count) of participants who agreed or alternatively disagreed with the high credible speaker. The researcher also recorded the number (frequency count) of participants who agreed or alternatively disagreed with the low credible speaker. The results of this tabulation are in the table below where the numbers in the cells are frequency counts

	Speaker Credibility	
	High	Low
	Column 1	Column 2
Agreed (Row 1)	25	10
Disagreed (Row 2)	5	40

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 **Freq** (for frequency)

6. Click on the white cell in **Row 1** under the word **Label** and type in **Frequency**. (Doing this will provide you with a more expansive label in the results output).
7. Click on the white cell in **Row 2** under the word **Name** and type in the word **Decision**
8. Click on the white cell in **Row 2** under the word **Label** and type in **Decision**. (Doing this will provide you with a more expansive label in the results output).
9. Click on the white cell in **Row 2** under the word **Values**. 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. Click on 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 in **Agreed**
 - d. Click on **Add** button: 1 = “Agreed” will appear in bottom white box
 - e. Click on 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 in **Disagreed**
 - g. Click on **Add** button: 2 = “Disagreed” will appear in bottom white box
 - h. Click **OK**
10. Click on the white cell in **Row 3** under the word Name and type in the word **Source**
11. Click on the white cell in **Row 3** under the word **Label** and type in the words **Source Credibility**. (Doing this will provide you with a more expansive label in the results output).
12. Click on the white cell in **Row 3** 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. Click on 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 in **High**
 - d. Click on **Add** button: 1 = “**High**” will appear in bottom white box
 - e. Click on 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 in **Low**
 - g. Click on **Add** button: 2 = “**Low**” will appear in bottom white box
 - h. Click on **Ok**

DATA ENTRY PHASE

13. Click on the **Data View** tab in the lower left corner. The data **view** screen will now appear with Column 1 named **freq** (for frequency), Column 2 named **Decision**, and Column 3 named **Source**
14. Enter the data for each of the four cells as follows. Mouse to the top cell under the first column which is **freq** and type

25 tab 1 tab 1	Then mouse to the second row and enter
5 tab 2 tab 1	Then mouse to the third row and enter
10 tab 1 tab 2	Then mouse to the fourth row and enter
40 tab 2 tab 2	

The three number in each row represent respectively the frequency, the row cell of the table where a 1 means agreed and a 2 means disagreed, and the column of the table where a 1 means high credibility and a 2 means low credibility.

Data Analysis

1. Click on **Data** at top of screen then
 - a. Click on **Weight Cases** then
 - b. Click on **circle** by **Weight Cases by** (a dot will appear) then
 - c. Highlight **Freq** by clicking on it then
 - d. Click on **arrow >** to transfer this name (freq) to the **Frequency Variable** Box then
 - e. Click on **OK**
2. Click **Analyze** at top of screen then
 - a. Click on **Descriptive Statistics** then
 - b. Click on **Crosstabs**
3. Highlight **decision** by clicking on it then
 - a. Click on **arrow >** to transfer this name to the **Row(s)** box
4. Highlight **Source** by clicking on it then
 - a. Click on **arrow >** to transfer this name to the **Column(s)** box
5. Click on **Statistics** button then
 - a. Click on white square next to **Chi-square**. This will put a check in the box.
6. Click **Continue** button
7. Click **Cells** button then
 - a. Click on white squares next to **Observed** and **Expected** to put a check mark in the box if one is not already there then
8. Click **Continue** button
9. Click **OK**. Doing this will result in analysis being conducted. These results are below.

decision * Source Credibility Crosstabulation

			Source Credibility		Total
			High Credibility	Low Credibility	
decision	agreed	Count	25	10	35
		Expected Count	13.1	21.9	35.0
	disagreed	Count	5	40	45
		Expected Count	16.9	28.1	45.0
Total		Count	30	50	80
		Expected Count	30.0	50.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	30.561 ^b	1	.000		
Continuity Correction ^a	28.041	1	.000		
Likelihood Ratio	32.576	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	30.179	1	.000		
N of Valid Cases	80				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.13.

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

H_{null} : There will be no relationship between source credibility and whether the participant decides to agree or disagree with the speaker. In other words, the proportion of participants agreeing to the high credible source will be no different than the proportion of participants agreeing to the low credible source.

H_{alt} : There will be a relationship between source credibility and whether the participant decides to agree or disagree with the speaker. In other words, the proportion of participants who agree with the high credible speaker will be greater than the proportion of participants who agree with the low credible speaker.

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

A chi square analysis was conducted to determine whether source credibility was related to a participant's decision to agree or disagree with a speaker. Results of that analysis indicated that participants were significantly more likely to agree with a message when it was presented by a high credible speaker than when it was presented by a low credible speaker, $\chi^2(1) = 30.56, p < .05$.