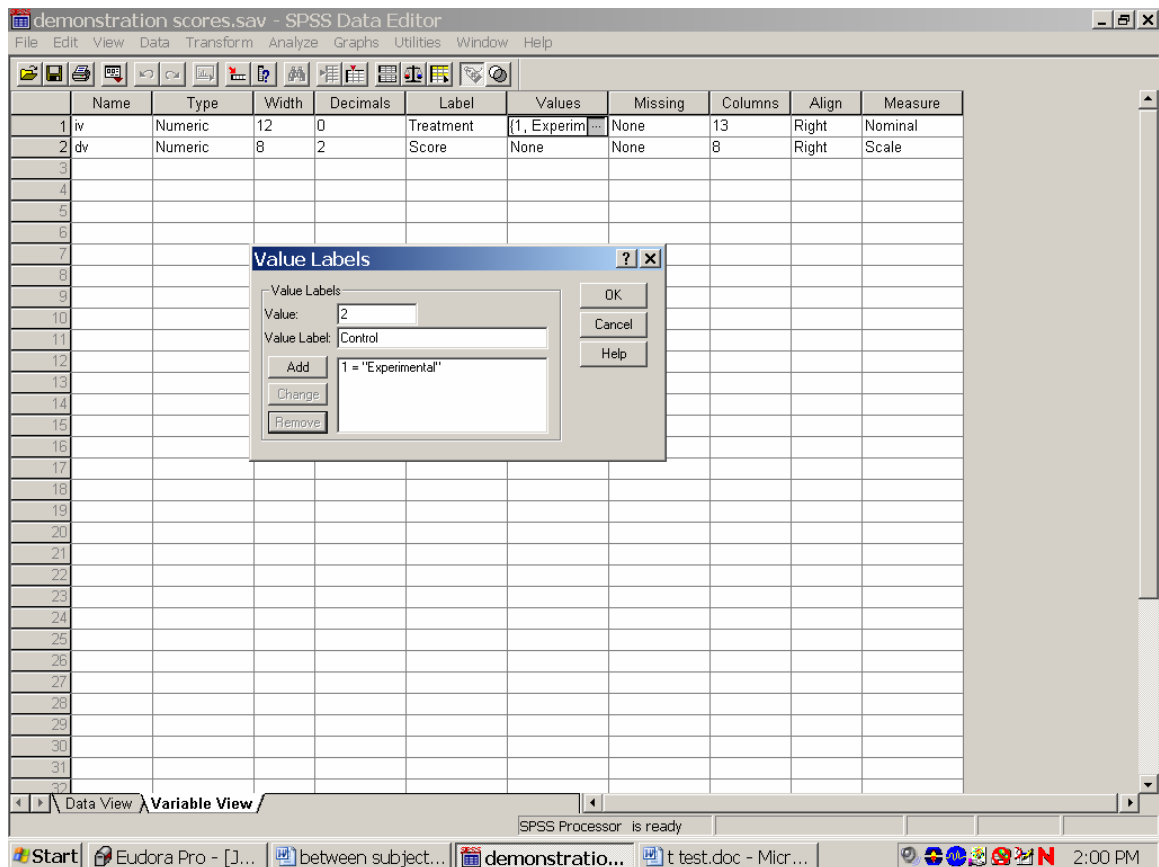


Tutorial for Independent-samples t Test

1. Before entering data for analysis, all variables must be defined. Variable definition is accomplished in the Variable View screen. In the first column, you must Name your variables. The variable Name is limited to no more than eight characters and should not include spaces or arithmetic operators (+, -, *, /). Note that the first variable being defined is the independent variable. I have chose “iv” for the variable Name.
2. The default variable type is Numeric. You may use this default for most analyses. The default for Width is 8. The default for Decimals is 2. You should use these defaults unless you have specific need for other values.
3. The Label section allows for longer and more descriptive identifiers for variables. The label section is not limited to 8 characters and will allow for spaces and other characters.
4. Note that Independent Variables have levels or Values in the case of SPSS terminology. By clicking on the Label cell (row) for the Independent variable, you may define the Value (a numeric value) that coincides with the Value label. To assign value labels, type in the numeric value followed by the Value Label and then click Add. Do this for each value before clicking on OK. Accept the defaults for Missing, Columns, and Align. However you will be required to assign a particular Measure in the last column. Under most circumstances, you will assign the independent variable as Nominal and the dependent variable as Scale.
5. Repeat the steps for the dependent variable. However, you may omit the assignment of Values since the dependent may take on various values.
6. Once all variables have been defined, click on Data View at the bottom of the screen.



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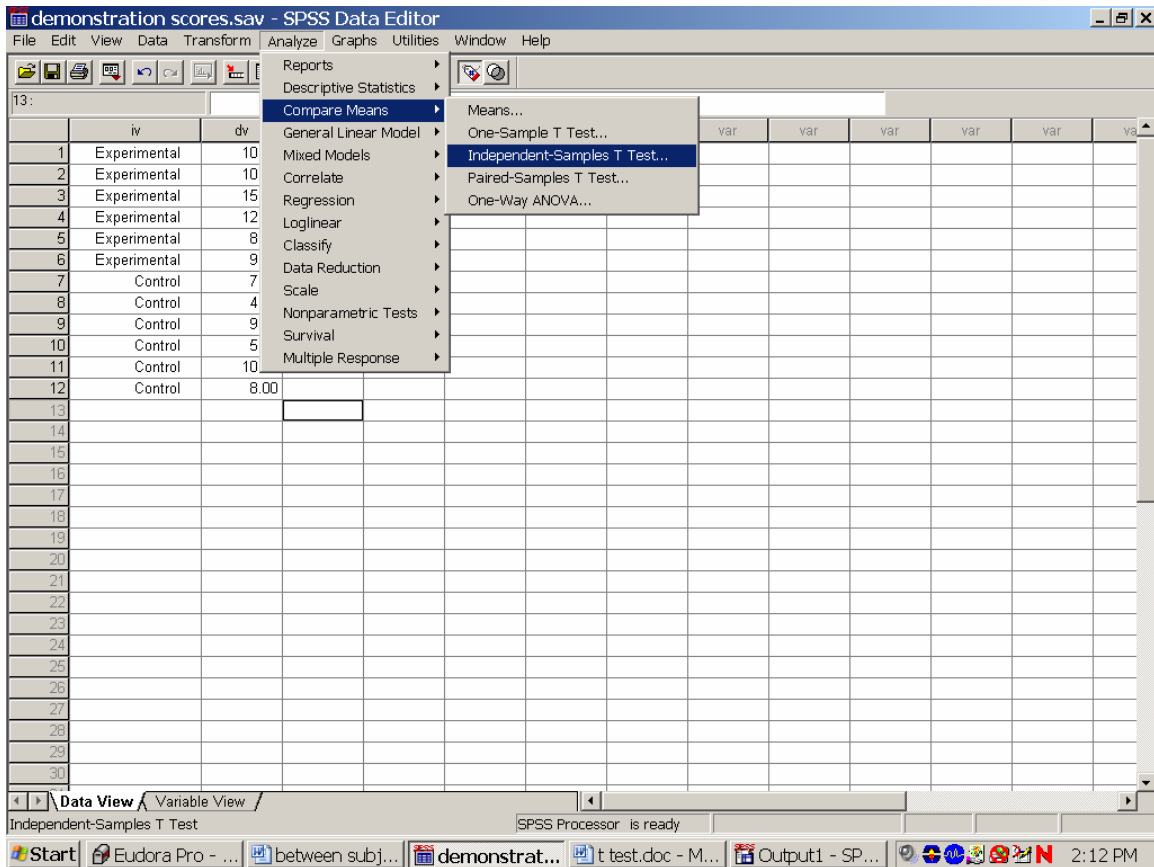
7. The Data Editor screen is where you actually enter your data. Note that the IV and DV appear at the top of the first two columns.
8. For the IV values you will enter 1 for the Experimental group and 2 for the Control group. Note that you have the option of displaying the numeric values (1 and 2) or the Value Labels (as shown below). The blue and red “label tag” on the tool bar allows you to select the option you prefer.
9. After entering the IV values, you may enter the DV scores for each case.
10. Note that this coding method is referred to as *univariate* coding and is used when the design is an “Between-subjects” design.

The screenshot shows the SPSS Data Editor window for a file named 'demonstration scores.sav'. The window title bar includes the file name and standard window controls. Below the title bar is a menu bar with options: File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Window, and Help. A toolbar with various icons is located below the menu bar. The main area displays a data table with 13 rows and 14 columns. The first two columns are labeled 'iv' and 'dv'. The data is as follows:

	iv	dv	var	var	var	var	var	var	var	var	var	var	var
1	Experimental	10.00											
2	Experimental	10.00											
3	Experimental	15.00											
4	Experimental	12.00											
5	Experimental	8.00											
6	Experimental	9.00											
7	Control	7.00											
8	Control	4.00											
9	Control	9.00											
10	Control	5.00											
11	Control	10.00											
12	Control	8.00											
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The status bar at the bottom of the window shows 'Data View' selected, 'Variable View' available, and 'SPSS Processor is ready'. The Windows taskbar at the very bottom shows the Start button and several open applications: Eudora Pro, between subj..., demonstrat..., t test.doc - M..., and Output1 - SP... The system clock shows 2:11 PM.

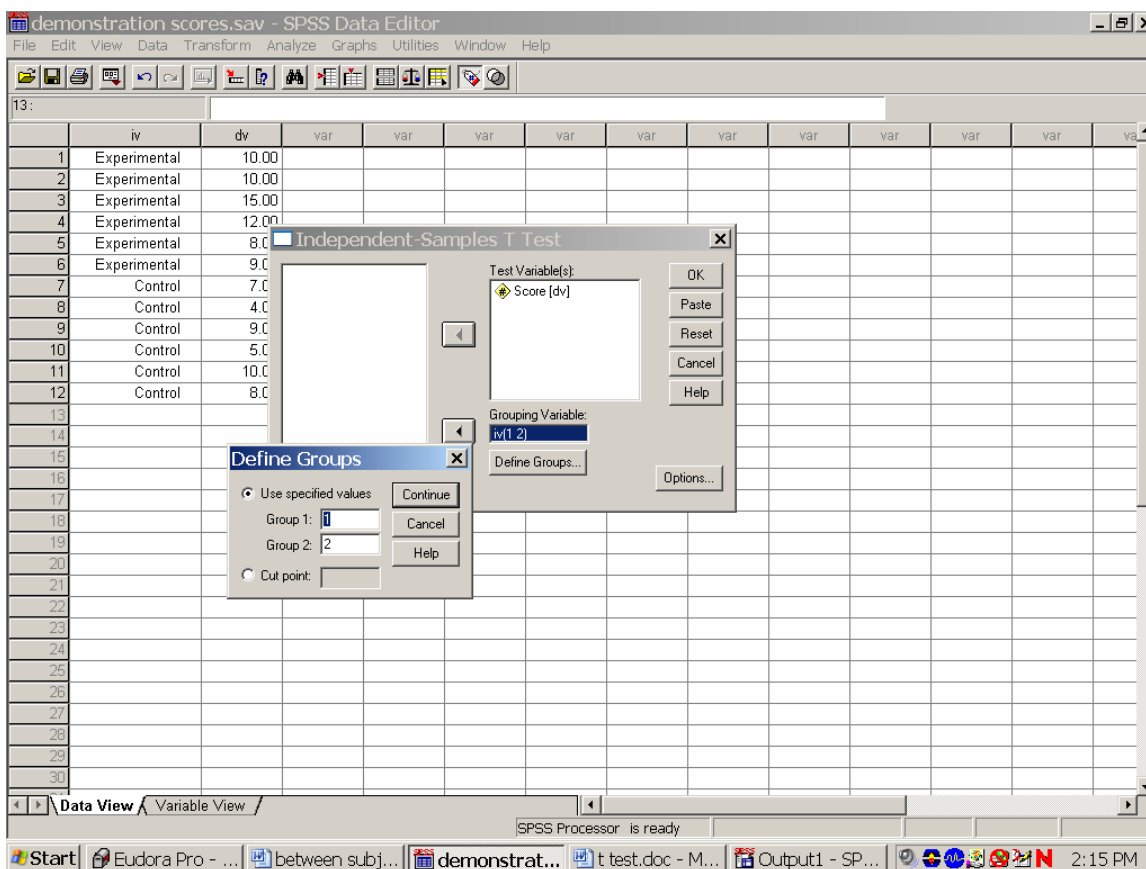
11. The next step is to conduct the Independent-Samples t Test. Click and select the following sequence: Analyze, Compare Means, Independent-Samples T test.



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12. A window will appear that will allow you to specify the variables. All available variables will appear on the left in the variable list window. This portion of the window is empty since the IV and DV have already been moved. The DV should be moved to the Test Variable window. The IV should be moved to the Grouping Variable slot.
13. Once the IV has been moved to the Grouping Variable slot, you should click on Define Groups. This will allow you to assign Group1 (Experimental Group) a value of 1 and Group 2 (Control Group) a value of 2.
14. Click on Continue and then OK. The analysis will be run and the screen will switch to the SPSS Viewer screen (the Output screen).



15. Note that the actual SPSS Viewer screen is not depicted here. When wide tables result from the analysis, it is easier to edit those tables and import them into a word processing program like Word or simply print them to a printer prior to interpretation of the analysis. The output below was imported into Word and printer. (Copy Object should be used when copying SPSS Output for import into Word)

T-Test

Group Statistics

Treatment	N	Mean	Std. Deviation	Std. Error Mean
Score Experimental	6	10.6667	2.50333	1.02198
Control	6	7.1667	2.31661	.94575

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 Difference	
									Lower	Upper
Score	Equal variances assumed	.006	.942	2.514	10	.031	3.5000	1.39244	.3975	6.603
	Equal variances not assumed			2.514	9.941	.031	3.5000	1.39244	.3949	6.605

16. Using the analyses above, the Results section can be written.

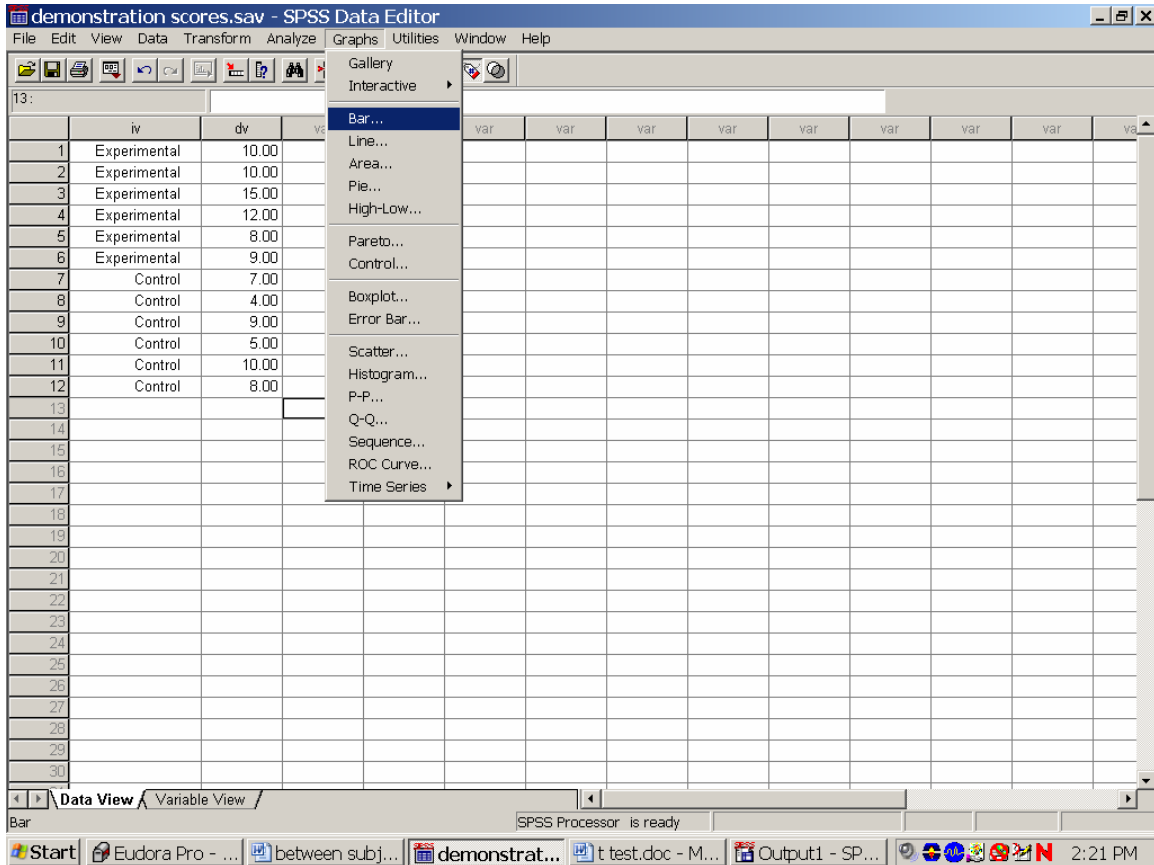
Results

A between-subjects *t* test was conducted to determine the effect of treatment on scores. Using a two-tailed .05 criterion, we reject the null hypothesis. The experimental group ($M = 10.67$, $SD = 2.50$) scored significantly higher than the control group ($M = 7.17$, $SD = 2.32$), $t(10) = 2.51$, $p = .031$, (see Figure 1). The effect size as measured by Cohen's $d = 1.45$.

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17. Note that the Results section above refers to Figure 1. The next section of the tutorial will provide steps for creating a bar graph.

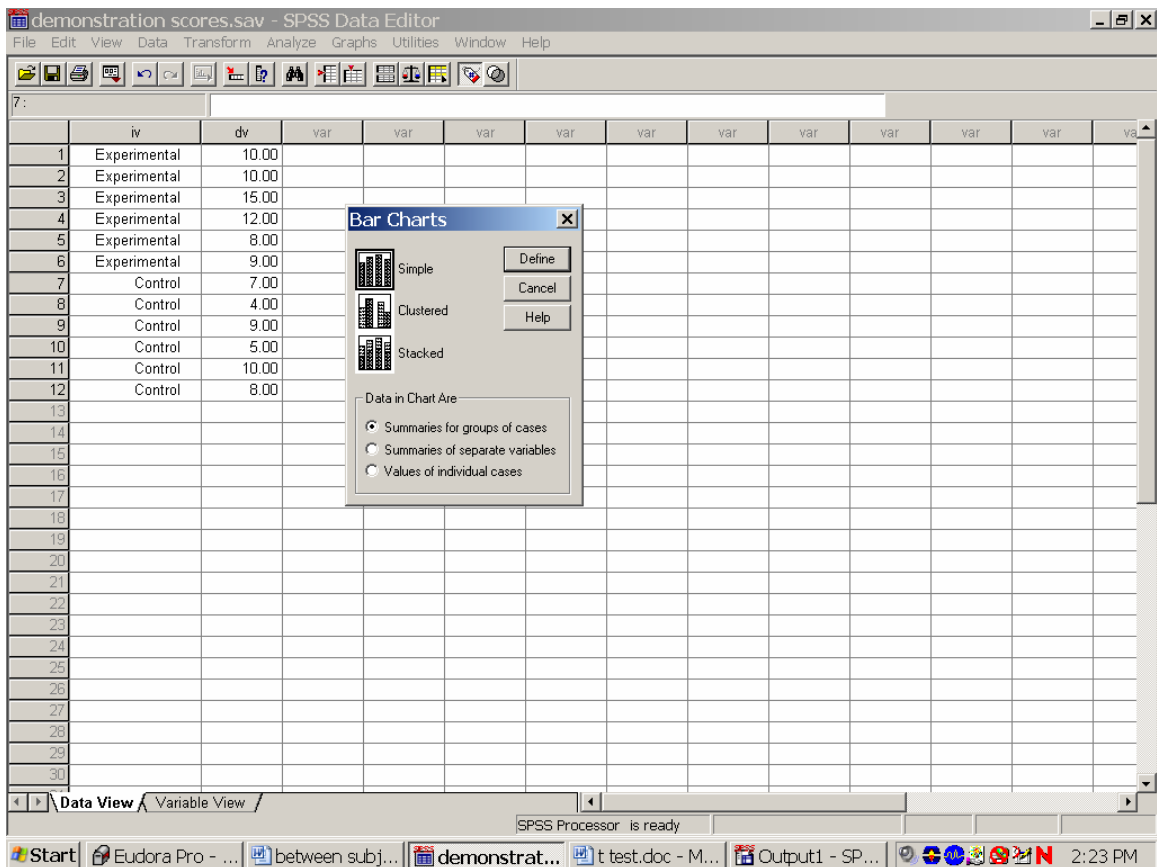
18. Start by clicking on Graphs then slide down and click on Bar.



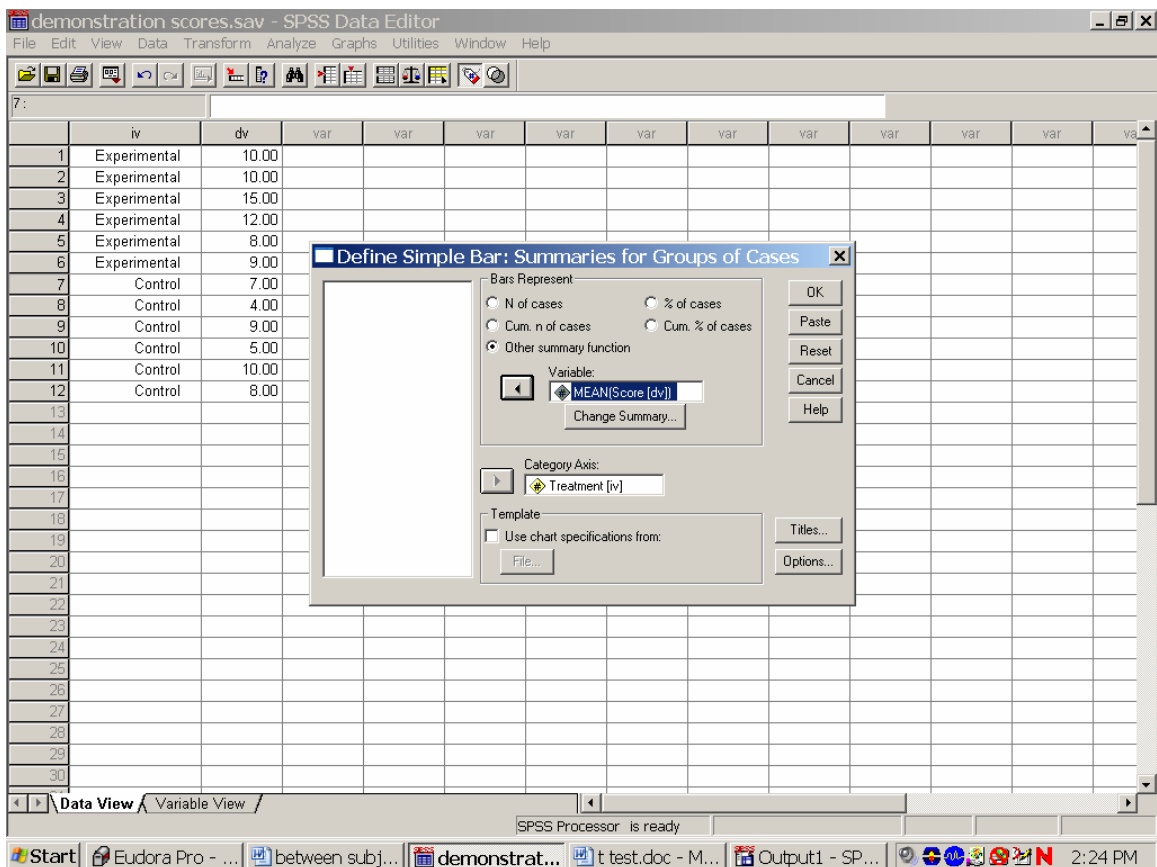
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19. After Clicking on Bar, The Bar Charts options window will appear.
20. The default is a Simple graph
21. Select “Summaries for groups of cases.” Note that this option is selected when graphing data for a “between-subjects” design.
22. Click on Define.



23. All available variables will appear in the window to the left (note the window is depicted as empty, because the variables have already been moved over when this screen was captured).
24. Select Other Summary Function. This function is defaulted to the Mean.
25. Move the Dependent Variable into the Variable slot.
26. Move the Independent Variable into the Category Axis slot.
27. Click on OK
28. The graph will appear in the SPSS Viewer screen just below your previous analysis- the *t* test tables.



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29. You will not again that the actual SPSS Viewer screen is not depicted, since your graph will usually need to be edited before being printed. The Bar graph you see below has been edited and imported into Word prior to printing.
30. You will also note that the graph appears as a “completed” figure- including the figure caption. This is not appropriate for APA manuscript preparation, since the *APA Manual* requires a separate figure caption page.

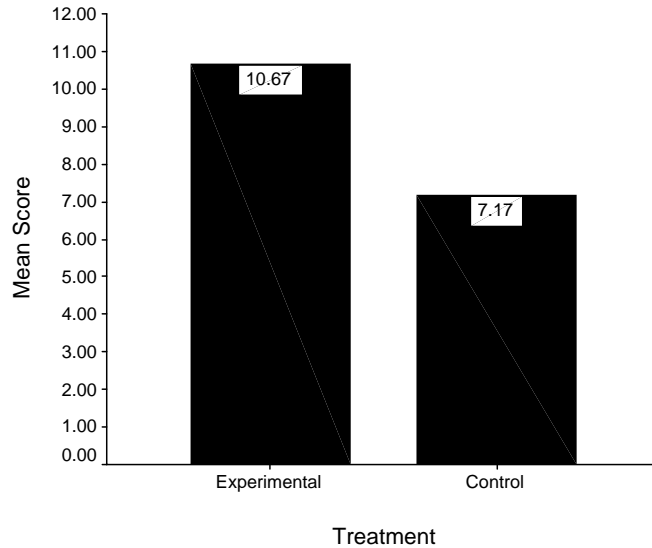


Figure 1. Mean score as a function of treatment.