

Psychology 420
Week 3: Lab

One of the most popular program, SPSS (Statistical Package for the Social Sciences) for Windows is used at universities and businesses across the world. The program has seen 3 updates in two years. We will be using version 8.0. Presenting any specific set of programming statements for such programs may quickly become unusable for students and researchers. So the goal is to present some general underlying characteristics within all of these statistical software that may have greater applicability to later and newer releases of the program. This particular computer program was chosen for this course because of its popularity and the greater probability that it will still exist five years from now.

There are student versions of the program that students can purchase and install on their home computers. SPSS has since their conception been a very easy to use program for researchers and students. Once some general ideas are made clear as to how one's data should be laid out and entered into the computer program, the request for certain statistical routines become very easy.

Untitled - SPSS Data Editor							
File Edit View Data Transform Statistics Graphs Utilities Windows Help							
	var	var	var	var	var	var	
1							
2							
3							
4							
5							
6							
7							

Figure 1. Opening Data Entry Table in SPSS.

When executing the SPSS for Windows program, the first screen to appear on the computer screen is a table for data entry. It would look like something similar to Figure 1. This data entry table is in the form of a spreadsheet. The user will need to input the data into this spreadsheet. If the researcher has a previously created data set acceptable for input to SPSS, it can be used directly without the researcher re-entering the data.

The general data format for nearly every statistical computer program is the data table where variables are the columns of the table and the observations (people, individuals) are the rows. So if we had the following set of data table given below, its entry into SPSS would be quite easy.

Person	Variables		
	Age	Gender	Test Score
1	12	M	60
2	13	F	75
3	15	F	45
4	14	M	80
5	14	F	85
6	12	M	39
7	13	F	62

Our first step would be to define the variables for SPSS. Wherever we see the “var” label on the spreadsheet, we would need to change those to reflect our variables. To do this we would use the mouse and double click on the cell on the spreadsheet with the label “var”. When we do this, we will another screen that allows us to specify the variable name and attributes of that variable (e.g. numeric of character data). For the first column we would type in “Age,” and then click on the “OK” button. See Figure 2.

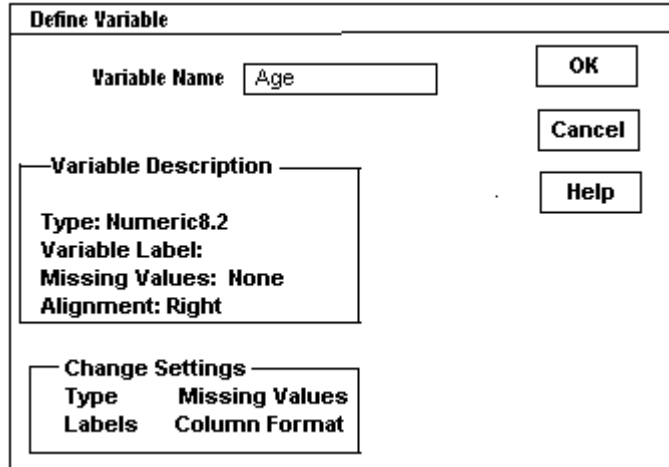


Figure 2 SPSS Define Variables Panel.

We would repeat this operation for each of our variables. For the variable “Gender” we will use a “1” for “F” and a “2” for “M”. Next, we enter the data from our data table. Each value occupies one cell of the spreadsheet. After we are finished with data entry our spreadsheet looks like Figure 3.

Untitled - SPSS Data Editor							
File Edit View Data Transform Statistics Graphs Utilities Windows Help							
	Age	Gender	Score	var	var	var	
1	12	2	60				
2	13	1	75				
3	15	1	45				
4	14	2	80				
5	14	1	85				
6	12	2	39				
7	13	1	62				

Figure 3 SPSS Spreadsheet with Data and Variable Names.

We can save this as a dataset by clicking on “FILE” and selecting “SAVE”. If we do this we will be asked for a dataset name. Our next step is to perform the statistical analysis. For this chapter we will do only descriptive statistics. This includes means and standard deviations. Figure 4 shows the panels in SPSS that are used. We would first click on “Statistics” and that will give us another menu. From the second menu we choose “Summarize.” When we do this we get a third menu and from that one we choose “Descriptives.” After choosing descriptive by clicking on it, we get the “descriptive statistics” window. This window is shown in Figure 5 before moving the variables from the left block to the right block. We move the variables from the left block to the right block by highlighting the variable with our mouse and clicking on the right arrow button. This button is found to lie in between the two blocks. Descriptive statistics will be computed for those in the right block only. Variables that may be of little or no

interest for the researcher can remain in the left block. Figure 6 shows the panel after the three variables have been moved to the right block. The purpose of this window is to allow the researcher to choose which variables should be used in the analysis. After this is done, we can select the “OK” button and the program will go off and perform the necessary computations and display them on the SPSS Output screen.

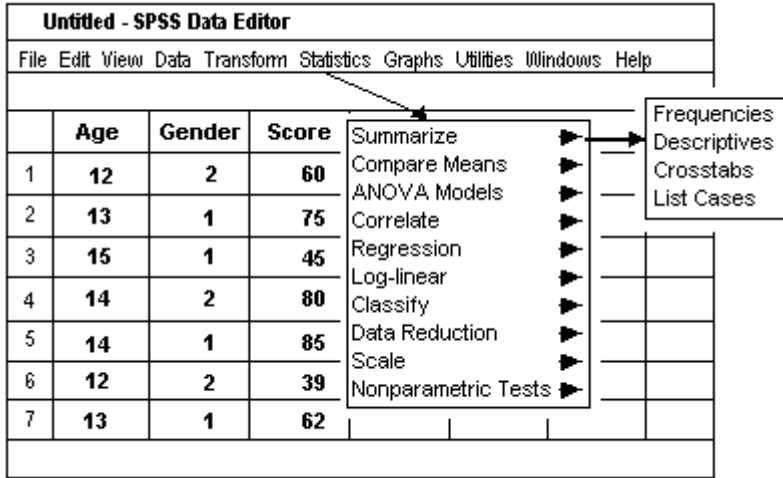


Figure 4 Selecting the Statistical Analysis in SPSS.

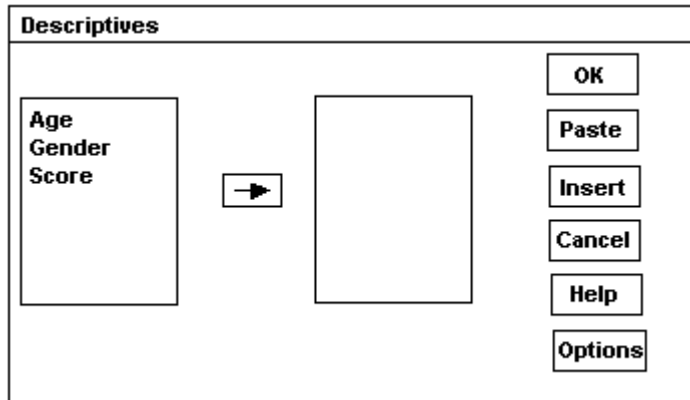


Figure 5 SPSS Panel to Choose variables for Analysis

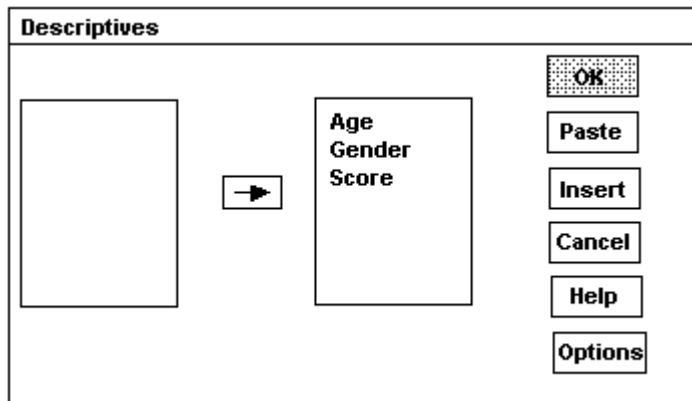


Figure 6. Variables Moved for Right Block for Analysis

The result of the analysis is shown below. After completion we can save the output to a file if we so desire. With SPSS for Windows, we can perform a number of different analyses on the same data set.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
AGE	7	12.00	15.00	13.2857	1.1127
GENDER	7	1.00	2.00	1.4286	.5345
SCORE	7	39.00	85.00	63.7143	17.4329
Valid N (listwise)	7				

If we want to compute the correlation and/or covariances between the variables we would select “Correlate” from the menu. This will in turn give a third menu of which we pick “Bivariate.” See Figure 7. To obtain the covariances, we do need to selection the “options” button and put a check mark in the box requesting the display of covariances.

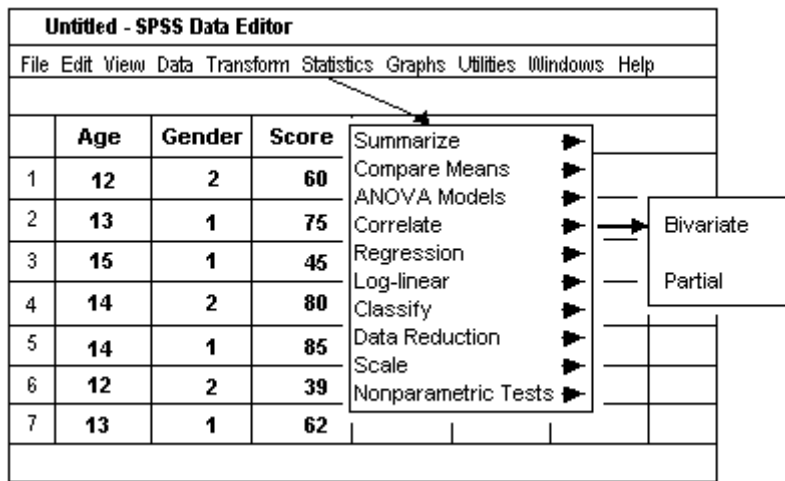


Figure 7 Selecting the Routine for Computing Correlation.

The output from the computer was

Correlations				
		AGE	GENDER	SCORE
AGE	Pearson Correlation	1.000	-.520	.245
	Sig. (2-tailed)	.	.231	.596
	N	7	7	7
GENDER	Pearson Correlation	-.520	1.000	-.217
	Sig. (2-tailed)	.231	.	.640
	N	7	7	7
SCORE	Pearson Correlation	.245	-.217	1.000
	Sig. (2-tailed)	.596	.640	.
	N	7	7	7

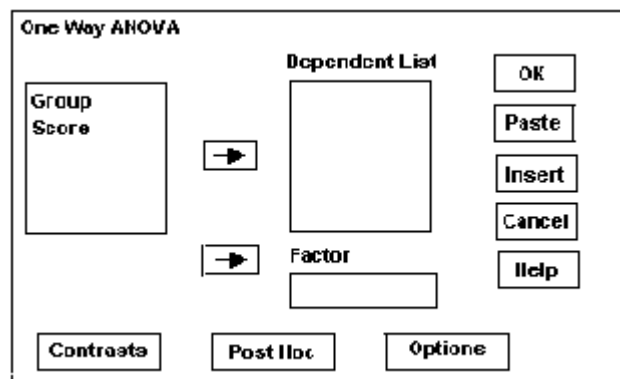
Other problems involving computations will be based on the demonstration given here. The information given here is fundamental and important in order to work efficiently with SPSS for Windows. However, this very brief introduction is not to serve as a substitute for the SPSS manuals that are available. The user of statistical computer software should realize that the computer only computes the statistics requested. It will not interpret the output nor will it know if we have made a logical error somewhere.

One Way ANOVA on SPSS

Again, we are assuming that the reader has created the data table within SPSS and is about to select and perform a specific statistical analysis. Figure 8 shows the data table to be used in SPSS. Although there are only two groups, the procedure shown here would be very similar for more than two groups or more than two levels of the independent variable. Pointing the mouse and click on “Statistics,” gives us another menu listing the different analyses one can perform on the data. For a one-way ANOVA, we choose “Compare Means”. This selection in turn gives us another menu from which we choose “One Way ANOVA.” When we do this, we get a panel that will ask us to specify which variable in our data table will be the independent variable(s) and the dependent variable(s). This panel is shown in Figure 9. We will choose “Score” as the dependent variable and “Group” as the independent variable. Here in SPSS terminology “Dependent List” is for the dependent variable and “Factor” is for the independent variable. We would highlight the “Score” variable name in the left most box and click on the arrow for the “Dependent List” box. This moves the variable name “Score” to the box associated with the Dependent List. We do likewise for the “Group” variable label. We would move it to the box associated with “Factor.” This is shown in Figure 10.

	Group	Score					
1	1	6					
2	1	7					
3	1	5					
4	1	4					
5	1	8					
6	2	3					
7	2	1					
8	2	5					
9	2	2					
10	2	4					

Figure 8. Data Table for One-Way ANOVA Example.



The image shows the "One Way ANOVA" dialog box in SPSS. On the left, there is a list box containing "Group" and "Score". Two arrows point from this list to a "Dependent List" box and a "Factor" box. The "Dependent List" box is currently empty, and the "Factor" box is also empty. To the right of the dialog are buttons for "OK", "Paste", "Insert", "Cancel", and "Help". At the bottom of the dialog are buttons for "Contrasts", "Post Hoc", and "Options".

Figure 9. SPSS Panel to Select Independent and Dependent Variables.

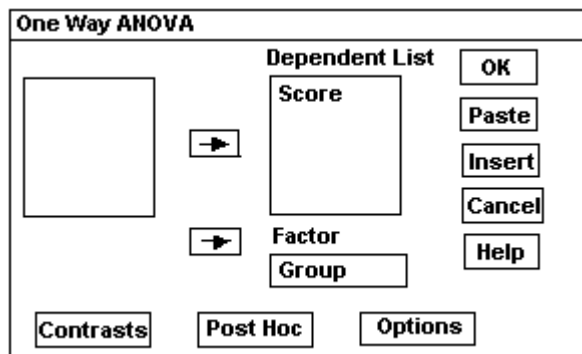


Figure10. Specifying the Dependent and Independent Variables

When we now click on the “OK” button, the analysis will start.

Note that if we wanted post hoc multiple comparison tests we can do them by clicking on the “post hoc” button before telling SPSS to go ahead with the analysis. When the “Post Hoc” button is activated through a click from the mouse, a panel containing a list of the most used post hoc tests are presented. The user only needs to select the one wanted.

The results of the one way ANOVA for the data are given in the box below. The results agree with those we had performed by hand. With SPSS, a table lookup for the critical value used to reject or not reject the null hypothesis is not necessary. If the value under the “Sig.” column is less than .05, we would reject the null hypothesis with an $\alpha = .05$. We would also say that we found a statistically significant difference between the group means. If the value of “Sig.” is greater than .05, we “not reject” the null hypothesis and state that we had insufficient evidence that the group means are statistically different.

SCORE	ANOVA				
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.500	1	22.500	9.000	.017
Within Groups	20.000	8	2.500		
Total	42.500	9			

To read the data from the diskette given to you for all of your assignments in this class, we would need to do the following. Insert the diskette into the “A” drive of the computer. With a blank SPSS spreadsheet, we would select “File” From File, select “Open”. This will give you the window shown in Figure 11.

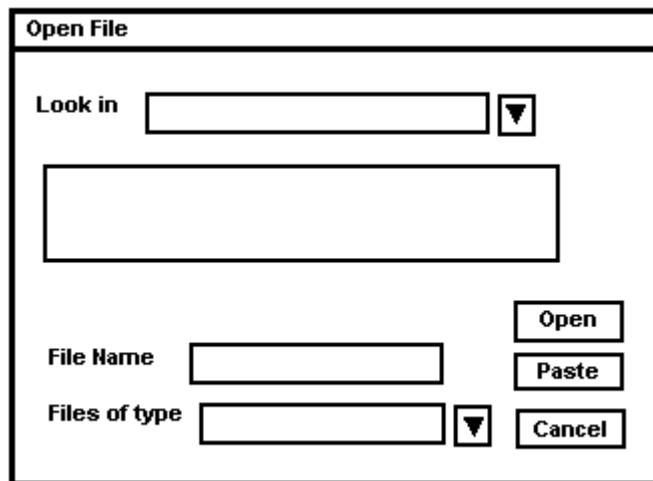


Figure 11.

Click on the downward arrow in the box next to “Look in”. From that menu, choose “3 ½ “ Floppy [A:]”. The program will now look for your Excel data file on the floppy diskette you inserted into the A” drive. The box below “look in” will still be blank. This is because the program is looking for a SPSS data set. Ours is in Excel format. To enable to program to find your Excel data file on the floppy, click on the downward arrow next to the box for “File of type.” Here you will find “Excel (*.xls)”. Choose that and you will see in the box below “look in” displaying the name of the file. Highlighting the file name will move the file name to the “File Name” box. See Figure 12 to see the resulting window for these operations.

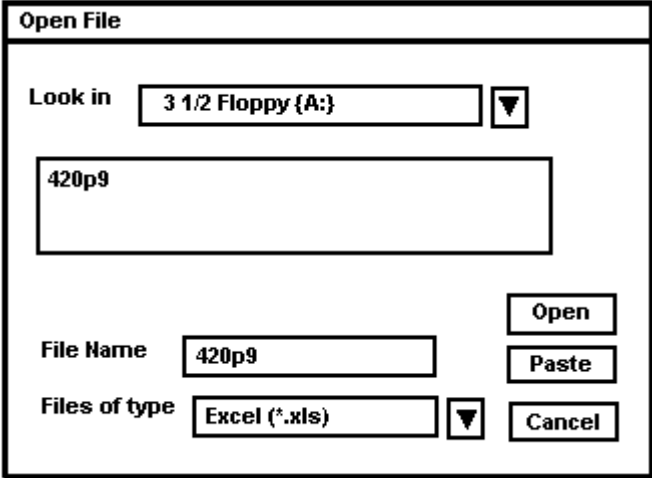


Figure 12.

When we click on “Open”. This will give you a window asking if you want to read in the variable names from the Excel file. (See Figure 13). Put a check mark in the box next to “Read variable names”. Choose “Okay” and the data will be converted from the Excel data file for use in SPSS.

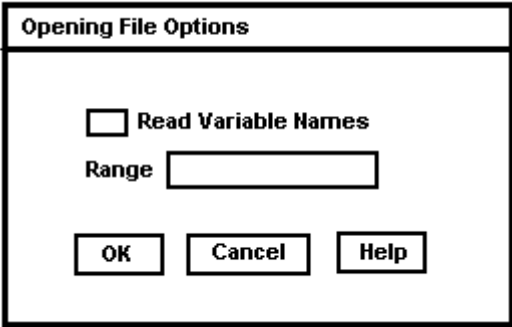


Figure 13