12.7: Using SPSS

As reviewed in Chapter 2, software such as SPSS can be used to expedite analyses once data have been properly entered into the program. SPSS version 29 was used for this book; if you are using a different version, you may see some variation from what is shown here.

Entering Data

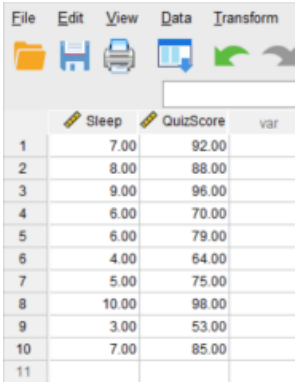
When using bivariate correlation, each variable needs to be quantitative and measured on the interval or ratio scale. If these things are all true of your data, you are ready to open SPSS and begin entering your data.

Open the SPSS software, click "New Dataset," then click "Open" (or "OK" depending on which is shown in the version of the software you are using). This will create a new blank spreadsheet into which you can enter data. Click on the Variable View tab on the bottom of the spreadsheet. This tab of the spreadsheet has several columns to organize information about the variables. The first column is titled "Name." Start here and follow these steps:

1. Click the first cell of the "Name" column and enter the name of your X-variable using no spaces, special characters, or symbols. Hit enter and SPSS will automatically fill in the other cells of that row with some default assumptions about the data.
2. Click the first cell of the column titled "Type" and then click the three dots that appear in the right side of the cell. Specify that the data for that variable appear as numbers by selecting "Numeric." For numeric data SPSS will automatically allow you to enter values that are up to 8 digits in length with decimals shown to the hundredths place as noted in the "Width" and "Decimal" columns, respectively. You can edit these as needed to fit your data, though these settings will be appropriate for most variables in the behavioral sciences.
3. Click the first cell of the column titled "Label." This is where you can specify what you want the variable to be called in output, including in tables and graphs. You can use spaces or phrases here, as desired.
4. Click on the first cell of the column titled "Measure." A pulldown menu with three options will allow you to specify the scale of measurement for the variable. Select the "Scale." option because the variables for a standard bivariate correlation are on the interval or ratio scale. Now SPSS is set-up for data for the X-variable.
5. Repeat steps 1-4 for the Y-variable.

Now you are ready to enter your data. Click on the Data View tab toward the bottom of the spreadsheet. This tab of the spreadsheet has several columns into which you can enter the data for each variable. The top of each column will show the names given to the variables. Click the cell corresponding to the first row of the X-variable. Start here and follow these steps:

1. Enter the data for the X-variable moving down the rows under the first column. If your data are already on your computer in a spreadsheet format such as excel, you can copy paste the data in for the variable.
2. Repeat the prior step for the Y-variable column and data. Take special care to ensure the data are case-matched. This means data for the X-variable and Y-variable for each case must share the same row.
3. Then hit save to ensure your data set will be available for you in the future. Here is how Data Set 12.1 looks after being entered into SPSS:



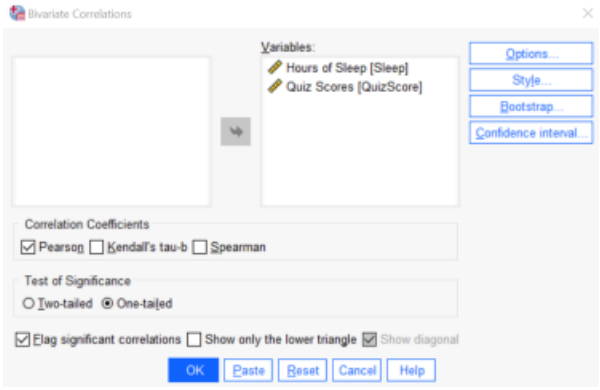
	Sleep	QuizScore
1	7.00	92.00
2	8.00	88.00
3	9.00	96.00
4	6.00	70.00
5	6.00	79.00
6	4.00	64.00
7	5.00	75.00
8	10.00	98.00
9	3.00	53.00
10	7.00	85.00
11		

Once all the variables have been specified and the data have been entered, you can begin analyzing the data using SPSS.

Conducting a Pearson's Product Moment Correlation (PPMC) in SPSS

The steps to running this bivariate correlation in SPSS are:

1. Click Analyze -> Correlation -> Bivariate from the pull-down menus.
2. Drag the names of the two quantitative variables you wish to test from the list on the left into the Variables box on the right of the command window. You can also do this by clicking on the variable names to highlight them and the clicking the arrow to move each of them to the desired location. Select the "Pearson" option for the type of correlation coefficient. Click to select either "Two-tailed" or "One-tailed" for the test of significance for non directional or directional hypotheses, respectively. For Data Set 12.1, we would select "One tailed" because a directional hypothesis was proposed.



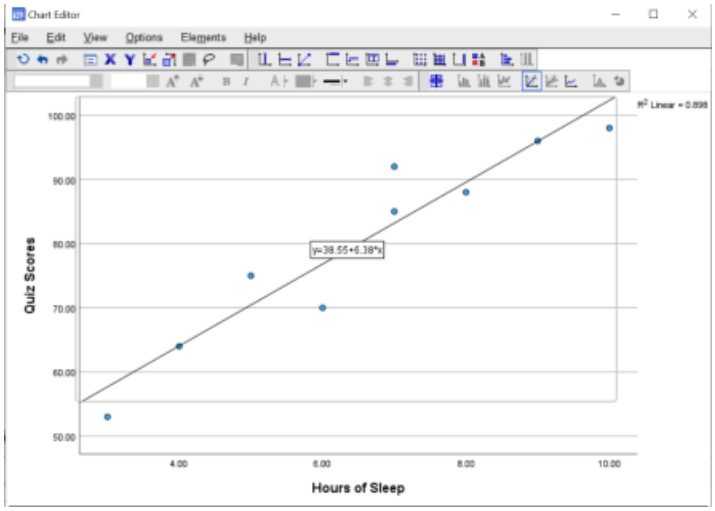
3. Click "OK" to run the analyses.
4. The output (which means the page of calculated results) will appear in a new window of SPSS known as an output viewer. The results will appear in one table as shown below.

Correlations

		Hours of Sleep	Quiz Scores
Hours of Sleep	Pearson Correlation	1	.948**
	Sig. (1-tailed)		<.001
	N	10	10
Quiz Scores	Pearson Correlation	.948**	1
	Sig. (1-tailed)	<.001	
	N	10	10

**. Correlation is significant at the 0.01 level (1-tailed).

5. If a scatterplot is desired to visualize the correlation, click Graphs -> Scatter/Dot -> Simple Scatter -> Define. Move the names of X- and Y-variables from the left to their respective boxes on the right. Then click "OK." The graph will appear in the output window.
6. If a fit line is desired, double-click the graph to open the graph editor. Then click the Fit Line button as shown below. Choose the "Linear" option for the fit line and click "Apply"



Reading SPSS Output for a Bivariate Correlation

The table shows the correlation coefficient on the first line which is r = .948. This is .95 when rounded to the hundredths place for reporting purposes. This is a very strong, positive correlation. The second line shows the chance of a Type I Error which is the p-value; SPSS calls this value "Sig." The output show that for Data Set 12.1, the p-value is < .001. The alpha level chosen was .05 so this result is significant because the p-value is less than the alpha-level of .05 (i.e. $p < .05$). The third line shows the sample size but SPSS uses the symbol N rather than n. The output show that the sample size for Data Set 12.was 10. These match the results from the hand-calculations performed earlier in this chapter for Data Set 12.1.

The scatterplot with the fit line shows a positive slope. The coefficient of determination is shown in the top right corner of the graph as r^2 = .898. This means that approximately 89.8% of the variance in Quiz Scores was accounted for by Hours of Sleep. This also matches the result from the hand-calculations performed earlier in this chapter for Data Set 12.1.

Reading Review 12.4

1. What scale of measurement should be indicated in SPSS for both variables when performing a Pearson's correlation?
2. What information is provided in each of the three lines of SPSS output for correlation?
3. Which kind of graph should be used for a bivariate correlation?
4. How can the coefficient of determination be checked using SPSS?
