1

FIRST ENCOUNTERS

1.1 INTRODUCTION AND OBJECTIVES

Hi, and welcome to the IBM SPSS Statistics software package. The value in learning how to utilize the power of the SPSS program has the potential to have a tremendous impact on one's life. This impact can be especially evident when one is searching for the *truth*, which is often hidden within a mass of data. One way to discover truth is to utilize the scientific method and mathematical calculations; both of these are made more easily accessible by using SPSS.

Science, when reduced to its simplest definition, can be said to be the *measurement and analysis of observations made by humans*. Taking this into account, one of the reasons for writing this book was to provide readers with the knowledge to use the *power* of the IBM SPSS Statistics software package to measure and analyze data from their own research/ observations. This first chapter begins with a demonstration of the entry and analysis of data. It is the ability to analyze one's own data, see them come to life, that makes data analysis an exciting adventure into the unknown. Many (or most) of the SPSS instructional textbooks only utilize existing datasets and provide minimal, if any, guidance on how to structure and enter data. Therefore this first chapter, and the entire book, continues with the philosophy that it is wise to know how to enter personal data into the IBM SPSS software package. On leaving the academy and finding work in the real world, the ability to analyze data using SPSS can prove extremely useful in advancing one's career. This third edition continues to provide the reader with many opportunities for actually entering data, not just opening existing datasets. Readers are encouraged to enter their own personal data as this makes the discovery process that much more exciting. There are few things in research that are more rewarding than making that final click on the mouse and watching your mass of numbers come to life with new meaning and purpose. Whether it's a graph, a prediction equation, or perhaps a test showing a statistically significant difference between groups, the discovery of the unknown that was hidden within the data can be extremely gratifying. The rewards of data analysis can give, and often have given, new meaning to the lives of researchers and to entire societies that benefit from discovery. The major purpose of this book is to assist the student/statistician in exactly that—making discoveries with the

assistance of the IBM SPSS Statistics software. This first chapter begins a journey leading to an understanding of how to use SPSS in making such discoveries in an effort to find statistical evidence supportive of *truth*.

With that being said, it is assumed that you know little about variables, values, constants, statistics, and those other tedious things. But it is assumed that you know how to use a mouse to move around the computer screen and how to click an item, select an item, or drag (move) an item.

An easy mouse-using and -typing convention has been adopted for you to respond to requests. For example, if you are requested to open an existing file from the SPSS *Menu*, you will see click **File**, select **Open**, and then click **Data**. In general, you will be asked to click an item, select (position the pointer over) an item, drag an item, or enter data from the keyboard. Note that in SPSS, the columns in the spreadsheets run vertically and the rows run horizontally, as in a typical spreadsheet such as Excel.

OBJECTIVES

After completing this chapter, you will be able to

Enter variables into the Variable View screen

Enter data into the Data View screen

Generate a table of statistics

Generate a graph summarizing your statistics

Save your data

Open Output Viewer

Save the analysis (output)

1.2 ENTERING, ANALYZING, AND GRAPHING DATA

Watch the tutorial video at study.sagepub .com/aldrich3e

In this section you are walked through your first encounter with SPSS and shown how to enter some data, analyze those data, and generate a graph. Once these steps are completed you will have a better understanding of the data by viewing the table and graph.
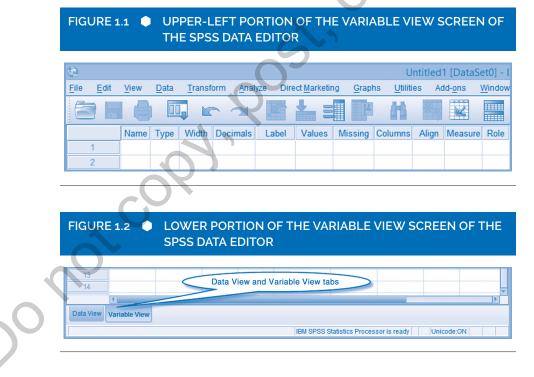
If you see the IBM SPSS icon anywhere on the screen, simply click it; otherwise, locate your computer's program files, and open SPSS from there. Once the SPSS starts, a screen will appear, which can take different forms depending on the SPSS version you are using. There are some useful shortcuts in these SPSS opening windows, but for

now simply close the window. When the window closes, you will see the Data Editor spreadsheet on the screen. This screen can appear in two different ways depending on which tab is clicked at the bottom of the Data Editor screen. These two tabs, Data View and Variable View, are together called the SPSS Data Editor. When you wish to enter or view variable information, you click the Variable View tab, and when you wish to enter or view data, you simply click the Data View tab. Figures 1.1 through 1.4 provide pictures of various portions of these two screens.
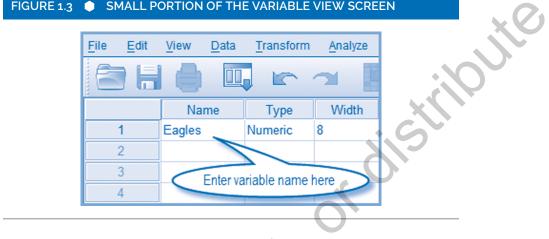
Let's get started with a demonstration of the bullet point part of this introduction to SPSS. Within the text of various bullet points you will often find parentheses containing figure numbers. These referenced figures will assist the SPSS user when following the step-by-step instructions.

- Start SPSS, close the opening window as discussed above.

- At the bottom of the Data Editor spreadsheet screen, there are two tabs; click **Variable View** (see Figures 1.1 and 1.2).

FIGURE 1.1 ⬡ UPPER-LEFT PORTION OF THE VARIABLE VIEW SCREEN OF THE SPSS DATA EDITOR

FIGURE 1.2 ⬡ LOWER PORTION OF THE VARIABLE VIEW SCREEN OF THE SPSS DATA EDITOR

- At the top of the screen, type the word *Eagles* in the cell (this is the cell below *Name* and to the right of Row 1). The callout (balloon) shown in Figure 1.3 points to the cell in which you are to enter the variable name "Eagles." Cells are the little boxes at the intersection of *columns* and *rows*.
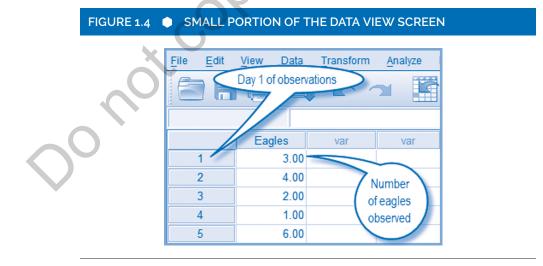
- Click the **cell** below *Measure*, and select *Nominal* (see Figure 1.1).

FIGURE 1.3 ◆ SMALL PORTION OF THE VARIABLE VIEW SCREEN

- At the bottom of the screen, click **Data View** (note that the screen's appearance changes slightly).

- You will now enter the number of eagles observed on five consecutive days at the top of Holcomb Mountain. The callout in Figure 1.4 shows exactly where to type the number *3* (Row 1 and Column 1); for now, don't worry about the decimal points (this will be addressed in the next chapter).

FIGURE 1.4 ◆ SMALL PORTION OF THE DATA VIEW SCREEN

- Click in Row **2**, and type *4*; click in Row **3**, and type *2*; click in Row **4**, and type *1*; and finally click in Row **5**, and type *6*. Your screen should now look as shown in Figure 1.4. If you make a mistake in entering the numbers, just click the cell and reenter the correct number.

- After you have entered the five pieces of data, check carefully to see if the entries are correct. If they are, save your work as follows: Click **File**, and then click **Save As**.

- A window titled *Save Data As* will open, in which you will enter a name for your work (throughout this book, work like this is referred to as a project). For this project, enter the name *eagles_expl.sav* in the *File Name* box (you will use this saved dataset later). The *Look in* box (located in the middle of the window), showing where the file will be saved, should have an entry titled *Documents* (if not, then click the **black arrow** and scroll until you see *Documents*). Click **Save**. Your data have now been saved in the *Documents* section of your computer.

- An *Output* window may open; if so, close it by clicking the **white "x" in the red box**. Another dialog box may open asking if you wish to save the output; click **No**.

- Let's continue with the exercise. On the SPSS *Menu* at the top of the screen, click **Analyze**, select **Descriptive Statistics**, and then click **Frequencies**. A window will appear titled *Frequencies*. Drag **Eagles** to the *Variable(s)* panel, or click **Eagles** and then click the **right arrow** to place *Eagles* in the *Variable(s)* panel (both methods work equally well).

- Click the **Statistics** button (the *Frequencies: Statistics* window opens). In the *Central Tendency* panel, click **Median** and **Sum**, then click **Continue**.

- Click **OK** (another screen opens, titled *Output IBM SPSS Statistics Viewer*, which shows the results of the analysis just requested). Look at Figure 1.5 for these results.

FIGURE 1.5 ◆ FREQUENCY STATISTICS FOR 5-DAY EAGLE OBSERVATION

Frequencies

Days of observation

Statistics

Eagles

N	Valid	5
	Missing	0
Median		3.0000
Sum		16.00

- On the Main Menu, click **Graphs**, select **Legacy Dialogs**, and then click **Bar**.

- The *Bar Charts* window opens; click **Simple**, and then click **Values of Individual Cases**. Click **Define**.

- The *Define Simple Bar: Values of Individual Cases* window opens. Click **Eagles** and drag it to the *Bars Represent* box, or click the **right arrow** to place *Eagles* in that box. Click **OK**. A simple bar graph will appear in the same *Output IBM SPSS Statistics Viewer* screen below the table, as shown in Figure 1.6.

After you have reviewed the graph, you will save the *Output IBM SPSS Statistics Viewer* screen, which contains the results of your analysis and the graph. In the future this screen will simply be referred to as the *Output Viewer*.

- In the *Output Viewer* screen, click **File**, and then click **Save As**.

- A window titled *Save Output As* will appear. In the *File name* box, type *eagles_expl. sav*. Note that the file name is all lowercase and does not include any embedded spaces (blanks). The *Look in* box indicates the location where your file will be saved and should have an entry titled *Documents*. Click **Save**.

- After saving your work, your *Output Viewer* screen will remain. Click the **white "x" in the red box** found in the top right corner to make it go away.

Congratulations! You have just used SPSS (perhaps for the first time) to analyze some data and provide some statistical results and a graph. Looking at the *Frequencies* table shown in Figure 1.5, we see that 16 eagles were observed over a period of 5 days with the median number per day of 3. The bar graph seen in Figure 1.6 provides the details regarding each day's observations. For example, we see that Day 5 yielded the most eagle sightings at 6, while the fewest were observed on Day 4, when only 1 was seen.

FIGURE 1.6 ● BAR GRAPH FOR 5 DAYS OF EAGLE OBSERVATION

Admittedly, the statistical analysis and graph are not that exciting. But they do show you that SPSS is not difficult to use. Of course, you could have used a handheld calculator to do the same analysis in a few minutes. But suppose you had 50 different variables, such as height, weight, eye color, and so on, and thousands of cases for each of the variables! Using a calculator to analyze these data would be a monumental task. But SPSS can do 10,000 cases just as easily as is shown above.

- If you wish to exit (quit using SPSS) at this time, click **File**, and then click **Exit**.

1.3 Summary

In this chapter, you learned how to enter variable names and data. You also learned how to generate a basic table of statistics and a graph summarizing those statistics. In the next chapter, you will learn to navigate in SPSS. You will be introduced to the Main Menu, the Toolbar editor, and the options available for these. Finally, you will be introduced to the various dialog boxes and windows in SPSS that allow you to enter information regarding your variables.

1.4 Review Exercises

Answers for Exercises 1, 2, and 3 can be found in Appendix C while answers for 4 and 5 can be found on the professor-facing portion of the companion website (study.sagepub.com/aldrich3e).

1.1   You have classified the size of several fish that were caught in a "catch and release" fishing contest for children as small, medium, and large. The number of fish caught by the children are 32 small, 21 medium, and 11 large. *Note:* When inputting these data and information, you are *not* required to enter the names for the categories of the fish (small, medium, large). SPSS calls these categories *Labels* and *Label Values*. You will learn to input this information in the next chapter. Input the variable information and data, and build a frequency table and a bar graph. Naming and saving this dataset is optional.

1.2   One day you are sitting in your professor's office getting help on regression analysis. His phone rings; he apologizes but says that he must take the call. As you wait for him to end his phone call, you scan his bookshelves and make mental notes of the titles. You arrive at the following: 15 books on introductory statistical analysis, 12 on advanced statistics, 3 on factor analysis, 8 on various regression topics, 13 on research methods, and 2 on mathematical statistics. You think to yourself, "Wow! This guy must have an exciting life!" As in the previous exercise, don't concern yourself with the category labels for the textbooks. For now, just input the data and variable information, build a bar chart, and generate a descriptive table. Naming and saving this dataset is optional.

1.3 There was a quarter-mile drag race held at the abandoned airport last week. The makes of the winning cars were recorded by an interested fan. The results of her observations were as follows: Chevrolets won 23 races, Fords won 19 times, Toyotas won 3, Hondas won 18, and KIAs won 8 races. As in the previous two exercises, don't concern yourself with the categories' labels for the makes of the cars. Your task is to enter these data and generate a bar graph and a frequency table. Naming and saving this dataset is optional.

1.4 The durability of outside house paint was studied under actual outdoor conditions. Four unique brands—A, B, C, and D—were utilized in the test. A rating scale evaluated each paint's durability over a period of one year. The scale went from 1 to 10, with 10 being the most durable. The results of the test follow: brand A = 6, brand B = 4, brand C = 8, and brand D = 9. You must now enter these data, generate a bar graph (using legacy), and then name and save the dataset. Interpret the graph and decide which brand is most durable and which is the least. Labels are not required at this time—they are covered in the next chapter. Naming and saving this dataset is optional.

1.5 A demographer has collected the following data and must now use SPSS to build a simple bar graph to display her findings. At this time don't be concerned about labels as the *x*-axis will automatically display the ordinal scale as shown in the table—just build the simple bar graph using SPSS. Naming and saving this dataset is optional. The data are given in the following table:

Socioeconomic Class	Income Level	Ordinal Scale	Number of Persons
Lower	0–11,999	1	879
Middle	12,000–99,999	2	3,278
Upper	→100,000	3	250