

Chapter 2

Close Encounter: The Data Editor, Syntax Editor & Output Viewer Windows

2.1 Introduction to SPSS

The capability of SPSS is truly astounding. The package enables you to obtain statistics ranging from simple descriptive numbers to complex analyses of multivariate matrices. You can plot the data in histograms, scatterplots, and other ways. You can combine files, split files, and sort files. You can modify existing variables and create new ones. In short, you can do just about anything you'd ever want with a set of data using this software package.

A number of specific SPSS procedures are presented in the chapters that follow. Most of these procedures are relevant to the kinds of statistical analyses covered in an introductory level statistics or research methods course typically found in the social and health sciences, natural sciences, or business.

Yet, we will touch on just a fraction of the many things that SPSS can do. Our aim is to help you become familiar with SPSS, and we hope that this introduction will both reinforce your understanding of statistics and lead you to see what a powerful tool SPSS is, how it can actually help you better understand your data, how it can enable you to test hypotheses that were once too difficult to consider, and how it can save you incredible amounts of time as well as reduce the likelihood of making errors in data analyses.

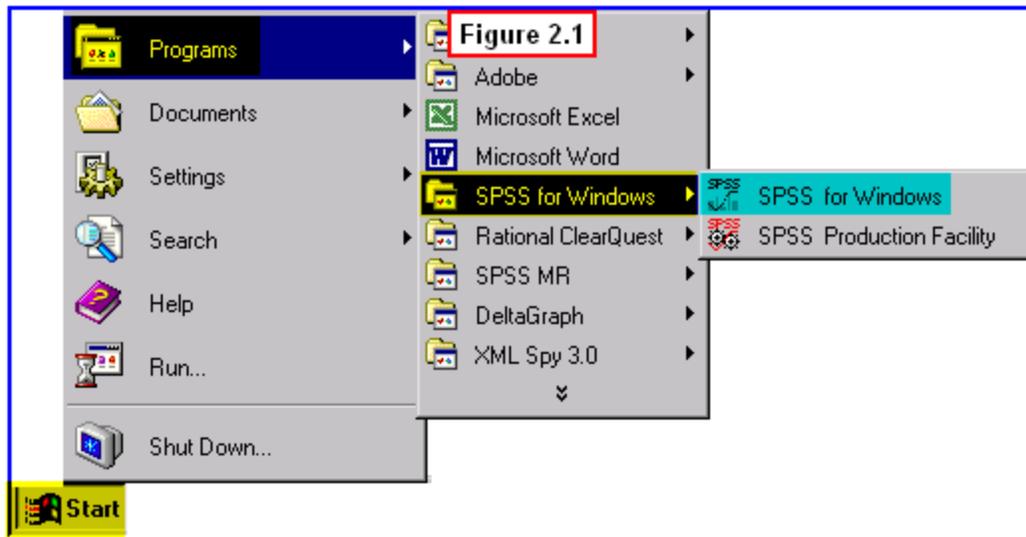
In this chapter we discuss the ways to open SPSS and we introduce the three main windows of SPSS. We show how to create a data file and generate an output file. We also discuss how to name and save the different types of files created in the three main SPSS windows.

2.2 The First Step: Opening SPSS

There are two methods of accessing SPSS, depending on whether you have the program installed on your hard drive or need to access it from a network.

2.2a Opening SPSS on a PC

If SPSS is installed on your hard drive, click **Start, Programs, SPSS for Windows, SPSS for Windows** (Figure 2.1).

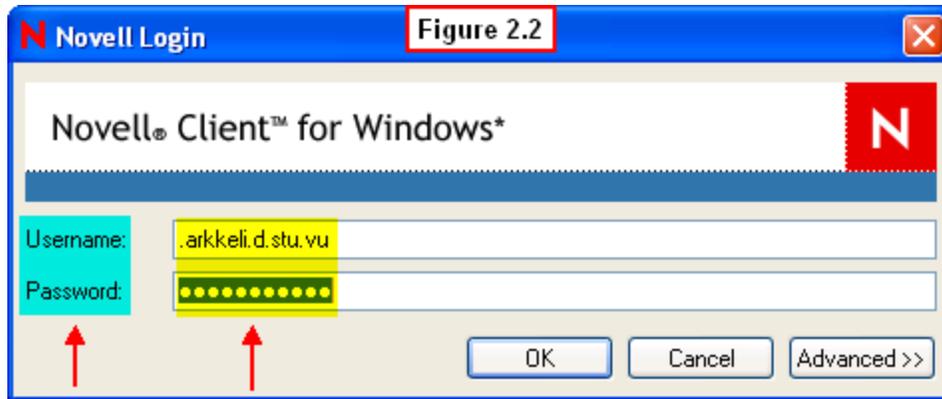


Recall from Chapter 1 that when you open SPSS, a start up screen appears asking "**What do you want to do?**" In Chapter 1 we answered that we wanted to run the tutorial. We will return to how to answer this question in the present chapter, but first we want to discuss how to access SPSS on a network. So if you have just loaded SPSS from your PC, just leave the start up screen open for now.

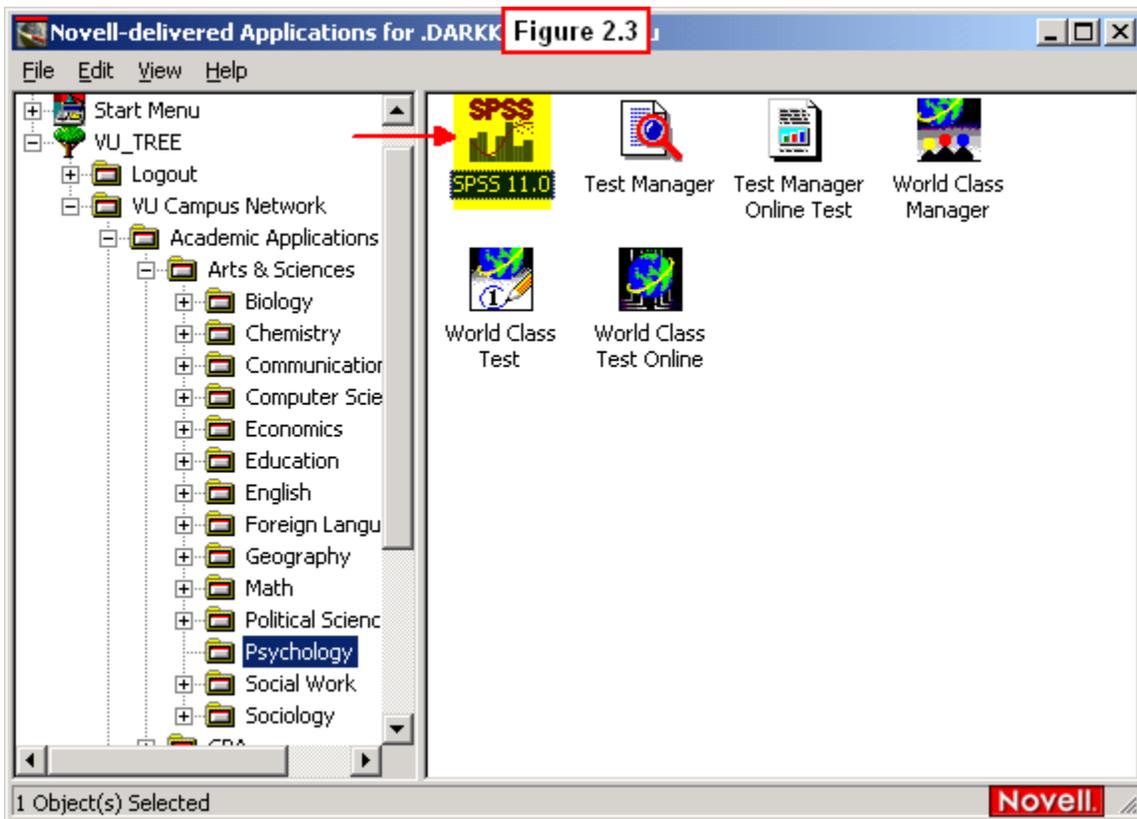
2.2b Logging in to a Local Area Network (LAN)

Different computers may have different operating systems, so you will have to learn the procedures specific to your computer system. If you do not already know how to log on to your computer system (or you do not know your username and password), we suggest that you learn how to do this before reading further.

In other words, you need to be able to log on to your computer network in order to access the SPSS software. Typically, your computer center or your instructor will be able to provide you with these procedures. As an example, below we illustrate how one would log on to the network and access SPSS for Windows at our own university. To log on to our campus network, users must type a Username and Password in the **Novell Login** window that appears when a computer connected to our LAN is booted up (Figure 2.2).



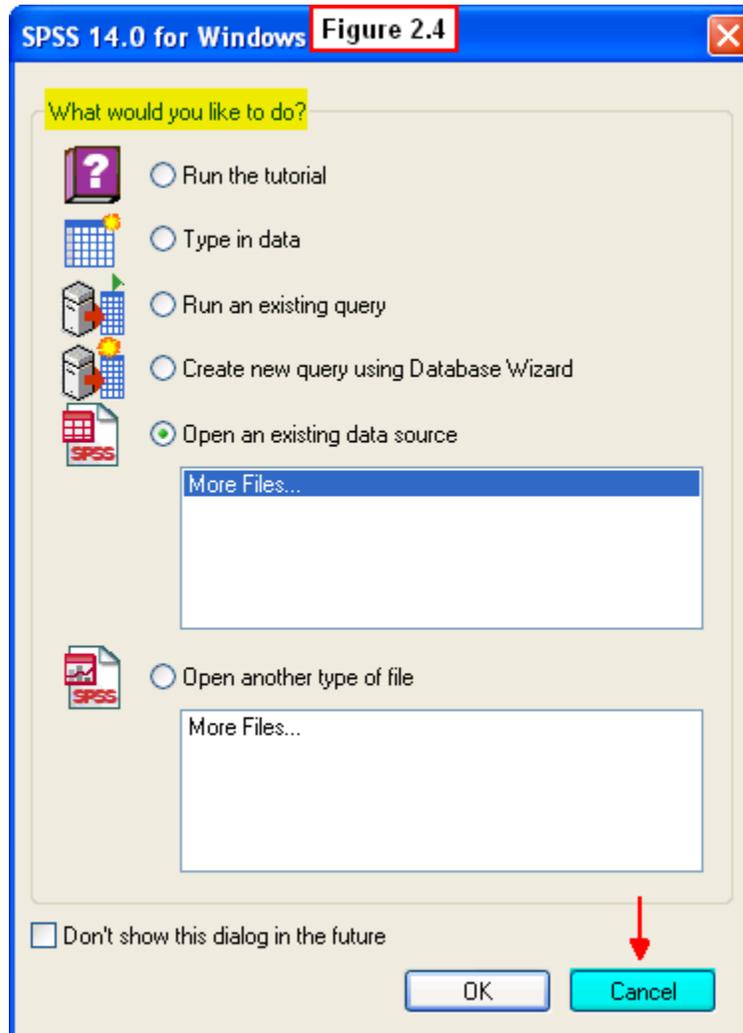
After entering the username and password, a **Novell-delivered Applications** window will pop up with an interface in the left panel similar to Windows Explorer tree menu (Figure 2.3).



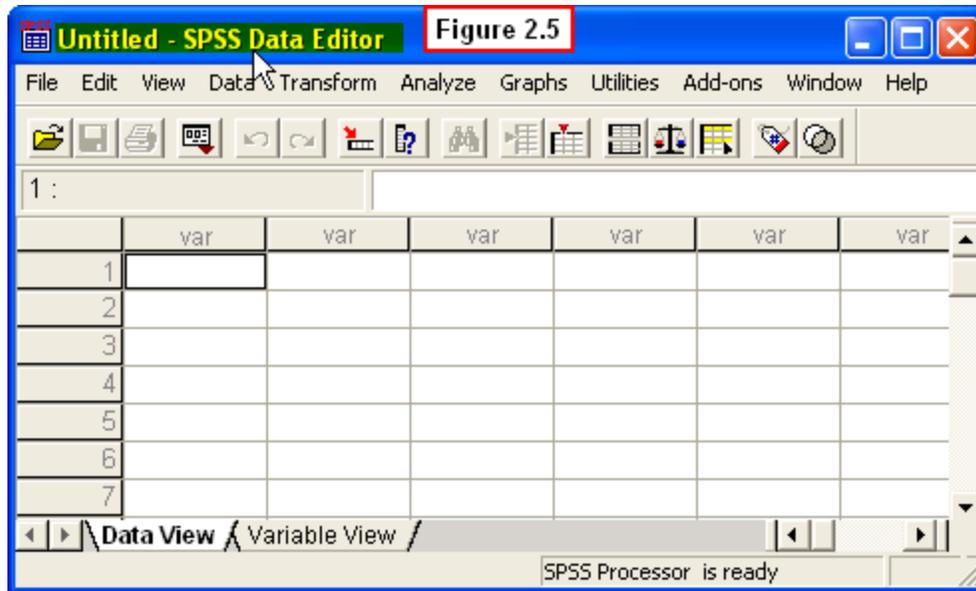
To access SPSS, the user clicks on the plus signs in front of various folders to navigate to the folder containing SPSS. At our institution, the user would click on the folders in the left panel of Figure 2.3 in this order: **VU Campus Network, Academic Applications, Arts & Sciences, Psychology**. After clicking the last folder, the **SPSS** icon appears in the right panel of the window. Double-clicking on this icon will start the SPSS program.

2.2c SPSS start up screen

Recall that when you open SPSS, a dialog box appears with the question, **What would you like to do?** (Figure 2.4). This window allows the user to choose from a number of quick-start options, such as loading an existing data file or opening a recently-used file.



In Chapter 3 we will open an existing data file (the one we will create in this chapter). But since we don't yet have an existing file yet, just click **Cancel** in the lower right of this start up dialog box. The box will close, leaving a blank **Untitled - SPSS Data Editor** window open (Figure 2.5).¹



[Show Me Video!](#)

2.3 The Second Step: Creating and Saving a Data File in the Data Editor

Now that we have accessed SPSS for Windows, we need to have a data file to analyze. SPSS recognizes and is able to import files created in other applications (e.g., Microsoft Excel, Microsoft Word, and Windows Notepad). We will not describe importing files from other applications - instead, we want to get you started by creating a data file from scratch.

Doing this will familiarize you with the main components of SPSS for creating data files, analyzing the data and viewing the results of those analyses. These three components consist of three types of windows:

- **Data Editor Window**
- **Syntax Editor Window**
- **Output Viewer Window**

In this section, we will discuss the first two windows, which are used to create data files (we'll discuss the Output Viewer window later). By learning how to create data files from scratch in the **Data Editor** and **Syntax Editor** windows, you will also come to understand how data is organized into a file. Files that can be imported into SPSS from other applications would be imported into either the Data or Syntax editors anyway, so working directly with these editors to create a file will help you understand any files that you would import from other applications.

Data files are created in SPSS by directly typing data into one of these two editors. The **Data Editor** works similar to a spreadsheet application, while the **Syntax Editor** works like a basic word processing application.

In the following we will describe the process of creating a data file in each of these editors. However, note that in subsequent chapters, we will work only with the Data Editor, since this is the primary window users of SPSS employ for data analysis. Use of the Syntax Editor for data analysis requires somewhat more advanced skills, so we will only refer to it occasionally in subsequent chapters. There is value in learning about this editor and how files are created with it, however, so we will address that in this section.

2.3a Data File Organization

The **Data Editor Window** that appears by default when SPSS is opened looks similar to and works like other spreadsheet applications such as Microsoft Excel. Data files are created by entering data into the cells of the table. To do this, simply click on a cell and type the appropriate numbers representing scores on variables to be analyzed. We will illustrate this process in the following.

Let's assume that a statistics professor is interested in the number of psychology courses that students have taken prior to enrolling in his/her course. S/he is also interested in comparing the number of previous psychology courses taken by male and female students. Table 2.1 consists of data, or scores, for the number of psychology courses taken by ten students, five men and five women.

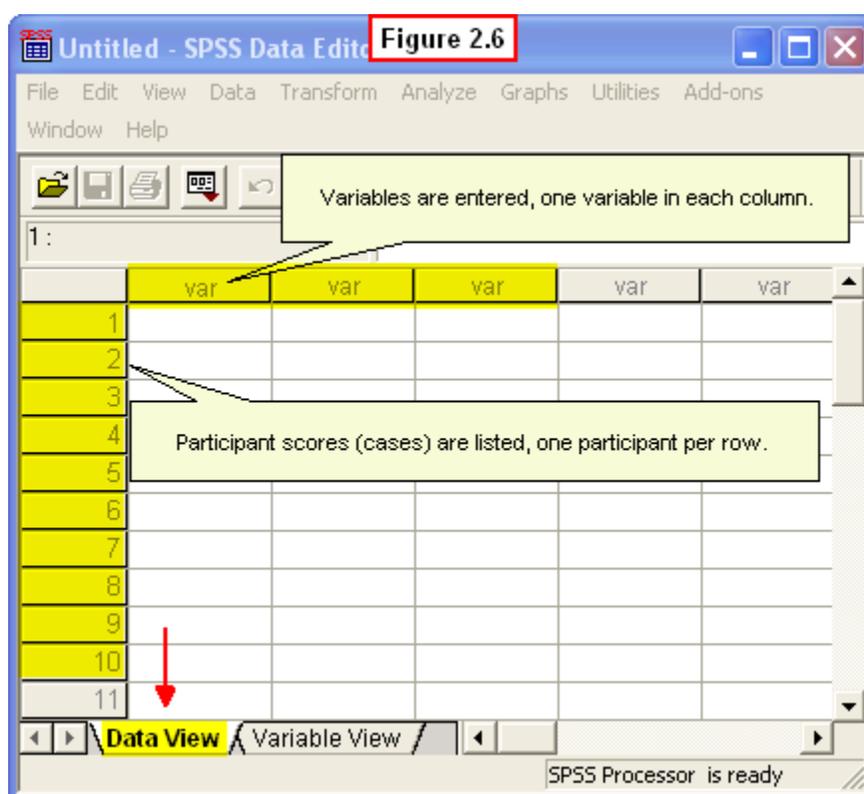
Student ID	Student Sex	No. of Courses
01	1	2
02	1	1
03	1	1
04	1	2
05	1	3
06	2	3
07	2	3
08	2	2
09	2	4
10	2	3

Note that there are three “variables” in this table: a student ID number (from 01 to 10), a code indicating the student’s sex (where 1 = male and 2 = female), and the number of psychology courses each student has taken (ranging from 1 to 4).

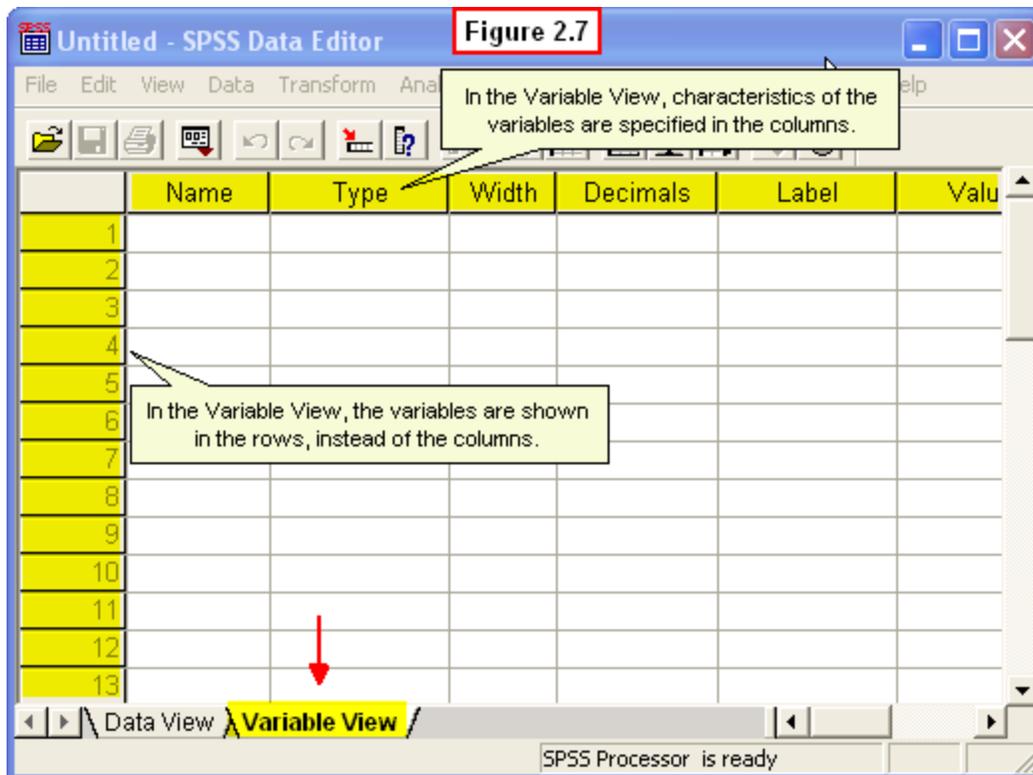
Thus, the data is organized with the three **variables** (ID, Sex, Courses) listed in **columns**, and the **scores** for each of the ten students on each of these three variables entered in the **rows**. You will see that the data needs to be organized in this same way in SPSS. If you haven't done so already, open SPSS now so you can follow along with this example.

2.3b Data Editor Rules

Let's create this file in the Data Editor window on your computer. As can be seen in Figure 2.6, SPSS expects you to list variables in the **columns**, and individual scores from each participant in the **rows** of this spreadsheet. This is the same way that the data has been organized in Table 2.1, so this shouldn't be difficult to do.



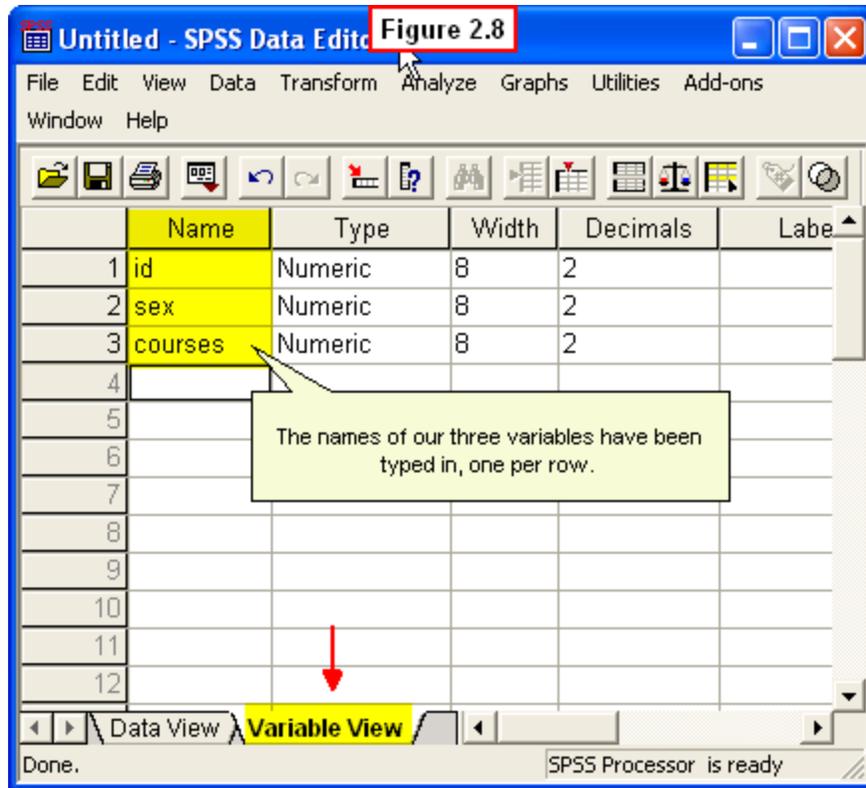
However, it's a good idea to name the variables in SPSS before entering the individual scores. More will be said about this in a later chapter, but for now, just note that the **Data View** tab is active at the bottom of this SPSS Data Editor window. To name the variables, we need to activate the **Variable View** tab. To do this, simply click on that tab. Figure 2.7 Shows the Data Editor window with the **Variable View** tab active.



It is important to note that in this view, the variables are listed in the **rows** (as opposed to being shown in the columns when the Data View tab is active). In the Variable View, instead of listing the variables in columns, **characteristics** of the variables are indicated in these columns.

Again, we will return to a more complete discussion of this view later, but for now, our main interest is in the column titled **Name**. This is where we will type the names of our three variables by clicking on the appropriate cell in the first column of each row.

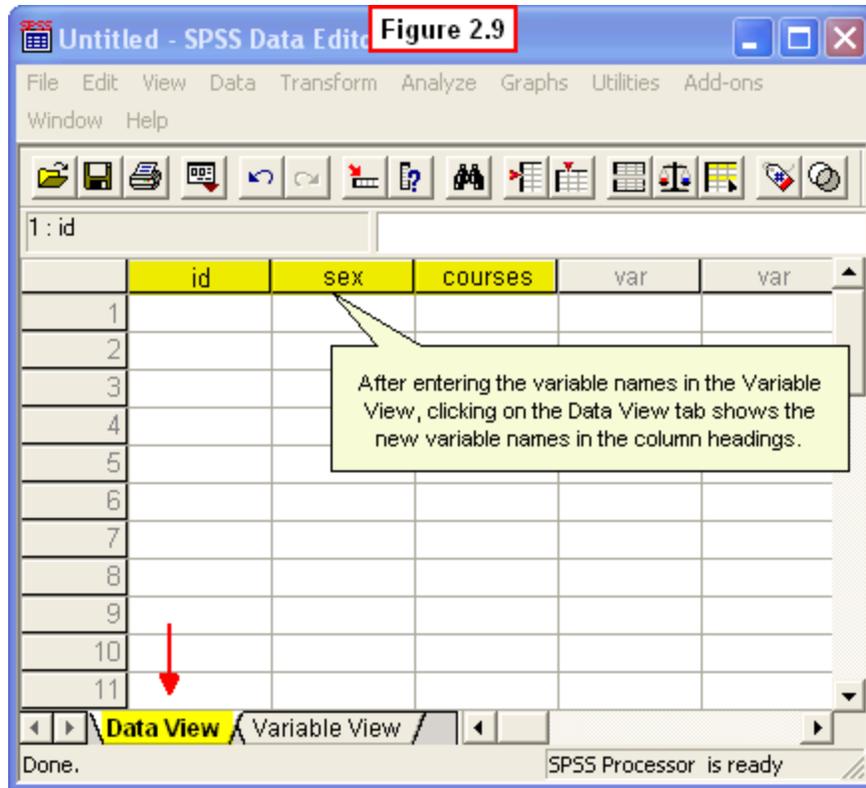
Figure 2.8 shows the variable names, **ID**, **Sex** and **Courses**, typed in the name column of the first three rows.



SPSS has rules for these variable names (e.g., there can be no spaces, the variable name must begin with a letter, and the maximum length is 8 characters). Upper or lower case may be used – SPSS doesn't care which you use, so we have used lower case.

Note that once a name has been typed in, SPSS default options appear in the next three columns. Don't worry about these for now. The most important one to note is that all three variables are numeric (as opposed to letters), which is correct.

Type these three variable names in your Data Editor window now. When you have finished, click the **Data View** tab at the bottom of the window. When you do this, you will see that the variable names you just typed in now appear as headings in the first three columns of the Data Editor window (Figure 2.9).



[Show Me Video!](#)

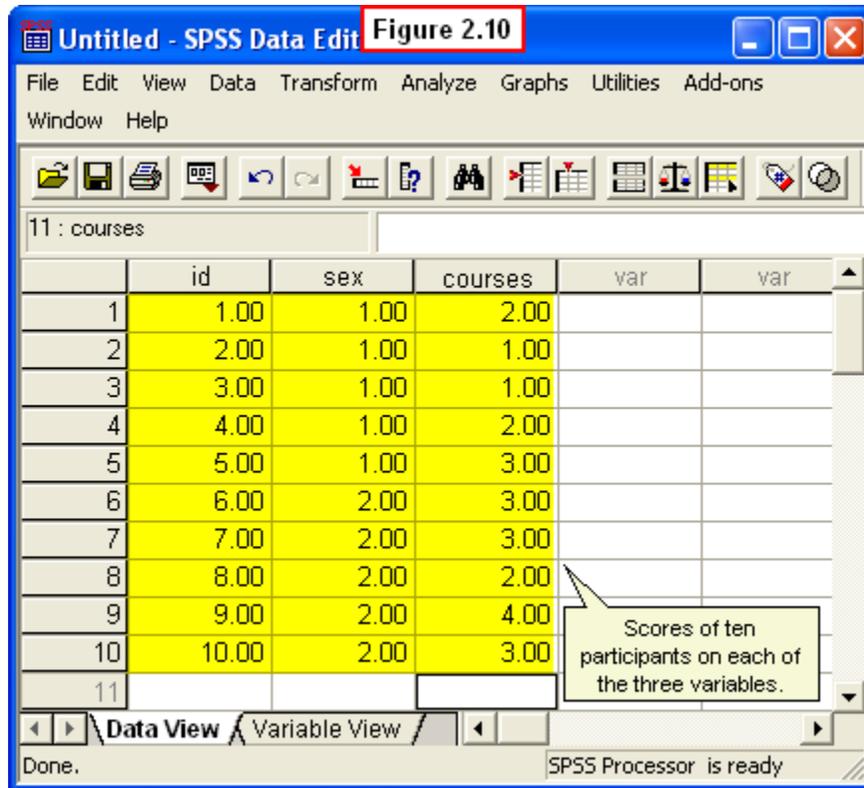
2.3c Entering Data in the Data Editor

Now we are ready to enter the data, or scores, for each student in the rows of this spreadsheet. To do this, simply type the scores shown in Table 2.1 into the appropriate cells. To begin, simply click the upper-most cell on the left and

- Enter the data in the first column
 - Type a 1 for the first **Student ID**; press enter.
 - Type a 2 for the second ID, press enter.
 - Continue typing the remaining ID numbers in this column.
- Enter the data in the second column
 - Click on the first cell of the column titled **Sex**; type a 1 for the first student's **Sex**.
 - Press enter and continue typing the remaining codes for student sex.
- Enter the data in the third column
 - Click on the first cell of the column titled **Courses**; type a 2 the number of courses.
 - Press enter and continue typing the remaining number of courses taken.

Alternatively, you could enter your data across each row rather than down the columns. That is, after typing the first student ID, you could use your right-arrow key to stay on that row and enter that student's sex; press the right-arrow again and type the number

of courses for the first student. Then click on the first cell of the second row and enter the data across that row for the second student in the same way. When you have finished entering your data from Table 2.1, your Data Editor window should look like the one shown in Figure 2.10.



[Show Me Video!](#)

While data entry can be tedious, it is a critical first step in analyzing the results of research, so it is **important to be careful to avoid text entry errors**. If you are not careful in entering data, the results of your analyses will be meaningless, so it is important to be careful and accurate in entering data. Further, after you have entered data, you should always double-check your file for accuracy. We cannot overemphasize the importance of accurate data entry. This is what the phrase, “garbage in, garbage out” is all about.

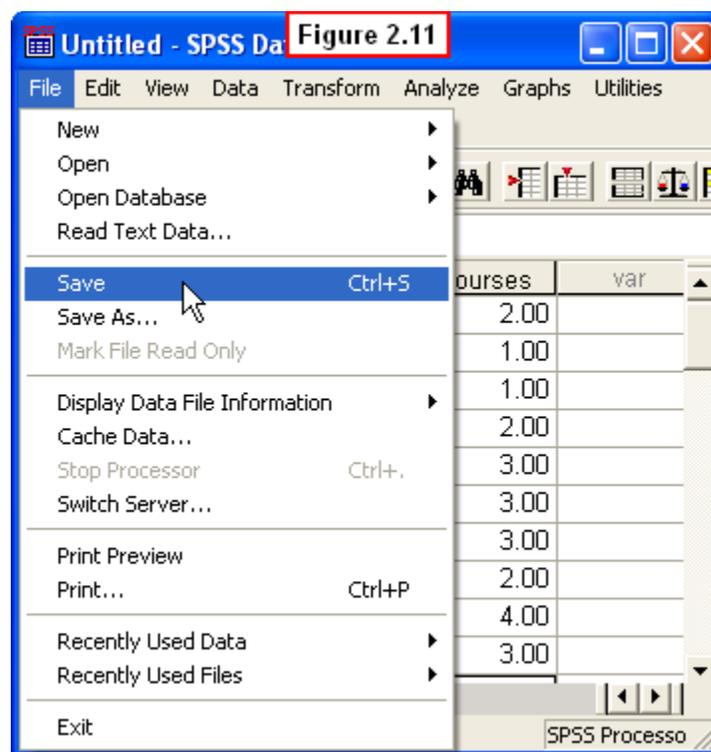
2.3d Saving files in the data editor: The **.SAV** File extension

When you name and save files created in the Data Editor to a hard drive or disk, SPSS by default adds the three letters, **.SAV**, (called the **file extension**) to these file names. That is, just as Microsoft Excel adds the file extension, **.xls**, to file names created and saved from Excel, SPSS adds the extension, **.SAV** to files created and saved in the SPSS Data Editor.

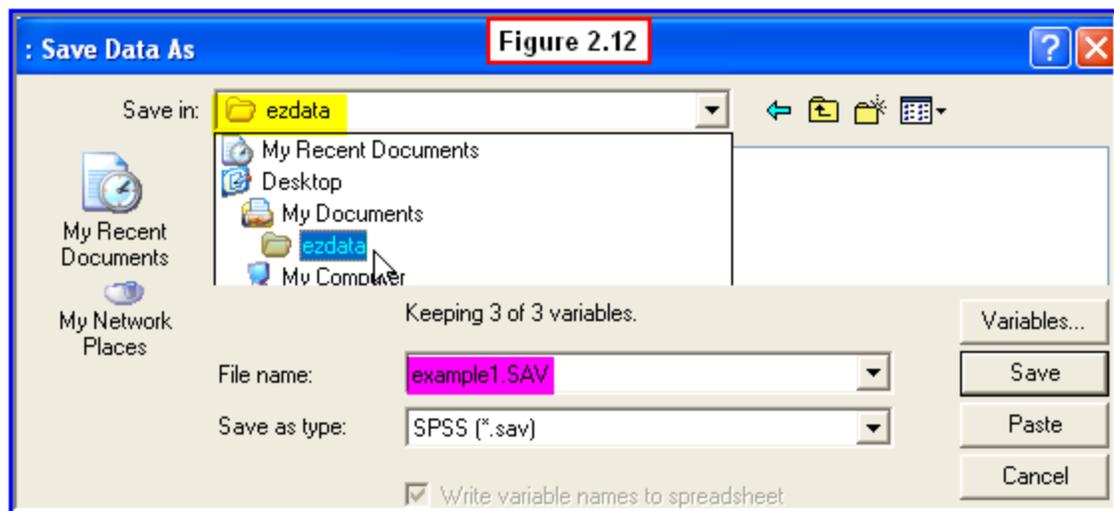
This is how your computer knows which program or editor to use when opening a given file. Each application (e.g., Excel, Notepad, SPSS Data Editor) has a unique file extension which causes the computer to use the appropriate program to open the file.

We recommend that you create a folder in which to save all of the examples and exercises you complete in this text. This folder can be on a floppy disk, your computer hard drive, a network drive, or some other media. This way you can always go back to look over examples you have completed.

To save your Data Editor file, follow the same procedure you would in saving any other file in another software application. From the drop-down menu at the top of your Data Editor window, select **File, Save** (Figure 2.11).



Then navigate to the folder you created for saving files. For this example, we recommend typing **example1.SAV** in the filename box of your **Save Data As** box (Figure 2.12).



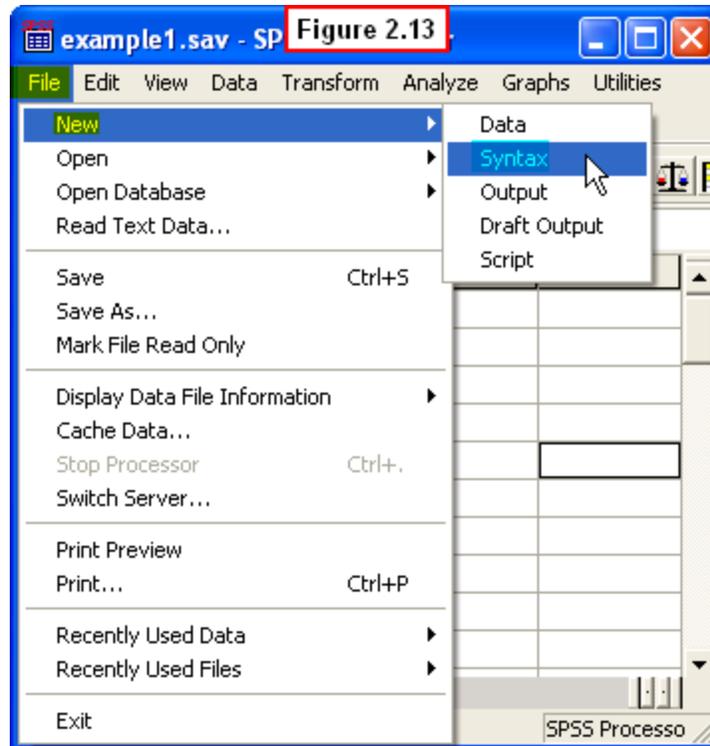
[Show Me Video!](#)

2.4 Creating files in the Syntax Editor Window

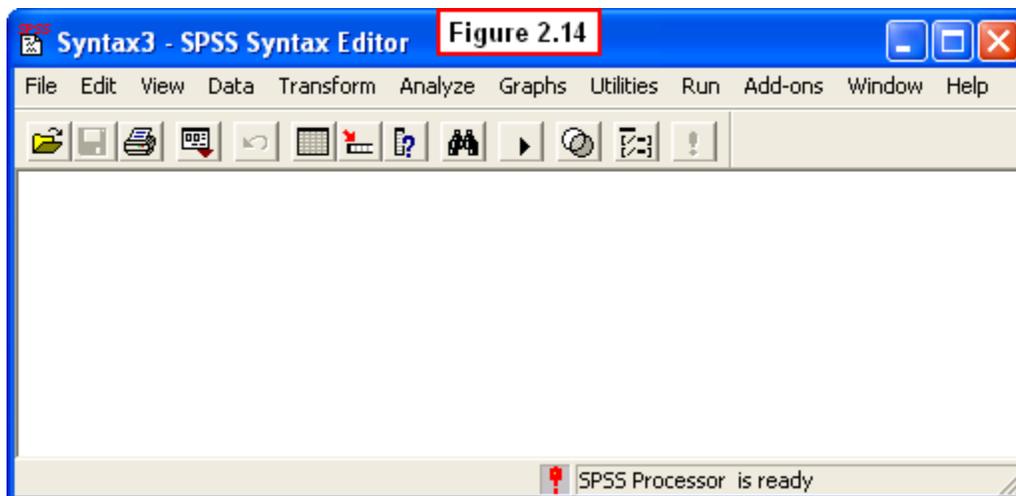
An alternate way to create data files is to use the SPSS **Syntax Editor Window**. The Syntax Editor works much like a word processor, such as Windows Notepad or a scaled-down version of Microsoft Word. That is, you can just type the data into this window as you would in creating any text file.

2.4a Accessing the Syntax Editor

Select **File, New, Syntax** from the drop-down menu at the top of the Data Editor window (Figure 2.13).



A new window will open (Figure 2.14).



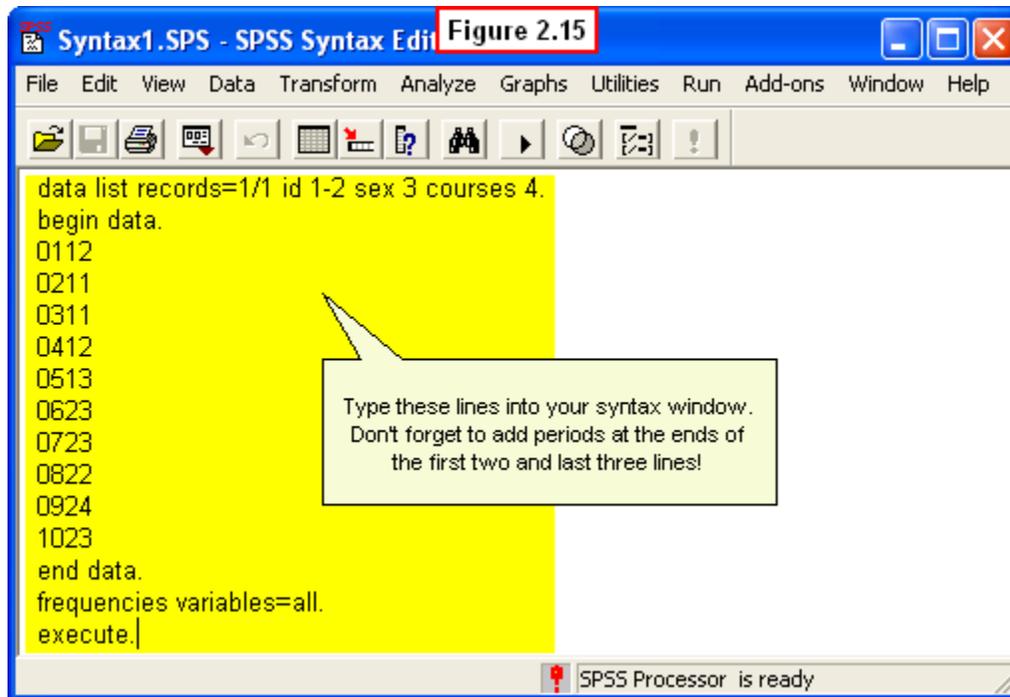
[Show Me Video!](#)

Note that in addition to typing text/data directly into the Syntax Editor window, you can "cut-and-paste" data into this editor. That is, just as you can cut-and-paste text from one Word file into another Word file, you can also cut-and-paste data into the Syntax Editor. Thus, data files that were created in a text editor such as Windows Notepad (called ASCII files) can be cut-and-pasted into this Syntax Editor. However, as mentioned, we will create this Syntax Editor file from scratch by typing the text and data directly into

this editor. Let's use the same example we just used to create this same data file in the Syntax Editor.

2.4b Entering Commands & Data in the Syntax File

We will be working with the Data Editor window in this book, so we will not discuss the Syntax Editor in detail here. For now, just type the file exactly as it appears in Figure 2.15 into your blank Syntax Editor.



[Show Me Video!](#)

The first line of this file consists of syntax code, or SPSS commands, called the **DATA LIST** statement. This instructs SPSS how to read the data in the file. Note that the three variables (ID, Sex, and Courses) are defined on this line.

The actual lines of data (scores) are always sandwiched between a Begin Data and an End Data syntax commands. Note that the data are organized exactly like they are in Table 2.1 and Figure 2.10. That is, each line of data (or row) consists of each student's ID number, code for sex, and number of psychology courses.

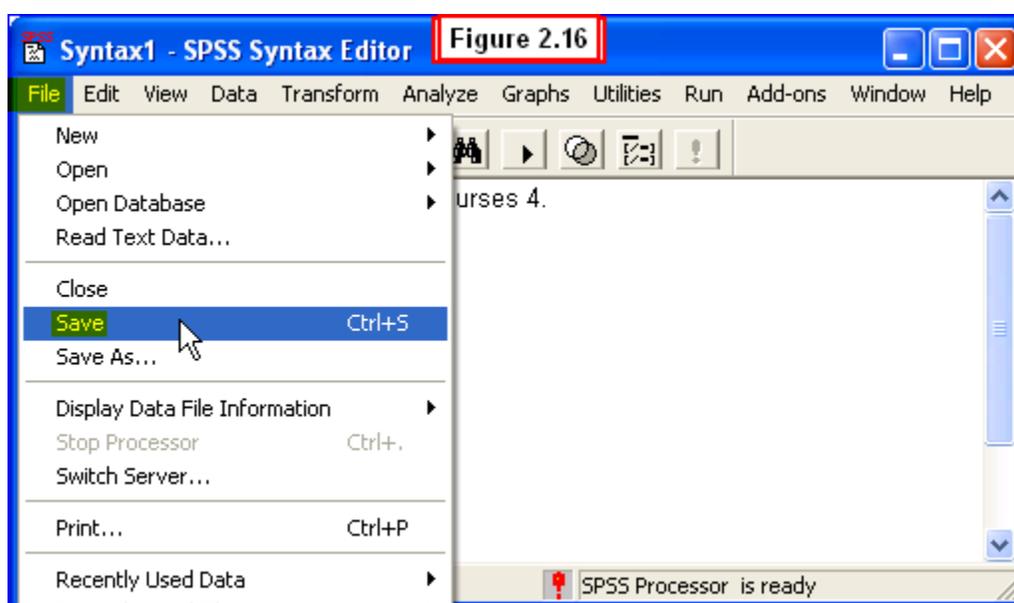
The last two lines instruct SPSS to generate **frequency tables** of each variable. Note that except for the lines listing the data, **the lines containing syntax code must all end with a period.** After you have created your file, you will be ready to save it as a syntax file.

2.4c Saving Files in the Syntax Editor: The .SPS File extension

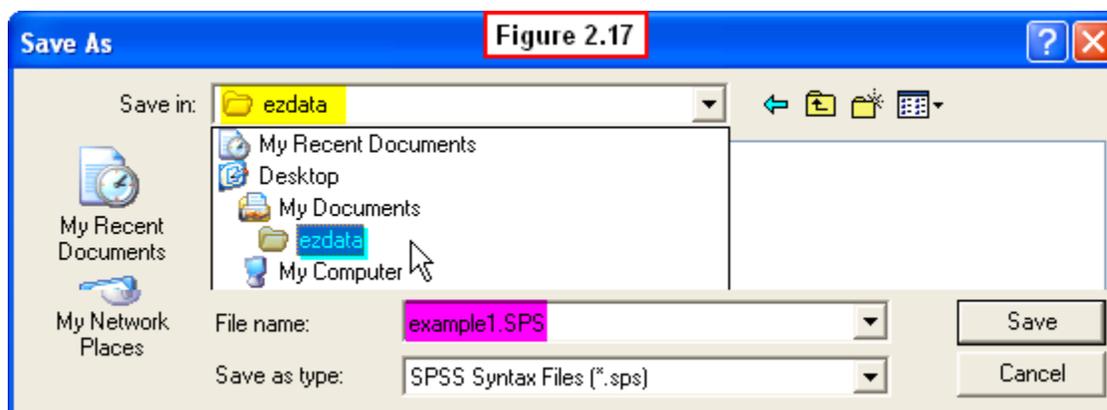
When you name and save files created in the Syntax Editor to a hard drive or disk, SPSS by default adds the file extension, **.SPS**, to these file names. That is, just as Microsoft Word adds the file extension, **.doc** to filenames created and saved in Word, SPSS adds the extension **.SPS** to files created and saved in the Syntax Editor.

As mentioned in our discussion of **.SAV** files saved from the Data Editor, it is important that you learn this file extension so that you recognize that a file name with the extension, **.SPS** (e.g., Example1.SPS) was created in the SPSS Syntax Editor and will automatically be opened with the Syntax Editor. This is important so that you do not confuse these with **.SAV** files created in the Data Editor.

To save this Syntax Editor file, select **File, Save** from the drop-down menu at the top of the Syntax Editor window (Figure 2.16).



Then navigate to the folder where you are keeping files for this book, and type **Example1.SPS** in the variable name box of the **Save As** box (Figure 2.17).



[Show Me Video!](#)

Leave this Syntax Editor window open, as we will use it to demonstrate the third major component of SPSS in the last section: the **SPSS Output Viewer** window.

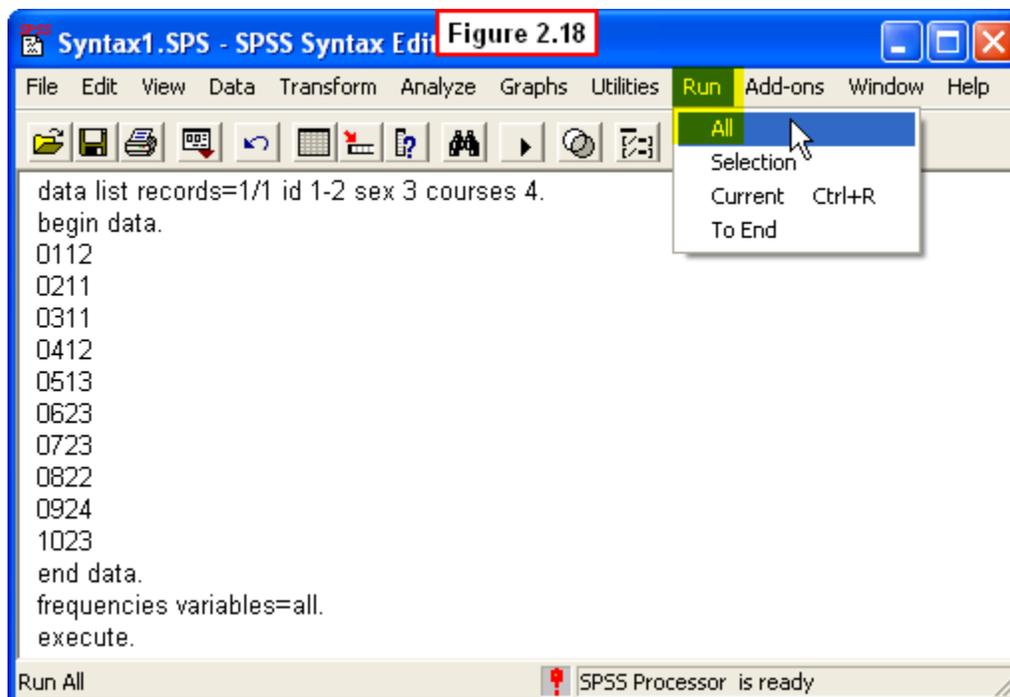
2.5 And Last, the SPSS Output Viewer Window

Once a syntax data file has been created consisting of a DATA LIST statement, lines of data, and an SPSS command statement specifying a procedure to execute, the user is ready to conduct the requested analysis.

2.5a Generating an output file

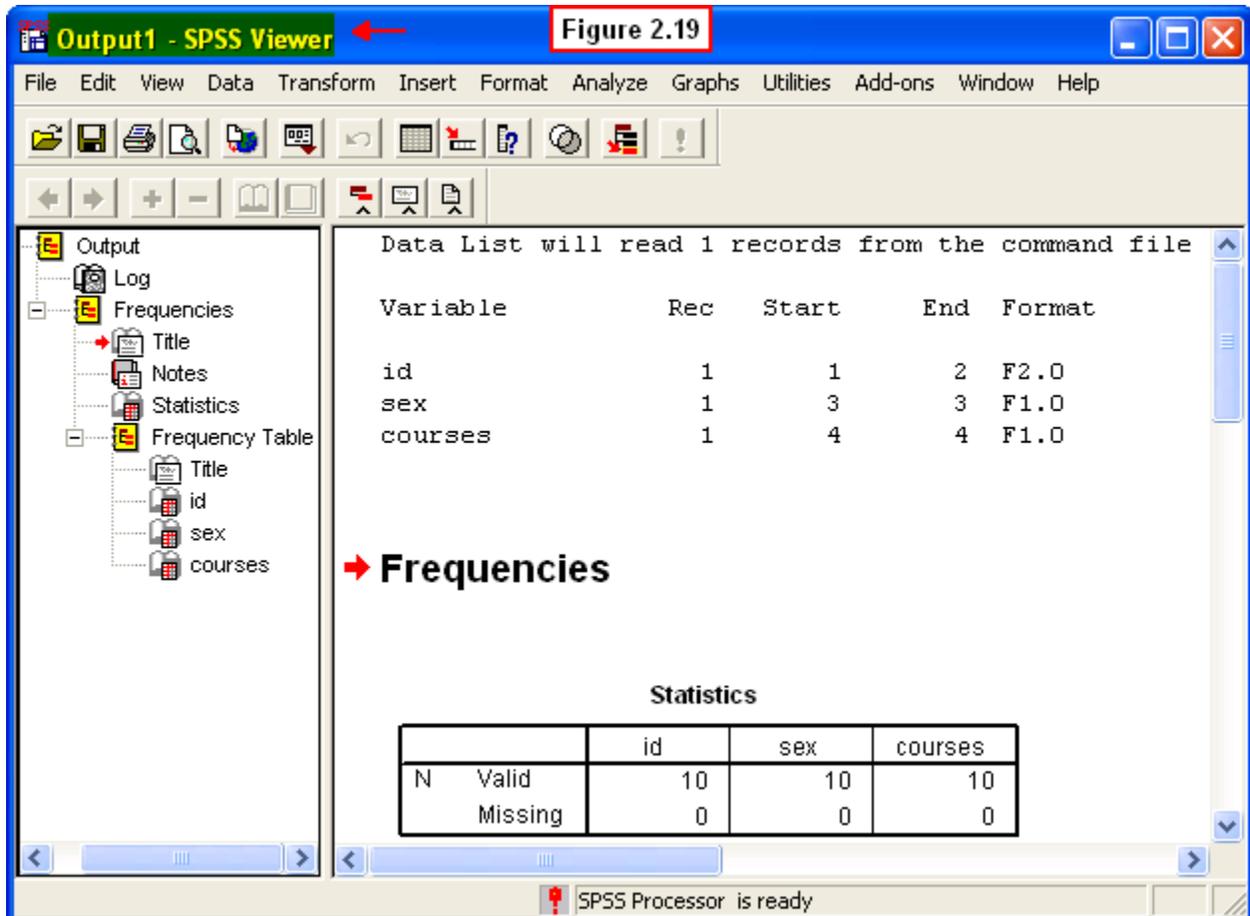
Let's go ahead and run the Frequencies procedure specified in this Syntax file so that we can generate an output file to view. We won't go into detail about this output now - we'll be doing plenty of that in later chapters! Our purpose here is to bring this example to completion and to show you a **SPSS Output Viewer Window**.

To generate this output, we need to instruct SPSS to run the procedure specified in the **Frequencies** syntax line at the end of the file. To do this, select **Run, All** from the drop-down menu at the top of this Syntax Editor Window (Figure 2.18).



When you do this, the SPSS processor will run the procedure. Shortly a new window will appear presenting the results (**output**) of the **Frequencies** procedure.

The **Output Viewer** window shown in Figure 2.19 will now appear. This file shows the frequency tables we requested SPSS to generate. We won't discuss this output – our goal here is to contrast the **Output Viewer** window and its files from files created in the **Data Editor** and **Syntax Editor** windows.



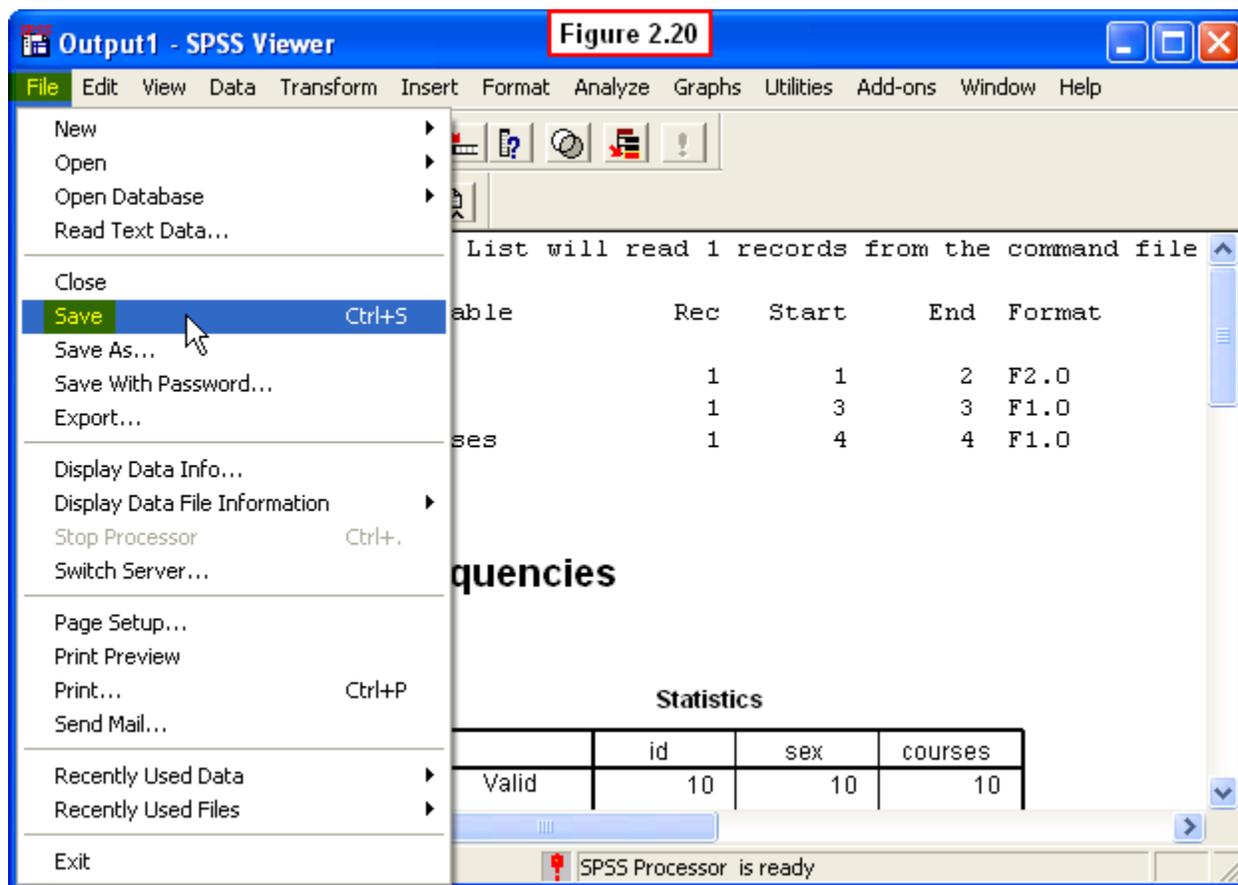
[Show Me Video!](#)

2.5b Naming and Saving files in the Output Viewer: The **.SPO** File extension

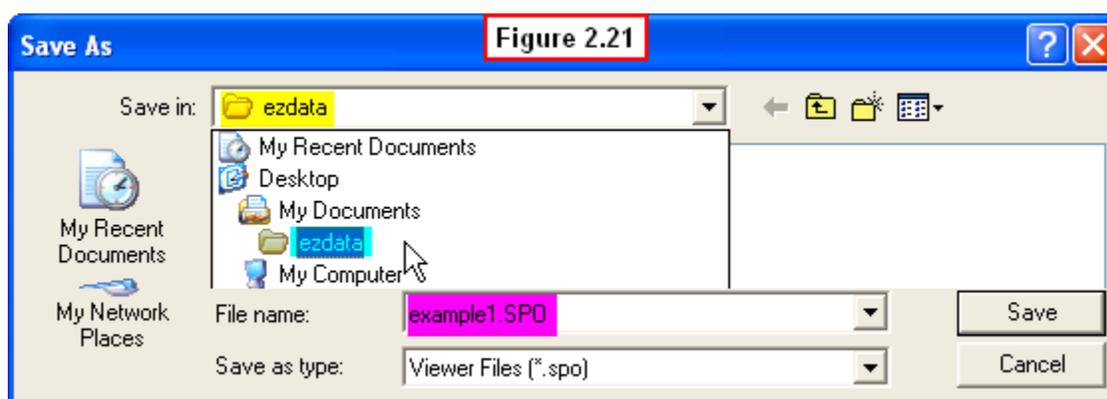
Just as SPSS uses unique file extensions for Data Editor files (**.SAV**) and Syntax Editor files (**.SPS**), when you save an output file in the **SPSS Viewer** window, SPSS adds the extension **.SPO** to the file so that you and SPSS can recognize the file as an output file.

We emphasize that it is important that you learn this file extension so that you recognize that a file name with the extension, **.SPO** was saved in the **SPSS Viewer** window. This is important so you do not confuse these with **.SAV** files created in the Data Editor or **.SPS** files created in the Syntax Editor.

To save this file, select **File, Save** from the drop-down menu at the top of this window (Figure 2.20).



Navigate to the appropriate folder and type **example1.SPO** in the variable name box of the **Save As** box (Figure 2.21).



[Show Me Video!](#)

2.6 Summary of the three SPSS windows

This chapter has introduced the three major components of SPSS:

- **Data Editor** - a spreadsheet used to create data files and run analyses using menus
- **Syntax Editor** - a text editor used to create files and run analyses using syntax code
- **Output Viewer** - a window displaying the results of analyses performed by SPSS

As mentioned, we will use the **Data Editor** window in the remaining chapters of this book, and will refer only occasionally to the **Syntax Editor** window. Regardless of whether we are working with the Syntax Editor or the Data Editor, the results of our procedures will always be displayed in the **Output Viewer** window. In both cases, the results will be displayed in the Viewer window.

To summarize what we have covered in this chapter, you will progress through the following steps as you create and execute an SPSS program:

- **Access SPSS** for Windows from your PC hard drive or from your network (LAN)
- **Create a data file** in the SPSS Data Editor or the SPSS Syntax Editor
- **Save the data file** using the appropriate file extension (**.SAV** or **.SPS**)
- **Specify an analysis** to be run on the data file (e.g., **Frequencies**)
- **View the results** of an analysis in the SPSS Viewer Window
- **Save the output file** in this Viewer Window using the **.SPO** file extension.

Once again, although this may seem confusing at first, we assure you that all of this will soon become second nature to you once you have conducted a few analyses using SPSS! We conclude the present chapter by explaining some of the differences between working with files in the Data Editor versus the Syntax Editor.

2.7 The SPSS Data and Syntax Editors: Point-and-Click vs. Syntax Code Methods

The Data Editor window allows the researcher to work with SPSS using a method commonly referred to as **point-and-click**, meaning that you use your computer's mouse to **point** the cursor at various buttons/icons, and then you select options from drop-down menus by **clicking** the appropriate options.

This use of SPSS for Windows works just like most other software programs that operate in Windows that you have undoubtedly used many times (e.g., Microsoft Word). It might not surprise you to learn that when you use the point-and-click method in SPSS, you are actually generating a sequence of syntax or command statements that will

eventually be used to execute a program (or run the procedure) using the data entered through the Data Editor window.

Although you don't see them as part of the point-and-click method, as you will learn later, you are able to view these "behind the windows" syntax commands and save them in a Syntax Editor file. These commands are actually fairly intuitive (e.g., we saw earlier that the word, **Frequencies**, is the syntax command to generate frequencies tables).

Typing these syntax command codes directly into a Syntax Editor window is referred to as the **syntax code method**. The procedure produces the same analyses as those generated by the point-and-click method (without having to do all the pointing and clicking!). The user just needs to learn the relevant syntax command codes to type them into the Syntax Editor.

The point-and-click method is in some ways is the easiest way to use SPSS for Windows, though it can be tedious to point and click through the many steps in creating a file, modifying the file, selecting the type of analysis to conduct and specifying the various options available at each step of this process.

Further, there are some real advantages of the syntax code method, so to fully tap all of SPSS's capabilities, it's worth learning about SPSS syntax. For example, some procedures are simply not available using the point-and-click method, and can only be performed using the syntax code method. Thus, although we have chosen to introduce the point-and-click method to avoid overwhelming the beginner, the more advanced student is encouraged to learn about the syntax code method as well.

Just remember that which method you are using will determine which SPSS window you will employ:

- **Data Editor:** User selects options by pointing and clicking on menus/buttons
- **Syntax Editor:** User selects options by typing in appropriate syntax command codes

From here on, we will present only the **point-and-click method** in the **Data Editor** window. For example, in Chapter 3 we will show you how to use the point-and-click method to generate the frequency tables we produced using the syntax code method in the example in the present chapter.

2.8 Chapter Review Video

[Review Me!](#)

2.9 Try It! Exercises

1. Creating a data file in the Data Editor

Open SPSS and use the Data Editor to create the **example1.sav** file described in Section 2.3. After you have created the file:

- **Save** the file to a disk, your hard drive or a network drive - ***you will need this file in a later chapter!*** We recommend that you create a folder titled **ezdata** in which to store all files you generate as you follow along with examples and do the exercises. These can be helpful review.
- **Print** this file by selecting **File, Print** from the Data Editor menu to submit to your instructor.

2. Creating a data file in the Syntax Editor

Use the Syntax Editor to create the file **example1.sps** file described in Section 2.4. Leave this file open.

3. Creating an Output file

With the **example1.sps** file open in the Syntax Editor, generate an output file by selecting **Run, All** from the menu. SPSS will perform the analysis and display the results in an Output Viewer window. Your file should look like the one shown in Video 2.9.

- **Print** this file to submit to your instructor by selecting **File, Print** from the Output Viewer menu.