

Instructor's Manual

for

SPSS for Windows Step by Step A Simple Study Guide and Reference 17.0 Update Tenth Edition

Darren George
Canadian University College

Paul Mallery
La Sierra University

Allyn & Bacon

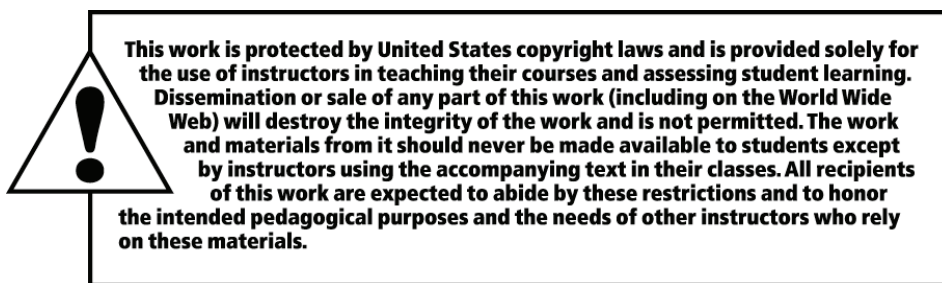
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Section I: Introduction

The Author(s)

Although Darren George (one of the authors of the textbook) was the primary author for this manual, reference is often made to “us”. The other half of us, is, of course Paul Mallery, the co-author of the textbook (and contributor to Section III of this manual, and editorial work throughout). When the term “us” is used, the material that follows is based on consensual thoughts or findings of both authors. The manual is written in the first person and the tone is conversational. In pages that follow, I share some of my experiences using the SPSS book and provide helpful hints on how to use the book, chapter by chapter, in your own teaching.

Content and Organization of the Manual

This manual contains three primary sections.

1. **The introduction (this section):** The introduction considers a variety of general issues associated with the structure, rationale, creation of, revisions to, applications of, and other concerns associated with the book and its use. Reading this section will provide you with a (hopefully) pleasurable foray into many issues that motivated the creation of the book, determined the content, and dictated the structure we have followed. Many professors don't even open the Instructor's Manual; you, clearly, have done at least that much. I think that the 15 minutes required to read this section will be well worth your time.
2. **Chapter-by-chapter analysis (p. 19):** This section considers each chapter individually in some detail. Both Paul and I are teachers. We have extensive experience presenting statistical material at an introductory statistics level, in research methods classes, and in more advanced multivariate classes. These pages deal largely with teaching tips for clear presentation of the contents of each chapter. Only material up to Chapter 16 is included in this chapter-by-chapter analysis—the typical coverage in an introductory statistics class. Chapter 17 through 28 are not only advanced and more complex, but teaching these techniques is so closely associated with the context of the class or the teaching style of the instructor that it seems unwise to comment extensively on styles of presentation in a this manual. Further, presentation of these more-challenging procedures is typically dictated by the need for an immediate application in a particular setting.
3. **Answers to all exercises (p. 50):** There are 109 exercises in the text; most appear in the first 16 chapters and cover the standard statistical procedures. The majority of these exercises are class tested. I have taught a multivariate analysis class for the past 7 years and many of the exercises in the present volume have emerged out of class assignments created for my students. Paul Mallery has also contributed a number of exercises from his own teaching experience. Exercises are included for the following chapters:

Chapter 3: Creating and Editing a Data File

Chapter 4: Managing Data: Listing cases, replacing missing values, computing new variables, recoding variables, exploring data, selecting cases, sorting cases, merging files

Chapter 5: Graphs: Creating and editing graphs and charts

Chapter 6: Frequencies: Frequencies, bar charts, histograms, percentiles

Chapter 7: Descriptive Statistics: Measures of central tendency, variability, deviation from normality, size, and stability

Chapter 8: Crosstabulation and Chi-Square (χ^2) Analyses

Chapter 9: The Means Procedure

Chapter 10: Bivariate Correlation, partial correlations, and the correlation matrix
 Chapter 11: The t-Test Procedure: Independent-samples, paired-samples, and one-sample tests
 Chapter 12: The One-Way ANOVA Procedure: One-way Analysis of Variance
 Chapter 13: General Linear Models: Two-Way ANOVA
 Chapter 14: General Linear Models: Three-Way ANOVA and the influence of covariates
 Chapter 15: Simple Linear Regression
 Chapter 16: Multiple Regression Analysis
 Chapter 18: Reliability Analysis: Coefficient alpha (α) and split-half reliability
 Chapter 23: General Linear Models: MANOVA and MANCOVA
 Chapter 24: General Linear Models: Repeated-Measures MANOVA

We have not included exercises for the more advanced procedures. These topics are typically presented in a context-specific situation; for example, if you are building a model using log-linear modeling, you need to have a fairly extensive theoretical understanding of the context of the data in order to properly build the model; this would take a great deal of space in an exercise, and would rarely fit the needs of the instructor.

Answers for selected exercises are provided for students on the website. These are viewable in Adobe Acrobat format, but students cannot easily copy the answers (to minimize cheating on assignments). However, we have included answers to ALL exercises in the final section of this manual for your benefit. Many times answers to data-analysis exercises are long, complex, and very difficult to print out in compact form. My greatest challenge in classes I have taught is creating answer keys for me (or my TA) to grade the assignments. It may take more than an hour to create an answer key for a single topic and this often involves a number of after-printout edits. Now life is made easy. If you assign any problems from the exercises in this book, the answer is already available in a neat, reasonably complete, and coherent format in the final two thirds of this manual.

Why SPSS PASW Statistics for Windows Step by Step Was Written

The present book was initially written to make the use of statistical software (SPSS PASW Statistics in this case—though it was just “SPSS” when we started) clear and straightforward for students. Paul and I have both spent enough of our lives in teaching to have seen many students traumatized by the professor who cheerily says “analyze these data in the lab; read the SPSS PASW Statistics manuals for specifics of how to accomplish this.” The manuals are 3000 pages long and beyond comprehension to almost anyone other than statistical and computer experts. For us data analysis is easy; we have spent thousands of hours with computers, SPSS PASW Statistics, and analyzing data. It is not easy for someone who doesn't know the language (mathematics, specifically statistical terminology) and has no experience. The intense trauma experienced by these students was the major reason that we have invested so much time and effort to create a manual that is, above all else, clear.

This clarity is accomplished in several ways. First, we both come from the perspective that learning to use statistical software is best accomplished by *doing* rather than studying *about* it. That is why almost everything in the book is example-based. In the 1960's the “new math” was introduced based on the assumption that if students understood *why* they were doing what they were doing, that it would enhance their ability to do arithmetic. Thus first and second graders were subjected to subsets, supersets, elements of a set, numbers in base 8, transitive property, reflexive property (remember that one? something is equal to itself) and a lot of material that rightly belonged in classes taken by first year math majors in college. The kids don't give a hoot about *why* 2+3 equals 3+2. It works, that's why. They can see it with sticks, and marbles, and dolls. The new math died a well-deserved but relatively painless death soon after its inception; however, much of teaching in many classes today (particularly high school and college) is

still based on the assumption that if you read enough about *how* and *why* SPSS procedures work, you'll be able to do them.

We would challenge anyone who teaches research methods by reading and testing on some book for 15 weeks to match my students who read the book for 5 weeks and then spend 10 weeks taking a fairly major project from the initial idea to a finished APA-format paper. Have the final exam half-way through the term, and the paper due at the end of the term. There is far less time reading about research and much more time actually *doing* research. The 15-weeks-of-reading students wouldn't have a clue of how to conduct a real research project. The knowledge comes from doing. This, of course, parallels the focus and intention of our book. It is a book designed for doing. Some reading, of course, is necessary. However, after reading we urge that students practice, practice, practice on the computer, with real data if possible.

With this perspective in mind the present book has been created. Every line of the book has as its focus to make clear both the conceptual idea behind the statistical procedure and the procedure itself. As mentioned before, the 12 data sets are available for download at www.ablongman.com/george10e (along with datasets for some exercises, and versions of the main datasets that are compatible with the student version of SPSS PASW Statistics). This allows students to practice the procedures they are reading about. How successful we have been in creating clarity is now out of our hands and remains for you to judge. We welcome your input and suggestions. Our addresses (both geographical and e-mail) and phone numbers are included with the book and your comments will gain a response.

Because Allyn & Bacon plans a new revision most years, your comments can be incorporated into new editions. Why frequent revisions? SPSS PASW Statistics is like any other software business in that they wish to maintain a competitive advantage. Because of this they upgrade their software regularly, primarily to keep their programmers employed and secondarily to provide irritation to their users who have just become acquainted with the previous version. (Why the name change from SPSS to SPSS Statistics to PASW Statistics? Perhaps that is just to keep the users from getting complacent.) Often their changes are beneficial. For instance the shift from the command-syntax format of the DOC version to the click-and-paste of the windows version was nothing short of brilliant. A bulky, terrifying, process suddenly became easy. Error messages, by far the most frequent output you would see with the DOS version, essentially disappeared when you could click to select a variable rather than trying to remember how to spell a variable name.

Their revisions, however, also have a down side. For example, beginning with SPSS Statistics 16.0, setting up the printer became much less intuitive and harder to find than in previous versions. (To set the data editor output to landscape, you have to go to "Page Setup" in the Output editor.) And the semiannual changes to the Graphing procedures, while generally improving the ability to make customized graphs, occasionally drop or hide features that are commonly used. If you can avoid changing marker shapes and colors with SPSS PASW Statistics 17.0, your life will be easier (see the "Bugs" section in Chapter 5 of the text).

New revisions will happen as we keep up with current editions of the software. Although there were no major changes to SPSS PASW Statistics 17.0, there were many small changes (leading to over 1000 changes to the textbook). Allyn & Bacon plans to keep at least some of older editions for universities or individuals who have not yet upgraded to the most recent release.

Types of classes for which this book is appropriate

The Instructor's Manual that you are now reading is designed to serve a much narrower audience than the textbook. First, it addresses the needs of professors (rather than students) teaching undergraduate statistics or research methods classes. Secondly, it covers only about half the content of the textbook. The

SPSS Step by Step book (while including all the introductory statistical procedures) expands its scope to more advanced multivariate analysis classes, graduate statistics courses, major research projects (theses, dissertations), and as a reference guide to anyone who conducts data analysis occasionally or frequently.

I include fairly extensive analysis in the Chapter-by-Chapter Commentary section of this book. My comments about how to teach using this book must, therefore, be preceded by some description of classes with which it has been used. I have employed selected chapters from this book to assist in teaching my research methods courses. *SPSS for Windows Step by Step* (or prior editions of it) has, however, been my *primary* textbook in four different classes. One was a class on SPSS (Cal State Dominguez Hills) specifically devoted to the understanding of how to use SPSS software to analyze data. I have once taught an Introduction to Statistics course using the text (much to the dismay of the math department who thought it wasn't mathematical enough), and I have six times used the text to teach a course called Multivariate Analysis. Introduction to Statistics is a prerequisite for Multivariate Analysis—a class that is devoted to actual analysis of data, or the practical application of statistical concepts in the real world. Multivariate Analysis (and the SPSS class at Cal State) are the classes I have taught that provided the best fit for the book. Curiously, the Introduction to Statistics class was I think my greatest success teaching with this book. We managed to complete all the way through discriminant analysis with the lowest grade (in a class of 28) being C-. I felt this was testimony to the simple, direct treatment of material, and perhaps, to a lesser extent my fluency in the topic (at the practical level) and ability to present it clearly. Astonishingly, 10 students, after the class was over, actually purchased the SPSS Statistics software to install on their own computers! This suggests that they not only understood, but they actually wanted to continue using statistical software.

During my chapter-by-chapter presentation in the next section, when I refer to techniques of presenting material in my classes, I am typically referring to the Statistics or Multivariate Analysis classes. Those comments should be considered and implemented in your own classes with that in mind. If your goals in a particular class are quite different, many of the suggestions presented here may need to be adapted.

General Overview of the Book

An understanding of the structure of *SPSS for Windows Step by Step* should be useful. Chapters 1 through 5 are either introductory in nature or relate to SPSS processes that may apply to many of the statistical procedures that follow (Chapters 6-28). In the first five chapters special efforts have been made to present material in a way that is clear for the beginner. Of course, we have attempted to be clear in every chapter, but clarity in log-linear models, logistic regression, factor analysis and other advanced procedures is quite different from clarity in the first five introductory chapters or the 11 chapters of basic statistical procedures that follow. In the first 16 chapters we step-by-step carefully through the material and attempt to illustrate everything possible. The final 11 chapters deal with more complex procedures and a substantial grounding (viz., classes in advanced statistics) in those techniques is, in most instances, necessary. We still attempt, however, to make the conceptual bases of, say, factor analysis clear in the 6-page introduction, the many options straightforward in the Step by Step section, and the SPSS printouts coherent in the output section. We are under no illusion, however, that a beginner could understand factor analysis based only on our presentation.

By contrast, we have made every effort that introductions to the first 16 chapters would give a clear conceptual feel for different procedures *even* for someone who had never taken a statistics class. As we move into two- and three-way ANOVAs and multiple regression analysis, we undoubtedly become less successful at our efforts, but the effort is always there. I feel that a student with good math aptitude (necessary!) even without a statistics course could make very productive use of the first 16 chapters of the book. We don't recommend it; we feel the book is most useful to persons who have already had statistics

(or better, are taking it concurrently while learning SPSS), but this has not blunted our efforts to make it clear to the novice.

For the more advanced procedures, there was discussion with the publisher about writing a more limited book (for instance, one including only the first 16 chapters). We argued against this. The Introduction to Statistics class (mentioned earlier) progressed all the way through discriminant analysis. It was nice to have the same format description of the more advanced procedures to assist in the process. Paul's Methods of Research class regularly uses within-subject MANOVA's to allow within-subject experiments (more power with small N s), and an occasional student will use other advanced procedures as well (e.g., a log-linear model). We know that most introductory classes will not go beyond chapter 16, but, if someone is working with questionnaire data and wants to conduct a reliability analysis, the chapter is there, painstakingly written to be as clear as possible. The same applies to MANOVAs, discriminant analysis, or log-linear models.

A More Detailed Overview

This first introductory section of this manual introduces the reader to the structure and content of the book. In the next major section of the book (Chapter by Chapter Commentary, starting on page 19) we will extend the brief presentations offered here to address the concerns of those who teach using the book. In those pages we go into much greater chapter-by-chapter detail. In the three pages that follow, we consider additional preliminary information concerning the structure and content of individual chapters.

Chapter 1 is introductory. It is warm and friendly; it talks about SPSS PASW Statistics, it describes the structure of chapters that follow. Most importantly, it introduces the data file that is used in 16 of the 28 chapters and identifies typographical conventions that are used throughout the book. When I teach a course using the book I require that students memorize the typographical conventions. It is not much of a burden because they are not numerous and are very intuitive, but it acknowledges the importance of knowing the language before you proceed.

Chapter 2 deals with SPSS processes. While this chapter caters to someone who knows very little about computers and their use, there is much SPSS PASW-specific information that would be useful to anyone. Included are topics concerning:

- Mouse functions,
- Taskbar and start menu,
- Common buttons, both general and SPSS PASW Statistics specific,
- The data window and other commonly used windows with icons identified and defined,
- The output window with its bewildering pivot tables, also with icons identified and defined
- The "Options" option, and
- Instructions for printing output.

This chapter is often cited in the remainder of the book in case someone tries to use the book to conduct data analysis without reading Chapter 2. For instance, in the print sequence included in every analysis chapter, we refer the reader to Chapter 2 if they desire more information about print options or editing output.

Chapter 3 concerns data entry and creation of data files. This chapter painstakingly step-by-steps students through conceptual ideas (how to design research and organize data) and procedures (how to name, format, and enter variables). It also considers editing already-entered data, and provides a complete listing of all data in the file (**grades.sav**) so frequently used throughout the book.

Chapter 4 we regard as one of the most complex and important of the book. The ideas are not complex, the procedures often are. It would be rare for anyone sitting down to an analysis session to finish without

making use of one or more procedures included in the fourth chapter. We deal with manipulation of data. Each concept is presented with conceptual rationale, examples to illustrate, and step-by-step instructions to clarify access. Included are the topics of:

- listing cases,
- replacing missing values,
- computing new variables,
- recoding variables (both switches of coding for existing variables and creating new variables via re-coding),
- selecting subsets of data for further analysis,
- Reordering the data, and
- merging files.

Chapter 5 deals with graphing procedures. The graphing procedures for SPSS have undergone major transitions every couple of editions for some time now: “Graphs,” “Legacy Graphs,” “Interactive,” and “Chart Builder” have at various times all referred to different sets of menu options and interfaces. SPSS 17 has three graphics systems—“Chart Builder,” “Legacy,” and “Interactive” (hidden under the Legacy menu). As much as possible, we have used the Chart Builder, as the Interactive and Legacy methods of creating graphs are on their way out. In a few cases, in which the procedures are much simpler using Legacy graphs, we have used the older procedures.

Chapters 6 through 28 deal with different types of analyses. We need not list them here; you can read the table of contents. A word on organization, however, might be useful. SPSS is presented in different modules: Base, Regression Models, Advanced Models, Tables, Exact Tests, Categories, Trends, etc. We ALL basic procedures presented in the Base System Module and several selected procedures from the Advanced Statistics Module and the Regression Models Module.

Our book has been organized around this module structure:

- The first 5 chapters are SPSS processes that apply to all modules,
- Chapters 6-22 apply to procedures offered in the Base System Module,
- Chapters 23-27 describe procedures from the Advanced Statistics Module or the Regression Models Module, and
- Chapter 28 (on residuals) applies to all three modules.

The module structure is not a trivial issue. Undoubtedly you are working with a network of computers at your college or university. Each module is purchased separately. Thus the issue of budgetary constraint comes into play. Often a school can afford only the Base system module. If so, then only Chapters 1-22 and Chapter 28 are applicable to the system you are using. The book is created so as to make it easy to manage if you have only one or two of the modules covered here.

A word on the structure of each of the analysis chapters (6-27) is important. Each of the chapters is self-contained. That is, armed only with an understanding of the typographical conventions, if a person wished to conduct t tests on certain material, she or he could start with Chapter 11 and conduct t tests. True, if they didn't know how to create a data file, step 1 tells them to go to Chapter 3 and learn how; if they get output and don't know how to edit the material they will be referred to Chapter 2; but otherwise, everything is there. Each of the Analysis chapters is divided into three sections:

1. **Introduction:** The introduction of each chapter explains the procedure as clearly and parsimoniously as we are able. For several of the introductory chapters the introductory material is only about one page long. We see no need to take more than two lines to explain what a “mean” is. Notice our brief section on measures of central tendency from chapter 7:

The **Mean** is the average value of the distribution, or, the sum of all values divided by the number of values. The mean of the distribution [3 5 7 5 6 8 9] is

$$(3 + 5 + 7 + 5 + 6 + 8 + 9)/7 = \underline{6.14}.$$

The **Median** is the middle value of the distribution. The median of the distribution [3 5 7 5 6 8 9], is 6, the middle value (when reordered from small to large, 3 5 5 **6** 7 8 9).

The **Mode** is the most frequently occurring value. The mode of the distribution [3 5 7 5 6 8 9] is 5, because the 5 occurs most frequently (twice, all other values occur only once).

Ours is not a statistics book or a commentary. We see no need to be anything other than clear. On the median we ignore the issue of "how about if you have an even number of values?" That's your job.

In other instances we go into some detail if we feel it is necessary for clarity. In Chapter 7 we spend a full page on statistical significance. More could be said about it, of course, but we felt it important enough to attend to it carefully. Also in chapter 7 we spend a full page on the normal distribution. Nearly all the statistical procedures presented in the book (with the exception of Chi-square analyses and Nonparametric tests) are predicated upon an assumption of normality of your data. Thus, we felt it worthy of a full page.

On other procedures we may take several pages to inch our way through a clear presentation. Paul and I know that in our 28 chapters, some are better than others (we would never admit, however, that any chapter is worse than another!). I feel one of our best is the chapter on simple linear regression and curvilinear regression (Chapter 15). Regression is a difficult topic to understand and I feel the illustrations used to demonstrate regression in our book make a complex procedure essentially clear. That is the goal in all of our chapters.

2. Step-by-Step sections. Each Step by Step section begins with the identical first four steps (with minor variations depending on the procedure) and ends with the same two steps (explaining how to print their output and exit the program). It is the middle (various versions of Step 5) where the instruction takes place. There are as many step-5 versions as there are specific analyses presented in a particular chapter (labeled 5, 5a, 5b, 5c, etc.). Please refer to any of Chapters 6-27 to see examples of these. Prior to the step 5's, are descriptions of essentially all screens (or dialog boxes) used in that procedure. In this portion of the Step by Step section, a narrative description of the screens plus identification and definition of terms helps the student gain a thorough awareness of how to use the screens in the analyses.

3. Output: the output includes the results of analyses produced by SPSS PASW Statistics. In almost all instances we use the format provided by the SPSS 16.0 version but edited to be clearer and more space conservative. Finally, most output sections contain one or more boxes that define all output terms. These terms are also included in the comprehensive Glossary at the end of the book.

Section II: Chapter-by-Chapter Commentary

Chapter 1: Introduction

The First Four Sections, pages 1-5

The content of the chapter is clear from the Chapter cover page. The first four sections, (Necessary Skills for the User, Scope of Coverage, Overview of the Book, and Organization Chapter by Chapter) are largely for perspective and have a friendly, chatty feel to them despite the technical content. To the absolute novice, the Chapter-by-Chapter section would be essentially non-understandable and boring. The other parts, however, give one a feel for what is about to take place.

The final two sections (the example, and typographical conventions) is where we move away from friendly noises to material that is critical for understanding. We start with the example.

Introduction to the Example, pages 5-6

As explained briefly in the introduction, the purpose of creating the example data file was to allow students to focus on data analysis rather than spending a lot of time trying to understand the file. In teaching a course using the book I actually quiz them on content of the data file to assure that they have reasonable fluency in the file that is used so often in the remainder of the book. For introductory students it is good to know that this file is used to illustrate procedures in all but two (Chapters 15 and 16) of the first 19 chapters. The data are all fictional, but do a good job of demonstrating many types of analyses.

Typographical and Formatting Conventions, pages 6-8

This is the other section critical for understanding. We have created these conventions to be as intuitive as possible, and a thorough understanding of the 2 pages that comprise this section will place the users of the book in an excellent position to make most effective use of the chapters that follow. In my classes I will quiz students to assess their profound internalization of this material. The number of items is not great, but it sets a secure foundation for the remaining chapters.

Chapter 2: Processes

Chapter 2 is divided into a number of sections, some more important than the others. Having used this book (or prior versions of it) several times to teach statistics-related classes, I will attempt to help you place in perspective the amount of attention each section deserves.

The Mouse, page 10

This section is for the novice. It is worth reading (less than a page) for anyone who is not acquainted with mouse processes. There is, however, one element of substantive importance here, which is the right click: The right click often speeds up the data analysis process by its influence on variable names. A right click in many settings identifies the **variable label** and the **value labels** in a convenient box that disappears when you click elsewhere. How often have you tried to remember how you coded gender or ethnicity? This feature eliminates ever wondering. Also, a right click on many other terms will provide a definition or description.

The Taskbar and Start Menu, Common buttons, pages 11-12

Both sections are essentially for the novice, but serve as a handy reminder for anyone who has forgotten.

The Data Window, page 13

This is of substantial importance in the early stages. Once the data window has been used a few times, its importance diminishes. The lists of icons are handy but hardly worth memorizing; besides, the page 14 illustration is one of the front cover screens, so if a student wishes to recall the meaning of the icons, they are always handy. And, when you place the cursor on an icon it identifies its function. The advantage of the descriptions on page 14 (and the front cover) is that they often have more complete definitions. Most frequently used icons include:

- Open file
- Save current file
- Print file
- Undo the last operation (this is short-term memory: It undoes only the ten most recent operations)
- Go to a particular case number
- Access information about the current variable
- Find data
- Insert subject or case into the data file
- Insert new variable into the data file
- Shift between numbers and labels for variables with several levels

The Open Data File Dialog Window, page 16

This is the second of the front cover screens. It is intuitive and not very difficult, but this is one spot that it would do well for the professor to stop and spend a few minutes. The four methods for accessing a data file listed on page 16 are important for users to internalize.

The Statistical-Procedure Dialog Windows, page 17

Every statistical procedure has a main dialog window. Many of the features are similar in each window. The OK, Paste, Reset, Cancel and Help are always included. Also, the list of available variables is always present. This section is worth some quiz items because of its centrality to all statistical processes.

Keyboard Processing, Check Boxes and Radio Buttons, page 18

The check boxes and radio buttons should occupy a solid 15 seconds of your lecture. The keyboard processing is not as trivial as it might initially seem. Few people are scared of mice, however, many times

the keystrokes are far quicker than the equivalent mouse processes. For instance when creating value labels, once you have identified the value and its label, you may click “Add” or press “ALT-A”. The ALT-A is much faster. Talk with students about the meaning of the underlined letter.

The SPSS Output Navigator, pages 19-24

This topic occupies 6 pages because (in my opinion only, I'm sure) the pivot tables SPSS has introduced are such a nuisance. With small data sets or very limited output they are kind of cute. The pivot features allow you to switch rows and columns, put labels on their ends and to engage in a variety of other entertaining activities. With large outputs, they become a special type of purgatory. I personally find the text output much easier to deal with.

How you respond to this section of the chapter is, of course, your prerogative, but it cannot be ignored. A good starting point is to read the pages yourself and practice with some actual output. You can click and drag the lines of the output to create a neater look. SPSS has not yet figured out how to get value labels to fit in the boxes, but some click and drag activity can create greater order. I haven't quite decided if my irritation with present format is due to the thousands of hours I have spent with the simplicity of the former versions' text output, or if the present format is truly more cumbersome. Here, however, are some tips about issues that need to be covered:

Page 20 and 21: Distinguish between the two halves of the screen: the Outline view (to the left) and the actual output (to the right). The heavy border between them may be moved (via a click and drag mouse operation) so as to eliminate either section and allow a clear version of other window. Still on page 20, frequently used icons include:

Open file

Save file

Print output

Undo the last operation

Go to the SPSS PASW Statistics Data editor (very handy to access your data screen on demand)

Go to a particular case number

Get information about variables

Display currently selected object (a double click on the closed book icon in the outline view to the left will accomplish the same, see diagram on page 21)

Hide currently selected object (a double click on the open book outline icon in the outline view to the left will accomplish the same, see diagram on page 21)

The small + or – signs to the left of outline items (see visual display on the top of page 22) are also important to be aware of.

The **pivot functions** should at least be presented: Explain that it first takes a double click on the output object to activate the pivot tables. A new menu bar heading will emerge called “**Pivot**” that allows you to access a number of pivoting functions. Beyond that I would suggest that you tell your students to play around with it to see what each menu item does. Warn them to save their file prior to their experimentation so if they tie themselves in hopeless knots, they can simply revert to the saved version of the file; or, just run the analysis again. The “persistence” function of SPSS PASW Statistics main dialog windows allows an analysis to be rerun without having to remember which variables or options you included on the previous try. If you have a burden to help your students become fluent in pivot-table operations, you will need to create your own agenda.

Printing Output, page 24

Printing output is quite straightforward. The print dialog boxes are intuitive and very similar to many other print dialog boxes for word processing or other software programs. The only issue of significance con-

cerning printing is the frequent need to edit the output prior to printing. SPSS has a long history of collusion with the timber industry to consume as many pages as possible in their output. Thoughtful editing prior to printing output can save many reams of paper. In my classes I will often specify: "Edit output so it fits on one page." This gives students practice in output editing, and, by time the course is finished, they will have become fairly fluent in this practice through many instances of actually editing output.

Printing a *data* file is quite a different dynamic. There is really no space-conservative way that either Paul or I have found to print an entire data file. SPSS is quite capable of printing even a large file but it takes many pages. The key concern is that usually a researcher wants to print only a *portion* of the file. This is accomplished by highlighting the desired material: Click & drag within the data file to print a particular rectangle of data; click on the variable name(s) to print particular variables (all cases); click on the case number(s) to print certain cases (all variables). When you arrive at the print screen, make sure that the "Selection" option is highlighted prior to clicking the OK.

The "Options" Option

As a starting point, acquaint your students with the "Options" option. There are a variety of irritants in SPSS PASW Statistics default formatting that you can eliminate with an appropriate click in one of the "Options" sub categories. Of particular distress is the default practice of printing variable labels in your output rather than variable names. This creates chaos in your output tables because the labels are usually much too long to fit neatly in boxes. Whether the variable list is in dialog boxes is presented in alphabetical order or in the order of original entry also deserves attention. Based on your situation a strong preference for one of the other is almost always present. Become acquainted with the various options yourself, and then you will be able to help students as they learn to negotiate through SPSS PASW Statistics procedures.

