

IBM SPSS Statistics 29 Step by Step

A Simple Guide and Reference

EIGHTEENTH EDITION

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Preface

IBM SPSS Statistics Software (“SPSS”) is a powerful tool that is capable of conducting just about any type of data analysis used in the social sciences, the natural sciences, or in the business world. Mathematics is the language of science, and data analysis is the dialect of research. The present book is designed to make data analysis more comprehensible and less toxic.

In our teaching, we have frequently encountered students so traumatized by the professor who cheerily says, “Analyze these data on SPSS; read the help files if you need help” that they dropped the course rather than continue the struggle. It is in response to this anguish that the present book was conceived. In our previous jobs (before we became academic psychologists), Darren George taught high school mathematics, and Paul Mallery programmed computers and trained people how to use them. Both of us find great pleasure in the challenge of making a process that is intrinsically complex as clear as possible. The ultimate goal in all our efforts with the present book has been to make SPSS procedures, above all else, clear.

As the book started to take shape, a second goal began to emerge. In addition to making SPSS procedures clear to the beginner, we wanted to create a tool that was an effective reference for anyone conducting data analysis. This involved the expansion of the original concept to include most of the core statistical procedures in SPSS. The result of years of effort you now hold in your hands.

This edition includes one major update, and hundreds of minor changes. Most significantly, a new chapter describes SPSS’ new meta-analysis procedures. Although meta-analysis includes many complex possibilities that go beyond the scope of this book (and indeed, often go beyond the scope of SPSS’ capabilities), this new chapter will introduce meta-analysis and allow the most common kinds of analyses. Our hope is that this chapter will provide a solid foundation for students to learn about meta-analysis and researchers to perform the most common meta-analyses.

This book also includes many new screenshots, output details that have changed, and improvements to clarity throughout. As usual, every step-by-step sequence has been executed and all outputs scrutinized to make certain everything in the current edition is accurate.

While the first 17 chapters of the book cover basic topics and would be understandable to many with very limited statistical background, the final 13 chapters involve procedures that progressively require a more secure statistical grounding. Those 13 chapters have provided our greatest challenge. At the beginning of each chapter we spend several pages describing the procedure that follows. But, how can one adequately describe, for instance, factor analysis or discriminant analysis in five or six pages? The answer is simple: We can’t, but we can describe the procedures at a common sense, conceptual level that avoids excessive detail and excessive emphasis on computation that is useful as an introduction for beginners or as a useful adjunct to more advanced reading or mentoring for more advanced data analysts. Writing these introductions has not been at all simple. The chapter introductions are the most painstakingly worked sections of the entire book. Although we acknowledge the absence of much detail in our explanation of most procedures, we feel that we have done an adequate job at a project that few would even attempt. How successful have we been at achieving clarity in limited space? The fact that this book is now in its 18th edition, has been an academic best seller for most of those editions, and is distributed in 85 countries of the world suggests that our efforts have not been in vain.

SPSS Versions

This edition of the text is aligned perfectly with SPSS 29: We have checked every step-by-step procedure with SPSS 29. If you are using a previous version, you will find discrepancies; for example, if you use this book with SPSS 27, you will find many little changes and one big one (nothing in Chapter 30 will work).

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Acknowledgments

As we look over the creative efforts of the past years, we wish to acknowledge several people who have reviewed our work and offered invaluable insight and suggestions for improvement. Our gratitude is extended to Richard Froman of John Brown University, Michael A. Britt of Marist College, Marc L. Carter of the University of South Florida, Randolph A. Smith of Ouachita Baptist University, Roberto R. Heredia of Texas A&M International University, and several anonymous reviewers. We have had many editors over the years, who have all contributed to making this book what it is. Further, we would like to express gratitude to Luke Solomon, the IT guy at Burman University, as Paul and I have worked toward fluency in the Adobe programs InDesign, Illustrator, and Photoshop. And then there's the people who supported us more broadly: Our families and friends who endured while we wrote this. Particular notice goes to our wives Elizabeth George and Suzanne Mallery as well as our families for their support and encouragement.

Chapter 1

An Overview of IBM® SPSS® Statistics

Introduction: An Overview of IBM SPSS Statistics 29

THIS BOOK gives you the step-by-step instructions necessary to do most major types of data analysis using SPSS. The software was originally created by three Stanford graduate students in the late 1960s. The acronym “SPSS” initially stood for “**S**tatistical **P**ackage for the **S**ocial **S**ciences.” As SPSS expanded their package to address the physical sciences and business markets, the name changed to “Statistical Product and Service Solutions.” In 2009 IBM purchased SPSS and the name morphed to “IBM SPSS Statistics.” SPSS is now such a standard in the industry that IBM has retained the name due to its recognizability. No one particularly cares what the letters “SPSS” stand for any longer. IBM SPSS Statistics is simply one of the world’s largest and most successful statistical software companies. In this book we refer to the program as **SPSS**.

1.1 Necessary Skills

For this book to be effective when you conduct data analysis with SPSS, you should have certain limited knowledge of statistics and have access to a computer that has the necessary resources to run SPSS. Each issue is addressed in the next two paragraphs.

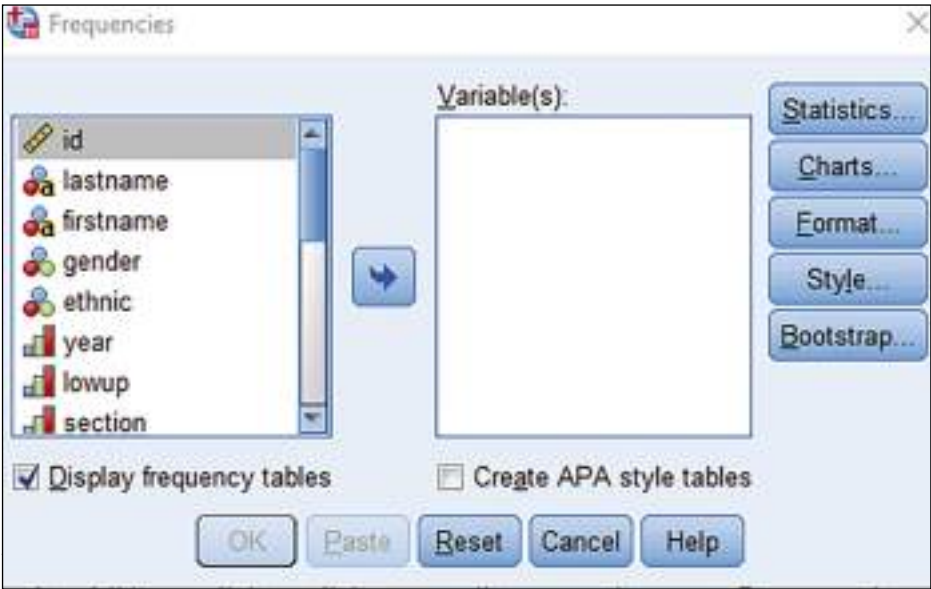
STATISTICS You should have had at least a basic course in statistics or be in the process of taking such a course. While it is true that this book devotes the first two or three pages of each chapter to a description of the statistical procedure that follows, these descriptions are designed to refresh the reader’s memory, *not* to instruct the novice. While it is certainly possible for the novice to follow the steps in each chapter and get SPSS to produce pages of output, a fundamental grounding in statistics is important for an understanding of which procedures to use and what all the output means. In addition, while the first 17 chapters should be understandable by individuals with limited statistical background, the final 13 chapters deal with much more complex and involved types of analyses. These chapters require substantial grounding in the statistical techniques involved.

COMPUTER REQUIREMENTS You must:

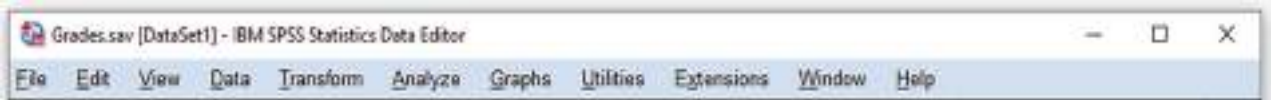
- Have access to a personal computer that has
 - Microsoft® Windows® 10 or higher; or Mac OS® 10.13 (High Sierra) or higher installed
 - IBM SPSS Statistics 29 installed.
- Know how to turn the computer on

THE SCREENS: Due to the very visual nature of SPSS, every chapter contains pictures of screens or windows that appear on the computer monitor as you work. The first picture from Chapter 6 (below) provides an example. These pictures are labeled “Screens” despite the fact that sometimes what is pictured is a screen (everything that appears on the monitor at a given time) and other times is a portion of a screen (a window, a dialog box, or something smaller). If the reader sees reference to Screen 13.3, she knows that this is simply the third picture in Chapter 13. The screens are typically positioned within breaks in the text (the screen icon and a title are included) and are used for sake of reference as procedures involving that screen are described. Sometimes the screens are separate from the text and labels identify certain characteristics of the screen (see the inside front cover for an example). Because screens take up a lot of space, frequently-used screens are included on the inside front and back covers of this book. At other times, within a particular chapter, a screen from a different chapter may be cited to save space.

Screen 1.1 The Frequencies Window



Sometimes a portion of a screen or window is displayed (such as the menu bar included here) and is embedded within the text without a label.



The Step by Step boxes: Text that surrounds the screens may designate a procedure, but it is the Step by Step boxes that identify exactly what must be done to execute a procedure. The following box illustrates:

In Screen	Do This	Step 3 (sample)
Front1	File → Open → Data [or]	
Front2	type grades.sav → Open [or grades.sav] Data	