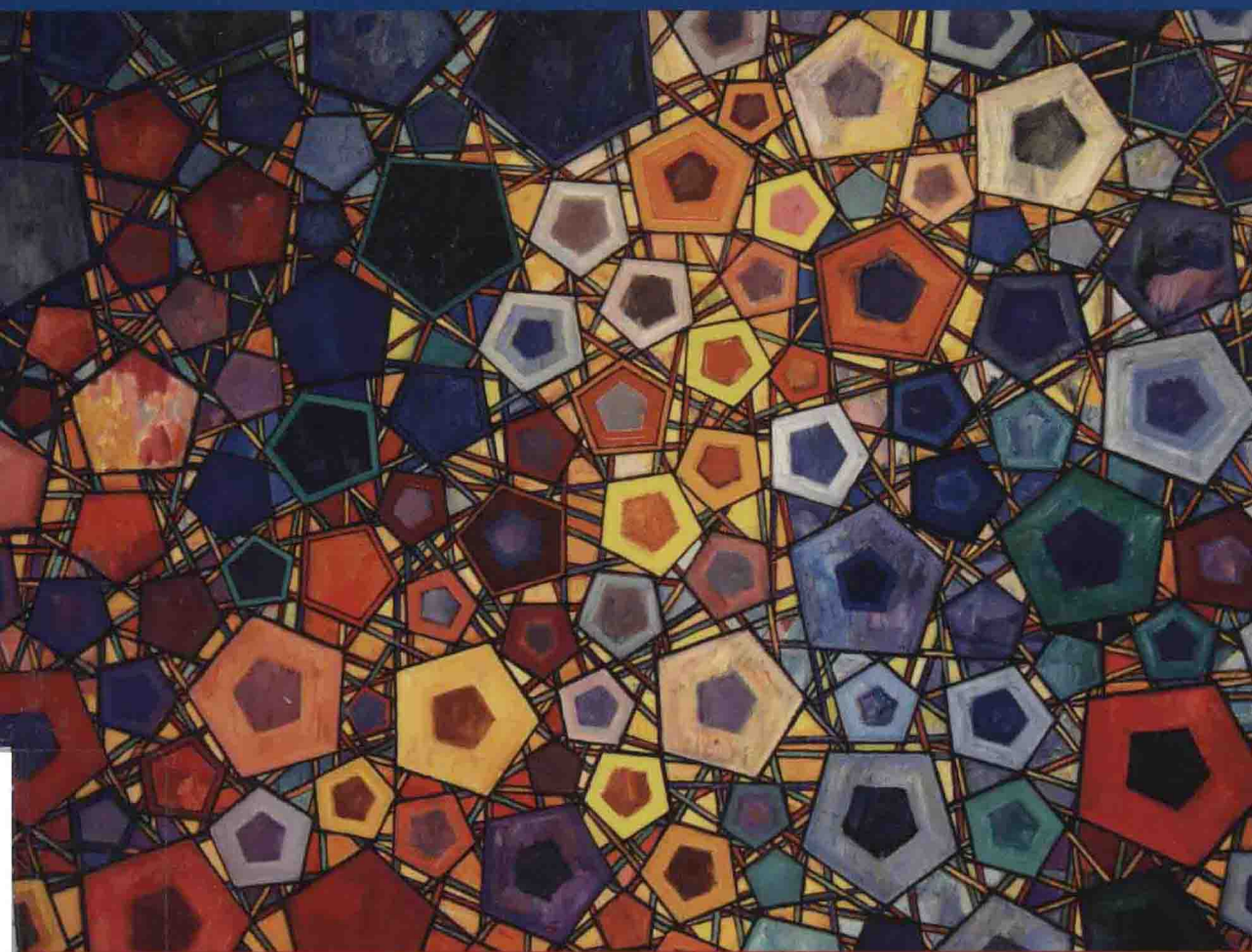


EXCEL 2010 EDITION

3^{EDITION}

Statistics for People Who *(Think They)* Hate Statistics



Neil J. Salkind



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Neil J. Salkind

University of Kansas



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PRAISE FOR STATISTICS FOR PEOPLE WHO (THINK THEY) HATE STATISTICS

Just a quick note to say "Thank You! I had my engineering analysis class last fall at Eastern Kentucky University and we used your book, *Statistics for People Who Think They Hate Statistics*. I learned so much and really appreciate it. I am currently doing some research and was reading another master's thesis on my subject and they were discussing "t-testing." I was so excited that I was able to grab my marked-up and highlighted book to review. I just had to write and thank you for producing a great book that I am able to use beyond a classroom. Again, thank you for making statistics a practical tool for my everyday life!

—Mark A. Campbell, CFPS, SET

As a statistics professional with a creative writing English BA, let me be just one of many to say thank you for your book. You have helped me find what I have been looking for my entire career, a passion. I thoroughly enjoyed your writing style, your explanation of theory and practical usage, the incorporation of Excel, chapter quizzes, and—most of all—the examples. I sincerely hope to find more of your work for my continued learning. Thank you again for your inspiration. You have made a running joke with my staff at the office more fun than ever, "I math do well!"

—Sam Johnson

I am taking statistics at the graduate level for a master's program—late in life I might add—and I hate statistics to the depth, breadth, and volume of all the oceans of all the earth combined. I do however, love statisticians. They . . . you are the resource for all things sadistically statistical . . . ?! Even more, I love brownies. And the recipe is fabulous. Thanks. This text has helped me more than any other, and I would be remiss if I did not give credit to my current instructor. Were it not for his style and sense of humor, stats would be lost on me. I think I will make brownies for class! (Mayonnaise?! Really, whoda thunk!)

—Bruce Bailey

Lead C.D. Technician

Hazelden Fellowship Club Intermediate

My name is Jessica Maes and I am currently working on attaining a master's degree in Curriculum and Instruction from New Mexico Highlands University. In the statistics class I am taking at this time, our required text is your book. I just wanted to take this time to tell you that your book has changed my perception and attitude towards statistics. I find that it is very well written, the language is completely user friendly, and the progression of new concepts within each chapter is fantastic. Although my class is only on Chapter 5 at this point, I have found my interest in the concepts and order in which you introduce them becoming greater. I THANK you with very much appreciation as I WAS someone who dreaded taking statistics and thought I hated it!

Very Grateful,

Jessica Maes

I am a full-time registered nurse of 19 years and have recently begun my journey of obtaining my Bachelor of Science in Nursing. Tomorrow is my first statistics class. I have just read your "note to student" and wanted to write to you and inform you that you have described my symptoms to a T. My classmates and I are extremely anxious about our course and what we are in for over the next three months. After reading these two pages, I wanted to tell you that you have alleviated some of my anxiety and allowed me to stop fretting about the unknown and begin to read on. Thank you for that. I am working a night shift tonight. Hopefully I will find time to read my required chapters with less anxiety and actually absorb some of the material I am reading. Thank you again. I will try and look forward to learning from your book, my excellent instructor, and my classmates.

Sincerely,

Lori Vajda, RN

It is easily the best book of its kind that I have come across. I enthusiastically recommend it for anyone interested in the subject—and even (and especially) for those who aren't!

—Professor Russ Shafer-Landau

University of Wisconsin

I just wanted to send a little "thank you" your way for writing an extremely user-friendly book, *Statistics for People Who (Think They) Hate Statistics*. I'm a psychology major doing an independent study over break (at Alverno College, a statistics course is a prerequisite for a class I'm taking this spring, Experimental Psychology). In other words, I'm pretty much learning this on my own (with a little guidance from my mentor), so I appreciate having a book that presents the material in a simple, sometimes humorous manner.

Sincerely,

Jenny Saucerman

Dr. Salkind's book is a "must read" for students who think they don't "do statistics." He writes clearly about statistical topics and has a unique way of making them fun. The book contains useful explanations, examples that help students understand the underlying concepts, and graphics that clarify the material without overwhelming the novice.

—Professor Nancy Leffert
Fielding Graduate Institute

I just wanted to let you know how much I enjoyed your book *Statistics for People Who (Think They) Hate Statistics* and how easily it jogged my faint memories of statistics (my work had been primarily in the clinical world before I returned to the academic world) and of SPSS. I am sure you hear from students all the time, but I wanted to let you know that even other academics find your book useful.

—Professor John T. Wu, EdD
Point Loma Nazarene University

Great presentations for a subject that tends to be esoteric—the text makes statistics alive and vibrant. I told my wife that the book reads like a novel—I can hardly put it down.

—Professor Kenrick C. Bourne
Loma Linda University

I love the clear description of the two-tailed test.

—Pepper
The author's dog

My students really appreciate your approach, which is making my job a lot easier.

—Professor Tony Hickey
Western Carolina University

Hello! First and foremost, I think your book is wonderful, and it is helping me tremendously in understanding concepts that, for instance, our chosen class textbook cannot. I am supplementing my class text with your book. Thanks so much!

—Melissa W.
Administrator

I love your book *Statistics for People Who (Think They) Hate Statistics*. I thought I did hate statistics; to be honest, I feared the concepts of stats, numbers, math, etc. . . . Ewwww! But thanks to your book, I understand it now (I get it). Your book gives me hope. I'm working on my PhD in nursing here in Baton Rouge, Louisiana, and I'm confident that I will ace my 100 percent online, graduate stats class. This text is my professor and guidance during these late nights of studying (my best time to study). This book is loaded with helpful tips and clarity, and it's fun. I love the part about the 100 airline pilots and the flying proficiency test. The lowest value was 60—"don't fly with this guy." Love it—funny. Thanks, Dr. Salkind.

—Del Mars

I studied statistics 20 years ago and recently moved from administration into health research. Your book has been a big help in reviewing basic statistics. I love the book! Please write another.

—Susan Lepre, PhD
Bergen County Department of Health Services

Hello! I bought your book at Barnes and Noble among 30 books that I browsed for my statistics class. I was intrigued by the title . . . and it was so simple to understand with the stepladder format. I followed those steps, and boy, they really work! Thanks a lot!

—Anne Marie Puentes-pina, RN, BSN
Legal Nurse Consultant

For my beginning students, this is the book that fits their needs. It is clear, concise, and not intimidating. It's even fun. I strongly recommend it.

—Professor Lew Marglois
School of Public Health, University of North Carolina

I have loved statistics ever since my second undergraduate course. Your book *Statistics for People Who (Think They) Hate Statistics* has cleared up confusion and partial understandings that I have had for years. It is a must for anyone beginning or continuing their journey in this science. I love it and will use it for all of the foreseeable future.

—Ronald A. Straube
Performance Improvement Coordinator, Mission Texas Regional Medical Center

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*Outside of a dog, a book is man's best friend.
Inside of a dog, it's too dark to read.*

—Groucho Marx



"Two Tails Up"
In memory of Pepper
1994–2009



A NOTE TO THE STUDENT: WHY I WROTE THIS BOOK

It's always fun to continue helping students learn new skills, and in writing this third edition of *Statistics for People Who (Think They) Hate Statistics, Excel 2010 Edition* (which focuses on the 2010 version of Excel), I hope that the process for you is interesting and productive.

What many of the students who study statistics, as well as people in various other roles (researchers, administrators, and professionals in many different fields), have in common (at least at the beginning of the course) is a relatively high level of anxiety, the origin of which is, more often than not, what they've *heard* from their fellow students. Often, a small part of what they have heard is true—learning statistics takes an investment of time and effort (and there's the occasional monster for a teacher).

But most of what they've heard (and where most of the anxiety comes from)—that statistics is unbearably difficult and confusing—is just not true. Thousands of fear-struck students have succeeded where they thought they would fail. They did it by taking one thing at a time, pacing themselves, seeing illustrations of basic principles as they are applied to real-life settings, and even having some fun along the way. That's what I tried to do in writing all the editions of *Statistics for People Who (Think They) Hate Statistics*, and I tried even harder in completing this revision.

After a great deal of trial and error, and some successful and many unsuccessful attempts, I have learned to teach statistics in a way that I (and many of my students) think is unintimidating and informative. I have tried my absolute best to incorporate all of that experience into this book.

What you will learn from this *Statistics for People . . .* is the information you need to understand what the field and study of basic statistics is all about. You'll learn about the fundamental ideas and the most commonly used techniques to organize and make sense out of data. There's very little theory (but some), and there are few mathematical proofs or discussion of the rationale for certain mathematical routines. And, for this Excel edition, you'll also learn how



ABOUT THE AUTHOR

Neil J. Salkind received his PhD from the University of Maryland in Human Development, and after teaching for 35 years at the University of Kansas, he remains as a Professor Emeritus in the Department of Psychology and Research in Education, where he continues to collaborate with colleagues and work with students. His early interests were in the area of children's cognitive development, and after research in the areas of cognitive style and (what was then known as) hyperactivity, he was a postdoctoral fellow at the University of North Carolina's Bush Center for Child and Family Policy. His work then changed direction and the focus was on child and family policy, specifically the impact of alternative forms of public support on various child and family outcomes. He has delivered more than 150 professional papers and presentations; written more than 100 trade and textbooks; and is the author of *Statistics for People Who (Think They) Hate Statistics* (Sage), *Theories of Human Development* (Sage), and *Exploring Research* (Prentice Hall). He has edited several encyclopedias, including the *Encyclopedia of Human Development*, the *Encyclopedia of Measurement and Statistics*, and the recently published *Encyclopedia of Research Design*. He was editor of *Child Development Abstracts and Bibliography* for 13 years and lives in Lawrence, Kansas, where he likes to read, swim with the River City Sharks, bake brownies (see the Excel version of *Statistics for People . . .* for the recipe at <http://www.statisticsforpeople.com>), and poke around old Volvos and old houses.

- In addition, more material is now included on the central limit theorem when the discussion of inferential statistics begins in Chapter 8.
- The third edition features the latest version of Excel, from Office 2010. There are some pretty significant changes from prior versions, so students (and others) might want to look through Appendix A, which is a quick guide to some main features. For example, many of Excel's functions have been renamed. Many of the names are pretty similar (for example, STDEV.P instead of STDEVP—we can live with that).
- Also, the Mac and Windows versions of Excel appear to be almost identical or very easy to use interchangeably, so users of this book can work on either platform—except for one huge caveat! The Mac version does not (yet) offer the handy-dandy Analysis ToolPak (discussed throughout the book). Yikes—what is Microsoft thinking? Instead, functions and formulas can be used (but without having as much fun). Data files between the two are interchangeable as well.

Whatever typos and such have appeared in any edition of this book are entirely my fault, and I apologize to the professors and students who were inconvenienced by their appearance. You can find a list of typos from the previous printings and editions of this book at www.statisticsforpeople.com. And I so appreciate all the letters, calls, and emails pointing out these errors and making this third edition a better book for it. We have all made every effort in this edition to correct them and hope we did a reasonably good job. Let me hear from you with suggestions, criticisms, nice notes, and so on. Good luck.

Neil J. Salkind
University of Kansas
njs@ku.edu

AND NOW, ABOUT THE THIRD EDITION . . .

What you read above about this book reflects my thoughts about why I wrote this book in the first place. But it tells you little about this new edition.

Any book is always a work in progress, and the Excel edition of *Statistics for People Who (Think They) Hate Statistics* is no exception. Over the past 5 years or so, many people have told me how helpful this book is, and others have told me how they would like it to change and why. In revising this book, I am trying to meet the needs of all audiences. Some things remain the same, and some have changed.

There are always new things worth consideration and different ways to present old themes and ideas. Here's a list of what you'll find that's new in the third edition of *Statistics for People Who (Think They) Hate Statistics, Excel 2010 Edition*.

- There are a bunch of new exercises at the end of each chapter. Not only are there more exercises, but they also vary more in their level of application and (I hope) interest. As in earlier editions, these exercises use data sets that are available at www.sagepub.com/salkindexcel3e, and you can also download them at www.onlinefilefolder.com. The username is ancillaries, and the password is files. Locate the files you want and then just right-click your mouse and select Download. And, if you have any trouble downloading from either, or both, of these sites, email me and I will send them to you immediately. The version of Excel that these were developed for is Excel 2010, but these files will work with earlier versions of the application as well.
- The answers to the Time to Practice questions are now in a separate appendix (Appendix D). After going back and forth with students and faculty, this seemed to be the winning location.
- A new Chapter 10, which includes one-sample tests, fills the hole that was present in the last edition. It's a nice, simple introduction to inferential testing.



ACKNOWLEDGMENTS

Everybody, and I mean everybody (including Steve in shipping, Kalie in editorial, and Nicole in marketing) at SAGE deserves a great deal of thanks for providing me with the support, guidance, and professionalism that takes only an idea (way back before the first edition) and makes it into a book like the one you are now reading, and then makes it successful.

However, there are some people who have to be thanked individually for their special care and hard work. C. Deborah Laughton supported the original idea for this type of book, and Lisa Cuevas-Shaw encouraged the writing of this particular book, which uses Excel as a framework for teaching introductory statistics. Vicki Knight is the publisher who saw to it that this revision reached fruition, and she has provided the support and patience necessary to make this a reality. Her experience, insight, and advocacy are an author's dream. I am greatly appreciative. Others who deserve a special note of thanks are Lauren Habib, associate editor; Kalie Koscielak, editorial assistant; Nicole Elliott, marketing manager; and Libby Larson, production editor. Special thanks goes to Paula Fleming for her sharp eye and sound copy editing, which makes this material read as well as it does.

I also want to thank the following people for their help in providing feedback on the previous edition as well as this edition. Apologies to those I may have missed.

Stacey Barlow Hills, Utah State University

Deborah Behan, University of Texas at Arlington

Teresa Martinelli-Lee, University of La Verne

Chris O. Odionu, Alabama A & M University

Andrew Tinsley, Eastern Kentucky University



AND A (LITTLE) NOTE TO THE INSTRUCTOR

This is the first time I have included a note to the instructor in any of the editions of this book, and I would like to share two things.

First, I applaud your efforts at teaching these materials. While they may be easier for some students, most find the material very challenging. Your patience and hard work is appreciated by all, and if there is anything I can do to help, please send me a note.

Second, the Excel edition of *Statistics for People Who (Think They) Hate Statistics* is not meant to be a dumbed-down book similar to others you may have seen. Nor is the title meant to convey anything other than the fact that many students new to the subject are very anxious about what's to come. This is not an academic version of a book for dummies or anything of its kind. I have made every effort to address students with the respect they deserve, to not patronize them, and to ensure that the material is approachable. How well I did in these regards is up to you, but I want to convey my very clear intent and feeling that this book contains the information needed in an introductory course and, even though there is some humor involved in my approach, nothing about the intent is anything other than serious. Thank you.

to better understand the world of statistics through the use of an easy to use, and powerful, tool.

Why isn't theory and other stuff in *Statistics for People Who (Think They) Hate Statistics*? Simple. Right now, you don't need it. It's not that I don't think it is important. Rather, at this point and time in your studies, I want to offer you material at a level I think you can understand and learn with some reasonable amount of effort, while at the same time not be scared off from taking additional courses in the future. I (and your professor) want you to succeed.

So, if you are looking for a detailed unraveling of the derivation of the analysis of variance F ratio, go find another good book from SAGE Publications (I'll be glad to refer you to one). But if you want to learn why and how statistics can work for you, you're in the right place. This book will help you understand the material you read in journal articles, explain what the results of many statistical analyses mean, and teach you how to perform basic statistical work.

And, if you want to talk about any aspect of teaching or learning statistics, feel free to contact me. You can do this through my email address at school (njs@ku.edu). You can also keep up on anything new regarding this edition (and all versions of *Statistics for People . . .*) by going to www.statisticsforpeople.com.

Good luck, and let me know how I can improve this book to even better meet the needs of the beginning statistics student.



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