

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

5  
EDITION

Neil J. Salkind



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



Neil J. Salkind

*University of Kansas*

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2455 Teller Road  
Thousand Oaks, California 91320  
E-mail: [order@sagepub.com](mailto:order@sagepub.com)

SAGE Publications Ltd.  
1 Oliver's Yard  
55 City Road  
London EC1Y 1SP  
United Kingdom

SAGE Publications India Pvt. Ltd.  
B 1/1 Mohan Cooperative Industrial Area  
Mathura Road, New Delhi 110 044  
India

SAGE Publications Asia-Pacific Pte. Ltd.  
3 Church Street  
#10-04 Samsung Hub  
Singapore 049483

Acquisitions Editor: Vicki Knight  
Editorial Assistant: Jessica Miller  
Assistant Editor: Katie Guarino  
Production Editor: Libby Larson  
Copy Editor: Paula L. Fleming  
Typesetter: C&M Digitals (P) Ltd.  
Proofreader: Wendy Jo Dymond  
Indexer: Molly Hall  
Cover Designer: Candice Harman  
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Printed in the United States of America

*Library of Congress Cataloging-in-Publication Data*

Salkind, Neil J.

Statistics for people who (think they) hate statistics / Neil J. Salkind. — Fifth edition.

pages cm  
Includes bibliographical references and index.

ISBN 978-1-4522-7771-4 (pbk.)  
ISBN 978-1-4833-1288-0 (web pdf)

1. Statistics. I. Title.

HA29.S2365 2013  
519.5—dc23 2013029357

This book is printed on acid-free paper.



13 14 15 16 17 10 9 8 7 6 5 4 3 2 1

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Statistics for People Who (Think They) Hate Statistics  
Neil J. Salkind  
5th Edition

**About the Book**  
The bestselling *Statistics for People Who (Think They) Hate Statistics* is now in its Fifth Edition! Continuing its hallmark use of humor, the text helps students develop an understanding of an often-misleading and difficult subject with an approach that is informative, personable, and clear. Author Neil J. Salkind takes students through various statistical procedures, beginning with correlation and graphical representation of data and ending with inferential techniques and analysis of variance. In addition, the book covers SPSS and includes reviews of most advanced techniques, such as reliability, validity, and introductory non-parametric statistics. The new Fifth Edition offers more examples than ever before, and a new Real World Stats feature at the end of each chapter. In addition, an interactive eBook edition (available spring 2014) features annotated figures, quiz questions, video clips, and more.

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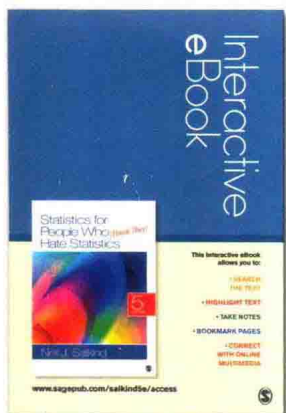
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NEIL J. SALKIND

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

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“I am a 58-year-old student at California State University, Northridge, and I have been taking Sociological Statistics this summer. I have been math phobic since the eighth grade, and I have been TERRIFIED of taking statistics for many years. Your textbook was a pure joy! It was so clear and concise and I loved the humor!!!”

Most sincerely,  
Kathy Culp

“I just wanted to say that as a SUNY Delhi online RN-to-BSN student one day into Statistics 101—your book has saved my career! I put off my BSN due to statistics, even enrolling and then backing out a couple of times. I have read the first two chapters and already “get it.” I know it will get harder, but I am so thankful for your easy-to-understand method. I told my husband last night I actually might like statistics and enjoy it. I was also thankful for the basic math review. No one ever broke it down like that for me, to the point where I was in remedial math in high school and still never got it. I no longer fear math or statistics.”

—Meghan Wheeler, RN

“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  
Mission Texas Regional Medical Center

“Dr. Salkind, I just felt compelled to send you a note thanking you for such a great book—*Statistics for People Who (Think They) Hate Statistics*.

“I bought a house two years ago. The people who lived there previously left the book behind. I didn’t throw it out because I am a book nut.

“Anyway, I have started work on a graduate degree in psychology and decided to pull your book out. This book has been a godsend. It is absolutely the best statistics book I have ever encountered when it comes to explaining things in understandable terms.

“It was well worth the 100K for the house, LOL!”

Bless you!!  
Brian Wright

“The project team of Denise, Renee, Shawn, and Trish stated for their research hypothesis that brownies made with regular flour would be preferred to those made with gluten-free flour. The brownie recipe chosen was “The Reward” in Appendix E. Denise made the



gluten-free brownies, Renee made the regular brownies, and our sample was our fellow students at Tusculum College. We used an ordinal survey process for rating the brownies on a scale from 1 to 5, with 1 being the worst and 5 being the best brownies you ever had. The gluten-free brownies won, disproving the research hypothesis. The mean and mode were the chosen method of comparison. The gluten-free brownies had a mean/mode of 4, and the regular brownies had a 3. The range for the gluten-free brownies was wider than the range for the regular-flour brownies. All who participated in the survey LOVED the brownies.

“This came about because I asked our instructor if we were going to use the information in Appendix E. Neither my instructor nor my classmates had checked out this particular appendix. The instructor told me I could make the brownies and bring them to class. That is when I told my instructor that I had celiac disease and only had gluten-free flour in my home. Usually gluten-free items are not preferred because of their texture. The instructor had always wanted to try something that was gluten-free, and that was how our in-class experiment was born.”

—Denise Proske  
Tusculum College

“I am a ‘nontraditional’ (that’s how the nice folks at the University of Dayton refer to ‘older’) grad student enjoying your *Statistics for People Who (Think They) Hate Statistics*. Although I publicize research in my job, being involved in research and statistics myself is an entirely new challenge. So please count me as one of the countless who appreciate your approach to statistics with a sense of humor—it definitely helps alleviate the intimidation factor of the subject.

“Thanks again for taking on this (and other topics) in such a ‘human’ way :-).”

Best regards,  
Pamela Gregg  
Communication Administrator  
University of Dayton Research Institute

“I just thought I would send a little positive reinforcement your way! As an undergraduate psychology student, I was urged by a friend to purchase your book but not, as you may think, for a stats class. I had taken the required stats class two years prior and had learned NOTHING! As I embarked on my senior honors thesis, I began to feel slightly—maybe more like extremely—overwhelmed by all of the data analysis I was about to undertake. That was when a friend of mine suggested I buy your book. My first reaction? ‘I’m not buying another statistics book just for the fun of it!’ Well after much prodding, I eventually bought it (the second edition at the time). Now as I take on statistics (multivariate, yikes!) yet again, only this time as a third-year graduate student, I find myself keeping your book alongside as an anxiety-reducing companion!

“Thanks for making statistics bearable for all these years!”

—Ashley Shier, MEd  
University of Cincinnati  
School of Psychology Doctoral Student

“Salkind’s examples assist with the application of key concepts and tests. The book is easy to read due to the way information is presented, such as the Tech Talk, Things to Remember, the Key to Difficulty Index, the various 10 lists, the icons, and the illustrations—including the cartoons. Even the title brings laughter to students—and humor can be a great antidote to stress!”

—Mary Beth Zeni  
Florida State School of Nursing

“Hi, Mr. Salkind,

“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 students’ 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 3 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 over 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

“I am a doctoral student, and we simply love your book.”

—Marisol Miller  
PhD candidate

“Dear Prof Salkind,

“I just want to thank you for the amazing book, *Statistics for People Who (Think They) Hate Statistics*. I definitely used to be one among them who hated statistics and used to ignore it so far. Now, as I am almost in the finishing of my PhD, I was thinking it would be a shame if I don’t have a minimum knowledge of statistics. The book has not just helped my understanding in the subject, but it inspires me to do further reading in statistics. I have even recommended the book to a few within 2 days! Thank you so much for such a wonderful work!”

—A. J. Padman

“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, 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. I only suggest writing another textbook at a higher level of statistics so I can read that one too!”

Sincerely,  
Jenny Saucerman

“I liked its humorous approach, which indeed helps to reduce statistical anxiety. The design of the book is inviting and relaxing, which is a plus. The writing style is great, and the presentation is appropriate for my students. A fun and well-written book, it is easy to read and use and presents statistics in a user-friendly way. . . . I would recommend it for sure.”

—Minjuan Wang  
San Diego State University

“Let me thank you for a wonderful textbook. Of all the texts I have used over the years, I would have to rate yours #1 for presenting material that can be followed and understood.”

—Carolyn Letsche  
MA Student in School Counseling

“I just wanted to take a moment of your time to inform you that I have selected your book, *Statistics for People Who (Think They) Hate Statistics*, to use in my course. I truly agree with the direction you have taken with your book, and I know that our students will appreciate it just the same.”

—Karl R. Krawitz  
Baker University

“Salkind’s book is in a class by itself. 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!”

—Russ Shafer-Landau  
University of Wisconsin

“*Statistics for People Who (Think They) Hate Statistics* is definitely the right book for people who have to overcome that familiar anxious feeling when opening a standard statistics book and who having finally managed to do so are still not able to make much sense of it all. The book by Salkind is easy and pleasant to read and one that hardly needs any pre-knowledge of the field to be able to follow the author’s train of thoughts. Salkind has managed to bring statistics home to people who hate statistics or thought they did.”

From a review in *Statistical Methods in Medical Research*  
(Arnold Publications)

—Dr. Andrea Winkler  
Maudsley and Bethlem Hospital  
London, UK



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*This book is dedicated with love and admiration to Sara, Micah,  
and Ted—simply the best—and to all the Sharks, and the very good  
people at Red Ink who keep us moving.*

*And, for Pepper*



1994–2009

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

—Groucho Marx

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## A NOTE TO THE STUDENT: WHY I WROTE THIS BOOK

**W**ith another new edition (now the fifth), I welcome you to what I hope will be, in all ways, a good learning experience. I am sometimes overwhelmed by the opportunity to continue to revise this book and the pleasure it brings me and, I hope, brings you.

What many students of introductory statistics (be they new to the subject or just reviewing the material) have in common (at least at the beginning of their studies) 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 the first four 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 book 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 discussions of the rationale for certain mathematical routines.

Why isn't this theory stuff and more 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 (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 tasks.

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

## **AND A (LITTLE) NOTE TO THE INSTRUCTOR**

---

I would like to share two things.

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

Second, *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 or textbook version of a "book for dummies" or anything of the kind. I have made every effort to address students with the respect they deserve, not to 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 that this book contain the information needed in an introductory course, and even though my approach involves some humor, nothing about my intent is anything other than serious. Thank you.



# ACKNOWLEDGMENTS

**E**verybody at SAGE deserves a great deal of thanks for providing me with the support, guidance, and professionalism that takes a mere 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, some people have to be thanked individually for their special care and hard work. Vicki Knight, publisher, Research Methods and Statistics, has shepherded this edition, being always available to discuss new ideas and seeing to it that everything got done on time and done well. She is the editor whom every author wants. Lisa Cuevas Shaw and C. Deborah Laughton, both previous editors, helped this book along the way, and to them, I am forever grateful. Others who deserve a special note are Katie Guarino, assistant editor; Lauren Habib, digital content editor; Nicole Elliott, marketing manager; and Libby Larson, production editor. Special, special thanks goes to Paula Fleming for her sharp eye and sound copyediting, which make this material read as well as it does. Libby and Paula are the best in the galactic empire. And, special thanks to Dr. Patrick Ament University of Central Missouri who, along with his very capable students, took the time to send me detailed feedback about typos, suggestions for changes, and more, making this edition much more accurate and complete than the previous one. Thanks to Patrick and his students.

SAGE would like to thank the following peer reviewers for their editorial insight and guidance:

Muhammet Bas  
Harvard University

Daniel R. Block  
Chicago State University

Karij Lindstrom Bremer  
Minnesota State University, Mankato

Robert S. Bristow  
Westfield State University

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## AND NOW, ABOUT THE FIFTH EDITION . . .

**W**hat 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 fifth edition.

Any book is always a work in progress, and this latest edition of *Statistics for People Who (Think They) Hate Statistics* is no exception. Over the past 13 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 indeed 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 fifth edition of *Statistics for People Who (Think They) Hate Statistics*.

- It seems like everyone always wants more exercises for practice, and we hope that the new ones (between two and four per chapter) found at the end of each chapter do not disappoint. They vary in their level of application and (I hope) interest. These exercises use data sets that are available in the back of this book and online (see below).
- These data sets continue to come in two flavors—SPSS (that popular statistical analysis program) and Excel (the spreadsheet that many people use for data analysis). These data sets are available in Appendix C as well as online at
  1. the SAGE website: [www.sagepub.com/salkind5e](http://www.sagepub.com/salkind5e).
  2. the author's website: [www.onlinefilefolder.com](http://www.onlinefilefolder.com). The username is *ancillaries* and the password is *files*. Locate the files you want in the Excel or SPSS folder and then just right-click your mouse and select Download.



Scan this QR code to visit Neil Salkind's website, **statistics for people.com**.