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Preface

I decided to write this book in order to convince the next generation of students and researchers that data analysis is a powerful tool for answering many important and interesting questions about societies and human behavior. Today's societies confront a number of challenging problems, including those in economics, politics, education, and public health. Data-driven approaches are useful for solving these problems, and we need more talented individuals to work in this area. I hope that this book will entice young students and researchers into the fast-growing field of quantitative social science.

This book grew out of the two undergraduate courses I have taught at Princeton over the last several years: POL 245: Visualizing Data and POL 345: Quantitative Analysis and Politics. While teaching these courses, I realized that students need to be exposed to exciting ideas from actual quantitative social science research as early in the course as possible. For this reason, unlike traditional introductory statistics textbooks, this book features data analysis from the very beginning, using examples directly taken from published social science research. The book provides readers with extensive data analysis experience before introducing probability and statistical theories. The idea is that by the time they reach those challenging chapters, readers will understand why those materials are necessary in order to conduct quantitative social science research.

The book starts with a discussion of causality in both experimental and observational studies using the examples of racial discrimination and get-out-the-vote campaigns. We then cover measurement and prediction as two other primary goals of data analysis in social science research. The book also includes a chapter on the analysis of textual, network, and spatial data, giving readers a glimpse of modern quantitative social science research. Probability and statistical theories are introduced after these data analysis chapters. The mathematical level of the book is kept to a minimum, and neither calculus nor linear algebra is used. However, the book introduces probability and statistical theories in a conceptually rigorous manner so that readers can understand the underlying logic.

This book would not exist without support from a number of individuals. I would like to thank my colleagues at Princeton, especially those in the Dean of the College's office and the McGraw Center for Teaching and Learning, for their generous support. I was one of the first beneficiaries of the 250th Anniversary Fund for Teaching Innovation in Undergraduate Education. I thank Liz Colagiuri, Khristina Gonzalez, Lisa Herschbach, Clayton Marsh, Diane McKay, and Nic Voge, who trusted my ambitious vision of how introductory data analysis and statistics should be taught.

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They allowed me to design a course at the Freshman Scholars Institute (FSI), and many of the ideas in this book were born there. The FSI is a great diversity initiative for first-generation college students, and I am proud to be a part of it. I am also grateful to Princeton University administrators for their generous support for my teaching initiatives. They include Jill Dolan, Chris Eisgruber, Dave Lee, Nolan McCarty, Debbie Prentice, and Val Smith.

I especially thank my coinstructors who helped me develop the materials included in this book. James Lo, Jonathan Olmsted, and Will Lowe made significant contributions to POL 245 taught at FSI. I was fortunate to have an amazing group of graduate students who served as teaching assistants for my courses. They include Alex Acs, Jaquilyn Waddell Boie, Will Bullock, Munji Choi, Winston Chou, Elisha Cohen, Brandon de la Cuesta, Ted Enamorado, Matt Incantalupo, Tolya Levshin, Asya Magazinnik, Carlos Velasco Rivera, Alex Tarr, Bella Wang, and Teppei Yamamoto, several of whom won teaching awards for their incredible work. Evan Chow and Hubert Jin contributed to the creation of **swirl** exercises. Other students, including Alessia Azermadhi, Naoki Egami, Tyler Pratt, and Arisa Wada, helped me develop materials at various stages of this book project.

During the production phase of this book, the following individuals gave me detailed comments and suggestions that have significantly improved the presentation: Jaquilyn Waddell Boie, Lauren Konken, Katie McCabe, Grace Rehaut, Ruby Shao, and Tyler Simko. Without their contributions, this book would have looked quite different. I also thank at least several hundred students at Princeton and many other institutions who used an earlier version of this book. Their extensive feedback has helped me revise the manuscript. I also thank Neal Beck, Andy Hall, Ryan Moore, and Marc Ratkovic for their comments on earlier versions of the manuscript. I wish to thank Eric Crahan and Brigitte Pelner of Princeton University Press for guiding me through the publication process.

Several people had a significant impact on how this book is written. My graduate school adviser, Gary King, taught me everything, from how to conduct quantitative social science research to how to teach statistics to social scientists. Although more than a decade has passed since I left Harvard, Gary has always been someone to whom I can turn for advice and support. Three of my Princeton colleagues—Christina Davis, Amaney Jamal, and Evan Liebenman—formed the team "old dogs learning new tricks" and took the three-course graduate quantitative methods sequence. Their willingness to patiently sit through my lectures gave me new motivation. They also set a great example for young researchers that even senior scholars should continue learning. Interactions with them during those classes gave me new insights about how statistical methods should be taught.

My deepest gratitude goes to my family. My mother, Fumiko, my father, Takashi, and my brother, Mineki, have always encouraged me to pursue my dreams regardless of what they are. Although we now live on opposite sides of the globe, every day I feel lucky to have such a wonderful family. My parents-in-law, Al and Carole Davis, have been supportive of me since the mid-1990s when I first came to the United States without being able to speak or understand much English. They have always made me feel at home and part of their family. My two wonderful children, Keiji and Misaki, have been a source of joy and happiness. However difficult my work is, their beautiful

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smiles remind me what the most important things are in my life. Finally, I dedicate this book to my wife, Christina, who has been the best partner and a constant source of inspiration for more than two decades. Christina encouraged me to write this book, and as always I am glad to have followed her advice. Even though one never observes counterfactuals, I can say with confidence that I have lived and will continue to live life to the fullest because of our partnership.

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November 2016
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