RESEARCH METHODS AND STATISTICS

Research Methods and Statistics provides a seamless introduction to the subject, identifying various research areas and analyzing how one can approach them statistically. The text provides a solid empirical foundation for undergraduate psychology majors, and it prepares the reader to think critically and evaluate psychological research and claims they might hear in the news or popular press. The text can be used in all statistics, methods, and experimental psychology courses.

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As always, I dedicate this book to Linda, Agatha, and Simon—my wonderful family that makes it all worthwhile.

—Barney Beins

I dedicate this book to Dennis, Mary Ann, Tom, Dan, and Brenda—as they made this work possible.

—Maureen McCarthy

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PREFACE

Students who are curious and who like solving puzzles are ideal candidates for a course in psychological research methods. We developed this book in order to meet the needs of students who are learning to think like psychologists. We assume that you have already completed at least one course in psychology and have developed an interest in the discipline, so you are ready to apply your knowledge to ask and answer questions about thought, attitude, and behavior.

We also think that you are probably uncertain about the prospect of learning about statistics and the methods of research. Throughout the book, we have tried to show how the content of this course involves tools for understanding people. What is most important is that these tools help us learn about people and other animals. So we worked to create a book that will not let you lose sight that psychologists focus on questions about what people do and why they do it.

To benefit from your course on asking and answering research questions about people, you only need to bring your sense of curiosity and a willingness to puzzle through the complexities of behavior. It is not always an easy task, but it is an interesting task. And at the end of a research project, you know something that nobody else in the world knows; you have created knowledge through your research that helps us advance, one step at a time, what we know about people.

Throughout the book, we have tried to make our writing as clear and accessible to you as possible. There are technical terms that you need to learn and understand, but we strove to minimize wording that would distract you from the points that we think you should know. As we progress through each chapter, our goal is to help you gradually build your skill set. First, we introduce basic tools for understanding research, then we show how you use those tools. At each step along the way, your knowledge will grow until, at the end of the course, you will understand the process of planning a research project, carrying it out, and then drawing conclusions about the question that interests you. And, as we mentioned before, at the end of your project, you will know something that nobody else in the world knows. You will have created a new nugget of knowledge.

In order to think like a psychologist, you have to acquire some skills that you may not already have. These skills include the ability to formulate a question that can be answered through psychological, scientific procedures; to develop a plan for arriving at a valid answer; and to draw conclusions that are sound.

You must also learn how to analyze data that you might collect to answer a research question. We explain basic statistical concepts using a clear and direct approach. We focus on helping you to understand how and why to use statistics rather than emphasizing calculations of statistics. After all, statistical software is very useful for performing the actual calculations.

As you learn the tools of research, we will show you how psychologists have studied interesting topics using those tools. Previous research is often the key to developing new projects. With the diversity of topics we provide in this book, you will be able to see the diversity of projects that psychologists undertake. We also give ideas about how to extend previous research. To help you solidify your knowledge, we have created problem sets for you to use to check your progress.

In addition, we have provided guidance for writing research reports. Psychologists typically use the style of the American Psychological Association. There are a lot of details, but we have outlined them in a way that will make it possible for you to create a report that conforms closely to APA style. Beyond the written report, we have also included ways to enhance a poster presentation of your work and an oral presentation.

The book has six sections, each with its own focus. The first section (Chapter 1) introduces you to the general principles of scientific research. The second section (Chapters 2 to 5) provides practical guidance for creating a sound research project. The third section (Chapters 6 to 10) describes how to set up experiments and analyze data to draw conclusions about behavior. The fourth section (Chapters 11 to 13) provides information about nonexperimental types of research, like surveys and case studies and ways to make sense of the data. The fifth section (Chapter 14) shows how individual and cultural differences can affect research results. This final chapter is unique to this book; most treatments of research methods do not consider the effects of culture, race, ethnicity, gender, and so forth in research. We have tried to remedy this shortcoming to account for these important issues.

In order to help instructors with their work, we have included supplements to this book. The instructors' manual includes many activities that will help students to actively engage in creating research designs and interpreting statistical analyses. Laboratory and data-collection exercises will help students understand how psychologists actually collect and analyze data. The data sets will be particularly useful for small classes that may not have enough students to generate data with sufficient power to detect real differences across groups or correlations among variables. The data sets are the result of participation of students across many semesters.

We also provide instructors with PowerPoint slides that will aid in presenting information to students in a traditional class setting or in an online format. A set of testing materials for evaluating student progress is also available to faculty. We provide questions in a variety of formats to aid instructors in designing tests that might be used in a variety of instructional formats.

We are happy to acknowledge the people who have helped us bring this project to a successful conclusion. They include a group of fastidious reviewers who provided very helpful feedback during the development of the book: Pam Ansburg, Metropolitan State College, Denver; Joan Bihun, University of Colorado, Denver; Alaina Brenick, University of Maryland; Jay Brown, Texas Wesleyan University; Stephen Burgess, Southwestern Oklahoma State University; Pamela Costa, Tacoma Community College; Alyson Froehlich, University of Utah; Don Hantula, Temple University; Constance Jones, California State University, Fresno; David Kreiner, University of Central Missouri; Marianne Lloyd, Seton Hall University; Bryan Myers, University of North Carolina, Wilmington; Katia Shkurkin, St. Martin's University; and Eric Stephens, University of the Cumberlands. We also want to thank Tim Martin and Terry Jorgensen, Kennesaw State University, and Sue Frantz, Highline Community College, for their technical help.

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