

## Research Methods and Statistics in Psychology

Second edition

*Research Methods and Statistics in Psychology* provides a seamless introduction to statistics and research in psychology, 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. This second edition features updated examples of research and new illustrations of important principles. It also includes updated coverage of ethical issues in research and of current diversity issues.

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# Research Methods and Statistics in Psychology

**Second edition**

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*For my parents, Dennis and Mary Ann McCarthy.*

— M.A.M.

*For Linda, Agatha, Simon, Evie, and Julian, who are significant in so many ways.*

— B.C.B.

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## Preface

Students who are curious and who like solving puzzles are ideal candidates for a course in research methods and statistics. We developed this book to meet the needs of students who are learning to investigate human behavior. We assume that you have already completed one course in psychology and have developed an interest in the discipline, so you are ready to apply your knowledge to ask questions about behavior. Throughout this book, we tried to show how research methods and statistics can be used to help us understand people. We worked to create a book that will help you understand that psychologists focus on questions about what people do and why they do it.

Psychologists have also used research to help us understand and predict behavior. Courses in statistics and research methods will give you the tools to conduct research yourself. Any study you conduct could add to our knowledge of what people are like, how they behave, and what you might predict about them in the future. You can use the tools that you will learn to conduct your own research into human behavior. At the end of your research project, you will have discovered something that nobody else in the world knows; you have created knowledge 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 as possible. There are technical terms that you need to learn, but we strove to minimize wording that would distract you from the essential points that you need to understand. This book is designed to help you build your skill set. First, we introduce basic tools for understanding research, then we demonstrate how to use these tools. At each step along the way we introduce new tools, so that by the end of the text you will understand the entire process of planning a research project, conducting the project, and drawing conclusions.

We also provide guidance for writing research reports. Psychologists typically use the style of the American Psychological Association (APA) to write reports. There are a lot of details, so we have outlined them in a way that will allow you to create a report that conforms to APA style. We have also included ways that you can enhance a poster presentation of your work.

Your course in statistics and psychological research will let you develop skills needed to conduct research projects yourself. But even if you don't engage in research, this course will help you learn to evaluate information to determine if it is credible. This is one of the most important aspects of becoming scientifically literate and becoming an effective contributor to society, which increasingly relies on scientific knowledge. Scientific awareness is important because, with newly developed artificial intelligence applications, a computer can gather information and summarize it more quickly than a person can. But the computer can't evaluate the validity of claims that are made. That is something that you need to do. Understanding research can aid you in evaluating claims that people make.

Ultimately, knowledge about how we use statistics and understand research helps us live better lives through understanding human behavior. The purpose of this book is to show you how scientists apply statistics to research that has helped us to discover why we think, act, and behave as we do. Beyond this, it is as important to be able to recognize good arguments based on statistics and research and to reject invalid claims that do not use scientific methods. With this knowledge, you will be able to make better decisions as you move through life.

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## Advantages to this Book

There are several advantages to using this book. We hope the format of the chapters and the varied features both enhance the learning of statistical and research techniques and foster an appreciation of why research is important. The features include the following:

- Clear and engaging writing style that will capture the reader's interest.
- Presentation of important concepts without reliance on excess technical jargon.
- A chapter focusing specifically on diversity and its importance in understanding behavior.
- Presentation of research that involves diversity in sampling, going beyond the typical American undergraduate groups.
- Demonstrations of the wide range of methods that psychological scientists use to address varied research questions.
- Interesting examples that relate to the lives that people lead.
- Discussions that show how laboratory studies are important to everyday life.
- Explanations of research that has an impact on important societal issues.
- Inclusion of end-of-chapter practice quizzes with multiple-choice and short-answer items for each chapter.

## Using this Book

This book is intended for students who are newly involved in learning about and conducting research, and applying statistics. Instructors do not need to follow the order of chapters. Students can benefit from the material in the book when the presentation of chapters is changed.

The order of the chapters is such that the first four chapters provide the basic philosophy of research and elements of critical thinking and scientific literacy. After students learn this introductory material, they will have the essential tools to create a research project. The next five chapters provide the basis for understanding and applying elementary statistics with the context of experimental research designs, while the following two chapters cover more advanced research and data analysis techniques. The subsequent two chapters deal with nonexperimental designs and correlational approaches that are valuable in spotting relations among variables even when we cannot draw conclusions about causation.

Finally, we have included a chapter that specifically addresses diversity in psychological research. With the changes in society associated with issues of race, ethnicity, nationality, sex and gender, and so forth, it is important to be aware of the impact of these factors on the people we study.

This text provides comprehensive coverage of research methods and statistical analysis consistent with the undergraduate curriculum in psychology (APA, 2013). This book can be used as the text for a single combined statistics and methods course. Some departments offer a methods course and a statistics course, and this text could be used for both courses, either course, or a combined course.

## Supplementary Material

Part of the pedagogical package for this book is an instructor's manual with activities, demonstrations, and data-collection exercises. Data sets for increasing the power of statistical analysis are available to supplement data collected in small classes.

There is also a test bank that contains multiple-choice questions, short-answer questions, and other integrative questions. The items generally focus on understanding concepts rather than simply repeating vocabulary, and they require that students go beyond simple memorization.

The supplementary material also includes PowerPoint files that track the material in the chapters. Some of the material in these files goes beyond what appears in the book so that the instructor can generate useful discussion of actual research projects.