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Methods for Discovery and Validation

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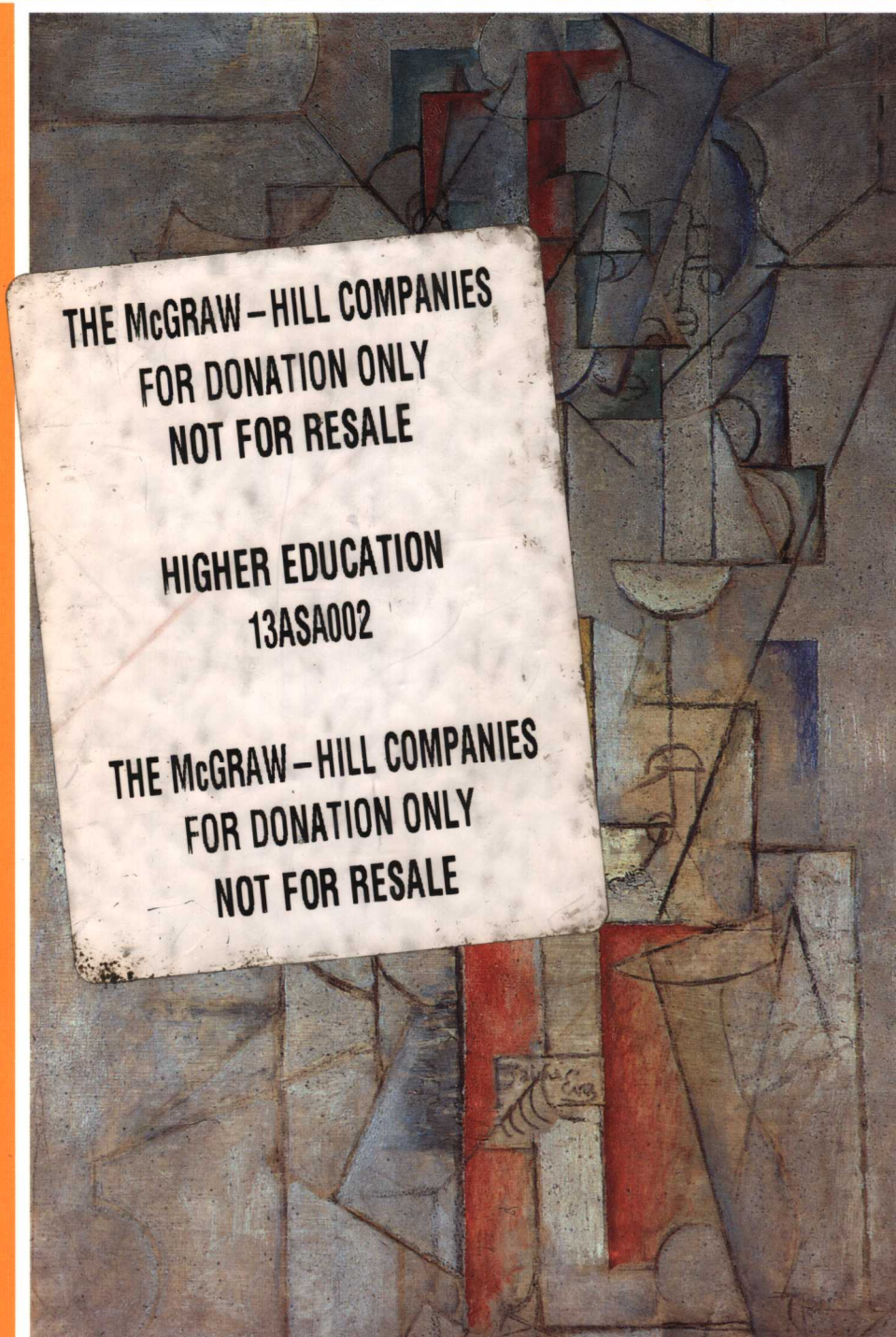

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Preface

This textbook, written for undergraduate courses in research methods, covers basic issues, advanced topics, and practical concerns in designing and conducting research. Our treatment of these issues is comprehensive, using classical and up-to-date examples of research to illustrate the methods discussed.

The first section of the book presents the fundamentals: scientific method, a classification of research designs, experimental control, measurement, correlation, randomized experimental designs, and ethics. The second section considers more advanced topics: factorial designs, single-case experimental designs, and field research, including quasi-experimental designs, observational techniques, and survey research. The last three chapters focus on practical concerns: finding a research problem, planning the study, and writing a research report in the APA style.

What distinguishes our text from others is how we present this material. In our book we tell the stories of how modern research methods, ethical principles, and procedures for communicating research developed and led to later advances. This approach highlights the logic of the methods and the kinds of research questions to which they apply, helping students to get the "big picture" of research methods in an understandable and memorable way. Explaining the context in which the methods developed naturally stresses their novel features, separating important ideas from less important ones. Because the innovators were fascinating people with brilliant ideas about how to do research, their stories also give students a sense of the challenges and excitement of science.

Our narrative, contextual approach allows us to use the originators' own words and examples to explain the methods. Their presentations are clear and compelling. When students are introduced to the ingenious logic of randomization as Fisher presented it (see Chapter 6), they can understand why his work revolutionized experimental design. When they learn how Galton developed the concepts of correlation and norm-based measurement (Chapters 4, 5), they can see why these methods are indispensable in modern psychology. When they read about the empirical studies that led to the Nuremberg Code and the Belmont Report (Chapter 7), they can appreciate the need for the ethical code and research review procedures used in psychology today. When students learn how scientists became a global community through shared writing

in scientific journals, they can better appreciate the noble tradition they are joining when they write their own reports.

We have tried to organize the book to allow instructors flexibility in assigning the readings. Because later chapters build on ideas presented in earlier ones, the first six chapters are best read in order. The chapter on ethics, seventh in the book, does not have to be assigned in this position. We chose to present ethics in the middle of the book so that students would have an understanding of the basics of research design before reading it. We think this helps them to better understand the ethical dilemmas facing researchers. We also find that discussing ethics at mid-semester provides a welcome break from focusing on the more technical aspects of research. The sections of Chapter 12 on debriefing, applying to the IRB, and writing consent forms can be read in conjunction with the chapter on ethics, as can Chapter 13's discussion of the ethics of analyzing data and reporting results. The Belmont Report, which the federal government states researchers and members of IRBs should consider as a required reference work, is reprinted in its entirety in Appendix A.

Each of the advanced chapters can stand alone, so instructors can assign all of them or select from among them. Chapter 8, Factorial Designs and Interactions, is an extension of the material in Chapter 6, Randomized Designs. If both Chapters 9 and 10 are used, we recommend assigning them in order. The discussion of n = 1 designs (Chapter 9) introduces the notation used in Chapter 10's discussion of quasi-experimental designs. There also is overlap between the n = 1 designs and time series quasi-experimental designs, discussed in Chapter 10.

Students can read the three chapters on practical concerns, Chapters 11, 12, and 13, at any time during the course. We recommend that they study Chapter 11, Finding a Research Problem, early in the semester. The chapter is filled with examples of research illustrating strategies that students can use to come up with ideas for projects. The chapter also teaches students the how-tos of doing library research, including the use of tools like *PsycINFO* and *PsycLIT*. Chapter 12, Planning the Study, and Chapter 13, Communicating Research, can be assigned whenever students need to know the particulars of doing research and writing the report. Chapter 12 offers practical advice on recruiting participants, randomly assigning them to groups, finding or developing measures, dealing with demand characteristics and experimenter expectancies, applying to the IRB, and debriefing participants. Chapter 13, which instructs students on the basics of writing APA style research reports, includes examples of leads, rationales, and closes to serve as models for students in their writing. As a further guide for students, we have included a published research paper, reprinted in APA manuscript form, in Appendix B.

In addition to these pedagogical features of the book, many of the chapters include boxes presenting concrete illustrations or extensions of ideas discussed in the narrative. The boxes contain documents, ethical codes, information on how to do computerized searches of the literature, computer programs for randomization, formats for questions, APA style rules, etc. As a further aid to students, important ideas are reviewed at the end of each chapter in a section on key concepts, key people, and review questions.

We also have set up a Website (http://www.assumption.edu/html/academic/users/avadum/index.html) that can be used with the text. The site has programs for randomly assigning subjects to groups, random sampling, and doing basic statistical calculations, such as the mean, standard deviation, and *t*-tests. These statistical applets, written in Java, can be run online from any computer with an Internet connection and a Web browser compatible with Java 1.0, such as Netscape Navigator 3.0. The Website also links to the Websites discussed in the text (e.g., APA and Buros Institute).

A complete statistical program, *Student Statistician*, and its manual (Rankin, 1986) also can be downloaded from our Website. *Student Statistician* runs on IBM compatible computers using the MS-DOS or Windows operating systems. This program does all the basic statistical tests usually encountered in student research (nonparametric and parametric through two-way analysis of variance), and it has an easy-to-learn graphical interface. Instructors using this text may distribute the program and manual to their students without charge, so students can take copies home to run on their own computers.

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Casey Rankin helped debug *Student Statistician* and shared his expert knowledge of how to navigate in cyberspace. Hal Kiess and Doug Bloomquist, both at Framington State College, tested *Student Statistician* in their classes, making the program easier for students to use. Kamal K. Mittal and others at the Office for Protection from Research Risks (OPRR), National Institutes of Health, offered us valuable advice and educational materials on the ethics of doing research with human and animal subjects. Carolyn Gosling of *PsycINFO* User Services, APA, generously read and corrected our discussion of *PsycINFO, PsycLIT,* and *Psychological Abstracts.* The friendship of Laura Menides and Leena Osteraas encouraged us during the many years we worked on this project.

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