

FOURTH EDITION

Research Methods in Psychology

EVALUATING A WORLD OF INFORMATION



Brief Contents

PART I Introduction to Scientific Reasoning

CHAPTER 1 Psychology Is a Way of Thinking 5

CHAPTER 2 Sources of Information: Why Research Is Best and How to Find It 23

CHAPTER 3 Three Claims, Four Validities: Interrogation Tools for Consumers of Research 55

PART II Research Foundations for Any Claim

CHAPTER 4 Ethical Guidelines for Psychology Research 89

CHAPTER 5 Identifying Good Measurement 117

PART III Tools for Evaluating Frequency Claims

CHAPTER 6 Surveys and Observations: Describing What People Do 153

CHAPTER 7 Sampling: Estimating the Frequency of Behaviors and Beliefs 179

PART IV Tools for Evaluating Association Claims

CHAPTER 8 Bivariate Correlational Research 203

CHAPTER 9 Multivariate Correlational Research 241

PART V Tools for Evaluating Causal Claims

CHAPTER 10 Introduction to Simple Experiments 277

CHAPTER 11 More on Experiments: Confounding and Obscuring Variables 323

CHAPTER 12 Experiments with More Than One Independent Variable 363

PART VI Balancing Research Priorities

CHAPTER 13 Quasi-Experiments and Small-N Designs 401

CHAPTER 14 Replication, Transparency, and Real-World Importance 437

STATISTICS REVIEW Descriptive Statistics 467

STATISTICS REVIEW Inferential Statistics 491

PRESENTING RESULTS APA-Style Reports and Conference Posters 523

APPENDIX A Random Numbers and How to Use Them 565
APPENDIX B Statistical Tables 571

Contents

[Preface](#)[x](#)

[Media Resources for Instructors and Students](#)[xix](#)

[PART I Introduction to Scientific Reasoning](#)

[CHAPTER 1 Psychology Is a Way of Thinking](#)[5](#)

[Research Producers, Research Consumers](#)[6](#)

[Why the Producer Role Is Important](#)[6](#)

[Why the Consumer Role Is Important](#)[7](#)

[The Benefits of Being a Good Consumer](#)[8](#)

[How Scientists Work](#)[9](#)

[Scientists Are Empiricists](#)[10](#)

[Scientists Test Theories: The Theory-Data Cycle](#)[10](#)

[Scientists Work in a Community](#)[15](#)

[Scientists Tackle Applied and Basic Problems](#)[16](#)

[Scientists Make Their Work Public](#)[17](#)

[Scientists Talk to the World: From Journal to](#)

[Journalism](#)[17](#)

[Chapter Review](#)[20](#)

[CHAPTER 2 Sources of Information: Why Research Is Best and How to Find It](#)[23](#)

[The Research Versus Your Experience](#)[24](#)

[Experience Has No Comparison Group](#)[24](#)

[Experience Is Confounded](#)[26](#)

[Research Is Better Than Experience](#)[27](#)

[Research Results Are Probabilistic](#)[29](#)

[The Research Versus Your Intuition](#)[30](#)

[Ways That Intuition Can Be Biased](#)[30](#)

[The Intuitive Thinker Versus the Scientific Reasoner](#)[35](#)

[Trusting Authorities on the Subject](#)[36](#)

[Finding and Reading the Research](#)[39](#)

[Consulting Scientific Sources](#)[39](#)

[Finding Legitimate Scientific Sources](#)[41](#)

[Reading the Research](#)43

[Legitimate Journalism Versus Disinformation](#)45

[INFOGRAPHIC FIGURE 2.17 Be Information Literate,](#)

[Not Gullible or Cynical](#)49

[Chapter Review](#)50

[CHAPTER 3 Three Claims, Four Validities: Interrogation](#)

[Tools for Consumers of Research](#)55

[Variables](#)56

[Measured and Manipulated Variables](#)56

[From Conceptual Variable to Operational Definition](#)57

[Three Claims](#)60

[Frequency Claims](#)61

[Association Claims](#)61

[Causal Claims](#)64

[Not All Claims Are Based on Research](#)65

[Interrogating the Three Claims Using the Four Big](#)

[Validities](#)66

[Interrogating Frequency Claims](#)67

[Interrogating Association Claims](#)68

[Interrogating Causal Claims](#)70

[INFOGRAPHIC Figure 3.5 Navigating Causal Claims:](#)

[Do Family Meals Really Curb Eating Disorders?](#)75

[Prioritizing Validities](#)78

[Review: Four Validities, Four Aspects of Quality](#)79

[WORKING IT THROUGH To Appear More](#)

[Intimidating, Just Tilt Your Head Down, Study](#)

[Suggests](#)80

[Chapter Review](#)82

[PART II Research Foundations for Any Claim](#)

[CHAPTER 4 Ethical Guidelines for Psychology Research](#)89

[Historical Examples](#)89

[The Tuskegee Syphilis Study Illustrates Three Major](#)

[Ethics Violations](#)89

[The Milgram Obedience Studies Illustrate a Difficult](#)

[Ethical Balance](#)92

[Core Ethical Principles](#)94

[The Belmont Report: Principles and Applications](#)[94](#)
[Guidelines for Psychologists: The APA Ethical](#)
[Principles](#)[98](#)

[Belmont Plus Two: APA's Five General Principles](#)[99](#)
[Ethical Standards for Research](#)[99](#)

[Ethical Decision Making: A Thoughtful Balance](#)[110](#)

[WORKING IT THROUGH Did a Study Conducted on](#)
[Facebook Violate Ethical Principles?](#)[111](#)

[Chapter Review](#)[113](#)

[CHAPTER 5 Identifying Good Measurement](#)[117](#)

[Ways to Measure Variables](#)[118](#)

[More About Conceptual and Operational Variables](#)[118](#)

[Three Common Types of Measures](#)[120](#)

[Scales of Measurement](#)[122](#)

[Reliability of Measurement: Are the Scores Consistent?](#)
[125](#)

[Introducing Three Types of Reliability](#)[125](#)

[Using a Scatterplot to Quantify Reliability](#)[126](#)

[Using the Correlation Coefficient \$r\$ to Quantify](#)
[Reliability](#)[128](#)

[Reading About Reliability in Journal Articles](#)[132](#)

[Validity of Measurement: Does It Measure What It's](#)
[Intended to Measure?](#)[133](#)

[Measurement Validity of Abstract Constructs](#)[133](#)

[Face Validity and Content Validity: Does It Look Like a](#)
[Good Measure?](#)[134](#)

[Criterion Validity: Does It Correlate with Key](#)
[Behaviors?](#)[136](#)

[Convergent Validity and Discriminant Validity: Does the](#)
[Pattern Make Sense?](#)[139](#)

[The Relationship Between Reliability and Validity](#)[142](#)

[Review: Interpreting Construct Validity Evidence](#)[143](#)

[WORKING IT THROUGH How Well Can We Measure](#)
[the Amount of Gratitude Couples Express to Each](#)
[Other?](#)[145](#)

Chapter Review147

PART III Tools for Evaluating Frequency Claims

CHAPTER 6 Surveys and Observations: Describing What People Do153

Construct Validity of Surveys and Polls153

Choosing Question Formats154

Writing Well-Worded Questions156

Encouraging Accurate Responses160

Construct Validity of Behavioral Observations166

Some Claims Based on Observational Data166

Making Reliable and Valid Observations170

Chapter Review175

CHAPTER 7 Sampling: Estimating the Frequency of Behaviors and Beliefs179

Generalizability: Does the Sample Represent the Population?179

Populations and Samples180

When Is a Sample Biased?182

Obtaining a Representative Sample: Probability Sampling Techniques186

Settling for an Unrepresentative Sample:

Nonprobability Sampling Techniques191

Interrogating External Validity: What Matters Most? 193

In a Frequency Claim, External Validity Is a Priority193

When External Validity Is a Lower Priority193

Larger Samples Are Not More Representative195

Chapter Review198

PART IV Tools for Evaluating Association Claims

CHAPTER 8 Bivariate Correlational Research203

Introducing Bivariate Correlations204

Review: Describing Associations Between Two Quantitative Variables205

Describing Associations with Categorical Data207

A Study with All Measured Variables Is Correlational208

[Interrogating Association Claims](#)209

[Construct Validity: How Well Was Each Variable Measured?](#)209

[Statistical Validity: How Well Do the Data Support the Conclusion?](#)210

[Internal Validity: Can We Make a Causal Inference from an Association?](#)219

[External Validity: To Whom Can the Association Be Generalized?](#)223

[WORKING IT THROUGH Are Parents Happier Than People with No Children?](#)228

[Chapter Review](#)231

[REPLICATE THE STUDY Do people who have moved frequently prefer shopping at chain stores?](#)234

[CHAPTER 9 Multivariate Correlational Research](#)241

[Reviewing the Three Causal Criteria](#)242

[Establishing Temporal Precedence with Longitudinal Designs](#)243

[Interpreting Results from Longitudinal Designs](#)243

[Longitudinal Studies and the Three Criteria for Causation](#)246

[Why Not Just Do an Experiment?](#)247

[Ruling Out Third Variables with Multiple-Regression Analyses](#)248

[Measuring More Than Two Variables](#)249

[Regression Results Indicate Whether a Third Variable Affects the Relationship](#)251

[Adding More Predictors to a Regression](#)256

[Regression in Popular Media Articles](#)257

[Regression Does Not Establish Causation](#)259

[Getting at Causality with Pattern and Parsimony](#)260

[The Power of Pattern and Parsimony](#)260

[Pattern, Parsimony, and the Popular Media](#)262

[Mediation](#)263

[Mediators Versus Third Variables](#)264

[Mediators Versus Moderators](#)265

Multivariate Designs and the Four Validities267

Chapter Review270

PART V Tools for Evaluating Causal Claims

CHAPTER 10 Introduction to Simple Experiments277

Two Examples of Simple Experiments277

Example 1: Taking Notes278

Example 2: Motivating Babies279

Experimental Variables280

Independent and Dependent Variables281

Control Variables282

Why Experiments Support Causal Claims283

Experiments Establish Covariance283

Experiments Establish Temporal Precedence285

Well-Designed Experiments Establish Internal Validity285

Independent-Groups Designs292

Independent-Groups Versus Within-Groups Designs292

Posttest-Only Design292

Pretest/Posttest Design293

Which Design Is Better?294

Within-Groups Designs295

Repeated-Measures Design295

Concurrent-Measures Design296

Advantages of Within-Groups Designs297

Covariance, Temporal Precedence, and Internal Validity in Within-Groups Designs298

Disadvantages of Within-Groups Designs301

Is Pretest/Posttest a Repeated-Measures Design?302

Interrogating Causal Claims with the Four Validities303

Construct Validity: How Well Were the Variables Measured and Manipulated?303

External Validity: To Whom or What Can the Causal Claim Generalize?306

Statistical Validity: How Much? How Precise? What Else Is Known?308

[Internal Validity: Are There Alternative Explanations for the Results?311](#)

[Chapter Review312](#)

[REPLICATE THE STUDY Do we remember words better if we process them deeply?316](#)

[CHAPTER 11 More on Experiments: Confounding and Obscuring Variables323](#)

[Threats to Internal Validity: Did the Independent Variable Really Cause the Difference?324](#)

[The Really Bad Experiment \(A Cautionary Tale\)324](#)

[Six Potential Internal Validity Threats in One-Group, Pretest/Posttest Designs326](#)

[Three Potential Internal Validity Threats in Any Study334](#)

[With So Many Threats, Are Experiments Still Useful? 337](#)

[WORKING IT THROUGH Did Mindfulness Training Really Cause GRE Scores to Improve?340](#)

[Interrogating Null Effects: What If the Independent Variable Does Not Make a Difference?342](#)

[Perhaps There Is Not Enough Between-Groups Difference344](#)

[Perhaps Within-Groups Variability Obscured the Group Differences347](#)

[The Opposite of Obscuring: Power and Precision353](#)

[Null Effects Should Be Reported Transparently354](#)

[WORKING IT THROUGH Do People's Political Views Change When They See Money?356](#)

[Chapter Review358](#)

[CHAPTER 12 Experiments with More Than One Independent Variable363](#)

[Review: Experiments with One Independent Variable363](#)

[Experiments with Two Independent Variables Can Show Interactions365](#)

[Intuitive Interactions365](#)

[Factorial Designs Study Two Independent Variables367](#)

[Factorial Designs Can Test Limits](#)368
[Factorial Designs Can Test Theories](#)370
[Interpreting Factorial Results: Main Effects and Interactions](#)373
[Factorial Variations](#)382
[Independent-Groups Factorial Designs](#)382
[Within-Groups Factorial Designs](#)382
[Mixed Factorial Designs](#)383
[Increasing the Number of Levels of an Independent Variable](#)383
[Increasing the Number of Independent Variables](#)385
[Identifying Factorial Designs in Your Reading](#)390
[Identifying Factorial Designs in Empirical Journal Articles](#)391
[Identifying Factorial Designs in Popular Media Articles](#)391
[Chapter Review](#)395

[PART VI Balancing Research Priorities](#)

[CHAPTER 13 Quasi-Experiments and Small-N Designs](#)401

[Quasi-Experiments](#)401
[Four Examples of Quasi-Experiments](#)402
[Internal Validity in Quasi-Experiments](#)408
[Balancing Priorities in Quasi-Experiments](#)415
[Quasi-Experiments and Correlational Studies](#)417
[Quasi-Independent Variables Compared with Participant Variables](#)417
[Small-N Designs: Studying Only a Few Individuals](#)418
[Research on Human Memory](#)419
[Disadvantages of Small-N Studies](#)422
[Behavior-Change Studies in Applied Settings: Three Small-N Designs](#)422
[Other Examples of Small-N Studies](#)428
[Evaluating the Four Validities in Small-N Designs](#)430
[Chapter Review](#)432

CHAPTER 14 Replication, Transparency, and Real-World Importance437

Replication437

Types of Replication438

Replication Projects441

Meta-Analysis: What Does the Literature Say?444

Replicability and Popular Media447

Research Transparency and Credibility448

Questionable Research Practices448

Transparent Research Practices449

Must a Study Have External Validity?451

Generalizing to Other Participants451

Generalizing to Other Settings452

Does a Study Have to Be Generalizable to Many People? 453

Does a Study Have to Take Place in a Real-World Setting?458

Chapter Review464

STATISTICS REVIEW Descriptive Statistics467

Describing Data467

Data Matrices468

Frequency Distributions and Dot Plots468

Describing Central Tendencies (Mode, Median, and Mean)470

Describing Variability (Variance and Standard Deviation)472

Describing Relative Standing (z Scores)478

Describing Associations Using Scatterplots or the Correlation Coefficient r 480

Describing Effect Size484

STATISTICS REVIEW Inferential Statistics491

Estimation and Precision491

A Formal Example of Estimation492

Point Estimates and Confidence Intervals493

The Steps of Estimation and Precision494

[Types of Point Estimates \(Overview\) 495](#)

[Determining the Confidence Interval for a Percentage Estimate 495](#)

[Determining the Point Estimate and Confidence Interval for a Dependent, or Paired Design 499](#)

[Determining the Confidence Interval for a Difference Between Two Groups \(an Independent-Groups Experiment\) 503](#)

[Effect Size \$d\$ or Original Units? 507](#)

[A Study with More Than Two Means 508](#)

[The Analysis of Variance Approach 511](#)

[Determining the Point Estimate and Confidence Interval for a Correlation Coefficient 512](#)

[Determining the Point Estimate and Confidence Interval for Beta \(Multiple Regression\) 514](#)

[The Confidence Interval Approach Versus NHST 514](#)

[The NHST Procedure 515](#)

[PRESENTING RESULTS APA-Style Reports and Conference Posters 523](#)

[Writing Research Reports in APA Style 523](#)

[APA Style Overview 524](#)

[Formatting an APA-Style Manuscript 535](#)

[Writing Style: Five Suggestions 536](#)

[Avoiding Plagiarism 539](#)

[Using Appropriate Paraphrasing 540](#)

[Citing Sources in APA Style 541](#)

[Preparing Posters for Conferences 560](#)

[The Purpose of a Poster Session 560](#)

[Preparing the Poster 560](#)

[Attending a Poster Session 561](#)

[APPENDIX A Random Numbers and How to Use Them 565](#)

[Random Sampling \(Probability Sampling\) 565](#)

[Random Assignment 566](#)

[APPENDIX B Statistical Tables 571](#)

[Areas Under the Normal Curve \(Distribution of \$z\$ \) 571](#)

[Critical Values of \$t\$ 577](#)

[Critical Values of \$F\$ 579](#)

[\$r\$ to \$z'\$ Conversion 584](#)

[Critical Values of \$r\$ 585](#)

[Glossary 589](#)

[Answers to End-of-Chapter Questions 599](#)

[Review Questions 599](#)

[Guidelines for Selected Learning Actively Exercises 600](#)

[References 611](#)

[Credits 625](#)

[Names Index 629](#)

[Subject Index 632](#)