

CONTENTS

Preface **ix** ♦ Study Tips **xi** ♦ Acknowledgments **xiii**

PART I Overview of the Research Process **1**

| | | |
|------------------|---------------------------------------------------------------------------|-----------|
| CHAPTER 1 | Introduction to Research in Physical Activity..... | 3 |
| | The Nature of Research | 3 |
| | Unscientific Versus Scientific Methods of Problem Solving | 10 |
| | Alternative Models of Research | 14 |
| | Types of Research | 17 |
| | Overview of the Research Process..... | 22 |
| | Parts of a Thesis: A Reflection on the Steps in the Research Process..... | 22 |
| | Summary..... | 24 |
| | | |
| CHAPTER 2 | Developing the Problem and Using the Literature..... | 25 |
| | Identifying the Research Problem | 25 |
| | Purpose of the Literature Review | 29 |
| | Basic Literature Search Strategies | 31 |
| | Steps in the Literature Search | 32 |
| | Summary..... | 50 |
| | | |
| CHAPTER 3 | Presenting the Problem..... | 53 |
| | Choosing the Title..... | 53 |
| | Writing the Introduction..... | 54 |
| | Stating the Research Problem | 56 |
| | Presenting the Research Hypothesis | 58 |
| | Operationally Defining Your Terms | 59 |
| | Basic Assumptions, Delimitations, and Limitations | 59 |
| | Justifying the Significance of the Study | 62 |
| | Differences Between the Thesis and the Research Article | 63 |
| | Summary..... | 64 |
| | | |
| CHAPTER 4 | Formulating the Method..... | 67 |
| | How to Present Methodological Details | 68 |
| | Why Planning the Method Is Important | 68 |
| | Two Principles for Planning Experiments | 69 |
| | Describing Participants | 69 |
| | Describing Instruments..... | 71 |
| | Describing Procedures..... | 72 |
| | Describing Design and Analysis | 74 |
| | Establishing Cause and Effect | 76 |
| | Interaction of Participants, Measurements, and Treatments | 77 |
| | Summary..... | 78 |

| | | |
|------------------|-------------------------------------------------------------|-----------|
| CHAPTER 5 | Ethical Issues in Research and Scholarship | 79 |
| | Seven Areas of Scientific Dishonesty | 79 |
| | Ethical Issues Regarding Copyright | 85 |
| | Model for Considering Scientific Misconduct | 85 |
| | Working With Faculty | 88 |
| | Protecting Human Participants | 90 |
| | Protecting Animal Subjects | 92 |
| | Summary | 93 |

PART II

Statistical and Measurement Concepts in Research

97

| | | |
|------------------|-----------------------------------------------------------------------------------------|------------|
| CHAPTER 6 | Becoming Acquainted With Statistical Concepts | 99 |
| | Why We Need Statistics | 99 |
| | Use of Computers in Statistical Analysis | 101 |
| | Description and Inference Are Not Statistical Techniques | 101 |
| | Ways to Select a Sample | 101 |
| | Justifying Post Hoc Explanations | 103 |
| | Difficulty of Random Sampling and Assignment: How Good Does It Have to Be? | 103 |
| | Unit of Analysis | 104 |
| | Measures of Central Tendency and Variability | 105 |
| | Basic Concepts of Statistical Techniques | 109 |
| | Data for Use in the Remaining Statistical Chapters | 112 |
| | Summary | 112 |
| CHAPTER 7 | Statistical Issues in Research Planning and Evaluation | 115 |
| | Probability | 115 |
| | Meaningfulness (Effect Size) | 117 |
| | Power | 118 |
| | Using Information in the Context of the Study | 121 |
| | Summary | 124 |
| CHAPTER 8 | Relationships Among Variables | 125 |
| | What Correlational Research Investigates | 125 |
| | Understanding the Nature of Correlation | 126 |
| | What the Coefficient of Correlation Means | 132 |
| | Using Correlation for Prediction | 135 |
| | Partial Correlation | 138 |
| | Uses of Semipartial Correlation | 138 |
| | Procedures for Multiple Regression | 139 |
| | Multivariate Forms of Correlation | 142 |
| | Summary | 144 |
| CHAPTER 9 | Differences Among Groups | 147 |
| | How Statistics Test Differences | 147 |
| | Types of <i>t</i> Tests | 148 |
| | Interpreting <i>t</i> | 153 |
| | Relationship of <i>t</i> and <i>r</i> | 156 |

| | | |
|-----------------------------------|----------------------------------------------------------------|------------|
| | Analysis of Variance | 158 |
| | Analysis of Covariance | 171 |
| | Experimentwise Error Rate | 172 |
| | Understanding Multivariate Techniques | 173 |
| | Summary | 177 |
| CHAPTER 10 | Nonparametric Techniques | 181 |
| | Chi Square: Testing the Observed Versus the Expected | 182 |
| | Procedures for Rank-Order Data | 187 |
| | Correlation | 188 |
| | Differences Among Groups | 189 |
| | Summary | 192 |
| CHAPTER 11 | Measuring Research Variables | 193 |
| | Validity | 193 |
| | Reliability | 197 |
| | Methods of Establishing Reliability | 201 |
| | Intertester Reliability (Objectivity) | 203 |
| | Standard Error of Measurement | 203 |
| | Using Standard Scores to Compare Performance | 204 |
| | Measuring Movement | 205 |
| | Measuring Written Responses | 206 |
| | Measuring Affective Behavior | 206 |
| | Scales for Measuring Affective Behavior | 208 |
| | Measuring Knowledge | 210 |
| | Item Response Theory | 211 |
| | Summary | 213 |
| PART III Types of Research | | 215 |
| CHAPTER 12 | Historical Research in Physical Activity | 217 |
| | Research Paradigms | 217 |
| | Lines of Inquiry and Topics | 219 |
| | Designing the Research | 222 |
| | Working With the Evidence | 222 |
| | Summary | 230 |
| CHAPTER 13 | Philosophic Research in Physical Activity | 235 |
| | Identifying the Purposes of Philosophic Research | 236 |
| | Locating a Research Problem | 239 |
| | Analyzing a Research Problem | 239 |
| | Summary | 247 |
| CHAPTER 14 | Research Synthesis (Meta-Analysis) | 253 |
| | Using Meta-Analysis to Synthesize Research | 254 |
| | Presenting Effect Size Data | 263 |
| | Summary | 263 |

| | | |
|-------------------|------------------------------------------------------------------------|------------|
| CHAPTER 15 | Surveys | 273 |
| | Questionnaires | 273 |
| | Electronic Surveys | 284 |
| | Delphi Method | 285 |
| | Personal Interviews | 285 |
| | Normative Survey | 288 |
| | Summary | 289 |
| CHAPTER 16 | Other Descriptive Research Methods | 291 |
| | Developmental Research | 291 |
| | Case Studies | 295 |
| | Job Analysis | 297 |
| | Observational Research | 298 |
| | Unobtrusive Research Techniques | 302 |
| | Correlational Research | 303 |
| | Summary | 304 |
| CHAPTER 17 | Physical Activity Epidemiology Research | 307 |
| | Observational Versus Experimental Research | 308 |
| | What Is Epidemiology? | 309 |
| | Physical Activity Measurement Definitions | 311 |
| | Assessment of Physical Activity | 312 |
| | Epidemiologic Study Designs | 315 |
| | Reading and Interpreting a Physical Activity Epidemiologic Study | 324 |
| | Summary | 327 |
| CHAPTER 18 | Experimental and Quasi-Experimental Research | 329 |
| | Sources of Invalidity | 330 |
| | Threats to Internal Validity | 331 |
| | Threats to External Validity | 334 |
| | Controlling Threats to Internal Validity | 336 |
| | Controlling Threats to External Validity | 338 |
| | Types of Designs | 338 |
| | Summary | 351 |
| CHAPTER 19 | Qualitative Research | 353 |
| | Procedures in Qualitative Research | 354 |
| | Analysis of the Data | 359 |
| | Concluding Remarks | 367 |
| | Summary | 368 |
| CHAPTER 20 | Mixed-Methods Research | 371 |
| | Combining Quantitative and Qualitative Methods | 372 |
| | Designing Mixed-Methods Research | 373 |
| | Specific Issues in Mixed-Methods Research | 373 |
| | Examples of Mixed-Methods Research | 374 |
| | Summary | 375 |

PART IV Writing the Research Report 377

| | | |
|-------------------|----------------------------------------------------------------------|------------|
| CHAPTER 21 | Completing the Research Process | 379 |
| | Research Proposal | 379 |
| | Developing a Good Introduction | 379 |
| | Describing the Method | 381 |
| | The Proposal Process | 382 |
| | Preparing and Presenting Qualitative Research Proposals | 386 |
| | Writing Proposals for Granting Agencies | 386 |
| | Submitting Internal Proposals | 388 |
| | Completing Your Thesis or Dissertation | 388 |
| | Results and Discussion | 388 |
| | Handling Multiple Experiments in a Single Report | 392 |
| | Using Tables and Figures | 393 |
| | Summary | 400 |
| | | |
| CHAPTER 22 | Ways of Reporting Research | 403 |
| | Basic Writing Guidelines | 403 |
| | A Brief Word About Acknowledgments | 404 |
| | Thesis and Dissertation Format: Traditional Versus Journal | 404 |
| | Helpful Hints for Successful Journal Writing | 410 |
| | Revising Research Papers | 412 |
| | Writing Abstracts | 415 |
| | Making Oral and Poster Presentations | 416 |
| | Summary | 419 |

Appendix: Statistical Tables **421**

References **435** ♦ Author Index **445** ♦ Subject Index **447** ♦ About the Authors **457**