Preface to the First Edition • xi
Preface to the Third Edition • xiii

PART I:
Science and Scientific Methods

Chapter 1
Why Study Science and Research Methods? • 3
The Need To Study Scientific Methods • 5
The Need To Produce In-House Knowledge • 8
Why Research by Clinicians Is Limited • 10
Problems Associated with Certain Research Practices • 11
Problems Associated with the Education and Training Models • 15
Evaluation of Research • 17
Summary • 18
Study Guide • 19

Chapter 2
An Introduction to Research:
The Formal and Formative Approaches • 21
What Is Research? • 24
Why Do Scientists Do Research? • 24
How Is Research Done? • 32
Serendipity in Research • 39
Planning Is Still Important • 42
Summary • 42
Study Guide • 43
Chapter 3
Science and Its Basic Concepts • 45

Popular Misconceptions About Science • 47
What Is Science? • 48
Outcome of Scientific Activity • 52
Variables and Their Types • 54
Causality and Functional Analysis • 59
Experiment and Experimental Control • 63
Hypotheses in Scientific Research • 64
Theories and Scientific Reasoning • 67
Theories and Scientific Laws • 72
Data and Evidence • 72
Summary • 74
Study Guide • 75

Chapter 4
Treatment Research • 77

What Is Treatment Research? • 79
Conceptual Issues: Consequences of Treatment • 80
Treatment Research: Logical and Empirical Constraints • 88
Group Treatment Research: Randomized Clinical Trials • 92
Single-Subject Treatment Research: Multiple Control Conditions • 104
Randomized Clinical Trials Versus Single-Subject Treatment Research • 124
Classification of Treatment Research • 133
Summary • 144
Study Guide • 147

Chapter 5
Other Types of Research • 151

Ex Post Facto Research • 153
Normative Research • 157
Standard-Group Comparisons • 161
Experimental Research • 165
Clinical and Applied Research • 171
Sample Surveys • 178
Relation Between Research Types and Questions • 180
Summary • 181
Study Guide • 182
True Experimental Designs • 265
Designs To Evaluate Multiple Treatments • 272
Factorial Designs • 275
Quasi-Experimental Designs • 281
Counterbalanced Within-Subjects Designs • 292
Correlational Analysis Design • 302
Group Designs in Clinical Research • 303
Summary • 306
Study Guide • 308

Chapter 9
Single-Subject Designs • 313
Historical Background of Single-Subject Designs • 315
Characteristics of Single-Subject Designs • 320
Experimental Control in Single-Subject Designs • 325
Preexperimental Single-Subject Design • 325
Experimental Designs for Single-Treatment Evaluation • 327
Experimental Designs for Multiple-Treatment Comparison • 346
Experimental Design for Interactional Studies • 356
Designs To Assess Response Maintenance • 360
Single-Subject Designs in Clinical Research • 362
Summary • 366
Study Guide • 368

Chapter 10
Generality Through Replications • 373
Direct Replication • 376
Systematic Replication • 379
Sample Size and Generality • 383
Failed Replications—Sources of Treatment Modifications • 386
Treatment Variables and Treatment Packages • 388
Homogeneity and Heterogeneity of Participants • 390
Summary • 392
Study Guide • 393

Chapter 11
Comparative Evaluation of Design Strategies • 395
Research Questions and Investigative Strategies • 397
# Contents

Advantages and Disadvantages of Design Strategies • 407
Problems Common to Design Strategies • 410
Philosophical Considerations in Evaluation • 412
The Investigator in the Design Selection Process • 413
Final Criterion: Soundness of Data • 413
Summary • 414
Study Guide • 417

## Chapter 12
**Designs Versus Paradigms in Research • 421**

Limitations of Exclusively Methodological Approaches • 423
Research Methods and Subject Matters • 423
Philosophy as Methodology • 425
Philosophy of Subject Matters • 425
Philosophy of the Science of Speech and Language • 427
Philosophical Ways of Handling Methodological Problems • 437
Interplay Between Philosophy and Methodology • 440
Summary • 441
Study Guide • 442

## PART III: Doing, Reporting, and Evaluating Research

## Chapter 13
**How To Formulate Research Questions • 447**

How To Formulate Research Questions • 449
Preparation of Theses and Dissertations • 462
Summary • 464
Study Guide • 464

## Chapter 14
**How To Write Research Reports • 467**

Format of Scientific Reports • 469
Writing Without Bias • 478
Good Writing: Some Principles • 480
Chapter 15
How To Evaluate Research Reports  •  509

Professionals as Consumers of Research  •  511
Understanding and Evaluating Research  •  511
Evaluation of Research  •  512
Evaluation of Research Reports: An Outline  •  518
Evaluation of Treatment Research: A Hierarchy of Evidence  •  523
Evaluation and Appreciation of Research  •  527
Summary  •  528
Study Guide  •  528

Chapter 16
Ethics of Research  •  531

Fraud in Scientific Research  •  533
Effects of Science on Society  •  536
Ethical Justification of Treatment Evaluation  •  537
Protection of Human Participants  •  540
Ethical Issues with Treatment Research Methods  •  547
Consequences of Ethical Constraints  •  555
Protection of Animal Subjects  •  558
Dissemination of Research Findings  •  560
Summary  •  560
Study Guide  •  561

References  •  563

Author Index  •  573
Subject Index  •  577