

Contents

Chapter 1

How Do We Know?

1

Introduction: What This Text Is About	1
Preamble for Chapter 1	2
A Brief History of Human Knowledge	4
<i>Metaphysical Systems</i>	4
<i>Philosophy</i>	6
<i>Physiology and the Physical Sciences</i>	7
<i>Experimental Psychology</i>	8
The Four Canons of Science	8
<i>Determinism</i>	8
<i>Empiricism</i>	12
<i>Parsimony</i>	15
<i>Testability</i>	18
Four Ways of Knowing About the World	22
HANDS-ON ACTIVITY 1: Galileo's Dice	25
Notes	29

Chapter 2

How Do We Find Out?

31

Laws, Theories, and Hypotheses	32
The Science of Observation	36
Three Approaches to Hypothesis Testing	39
<i>Validation</i>	43
<i>Falsification</i>	45
<i>Qualification</i>	48
The Experimental Paradigm	51
<i>Manipulation</i>	53
<i>Randomization</i>	54
<i>Inferential Calculation (Statistical Testing)</i>	57
Notes	59

Chapter 3

Moving from Fact to Truth: Validity, Reliability, and Measurement

60

- Three Strange Stories 60
- Validity 62
 - Internal Validity* 62
 - External Validity* 64
 - Construct Validity* 66
 - Conceptual Validity* 67
- Reliability 70
 - Interobserver Agreement* 71
 - Internal Consistency* 72
 - Temporal Consistency* 74
 - The “More Is Better” Rule of Reliability* 75
 - Measurement Scales* 77
 - Nominal Scales* 77
 - Ordinal Scales* 78
 - Interval Scales* 78
 - Ratio Scales* 79
 - Conversions and Perversions in Scaling and Measurement* 80

Chapter 4

How Do We Misinterpret? Common Threats to Validity

84

- One Strange and Lucrative Story 85
- People Are Different 86
 - Individual Differences* 87
 - Selection Bias and Nonresponse Bias* 89
- People Change 89
 - History and Maturation* 90
 - Regression Toward the Mean* 91
- The Process of Studying People Changes People 94
 - Hooke, Heisenberg, and (Perhaps) Hawthorne* 94
 - Testing Effects* 95
 - Experimental Mortality (Attrition)* 97
 - Participant Reaction Bias* 99
- Variables That Accompany a Treatment Change People 105
 - Experimenter Bias* 105
 - Confounds* 108

Chapter 5

Nonexperimental Research Designs

115

Describing the World of a Single Participant: Case Studies 115

Please Don't Try This at Home: The Case of Phineas Gage 116

My Life as a Dog: The Case of Stephen D. 118

Really, Really Late Night with Peter Tripp 119

The Life and Very Hard Times of Sarah 120

The Man Who Forgot His Wife and His Hat 120

What Makes a Case Study Scientific? 122

Describing the State of the World at Large:

Single-Variable Research 124

Describing Populations 125

Epidemiological Research 127

Research on Public Opinion 128

Limitations and Drawbacks of Population Surveys 130

Single-Variable Convenience Samples 131

Correlational Methods: Multiple-Variable Research 133

Person Confounds 134

Environmental Confounds 134

Operational Confounds 135

A Reminder About Reverse Causality 136

Archival Research 138

Observational Research 143

Questionnaire and Interview Research 145

Summary 148

METHODOLOGY EXERCISE 1: Partial Correlation 148

Notes 152

Chapter 6

Experience Carefully Planned: Experimental Research Designs

153

A Wonderful Method 153

A Brief History of True Experiments 154

Strengths of True Experiments 158

True Experiments Eliminate Individual Differences 158

<i>True Experiments Eliminate Other Kinds of Confounds</i>	160
<i>True Experiments Allow Researchers to Observe the Invisible</i>	163
<i>True Experiments Provide Information About Interactions</i>	165
<i>True Experiments Minimize Noise</i>	167
<i>Summary</i>	168
Are True Experiments Realistic?	168
<i>The Problem: Artificiality</i>	168
<i>The Solution: Two Forms of Realism</i>	169
<i>Is There a Recipe for Experimental Realism?</i>	175
Trade-Offs Between Internal and External Validity	176
METHODOLOGY EXERCISE 2: Random Assignment	181
Notes	183

Chapter 7

Experience Carefully Exploited:

Quasi-Experimental Research Designs

184

One Very Old Story	184
Why Quasi-Experiments?	186
Kinds of Quasi-Experiments	187
<i>Person-by-Treatment Quasi-Experiments</i>	187
<i>Natural Experiments</i>	192
<i>Other Categories of Quasi-Experiments</i>	196
Comparability	198
Patched-Up Designs	199
<i>Example 1: Evaluating a Teaching Tool</i>	200
<i>Example 2: Would a Rose by Any Other Name Move to Rosemont?</i>	207
When True Experiments and Quasi-Experiments Collide	211
Conclusions	216
Notes	217

Chapter 8

Research Design

218

One Obscure Movie	218
One-Way Designs	219
Factorial Designs	222
<i>Ins and Outs of Factorial Designs</i>	222
<i>Main Effects</i>	224
<i>Interactions</i>	226

Within-Subjects Designs	236
<i>Advantages of Within-Subjects Designs</i>	236
<i>Disadvantages of Within-Subjects Designs</i>	238
<i>Solutions</i>	240
Mixed-Model Designs	244
HANDS-ON ACTIVITY 3: A Blind Taste Test with Popular Colas	246
METHODOLOGY EXERCISE 3: Interactions	252

Chapter 9

Being a Successful Researcher

255

How to Generate Research Ideas	255
<i>Inductive Techniques</i>	257
<i>Deductive Techniques</i>	259
The Five or Six R's of Being a Successful Researcher	261
<i>Reading</i>	262
<i>Writing</i>	262
<i>Running and Revising</i>	268
<i>Rehearsing and Playing the Part</i>	270
<i>Replicating</i>	272
Being an Ethical Experimenter	274
METHODOLOGY EXERCISE 4: Repeated Measures Designs	279
HANDS-ON ACTIVITY 4: The Stroop Interference Effect	282
Notes	285

Chapter 10

A Brief Course in Statistics

286

Descriptive Statistics	286
<i>Central Tendency and Dispersion</i>	287
<i>The Shape of Distributions</i>	290
Inferential Statistics	292
<i>Probability Theory</i>	293
<i>A Study of Cheating</i>	296
Things That Go Bump in The Light: Factors That Influence the Results of Significance Tests	300
<i>Alpha Levels and Type I and II Errors</i>	300
<i>Effect Size and Significance Testing</i>	300
<i>Measurement Error and Significance Testing</i>	301

Sample Size and Significance Testing 301

Restriction of Range and Significance Testing 302

The Changing State of the Art: Alternate Perspectives
on Statistical Hypothesis Testing 303

Estimates of Effect Size 304

Meta-Analysis 306

Notes 308

Chapter 11

Telling the World About It

310

The Hourglass Approach to Empirical Research Papers 312

The Seven C's (and One G) of Good Research Papers 314

Rule 1: Be Correct 315

Rule 2: Be Clear 316

Rule 3: Be Comprehensive 317

Rule 4: Be Coherent 318

Rule 5: Be Concise 321

Rule 6: Be Cautious 321

Rule 7: Be Creative 321

Rule 8: Be Gender-Neutral 322

How to Give A Good Talk in Psychology (by Daniel T. Gilbert) 323

Have a Plan 324

Tell the Plan 324

Start at the Beginning 324

Be Painfully Clear 325

Talk About One Interesting Thing 327

Take Charge of the Interaction 327

End at the End 328

Chapter 12

How to Describe the Results of Statistical Analyses

330

The Mysterious Spheres 331

Study 1: The Murder Rate Study 331

Study 2: The Survey Study of Apathy and Energy 333

Study 3: The Newlywed Marriage Study 336

Study 4: The Stereotyping Study 339

Study 5: A Brief Return to Roberto and to the Newlywed Study 342

Study 6: The Duck in the Drugstore Study 343

Notes 346

Chapter 13
Putting Your Knowledge to Work:
20 Methodology Problems

348

1. *In Search of a Delicious, Low-Fat TV Show* 349
2. *Let's Get Supernatural* 349
3. *Fly Away Home* 349
4. *Impressive Pickup Lines* 350
5. *Clever Who?* 350
6. *Life Sucks and So You Die* 351
7. *On the Drawbacks of Liking Yourself* 352
8. *The Early Bird Gets the Win?* 353
9. *Testosterone Makes Better Dive Bombers* 352
10. *Working Your Fingers to the Dean's List* 353
11. *To Thine Own Selves Be True* 353
12. *A Rosy Mood by Any Other Name?* 354
13. *Old Geniuses Never Die Young?* 354
14. *Sampling Student Opinion* 355
15. *I'm Speechless* 355
16. *He May Be Small but He's Slow* 356
17. *Everyone's a Winner* 357
18. *Can a Couple of Beers Really Go Straight to Your Belly?* 357
19. *What's in a Name?* 358
20. *Are You Threatening Me?* 359

Coda **360**

Appendix
An Experimental Replication of the Depressed
Entitlement Effect Among Women **361**

Glossary **375**

References **391**

Name Index **402**

Subject Index **405**