



# THE PRACTICE OF SOCIAL RESEARCH

FOURTEENTH EDITION



EARL BABBIE

# The Practice of Social Research

## A Note from the Author

Writing is my joy, sociology my passion. I delight in putting words together in a way that makes people learn or laugh or both. Sociology shows up as a set of words, also. It represents our last, best hope for planet-training our race and finding ways for us to live together. I feel a special excitement at being present when sociology, at last, comes into focus as an idea whose time has come.

I grew up in small-town Vermont and New Hampshire. When I announced I wanted to be an auto-body mechanic, like my dad, my teacher told me I should go to college instead. When Malcolm X announced he wanted to be a lawyer, his teacher told him a colored boy should be something more like a carpenter. The difference in our experiences says something powerful about the idea of a level playing field. The inequalities among ethnic groups run deep.

I ventured into the outer world by way of Harvard, the USMC, U.C. Berkeley, and twelve



Earl Babbie

years teaching at the University of Hawaii. I resigned from teaching in 1980 and wrote full-time for seven years, until the call of the classroom became too loud to ignore. For me, teaching is like playing jazz. Even if you perform the same number over and over, it never comes out the same twice and you don't know exactly what it'll sound like until you hear it. Teaching is like writing with your voice.

In 2006, I retired from teaching once more, and can now devote myself more fully to writing. I've been writing textbooks for over half my life, and it keeps becoming more exciting, rather than less. I can't wait to see what happens next.

FOURTEENTH EDITION

# The Practice of Social Research

**Earl Babbie**

*Chapman University*



---

Australia • Brazil • Mexico • Singapore • United Kingdom • United States

This is an electronic version of the print textbook. Due to electronic rights restrictions, some third party content may be suppressed. Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. The publisher reserves the right to remove content from this title at any time if subsequent rights restrictions require it. For valuable information on pricing, previous editions, changes to current editions, and alternate formats, please visit [www.cengage.com/highered](http://www.cengage.com/highered) to search by ISBN#, author, title, or keyword for materials in your areas of interest.

***The Practice of Social Research,***  
**Fourteenth Edition**  
Earl Babbie

Product Director: Marta Lee-Perriard  
Product Manager: Jennifer Harrison  
Associate Content Developer: Naomi Dreyer  
Product Assistant: Julia Catalano  
Media Developer: John Chell  
Marketing Manager: Kara Kindstrom  
Content Project Manager: Cheri Palmer and  
Christy Frame  
Art Director: Michelle Kunkler  
Manufacturing Planner: Judy Inouye  
Production Service: Greg Hubit Bookworks  
Photo Researcher: Nazveena Syed, Lumina  
Datamatics  
Text Researcher: Nandhini Srinivasagopalan,  
Lumina Datamatics  
Copy Editor: Marne Evans  
Proofreader: Debra Nichols  
Illustrator and Composition: MPS Limited  
Cover Designer: Cheryl Carrington  
Cover, Part-opener, and Chapter-opener  
Images: MistikaS

© 2016, 2013 Cengage Learning

WCN: 02-200-203

ALL RIGHTS RESERVED. No part of this work covered by the copyright herein may be reproduced, transmitted, stored, or used in any form or by any means graphic, electronic, or mechanical, including but not limited to photocopying, recording, scanning, digitizing, tapping, Web distribution, information networks, or information storage and retrieval systems, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without the prior written permission of the publisher.

For product information and technology assistance, contact us at  
**Cengage Learning Customer & Sales Support, 1-800-354-9706.**

For permission to use material from this text or product,  
submit all requests online at **www.cengage.com/permissions.**

Further permissions questions can be e-mailed to  
**permissionrequest@cengage.com.**

Library of Congress Control Number: 2014944053

ISBN: 978-1-305-10494-5

**Cengage Learning**

20 Channel Center Street  
Boston, MA 02210  
USA

Cengage Learning is a leading provider of customized learning solutions with office locations around the globe, including Singapore, the United Kingdom, Australia, Mexico, Brazil, and Japan. Locate your local office at **www.cengage.com/global.**

Cengage Learning products are represented in Canada by  
Nelson Education, Ltd.

To learn more about Cengage Learning Solutions,  
visit **www.cengage.com.**

Purchase any of our products at your local college store or at our  
preferred online store **www.cengagebrain.com.**

Unless otherwise noted, all content is © Cengage Learning 2016

Printed in Canada

Print Number: 01 Print Year: 2014

## Dedication

---

*Suzanne Babbie*





# Contents in Brief

## PART 1

### An Introduction to Inquiry 3

- 1 Human Inquiry and Science 4
- 2 Paradigms, Theory, and Social Research 31
- 3 The Ethics and Politics of Social Research 60

## PART 2

### The Structuring of Inquiry: Quantitative and Qualitative 87

- 4 Research Design 88
- 5 Conceptualization, Operationalization, and Measurement 123
- 6 Indexes, Scales, and Typologies 155
- 7 The Logic of Sampling 182

## PART 3

### Modes of Observation: Quantitative and Qualitative 223

- 8 Experiments 224
- 9 Survey Research 246
- 10 Qualitative Field Research 287
- 11 Unobtrusive Research 322
- 12 Evaluation Research 351

## PART 4

### Analysis of Data: Quantitative and Qualitative 379

- 13 Qualitative Data Analysis 381
- 14 Quantitative Data Analysis 411
- 15 The Logic of Multivariate Analysis 432
- 16 Statistical Analyses 450
- 17 Reading and Writing Social Research 486

### Appendixes 509

- A Using the Library 510
- B Random Numbers 517
- C Distribution of Chi Square 519
- D Normal Curve Areas 521
- E Estimated Sampling Error 522



# Contents in Detail

Preface xvii  
Acknowledgments xxiii

## Part 1 An Introduction to Inquiry 3

### CHAPTER 1

## Human Inquiry and Science 4

### Introduction 5

### Looking for Reality 6

Knowledge from Agreement Reality 6  
Errors in Inquiry, and Some Solutions 8

### The Foundations of Social Science 10

Theory, Not Philosophy or Belief 10  
Social Regularities 11  
Aggregates, Not Individuals 13  
Concepts and Variables 14

### The Purposes of Social Research 19

### Some Dialectics of Social Research 20

Idiographic and Nomothetic Explanation 21  
Inductive and Deductive Theory 23  
Determinism versus Agency 25  
Qualitative and Quantitative Data 26

### The Research Proposal 28

### CHAPTER 2

## Paradigms, Theory, and Social Research 31

### Introduction 32

### Some Social Science Paradigms 32

Macrotheory and Microtheory 34  
Early Positivism 34  
Social Darwinism 35  
Conflict Paradigm 35  
Symbolic Interactionism 36  
Ethnomethodology 37  
Structural Functionalism 38  
Feminist Paradigms 38  
Critical Race Theory 40  
Rational Objectivity Reconsidered 41

### Elements of Social Theory 44

### Two Logical Systems Revisited 45

The Traditional Model of Science 45  
Deductive and Inductive Reasoning:  
A Case Illustration 49  
A Graphic Contrast 50

### Deductive Theory Construction 53

Getting Started 53  
Constructing Your Theory 53  
An Example of Deductive Theory:  
Distributive Justice 53

### Inductive Theory Construction 55

An Example of Inductive Theory: Why Do  
People Smoke Marijuana? 56

**The Links between Theory and Research 57**  
**Research Ethics and Theory 58**

**CHAPTER 3**

**The Ethics and Politics  
of Social Research 60**

**Introduction 61**

**Ethical Issues in Social Research 62**

- Voluntary Participation 62
- No Harm to the Participants 63
- Anonymity and Confidentiality 65
- Deception 68
- Analysis and Reporting 69
- Institutional Review Boards 70
- Professional Codes of Ethics 72

**Two Ethical Controversies 72**

- Trouble in the Tearoom 72
- Observing Human Obedience 76

**The Politics of Social Research 77**

- Objectivity and Ideology 78
- Politics with a Little “p” 81
- Politics in Perspective 82

**Part 2 The Structuring  
of Inquiry: Quantitative  
and Qualitative 87**

**CHAPTER 4**

**Research Design 88**

**Introduction 89**

**Three Purposes of Research 90**

- Exploration 90
- Description 91
- Explanation 91

**Idiographic Explanation 93**

**Nomothetic Explanation 93**

- Criteria for Nomothetic Causality 94
- Nomothetic Causal Analysis  
and Hypothesis Testing 95
- False Criteria for Nomothetic Causality 96

**Necessary and Sufficient Causes 96**

**Units of Analysis 97**

- Individuals 99
- Groups 99
- Organizations 100
- Social Interactions 100
- Social Artifacts 100
- Units of Analysis in Review 102
- Faulty Reasoning about Units of Analysis:  
The Ecological Fallacy and Reductionism 103

**The Time Dimension 105**

- Cross-Sectional Studies 106
- Longitudinal Studies 106
- Approximating Longitudinal Studies 110
- Examples of Research Strategies 111

**Mixed Modes 112**

**How to Design a Research Project 113**

- Getting Started 114
- Conceptualization 115
- Choice of Research Method 115
- Operationalization 116
- Population and Sampling 116
- Observations 116
- Data Processing 116
- Analysis 117
- Application 117
- Research Design in Review 117

**The Research Proposal 118**

- Elements of a Research Proposal 119

**CHAPTER 5**

**Conceptualization,  
Operationalization,  
and Measurement 123**

**Introduction 124**

**Measuring Anything That Exists 124**

- Conceptions, Concepts, and Reality 125
- Concepts as Constructs 127

**Conceptualization 128**

- Indicators and Dimensions 128
- The Interchangeability of Indicators 131
- Real, Nominal, and Operational Definitions 131
- Creating Conceptual Order 132

An Example of Conceptualization: The Concept of Anomie 133

### Definitions in Descriptive and Explanatory Studies 135

#### Operationalization Choices 136

Range of Variation 136  
 Variations between the Extremes 137  
 A Note on Dimensions 138  
 Defining Variables and Attributes 138  
 Levels of Measurement 139  
 Single or Multiple Indicators 143  
 Some Illustrations of Operationalization Choices 143  
 Operationalization Goes On and On 144

#### Criteria of Measurement Quality 145

Precision and Accuracy 145  
 Reliability 146  
 Validity 148  
 Who Decides What's Valid? 150  
 Tension between Reliability and Validity 151

#### The Ethics of Measurement 152

## CHAPTER 6

# Indexes, Scales, and Typologies 155

### Introduction 156

### Indexes versus Scales 156

### Index Construction 159

Item Selection 159  
 Examination of Empirical Relationships 160  
 Index Scoring 164  
 Handling Missing Data 165  
 Index Validation 169  
 The Status of Women: An Illustration of Index Construction 171

### Scale Construction 172

Bogardus Social Distance Scale 173  
 Thurstone Scales 174  
 Likert Scaling 174  
 Semantic Differential 175  
 Guttman Scaling 176

### Typologies 178

## CHAPTER 7

# The Logic of Sampling 182

### Introduction 183

### A Brief History of Sampling 184

President Alf Landon 184  
 President Thomas E. Dewey 185  
 Two Types of Sampling Methods 186

### Nonprobability Sampling 186

Reliance on Available Subjects 186  
 Purposive or Judgmental Sampling 187  
 Snowball Sampling 188  
 Quota Sampling 188  
 Selecting Informants 189

### The Theory and Logic of Probability Sampling 190

Conscious and Subconscious Sampling Bias 191  
 Representativeness and Probability of Selection 192  
 Random Selection 193  
 Probability Theory, Sampling Distributions, and Estimates of Sampling Error 194

### Populations and Sampling Frames 201

Review of Populations and Sampling Frames 205

### Types of Sampling Designs 205

Simple Random Sampling 206  
 Systematic Sampling 207  
 Stratified Sampling 209  
 Implicit Stratification in Systematic Sampling 211  
 Illustration: Sampling University Students 211

### Multistage Cluster Sampling 212

Multistage Designs and Sampling Error 212  
 Stratification in Multistage Cluster Sampling 214  
 Probability Proportionate to Size (PPS) Sampling 214  
 Disproportionate Sampling and Weighting 216

### Probability Sampling in Review 218

### The Ethics of Sampling 218

## Part 3 Modes of Observation: Quantitative and Qualitative 223

### CHAPTER 8

## Experiments 224

### Introduction 225

### Topics Appropriate for Experiments 225

### The Classical Experiment 226

- Independent and Dependent Variables 226
- Pretesting and Posttesting 226
- Experimental and Control Groups 227
- The Double-Blind Experiment 228

### Selecting Subjects 229

- Probability Sampling 230
- Randomization 230
- Matching 231
- Matching or Randomization? 232

### Variations on Experimental Design 232

- Preexperimental Research Designs 232
- Validity Issues in Experimental Research 234

### An Illustration of Experimentation 238

### Alternative Experimental Settings 240

- Factorial Designs 241
- Web-Based Experiments 242
- “Natural” Experiments 242

### Strengths and Weaknesses of the Experimental Method 243

### Ethics and Experiments 244

### CHAPTER 9

## Survey Research 246

### Introduction 247

### Topics Appropriate for Survey Research 247

### Guidelines for Asking Questions 248

- Choose Appropriate Question Forms 249
- Make Items Clear 250
- Avoid Double-Barreled Questions 250
- Respondents Must Be Competent to Answer 250
- Respondents Must Be Willing to Answer 251

- Questions Should Be Relevant 252
- Short Items Are Best 252
- Avoid Negative Items 252
- Avoid Biased Items and Terms 253

### Questionnaire Construction 254

- General Questionnaire Format 254
- Formats for Respondents 255
- Contingency Questions 255
- Matrix Questions 257
- Ordering Items in a Questionnaire 257
- Questionnaire Instructions 258
- Pretesting the Questionnaire 259
- A Composite Illustration 259

### Self-Administered Questionnaires 262

- Mail Distribution and Return 262
- Monitoring Returns 263
- Follow-Up Mailings 264
- Response Rates 264
- Compensation for Respondents 265
- A Case Study 266

### Interview Surveys 267

- The Role of the Survey Interviewer 267
- General Guidelines for Survey Interviewing 268
- Coordination and Control 270

### Telephone Surveys 271

- Computer-Assisted Telephone Interviewing (CATI) 272
- Response Rates in Interview Surveys 273

### Online Surveys 274

- Online Devices 275
- Electronic Instrument Design 276
- Improving Response Rates 276

### Mixed-Mode Surveys 277

### Comparison of the Different Survey Methods 278

### Strengths and Weaknesses of Survey Research 279

### Secondary Analysis 280

### Ethics and Survey Research 283

### CHAPTER 10

## Qualitative Field Research 287

### Introduction 288

### Topics Appropriate for Field Research 288

## Special Considerations in Qualitative Field Research 291

- The Various Roles of the Observer 291
- Relations to Subjects 293

## Some Qualitative Field Research Paradigms 296

- Naturalism 297
- Ethnomethodology 298
- Grounded Theory 300
- Case Studies and the Extended Case Method 302
- Institutional Ethnography 304
- Participatory Action Research 305

## Conducting Qualitative Field Research 307

- Preparing for the Field 307
- Qualitative Interviewing 310
- Focus Groups 313
- Recording Observations 315

## Strengths and Weaknesses of Qualitative Field Research 317

- Validity 318
- Reliability 319

## Ethics and Qualitative Field Research 319

### CHAPTER 11

## Unobtrusive Research 322

### Introduction 323

### Content Analysis 323

- Topics Appropriate for Content Analysis 324
- Sampling in Content Analysis 325
- Coding in Content Analysis 328
- Illustrations of Content Analysis 332
- Strengths and Weaknesses of Content Analysis 334

### Analyzing Existing Statistics 334

- Durkheim's Study of Suicide 335
- The Consequences of Globalization 336
- Units of Analysis 337
- Problems of Validity 338
- Problems of Reliability 338
- Sources of Existing Statistics 339

### Comparative and Historical Research 341

- Examples of Comparative and Historical Research 341
- Sources of Comparative and Historical Data 344
- Analytic Techniques 345

## Unobtrusive Online Research 347

## Ethics and Unobtrusive Measures 348

### CHAPTER 12

## Evaluation Research 351

### Introduction 352

### Topics Appropriate for Evaluation Research 353

### Formulating the Problem: Issues of Measurement 355

- Specifying Outcomes 356
- Measuring Experimental Contexts 357
- Specifying Interventions 357
- Specifying the Population 357
- New versus Existing Measures 358
- Operationalizing Success/Failure 359

### Types of Evaluation Research Designs 360

- Experimental Designs 360
- Quasi-Experimental Designs 361
- Qualitative Evaluations 364

### The Social Context 366

- Logistical Problems 366
- Use of Research Results 368

### Social Indicators Research 373

- The Death Penalty and Deterrence 374
- Computer Simulation 375

### Ethics and Evaluation Research 375

## Part 4 Analysis of Data: Quantitative and Qualitative 379

### CHAPTER 13

## Qualitative Data Analysis 381

### Introduction 382

### Linking Theory and Analysis 382

- Discovering Patterns 382
- Grounded Theory Method 384
- Semiotics 385
- Conversation Analysis 386

## Qualitative Data Processing 387

- Coding 387
- Memoing 391
- Concept Mapping 392

## Computer Programs for Qualitative Data 393

- QDA Programs 393
- Leviticus as Seen through Qualrus 394
- NVivo 396

## The Qualitative Analysis of Quantitative Data 399

## Evaluating the Quality of Qualitative Research 403

## Ethics and Qualitative Data Analysis 408

### CHAPTER 14

## Quantitative Data Analysis 411

### Introduction 412

### Quantification of Data 412

- Developing Code Categories 413
- Codebook Construction 414
- Data Entry 415

### Univariate Analysis 416

- Distributions 416
- Central Tendency 417
- Dispersion 420
- Continuous and Discrete Variables 422
- Detail versus Manageability 422

### Subgroup Comparisons 423

- “Collapsing” Response Categories 423
- Handling “Don’t Knows” 424
- Numerical Descriptions in Qualitative Research 425

### Bivariate Analysis 425

- Percentaging a Table 427
- Constructing and Reading Bivariate Tables 427

## Ethics and Quantitative Data Analysis 429

### CHAPTER 15

## The Logic of Multivariate Analysis 432

### Introduction 433

### The Origins of the Elaboration Model 433

## The Elaboration Paradigm 436

- Replication 437
- Explanation 437
- Interpretation 439
- Specification 439
- Refinements to the Paradigm 442

## Elaboration and Ex Post Facto Hypothesizing 444

## Sociological Diagnostics 445

### CHAPTER 16

## Statistical Analyses 450

### Introduction 451

### Descriptive Statistics 451

- Data Reduction 451
- Measures of Association 452
- Regression Analysis 456

### Inferential Statistics 460

- Univariate Inferences 460
- Tests of Statistical Significance 461
- The Logic of Statistical Significance 462
- Chi Square 465
- t-Test 467
- Some Words of Caution 468

### Other Multivariate Techniques 470

- Path Analysis 470
- Time-Series Analysis 472
- Factor Analysis 473
- Analysis of Variance 475
- Discriminant Analysis 477
- Log-Linear Models 479
- Odds-Ratio Analysis 481
- Geographic Information Systems (GIS) 482

### CHAPTER 17

## Reading and Writing Social Research 486

### Introduction 487

### Reading Social Research 487

- Organizing a Review of the Literature 487
- Reading Journals versus Books 488
- Evaluating Research Reports 489



**Using the Internet Wisely 494**

- Some Useful Websites 494
- Searching the Web 494
- Evaluating the Quality of Internet Materials 496
- Citing Internet Materials 500

**Writing Social Research 500**

- Some Basic Considerations 500
- Organization of the Report 502
- Guidelines for Reporting Analyses 505
- Going Public 506

**The Ethics of Reading and Writing  
Social Research 507**

**Appendixes 509**

- A Using the Library 510**
- B Random Numbers 517**

**C Distribution of Chi Square 519**

**D Normal Curve Areas 521**

**E Estimated Sampling Error 522**

Glossary 523

Bibliography 535

Index 549



# Preface

A “few” years ago (I hate to tell you how many), I began teaching my first course in social research methods. The course focused specifically on survey research methods, and I had only six students in the class. As the semester progressed, I became more relaxed as a teacher. Before long, my students and I began meeting in my office, where I could grab and lend books from my own library as their relevance occurred to me during class meetings.

One nagging problem I faced then was the lack of a good textbook on survey research. The available books fell into one of two groups. Some books presented the theoretical logic of research methods in such abstract terms that I didn’t think students would be able to apply any of the general principles to the practical world of “doing” research. The other books were just the opposite. Often termed “cookbooks,” they presented detailed, step-by-step instructions on how to conduct a survey. Unfortunately, this approach only prepared students to conduct surveys very much like the ones described by the authors. Neither the abstract nor the “cookbook” approach seemed truly useful to students or their instructors.

One day I found myself jotting down the table of contents for my ideal research methods textbook. It was organized around three themes:

1. Understanding the theoretical principles on which scientific research is based;
2. Seeing how those principles are reflected in the established techniques for doing research;
3. Being prepared to make appropriate compromises whenever field conditions do not

permit the routine application of established techniques.

The next day, unexpectedly, Wadsworth called and asked me to write a methods text!

*Survey Research Methods* was published in 1973. My editors and I immediately received some good news, some bad news, and some additional good news. The first good news was that all survey research instructors seemed to love the book, and it was being used in virtually every survey research course in the country. The bad news was that there weren’t all that many survey research courses.

The final good news, however, was that many instructors who taught general social research courses—covering survey research alongside other research methods—were inclined to use our book and supplement it with other books dealing with field research, experiments, and so on. While adjusting to our specialized book, however, many instructors suggested that Wadsworth have “that same guy” write a more general social research text.

The preface of the first edition of *The Practice of Social Research* (1975) acknowledged the assistance of a dozen social research instructors from California to Florida. The book was a collaboration in a very real sense, even though only my name was on the cover and I was ultimately responsible for it.

*The Practice of Social Research* was an immediate success. Although it was initially written for sociology courses, subsequent editions have been increasingly used in fields such as psychology, public administration, urban studies, education, communications, social sciences, and political

science—in some 30 different disciplines, I’m told. Moreover, it’s being used by teachers and researchers in numerous countries around the world, and in 2000 a Beijing publisher released a two-volume Chinese edition.

I’ve laid out this lengthy history of the book for a couple of reasons. First, when I was a student, I suppose I thought of textbooks the same way that I thought about government buildings: They were just there. I never really thought about them as being written by human beings. I certainly never thought about textbooks as evolving: being updated, getting better, having errors corrected. As a student, I would have been horrified by the thought that any of my textbooks might contain mistakes!

Second, pointing out the evolution of the book sets the stage for a preview of the changes that have gone into this 14th edition. As with previous revisions, several factors have prompted changes. For example, because social research technology and practices are continually changing, the book must be updated to remain current and useful. In my own teaching, I frequently find improved ways to present standard materials. Colleagues also often share their ideas for ways to teach specific topics. Some of these appear as boxed inserts in the book. Both students and instructors often suggest that various topics be reorganized, expanded, clarified, shrunk, or—gasp—deleted.

## New to the 14th Edition

In an earlier edition of this book, I said, “Revising a textbook such as this is a humbling experience. No matter how good it seems to be, there is no end of ideas about how it could be improved.” That observation still holds true. When we asked instructors what could be improved, they once again thought of things, and I’ve considered all their suggestions, followed many of them, and chosen to “think some more” about others. I’ve also received numerous comments and suggestions from students who have been assigned the book; many of the changes come from them.

### General Changes

- Revised the use of *gender* and *sex* for rigor and consistency
- Dropped the box series, “Keeping Humanity in Focus,” although I worked most of the

examples into the text

- Updated GSS and other data where available and appropriate
- C-O-L-O-R!

## Specific Changes

### Chapter One

- Discussed the distinction between *sex* and *gender*, explaining how the terms will be used throughout this book
- Added a discussion of the Arbesman’s Half-Life of Facts
- Added a discussion of probabilistic causation in the section on determinism and agency

### Chapter Two

- Have added bibliographic citations for classic works, such as Comte and Darwin
- Revised the introduction to the section, Traditional Model of Science
- Removed references to Chapter 1 discussion of postmodernism
- Added a discussion of big data
- Added discussion of Karl Popper’s principle of falsifiability
- Expanded the discussion of feminist paradigms

### Chapter Three

- Updated the AAPOR Code of Ethics to 2010
- Expanded discussion of National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research
- Added a comment on the need for special care when dealing with vulnerable populations
- Discussed an article about British RECs (aka IRBs) and the special problems faced by qualitative researchers
- Added discussion of confidentiality with visual images
- Added a discussion of fraudulent “research”

### Chapter Four

- Referenced Peter Lynn volume on longitudinal studies

- New Research in Real Life box reporting a graduate student's research in North Africa
- New diagram comparing several study types
- Discussion of how social research can combat environmental problems
- Introduced “panel mortality” and cited study using Facebook to track down missing subjects
- More explanation for Figure 4-1
- Updated dates in Figure 4-5
- Added a link from cohort to panel studies
- New section on mixed modes

### Chapter Five

- Revised the introduction to sections on Levels of Measurement and Nominal measures
- Augmented discussion of measuring quality of life at colleges
- Deleted discussion of *sex* and *gender*—discussed earlier
- Dropped the Patricia Fisher box on variable names
- Shortened the examples of operationalization
- Added an example of “Cornish” as an ethnic group in some studies

### Chapter Six

- Revised the discussion of Public Health ratings of U.S. states
- Added a Research in Real Life box, “Indexing the World”
- Updated GSS data on abortion attitudes
- Expanded the explanation of Guttman scaling

### Chapter Seven

- Moved discussion of cell phones and sampling from Chapter 9
- Augmented discussion of cell phones and sampling with Pew Center results
- Updated GSS data to 2012 for Guttman scale example
- Added a discussion of “credibility intervals”
- Introduced the term *chain referral*
- Cited Michael Brick's suggestion of a rebirth of quota sampling
- Revised Tips and Tools box on Using a Table of Random Numbers

- Revised Figure 7-11, referring to new random number appendix
- Streamlined the discussion of sampling frames
- Added discussion of difficulty of sampling for Internet surveys
- Added a section on Factorial Designs
- Added explanation of FCC rules on calling cell phones

### Chapter Eight

- Added suggestions by Horne and Lovaglia for using experiments in criminology
- Added suggestions by Schumann for using experiments to pretest survey-question wording

### Chapter Nine

- Moved discussion of cell phones and sampling to Chapter 7
- Introduced Mick Couper's Designing Effective Web Surveys
- Added example of qualitative secondary analysis involving gay and lesbian child rearing
- Expanded and updated section on online surveys
- Moved discussion of RDD sampling to Chapter 7
- Added examples for ways of increasing response rates
- Added a section on mixed-mode surveys
- Expanded on the advantages of online surveys

### Chapter Ten

- Added discussion of the American/European cultural roots of interviewing
- Discussion of the distinctions between journalistic and social research
- Added a fuller discussion of the role of the literature review in connection with the Grounded Theory Method
- Added caution of picking biased sample of cases

### Chapter Eleven

- Added example of climate change and population growth

- Updated census data on education/gender/income
- Discussed Wordscores for analyzing manifest content
- Study analyzing gendered toys offered on Disney website
- Added more-recent study of suicide rates
- Created a new section on Online Unobtrusive Research with a great many examples
- Introduced the Census Bureau's American Community Survey and Census Explorer
- Expanded on the concept of big data

### Chapter Twelve

- New Tips and Tools box introducing the concept of Positive Deviance
- New Research in Real Life box discussing social research in China with a special focus on the Canton Public Opinion Research Center
- Expanded the text explanation of Figure 12-2

### Chapter Thirteen

- Completely revamped the QDA example, introducing NVivo 9 and Qualrus
- Added another example of understanding quantitative data in a qualitative format (2012 election returns)

### Chapter Fourteen

- Clarified the discussion of measures of central tendency
- Added to the discussion of interpreting relationships between two variables
- Moved Sociological Diagnostics to Chapter 15

### Chapter Fifteen

- Deleted the tables from *The American Soldier*
- Moved Sociological Diagnostics from Chapter 14
- Related attitudes toward Medicare to attitudes toward Obamacare
- Added new and updated variables to gender/income analysis

### Chapter Sixteen

- Introduced Logit and Probit regression models
- Expanded section on GIS, including a graphic example

- Added a discussion of computer packages commonly used for statistical analyses

### Chapter Seventeen

- Expanded the discussion of the peer-review process
- Introduced the Digital Object Identifier as an attempt to make web materials available in the long run

As always, I've updated materials throughout the book. As an instructor, I'm constantly searching for new and more-effective ways of explaining social research to my own students; many of those new explanations take the form of diagrams. You'll find several new graphical illustrations in this edition. Once again, I've sought to replace aging research examples (except for the classics) with more-recent ones. I've also dropped some sections that I don't think do much for students anymore.

As with each new edition, I would appreciate any comments you have about how the book can be improved. Its evolution over the past years has reflected countless comments from students and others.

## Pedagogical Features

Although students and instructors both have told me that the past editions of this book were effective tools for learning research methods, I have used this revision as an opportunity to review the book from a pedagogical standpoint, fine-tuning some elements, adding others. Here's the package we assembled for the 14th edition.

**Chapter Overview** Each chapter is preceded with a pithy focus paragraph that highlights the principal content of the chapter.

**Chapter Introduction** Each chapter opens with an introduction that lays out the main ideas in that chapter and, importantly, relates them to the content of other chapters in the book.

**Clear and provocative examples** Students often tell me they find the research examples help to clarify difficult and/or abstract ideas, and this edition has many new examples as well as some that have proven particularly valuable in earlier editions.

**Graphics** From the first time I took a course in research methods, most of the key concepts have made sense to me in graphical form. Whereas my task here has been to translate those mental pictures into words, I've also included some graphical illustrations in the book.

**Boxed examples and discussions** Students tell me they like the boxed materials that highlight particular ideas and studies, and these features add variety to the format. Beginning in the tenth edition, I've added boxes showing the ways the mass media use and misuse social research.

**Running glossary** Key terms are highlighted in the text, and definitions for each term are listed at the bottom of the page. This will help students learn the definitions of these terms and locate them in each chapter to review them in context.

**Main Points** At the end of each chapter, a concise list of main points provides both a brief chapter summary and a useful review. The main points let students know exactly what ideas they should focus on in each chapter.

**Key Terms** A list of key terms follows the main points. These lists reinforce the students' acquisition of necessary vocabulary. The new vocabulary in these lists is defined in context in the chapters. The terms are boldfaced in the text, defined in the running glossary that appears at the bottom of the page throughout the text, and included in the glossary at the back of the book.

**Appendices** As in previous editions, a set of appendices provides students with some research tools, such as a guide to the library, a table of random numbers, and so forth.

**Clear and accessible writing** This is perhaps the most important “pedagogical aid” of all. I know that all authors strive to write texts that are clear and accessible, and I take some pride in the fact that this “feature” of the book has been one of its most highly praised attributes through its 13 previous editions. It is the one thing students write most often about. Whether you're new to this book or intimately familiar with previous editions, I invite you to open to any chapter and evaluate the writing for yourself.

## MindTap™: The Personal Learning Experience

MindTap Sociology for Babbie's *The Practice of Social Research* from Cengage Learning represents a new approach to a highly personalized, online learning platform. MindTap combines all of a student's learning tools—the chapter reading, review questions, and Research Tutor modules—into a Learning Path that guides the student through the research methods course. Instructors personalize the experience by customizing the presentation of these learning tools to their students, even seamlessly introducing their own content into the Learning Path. Learn more at [www.cengage.com/mindtap](http://www.cengage.com/mindtap).

MindTap Sociology for Babbie's *The Practice of Social Research* is easy to use and saves instructors time by allowing them to

- Customize the course—from tools to text—and make adjustments “on the fly,” making it possible to intertwine breaking news into their lessons and incorporate today's teachable moments;
- Promote personalization by segmenting course content into movable objects, encourage interactivity, and ensure student engagement;
- Integrate multimedia assets, in-context exercises, and supplements; student engagement will increase leading to better student outcomes;
- Track students' use, activities, and comprehension in real-time, providing opportunities for early intervention to influence progress and outcomes;
- Assess knowledge throughout each section: after readings, in activities, homework, and quizzes; and
- Automatically grade homework and quizzes.

## Supplements

*The Practice of Social Research*, 14th edition, is accompanied by a wide array of supplements prepared for both the instructor and student. All the continuing supplements for *The Practice of Social Research*, 14th edition, have been thoroughly revised and updated. I invite you to examine and take full advantage of the teaching and learning tools provided.

### **Guided Activities for *The Practice of Social Research*, 14th Edition**

The student study guide and workbook Ted Wagenaar and I have prepared continues to be a mainstay of my own teaching. Students tell me they use it heavily as a review of the text, and I count the exercises as half their grade in the course.

In this edition, Ted and I have once again sorted through the exercises and added new ones we've created in our own teaching or heard about from colleagues. These include matching, multiple-choice, and open-ended discussion questions for each chapter, along with four to six exercises that use examples from everyday life to reinforce the material learned in the text.

### **Readings in *Social Research*, 3rd Edition**

The concepts and methodologies of social research come to life in this interesting collection of articles specifically designed to accompany *The Practice of Social Research*. Diane Kholos Wysocki includes an interdisciplinary range of readings from the fields of psychology, sociology, social work, criminal justice, and political science. The articles focus on the important methods and concepts typically covered in the social research course and provide an illustrative advantage. Organized by key concepts, each of the reader's 11 chapters begins with an introduction highlighting and explaining the research concept that each chapter's readings elucidate.

### **Online SPSS Practice Workbook**

This handy guide is coordinated with the text to help students learn basic navigation in SPSS, including how to enter their own data; create, save, and retrieve files; produce and interpret data summaries; and more. Also included are SPSS practice exercises correlated with each chapter. Instructors can access this resource at <https://login.cengage.com/cb/> to distribute to their students.

### **Online 2014 GSS Data Sets to accompany *The Practice of Social Research***

Over the years, the publisher and I have sought to provide up-to-date personal computer support for students and instructors. Because there are now many excellent programs for analyzing data, we've provided data to be used with them. With this edition, the data sets will be updated to include the 2014 GSS data. Instructors can access this resource at <https://login.cengage.com/cb/> to distribute to their students.

### **Instructor's Manual with Test Bank**

This supplement offers the instructor brief chapter outlines, detailed chapter outlines, behavioral objectives, teaching suggestions and resources, Internet exercises, and possible study guide answers. In addition, for each chapter of the text, the Test Bank has 45–50 multiple-choice questions, 15–20 true-false questions, and 5 or more essay questions. All multiple choice and true-false questions have answers and page references, and are labeled as new, modified, or pickup so instructors know if the question is new to this edition of the Test Bank, picked up but modified from the previous edition of the Test Bank, or picked up straight from the previous edition.

### **Cengage Learning Testing Powered by Cognero®**

Cengage Learning Testing powered by Cognero is a flexible online system that allows instructors to author, edit, and manage Test Bank content and quickly create multiple test versions. You can deliver tests from your LMS, your classroom—or wherever you want.

### **PowerPoint® Lecture Slides**

Helping make your lectures more engaging, these handy Microsoft® PowerPoint® slides outline the chapters of the main text in a classroom-ready presentation, making it easy for instructors to assemble, edit, publish, and present custom lectures.



# Acknowledgments

It would be impossible to acknowledge adequately all the people who have influenced this book. My earlier methods text, *Survey Research Methods*, was dedicated to Samuel Stouffer, Paul Lazarsfeld, and Charles Glock. I again acknowledge my debt to them.

I also repeat my thanks to those colleagues acknowledged for their comments during the writing of the earlier editions of this book. The present book still reflects their contributions. Many other colleagues helped me revise the book as well—including the amazing 110 instructors who took the time to respond to our electronic survey. Their feedback was invaluable. I also particularly want to thank the instructors who reviewed the manuscript of the past two editions and made helpful suggestions; among them,

Melanie Arthur, Portland State University  
Michael Bisciglia, Southeastern Louisiana University  
Sheena Carey, Marquette University  
Daniel Coffey, University of Akron  
Craig Forsyth, University of Louisiana at Lafayette  
Robert Kleidman, Cleveland State University  
Marci B. Littlefield, Indiana State University  
Jeanne Mekolichick, Radford University  
Dan Okada, Sacramento State University  
Bruce H. Wade, Spelman College

Also, I appreciate the insights and assistance of those who reviewed the 14th edition:

Victor Agadjanian, Arizona State University  
Pat Christian, Canisius College

William T. Clute, University of Nebraska at Omaha

Marian A. O. Cohen, Framingham State College

Kimberly Dugan, Eastern Connecticut State University

Herman Gibson, Henderson State University

Ellen Goldring, Peabody College, Vanderbilt

Susan Gore, University of Massachusetts at Boston

Sarah Hurley, Arkansas State University

Jana L. Jasinski, University of Central Florida

Michael Kleiman, University of South Florida

Augustine Kposowa, University of California, Riverside

Patrick F. McManimon Jr., William Patterson University

Jared Schultz, Texas Tech University Health Sciences Center

Thomas C. Wilson, Florida Atlantic University

Gary Wyatt, Emporia State University

I also wish to thank Anne Baird, Morehouse College; Rae Banks, Syracuse University; Roland Chilton, University of Massachusetts, Amherst; M. Richard Cramer, University of North Carolina, Chapel Hill; Joseph Fletcher, University of Toronto; Shaul Gabbay, University of Illinois, Chicago; Marcia Ghidina, University of North Carolina, Asheville; Roland Hawkes, Southern Illinois University; Jeffrey Jacques, Florida A&M University; Daniel J. Klenow, North Dakota State University; Wanda Kosinski, Ramapo College, New Jersey; Manfred Kuechler,

CUNY Hunter College; Cecilia Menjivar, Arizona State University; Joan Morris, University of Central Florida; Alisa Potter, Concordia College; Zhenchoa Qian, Arizona State University; Robert W. Reynolds, Weber State University; Laurie K. Scheuble, Doane College; Beth Anne Shelton, University of Texas, Arlington; Matthew Sloan, University of Wisconsin, Madison; Bernard Sorofman, University of Iowa; Ron Stewart; Randy Stoecker, University of Toledo; Theodore Wagenaar, Miami University, Ohio; Robert Wolf, Eastern Connecticut State University; and Jerome Wolfe, University of Miami.

Over the years, I've become more and more impressed by the important role played by editors in books like this. Although an author's name appears on the book's spine, much of its backbone derives from the strength of its editors. Since 1973 I've worked with many sociology editors at Wadsworth/Cengage Learning, which has involved the kinds of adjustments you might need to make in successive marriages.

There are also others at Cengage Learning whose talents have had an impact on this book. I would like to acknowledge Michelle Kunkler, Art Director; John Chell, Media Developer; Naomi

Dreyer, Associate Content Developer; Deanna Ettinger, Intellectual Property Analyst; and Cheri Palmer, Content Project Manager, who shepherded the countless pieces and people required to turn a manuscript into a book.

I also wish to thank Greg Hubit for managing all the critical production processes with great skill, and Ted Wagenaar, who has contributed extensively to this book.

While I have always recognized and appreciated the many and varied editorial contributions made to the books that ultimately bear only my name, the closing moments of a book's birth (or rebirth in this case) come down to a close partnership between author and copy editor. This 14th edition reflects the skills of Marne Evans, who is a seasoned professional in her craft. I feel fortunate to have had her partnership and look forward to future editions.

I have dedicated this book to my soul mate, best friend, and wife, Suzanne Babbie. I see in Suze those things I am most proud of in myself, except I see purer versions of those qualities in her. She ennobles what is possible in a human being, and I become a better person because of her example.

# The Practice of Social Research



- 1 Human Inquiry and Science
- 2 Paradigms, Theory, and Social Research
- 3 The Ethics and Politics of Social Research

**S**cience is a familiar word; everyone uses it. Yet, images of science differ greatly. For some, science is mathematics; for others, it's white coats and laboratories. It's often confused with technology or equated with tough high school or college courses.

Science is, of course, none of these things per se. It is difficult, however, to specify exactly what science is. Scientists themselves disagree on the proper definition. For the purposes of this book, we look at science as a method of inquiry—a way of learning and knowing things about the world around us. Contrasted with other ways of learning and knowing about the world, science has some special characteristics. It is a conscious, deliberate, and rigorous undertaking. Sometimes it uses statistical analyses, but often it does not. We'll examine these and other traits in this opening set of chapters.

Dr. Benjamin Spock, the renowned author and pediatrician, began his books on child care by assuring new parents that they already know more about child care than they think they do. I want to begin this book on a similar note. Before you've read very far, you will realize that you already know a great deal about the practice of social research. In fact, you've been

# An Introduction to Inquiry

conducting research all your life. From that perspective, the purpose of this book is to help you sharpen skills you already have and perhaps to show you some tricks that may not have occurred to you.

Part 1 of this book lays the groundwork for the rest of the book by examining the fundamental characteristics and issues that make science different from other ways of knowing things. In Chapter 1, we'll begin with a look at native human inquiry, the sort of thing you've been doing all your life. In the course of that examination, we'll see some of the ways people go astray in trying to understand the world around them, and I'll summarize the primary characteristics of scientific inquiry that guard against those errors.

Chapter 2 deals with social theories and the links between theory and research. We'll look at some of the theoretical paradigms that shape the nature of inquiry

and that largely determine what scientists look for and how they interpret what they see.

Whereas most of this book deals with the scientific concerns of social research, Chapter 3 introduces two other important concerns: the ethics and politics of research. Researchers are governed by a set of ethical constraints that reflect ideals and values aimed at helping, not harming, people. Social research is also shaped by the fact that it operates within the political codes and systems of the societies it seeks to study and understand. These two topics appear throughout the book as critical components of social research.

The overall purpose of Part 1 is to construct a backdrop against which to view the specifics of research design and execution. After completing Part 1, you'll be ready to look at some of the more concrete aspects of social research.

# Human Inquiry and Science

## CHAPTER OVERVIEW

All of us try to understand and predict the social world. Scientific inquiries—and social research in particular—are designed to avoid the pitfalls of ordinary human inquiry.



### Introduction

#### Looking for Reality

- Knowledge from Agreement
- Reality
- Errors in Inquiry, and Some Solutions

#### The Foundations of Social Science

- Theory, Not Philosophy or Belief
- Social Regularities
- Aggregates, Not Individuals
- Concepts and Variables

### The Purposes of Social Research

#### Some Dialectics of Social Research

- Idiographic and Nomothetic Explanation
- Inductive and Deductive Theory
- Determinism versus Agency
- Qualitative and Quantitative Data

#### The Research Proposal

## Introduction

This book is about knowing things—not so much *what* we know as *how* we know it. Let's start by examining a few things you probably know already.

You know the world is round. You probably also know it's cold on the dark side of the moon (the side facing away from the sun), and you know people speak Chinese in China. You know that vitamin C can prevent colds and that unprotected sex can result in AIDS.

How do you know? Unless you've been to the dark side of the moon lately or done experimental research on the virtues of vitamin C, you know these things because somebody told them to you, and you believed what you were told. You may have read in *National Geographic* that people speak Chinese languages in China, and because that made sense to you, you didn't question it. Perhaps your physics or astronomy instructor told you it was cold on the dark side of the moon, or maybe you heard it on the news.

Some of the things you know seem absolutely obvious to you. If someone asked you how you know the world is round, you'd probably say, "Everybody knows that." There are a lot of things everybody knows. Of course, everyone used to "know" that the world was flat.

Most of what you and I know is a matter of agreement and belief. Little of it is based on personal experience and discovery. A big part of growing up in any society, in fact, is the process of learning to accept what everybody around us "knows" is so. If you don't know those same things, you can't really be a part of the group. If you were to question seriously whether the world is really round, you'd quickly find yourself set apart from other people.

Although most of what we know is a matter of believing what we've been told, there's nothing wrong with us in that respect. It's simply the way human societies are structured, and it's a quite useful quality. The basis of knowledge is agreement. Because you can't learn all you need to know by means of personal experience and discovery alone, things are set up so you can simply believe what others tell you. You know some things through tradition and some things

from "experts." I'm not saying you should never question this received knowledge; I'm just drawing your attention to the way you and society normally get along regarding what is so.

There are other ways of knowing things, however. In contrast to knowing things through agreement, we can know them through direct experience—through observation. If you dive into a glacial stream flowing through the Canadian Rockies, you don't need anyone to tell you it's cold. The first time you stepped on a thorn, you knew it hurt before anyone told you.

When our experience conflicts with what everyone else knows, though, there's a good chance we'll surrender our experience in favor of the agreement.

Let's take an example. Imagine you've come to a party at my house. It's a high-class affair, and the drinks and food are excellent. In particular, you're taken by one of the appetizers I bring around on a tray: a breaded, deep-fried appetizer that's especially zesty. You have a couple—they're so delicious! You have more. Soon you're subtly moving around the room to be wherever I am when I arrive with a tray of these nibbles.

Finally, you can't contain yourself any more. "What are they?" you ask. "How can I get the recipe?" And I let you in on the secret: "You've been eating breaded, deep-fried worms!" Your response is dramatic: Your stomach rebels, and you throw up all over the living-room rug. Argh! What a terrible thing to serve guests!

The point of the story is that both of your feelings about the appetizer were quite real. Your initial liking for them, based on your own direct experience, was certainly real. But so was your feeling of disgust when you found out that you'd been eating worms. It should be evident, however, that this feeling of disgust was strictly a product of the agreements you have with those around you that worms aren't fit to eat. That's an agreement you entered into the first time your parents found you sitting in a pile of dirt with half of a wriggling worm dangling from your lips. When they pried your mouth open and reached down your throat in search of the other half of the worm, you learned that worms are not acceptable food in our society.

Aside from these agreements, what's wrong with worms? They are probably high in protein and low in calories. Bite-sized and easily packaged, they are a distributor's dream. They are also a delicacy for some people who live in societies that lack our agreement that worms are disgusting. Some people might love the worms but be turned off by the deep-fried breading.

Here's another question to consider: "Are worms 'really' good or 'really' bad to eat?" And here's a more interesting question: "How could you know which was really so?" This book is about answering the second kind of question.

The rest of this chapter looks at how we know what is real. We'll begin by examining inquiry as a natural human activity, something we all have engaged in every day of our lives. We'll look at the source of everyday knowledge and at some kinds of errors we make in normal inquiry. We'll then examine what makes science—in particular, social science—different. After considering some of the underlying ideas of social research, we'll conclude with an initial consideration of issues in social research.

## Looking for Reality

Reality is a tricky business. You probably already suspect that some of the things you "know" may not be true, but how can you really know what's real? People have grappled with this question for thousands of years.

### Knowledge from Agreement Reality

One answer that has arisen out of that grappling is science, which offers an approach to both agreement reality and experiential reality. Scientists have certain criteria that must be met before they will accept the reality of something they have not personally experienced. In general, a scientific assertion must have both logical and empirical support: It must make sense, and it must not contradict actual observation. Why

**epistemology** The science of knowing; systems of knowledge.

**methodology** The science of finding out; procedures for scientific investigation.

do earthbound scientists accept the assertion that the dark side of the moon is cold? First, it makes sense, because the moon's surface heat comes from the sun's rays, and the dark side of the moon is dark because it's always turned away from the sun. Second, scientific measurements made on the moon's dark side confirm this logical expectation. So, scientists accept the reality of things they don't personally experience—they accept an agreement reality—but they have special standards for doing so.

More to the point of this book, however, science offers a special approach to the discovery of reality through personal experience. In other words, it offers a special approach to the business of inquiry. **Epistemology** is the science of knowing; **methodology** (a subfield of epistemology) might be called the science of finding out. This book presents and examines social science methodology, or how social scientists find out about human social life.

Why do we need social science to discover the reality of social life? To find out, let's start by considering what happens in ordinary, nonscientific inquiry.

### Ordinary Human Inquiry

Practically all people, and many other animals as well, exhibit a desire to predict their future circumstances. Humans seem predisposed to undertake this task by using causal and probabilistic reasoning. First, we generally recognize that future circumstances are somehow caused or conditioned by present ones. We learn that getting an education will affect how much money we earn later in life and that swimming beyond the reef may bring an unhappy encounter with a shark. Sharks, on the other hand—whether or not they reason the matter through—may learn that hanging around the reef often brings a happy encounter with unhappy swimmers.

Second, we also learn that such patterns of cause and effect are probabilistic. That is, the effects occur more often when the causes occur than when the causes are absent—but not always. Thus, students learn that studying hard produces good grades in most instances, but not every time. We recognize the danger of swimming beyond the reef, without believing that every such swim will be fatal. As we'll see throughout the book, science makes these



concepts of causality and probability more explicit and provides techniques for dealing with them more rigorously than casual human inquiry does. It sharpens the skills we already have by making us more conscious, rigorous, and explicit in our inquiries.

In looking at ordinary human inquiry, we need to distinguish between prediction and understanding. Often, we can make predictions without understanding—perhaps you can predict rain when your trick knee aches. And often, even if we don't understand why, we're willing to act on the basis of a demonstrated predictive ability. A racetrack buff who discovers that the third-ranked horse in the third race of the day always seems to win will probably keep betting without knowing, or caring, why it works out that way. Of course, the drawback in predicting without understanding will become powerfully evident when one of the other horses wins and our buff loses a week's pay.

Whatever the primitive drives or instincts that motivate human beings and other animals, satisfying these drives depends heavily on the ability to predict future circumstances. For people, however, the attempt to predict is often placed in a context of knowledge and understanding. If you can understand why things are related to each other, why certain regular patterns occur, you can predict better than if you simply observe and remember those patterns. Thus, human inquiry aims at answering both "what" and "why" questions, and we pursue these goals by observing and figuring out.

As I suggested earlier in this chapter, our attempts to learn about the world are only partly linked to direct personal inquiry or experience. Another, much larger, part comes from the agreed-on knowledge that others give us, those things "everyone knows." This **agreement reality** both assists and hinders our attempts to find out for ourselves. To see how, consider two important sources of our secondhand knowledge—tradition and authority.

### Tradition

Each of us inherits a culture made up, in part, of firmly accepted knowledge about the workings of the world and the values that guide our participation in it. We may learn from others that planting corn in the spring will garner the

greatest assistance from the gods, that eating too much candy will decay our teeth, that the circumference of a circle is approximately twenty-two sevenths of its diameter, or that masturbation will make you blind. Ideas about gender, race, religion, and different nations that you learned as you were growing up would fit in this category. We may test a few of these "truths" on our own, but we simply accept the great majority of them. These are the things that "everybody knows."

Tradition, in this sense of the term, offers some clear advantages to human inquiry. By accepting what everybody knows, we avoid the overwhelming task of starting from scratch in our search for regularities and understanding. Knowledge is cumulative, and an inherited body of information and understanding is the jumping-off point for the development of more knowledge. We often speak of "standing on the shoulders of giants," that is, on those of previous generations.

At the same time, tradition may hinder human inquiry. If we seek a fresh understanding of something everybody already understands and has always understood, we may be marked as fools for our efforts. More to the point, however, it rarely occurs to most of us to seek a different understanding of something we all "know" to be true.

### Authority

Despite the power of tradition, new knowledge appears every day. Quite aside from our own personal inquiries, we benefit throughout our lives from new discoveries and understandings produced by others. Often, acceptance of these new acquisitions depends on the status of the discoverer. You're more likely to believe that the common cold can be transmitted through kissing, for example, when you hear it from an epidemiologist than when you hear it from your uncle Pete (unless, of course, he's also an epidemiologist).

Like tradition, authority can both assist and hinder human inquiry. We do well to trust the

**agreement reality** Those things we "know" as part and parcel of the culture we share with those around us.

judgment of the person who has special training, expertise, and credentials in a given matter, especially in the face of controversy. At the same time, inquiry can be greatly hindered by the legitimate authorities who err within their own province. Biologists, after all, make their mistakes in the field of biology. Moreover, biological knowledge changes over time.

Inquiry is also hindered when we depend on the authority of experts speaking outside their realm of expertise. For example, consider the political or religious leader with no medical or biochemical expertise who declares that marijuana can fry your brain. The advertising industry plays heavily on this misuse of authority by, for example, having popular athletes discuss the nutritional value of breakfast cereals or having movie actors evaluate the performance of automobiles.

Both tradition and authority, then, act as double-edged swords in the search for knowledge about the world. Simply put, they provide us with a starting point for our own inquiry, but they can lead us to start at the wrong point and push us off in the wrong direction.

## Errors in Inquiry, and Some Solutions

Besides the potential dangers of tradition and authority, other pitfalls often cause us to stumble and fall when we set out to learn for ourselves. Let's look at some of the common errors we make in our casual inquiries and at the ways science guards against those errors.

### Inaccurate Observations

Quite frequently, we make mistakes in our observations. For example, what was your methodology instructor wearing on the first day of class? If you have to guess, it's because most of our daily observations are casual and semiconscious. That's why we often disagree about what really happened.

In contrast to casual human inquiry, scientific observation is a conscious activity. Just making

observation more deliberate helps reduce error. If you had to guess what your instructor was wearing on the first day of class, you'd probably make a mistake. If you'd gone to the first class with a conscious plan to observe and record what your instructor was wearing, however, you'd be far more likely to be accurate. (You might also need a hobby.)

In many cases, both simple and complex measurement devices help guard against inaccurate observations. Moreover, they add a degree of precision well beyond the capacity of the unassisted human senses. Suppose, for example, that you'd taken color photographs of your instructor that day. (See earlier comment about needing a hobby.)

### Overgeneralization

When we look for patterns among the specific things we observe around us, we often assume that a few similar events provide evidence of a general pattern. That is, we overgeneralize on the basis of limited observations. (Think back to our now-broke racetrack buff.)

Probably the tendency to overgeneralize peaks when the pressure to arrive at a general understanding is high. Yet it also occurs without such pressure. Whenever overgeneralization does occur, it can misdirect or impede inquiry.

Imagine you are a reporter covering an animal-rights demonstration. You have orders to turn in your story in just two hours, and you need to know why people are demonstrating. Rushing to the scene, you start interviewing them, asking for their reasons. The first three demonstrators you interview give you essentially the same reason, so you simply assume that the other 3,000 are also there for that reason. Unfortunately, when your story appears, your editor gets scores of letters from protesters who were there for an entirely different reason.

Realize, of course, that we must generalize to some extent to survive. It's probably not a good idea to keep asking whether *this* rattlesnake is poisonous. Assume they all are. At the same time, we have a tendency to overgeneralize.

Scientists often guard against overgeneralization by committing themselves in advance to a sufficiently large and representative sample of observations. Another safeguard is provided by the replication of inquiry. Basically, **replication**

**replication** Repeating a research study to test and either confirm or question the findings of an earlier study.

means repeating a study and checking to see whether the same results are produced each time. Then, as a further test, the study may be repeated again under slightly varied conditions.

### Selective Observation

One danger of overgeneralization is that it can lead to selective observation. Once we have concluded that a particular pattern exists and have developed a general understanding of why it exists, we tend to focus on future events and situations that fit the pattern, and we tend to ignore those that do not. Racial and ethnic prejudices depend heavily on selective observation for their persistence.

Sometimes a research design will specify in advance the number and kind of observations to be made as a basis for reaching a conclusion. If we wanted to learn whether women were more likely than men to support freedom to choose an abortion, we might select a thousand carefully chosen people to be interviewed on the issue. Alternately, when making direct observations of an event, such as attending the animal-rights demonstration, we might make a special effort to find “deviant cases”—precisely those who do not fit into the general pattern.

### Illogical Reasoning

There are other ways in which we often deal with observations that contradict our understanding of the way things are in daily life. Surely one of the most remarkable creations of the human mind is “the exception that proves the rule.” That idea doesn’t make any sense at all. An exception can draw attention to a rule or to a supposed rule (in its original meaning, “prove” meant “test”), but in no system of logic can it validate the rule it contradicts. Even so, we often use this pithy saying to brush away contradictions with a simple stroke of illogic. This is particularly common in relation to group stereotypes. When a person of color, a woman, or a gay violates the stereotype someone holds for that group, it somehow “proves” that, aside from this one exception, the stereotype remains “valid” for all the rest. For example, a woman business executive who is kind and feminine is taken as “proof” that all other female executives are mean and masculine.

What statisticians have called the *gambler’s fallacy* is another illustration of illogic in day-to-day reasoning. Often we assume that a consistent run of either good or bad luck foreshadows its opposite. An evening of bad luck at poker may kindle the belief that a winning hand is just around the corner. Many a poker player has stayed in a game much too long because of that mistaken belief. (A more reasonable conclusion is that they are not very good at poker.)

Although all of us sometimes fall into embarrassingly illogical reasoning, scientists try to avoid this pitfall by using systems of logic consciously and explicitly. We’ll examine the logic of science more deeply in Chapter 2. For now, simply note that logical reasoning is a conscious activity for scientists and that other scientists are always around to keep them honest.

Science, then, attempts to protect us from the common pitfalls of ordinary inquiry. Accurately observing and understanding reality is not an obvious or trivial matter, as we’ll see throughout this chapter and this book.

Before moving on, I should caution you that scientific understandings of things are also constantly changing. Any review of the history of science will provide numerous examples of old “knowledge” being supplanted by new “knowledge.” It’s easy to feel superior to the scientists of a hundred or a thousand years ago, but I fear there is a tendency to think those changes are all behind us. Now, we know the way things are.

In *The Half-Life of Facts* (2012), Samuel Arbesman addresses the question of how long today’s scientific “facts” survive reconceptualization, retesting, and new discoveries. For example, half of what medical science understood about hepatitis and cirrhosis of the liver was replaced in 45 years.

The fact that scientific knowledge is constantly changing actually points to a strength of scientific scholarship. Whereas cultural beliefs and superstitions may survive unchallenged for centuries, scientists are committed to achieving an ever better understanding of the world. My purpose in this book is to prepare you to join that undertaking.