

RESEARCH METHODS IN PRACTICE

THIRD EDITION

For my husband, Howard, thank you for everything, and to my father, who taught me analytical thinking from an early age (DKR)

For Ada, Alina, and Lucia, my best buddies in life, and to my parents, who each in their own way made me a researcher (GGVR)

Sara Miller McCune founded SAGE Publishing in 1965 to support the dissemination of usable knowledge and educate a global community. SAGE publishes more than 1000 journals and over 600 new books each year, spanning a wide range of subject areas. Our growing selection of library products includes archives, data, case studies and video. SAGE remains majority owned by our founder and after her lifetime will become owned by a charitable trust that secures the company's continued independence.

Los Angeles | London | New Delhi | Singapore | Washington DC | Melbourne

RESEARCH METHODS IN PRACTICE

STRATEGIES FOR DESCRIPTION AND CAUSATION

THIRD EDITION

DAHLIA K. REMLER

BARUCH COLLEGE AND THE GRADUATE CENTER, CITY UNIVERSITY OF NEW YORK

GREGG G. VAN RYZIN

RUTGERS UNIVERSITY, NEWARK



Los Angeles | London | New Delhi
Singapore | Washington DC | Melbourne



FOR INFORMATION:

SAGE Publications, Inc.
2455 Teller Road
Thousand Oaks, California 91320
E-mail: order@sagepub.com

SAGE Publications Ltd.
1 Oliver's Yard
55 City Road
London EC1Y 1SP
United Kingdom

SAGE Publications India Pvt. Ltd.
B 1/I 1 Mohan Cooperative Industrial Area
Mathura Road, New Delhi 110 044
India

SAGE Publications Asia-Pacific Pte. Ltd.
18 Cross Street #10-10/11/12
China Square Central
Singapore 048423

Acquisitions Editor: Leah Fargotstein
Product Associate: Ivey Mellem
Production Editor: Rebecca Lee
Copy Editor: Karen E. Taylor
Typesetter: C&M Digital (P) Ltd.
Cover Designer: Candice Harman
Marketing Manager: Victoria Velasquez
Cover Art: *Critical Masses* by Hanna Mandelbaum
(HannaMandelbaum.com | IG@hannajanecreates)

Copyright © 2022 by SAGE Publications, Inc.

All rights reserved. Except as permitted by U.S. copyright law, no part of this work may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without permission in writing from the publisher.

All third-party trademarks referenced or depicted herein are included solely for the purpose of illustration and are the property of their respective owners. Reference to these trademarks in no way indicates any relationship with, or endorsement by, the trademark owner.

SPSS® is a registered trademark of International Business Machines Corporation ("IBM®").

Printed in the Canada.

Library of Congress Cataloging-in-Publication Data

Names: Remler, Dahlia K., author. | Van Ryzin, Gregg G. (Gregg Gerard), author.

Title: Research methods in practice : strategies for description and causation / Dahlia K. Remler, Gregg G. Van Ryzin.

Description: Third edition. | London ; Washington, DC : SAGE Publishing, [2022] | Includes bibliographical references and index.

Identifiers: LCCN 2021026184 | ISBN 978-1-5443-1842-4 (paperback) | ISBN 978-1-5443-1840-0 (epub) | ISBN 978-1-5443-1841-7 (epub) | ISBN 978-1-5443-1843-1 (pdf)

Subjects: LCSH: Research—Methodology—Study and teaching (Graduate)

Classification: LCC LB2369 .R46 2022 | DDC 378.1/70281—dc23

LC record available at <https://lcn.loc.gov/2021026184>

This book is printed on acid-free paper.

21 22 23 24 25 10 9 8 7 6 5 4 3 2 1

BRIEF CONTENTS

Preface xxvi

Acknowledgments xxxiii

About the Authors xxxvii

PART I FOUNDATIONS

Chapter 1.	Research in the Real World	2
Chapter 2.	Theory, Models, and Research Questions	26
Chapter 3.	Qualitative Research	62

PART II STRATEGIES FOR DESCRIPTION

Chapter 4.	Measurement	104
Chapter 5.	Sampling	154
Chapter 6.	Secondary Data	202
Chapter 7.	Surveys and Other Primary Data	234

PART III STATISTICAL TOOLS AND INTERPRETATIONS

Chapter 8.	Making Sense of the Numbers	272
Chapter 9.	Making Sense of Inferential Statistics	314
Chapter 10.	Making Sense of Multivariate Statistics	350

PART IV STRATEGIES FOR CAUSATION

Chapter 11.	Causation	390
Chapter 12.	Observational Studies	424
Chapter 13.	Using Regression to Estimate Causal Effects	458
Chapter 14.	Randomized Experiments	492
Chapter 15.	Natural and Quasi Experiments	542

PART V CONTEXT AND COMMUNICATION

Chapter 16.	The Politics, Production, and Ethics of Research	584
Chapter 17.	How to Find, Review, and Present Research	616

Glossary G-1

References R-1

Index I-1

DETAILED CONTENTS

Preface xxvi

Acknowledgments xxxiii

About the Authors xxxvii

PART I: FOUNDATIONS

Chapter 1. Research in the Real World	2
Learning Objectives	3
Do Methods Matter?	3
Good Evidence Comes From Well-Made Research	3
May the Best Methods Win	4
Research-Savvy People Rule	4
Research, Policy, and Practice	5
Analytics	5
Performance Measurement	6
Evaluation Research	7
Evidence-Based Policy and Programs	7
Evidence Can Mislead	7
Misleading Measurements	8
Misleading Samples	8
Misleading Correlations	9
What Is Research?	9
Secondary and Primary Research	9
It Comes in Various Shapes and Sizes	10
It's Never Perfect	10
It's Uncertain and Contingent	10
It Aims to Generalize	11
Bits and Pieces of a Puzzle	11
It Involves Competition and Criticism	12
It Can Be Quantitative, Qualitative, or a Mix of Both	12
It Can Be Applied or Basic	13
Descriptive and Causal Research	13
Description: What Is the World Like?	13

Causation: How Would the World Be Different If Something Changed?	14
Description of a Correlation Is Not Proof of Causation	14
Epistemology: Ways of Knowing	15
The Scientific Method	15
Are There Objective Truths in Social Science?	16
Induction and Deduction	17
Proof Requires Fresh Data	17
Approaching Research From Different Angles	18
Consuming Research	18
Commissioning Research	19
Conducting Research	19
Ethics of Research	20
Poisoned by New York's Best Restaurants	20
History of Human Subjects Abuses in Research	21
Principles of Ethical Research Emerge	22
What Constitutes Informed Consent and Voluntary Participation?	23
Ethical Issues Depend on Research Form and Context	23
Conclusion: The Road Ahead	24
Exercises	25

Chapter 2. Theory, Models, and Research Questions 26

Learning Objectives	27
Community Policing Comes to Portland	27
● Box 2.1: Broken Windows Theory and Fighting Crime in New York City	28
What Is a Theory?	28
Theories Tell Causal Stories	29
Theories Explain Variation	30
Theories Identify Key Variables	31
Theories Generate Testable Hypotheses	31
Theories (in Applied Research) Focus on Modifiable Variables	31
Theories Are Positive, Not Normative	32
Where Do Theories Come From?	32
What Is a Model?	33
Variables and Relationships	34
● Box 2.2: Path Models, Causal Diagrams, and DAGs	34
Unit of Analysis, or Cases	35
Independent and Dependent Variables	36
● Box 2.3: Equations as Models	37
Sign of a Relationship	37
● Box 2.4: Relationship Signs for (Nominal) Categorical Variables	38
Patterns of Association: Correlation	39
Causal Mechanism	40
● Box 2.5: What Went Wrong With Broken Windows	42
Logic Models: Mechanisms of Programs	42
Do Smaller Classes Help Kids Learn?	43
Naming Variables	45

What About Other Causes of the Outcome?	45
Usefulness of a Logic Model	46
● Box 2.6: China Launches Nationwide AIDS Prevention Program	47
Tips for Creating a Logic Model	48
Multiple Mechanisms in a Logic Model	50
● Box 2.7: Implementation-Oriented Logic Models With Inputs, Activities, and Outputs	51
Alternative Perspectives on Theory in Social Research	52
Interpretivist Theory	52
Grand Theories	52
How to Find and Focus Research Questions	53
Applied Research Questions	53
Questions You Ideally Want to Answer, and Those You Actually Can	54
Know If Your Question Is Descriptive or Causal	55
Make Your Question Positive, Not Normative	55
Generating Questions and Ideas	55
Conclusion: Theories Are Practical	57
● Box 2.8: Critical Questions to Ask About Theory, Models, and Research Questions	57
● Box 2.9: Tips on Doing Your Own Research: Theory, Models, and Research Questions	58
Exercises	58

Chapter 3. Qualitative Research **62**

Learning Objectives	63
Fighting Malaria in Kenya	63
Theory, Causes, and Qualitative Research	65
What Is Qualitative Research?	65
Comparing Qualitative and Quantitative Research	66
Strengths of Qualitative Research	69
Existing Qualitative Data	70
Archival and Other Written Documents	71
Social Media	71
Visual Culture	72
Qualitative Interviews	72
Unstructured Interviews	72
Semistructured Interviews	73
Asking Truly Open-Ended Questions	74
The Power of Probes	75
Practical Considerations When Doing Interviews	76
Focus Groups	76
What Do People Think of Congestion Pricing?	77
Focus Group Selection and Composition	77
Why a Focus Group? Why Not Individual Interviews?	78
Moderating and Documenting a Focus Group	78
Virtual Focus Groups	79

Qualitative Observation	80
Participant Observation and Ethnography	81
Why Do the Homeless Refuse Help?	81
Levels on a Participation-Observation Continuum	82
Secret Shopping and Audit Studies	82
Case Study Research	83
Maryland's Gun Violence Act	83
Selecting a Case to Study	84
Comparing Cases	84
Qualitative Data Analysis	85
Integration of Analysis and Data Gathering	85
Tools of Qualitative Analysis	86
Coding and Content Analysis	87
Qualitative Data Analysis Software	89
Analyzing Big (Qualitative) Data	90
The Qualitative-Quantitative Debate	91
A Brief History of the Debate	91
How Qualitative and Quantitative Approaches Overlap	92
A Qualitative-Quantitative Research Cycle	93
Mixed-Methods Research and Triangulation	95
● Box 3.1: Transition Services for Incarcerated Youth: A Mixed Methods Evaluation Study	96
Ethics in Qualitative Research	97
Presenting Qualitative Data	97
Can You Obtain Informed Consent?	97
Should You Intervene?	98
Should You Empower People?	98
Conclusion: Matching Methods to Questions	98
● Box 3.2: Critical Questions to Ask About a Qualitative Study	99
● Box 3.3: Tips on Doing Your Own Qualitative Research	100
Exercises	100

PART II: STRATEGIES FOR DESCRIPTION

Chapter 4. Measurement	104
Learning Objectives	105
The U.S. Poverty Measure	105
What Is Measurement?	105
Measurement in Qualitative Research	106
Performance Measurement and Analytics	106
Measurement: The Basic Model and a Road Map	107
Conceptualization	107
What Is Poverty?	108
Where to Look for Conceptualizations?	109
Latent Variables	110
Dimensions	110

Operationalization	111
How the U.S. Poverty Measure Was Operationalized	111
Instruments	112
Protocols and Personnel	112
● Box 4.1: Operational Definition of Poverty in the United States	113
Proxies and Proxy Respondents	113
Indexes and Scales	114
● Box 4.2: Rensis Likert	117
Validity	117
Is the U.S. Poverty Measure Valid?	117
● Box 4.3: Using Items That Vary in Difficulty: Item Response Theory	118
Face Validity	119
Content Validity	120
● Box 4.4: Content Validity of Measured Race and Ethnicity	121
● Box 4.5: Content Validity of Measured Gender	122
Valid for What Purpose?	122
Criterion-Related Validity	123
Self-Reported Drug Use: Is It Valid?	123
Does the Measure Predict Behavior?	124
Does the Measure Relate to Other Variables as Expected?	124
Limitations of Validity Studies	126
● Box 4.6: Some Forms of Measurement Validity	127
Measurement Error	127
Bias	127
● Box 4.7: Example of a Validity Study	128
Random Error—Noise	129
Bias and Noise in the U.S. Poverty Measure	129
● Box 4.8: Bias, Bias Everywhere	130
● Box 4.9: Classical Test Theory: What Is Seen and Unseen	132
Reliability	132
Why Reliability Matters	133
Many Ways to Tell If a Measure Is Reliable	134
Validity and Reliability: Contrasted and Compared	136
● Box 4.10: Is It a Validity Problem or a Reliability Problem?	137
Validity and Reliability in Qualitative Research	137
Levels of Measurement	138
Quantitative Variables	139
● Box 4.11: Unit/Level of Measurement/Analysis?	140
Categorical Variables	141
Turning Categorical Variables Into Quantitative Ones	143
Units of Analysis and Levels of Measurement	145
Measurement in the Real World: Trade-offs and Choices	146
What Will It Cost?	146
Is It Ethical?	146
How Will It Affect the Quality and Rate of Responding?	147
The Validity-Reliability Trade-off	147
Use an Established Measure or Invent a New One?	147

Gaming and Other Behavior Responses to Measurement	148
Multiple Dimensions—or Just One?	148
Conclusion: Measurement Matters	149
● Box 4.12: Critical Questions to Ask About Measurement	149
● Box 4.13: Tips on Doing Your Own Research: Measurement	150
Exercises	150

Chapter 5. Sampling **154**

Learning Objectives	155
Gauging the Fallout From Hurricane Katrina	155
Generalizability	156
Population of Interest, Sampling, and Representativeness	156
Generalizing Beyond the Original Population of Interest	157
Are Relationships More Generalizable?	158
Replicating Research and Meta-Analysis	159
Generalizability of Qualitative Studies	160
Basic Sampling Concepts	161
Population, Sample, and Inference	161
Census Versus Sample	162
How to Select a Sample: Sampling Frames and Steps	163
Problems and Biases in Sampling	164
● Box 5.1: Likely Voters Versus Actual Voters	165
Coverage Problems	166
Nonresponse Problems	167
When Do Coverage and Nonresponse Problems Cause Bias?	168
● Box 5.2: Steps in Assessing Coverage and Nonresponse Bias	170
Ethics of Nonresponse	170
● Box 5.3: Nonresponse Bias in 2020 U.S. Presidential Election Polls?	171
Nonprobability Sampling	172
Voluntary Sampling	172
Convenience Sampling	173
Snowball Sampling	173
Quota Sampling	173
Online Sampling	174
Purposive Sampling and Qualitative Research	176
Random (Probability) Sampling	178
The Contribution of Random Sampling	178
Random Sampling Versus Randomized Experiments	179
Simple Random Sampling	179
Sampling Variability	180
Sampling Distributions, Standard Errors, and Confidence Intervals	180
Confidence Intervals (Margins of Error)	182
● Box 5.4: Relationship Between Various Precision Measures	183
Sample Size and the Precision of Government Statistics	184
Determining How Large a Sample You Need	185
● Box 5.5: What Is the True Sample Size?	187

Sampling in Practice	186
Systematic Sampling	186
Stratified Sampling	188
Disproportionate Sampling (Oversampling)	190
Poststratification Weighting	192
● Box 5.6: An Evaluation of 2016 Election Polls in the U.S.	193
Sampling With Probabilities Proportional to Size	194
Cluster and Multistage Sampling	194
● Box 5.7: Design Effects: Complex Survey Sampling Corrections	197
Random Digit Dialing Sampling	197
Sampling and Generalizability: A Summary	198
● Box 5.8: Critical Questions to Ask About Sampling in Studies	198
● Box 5.9: Tips on Doing Your Own Research: Sampling	199
Exercises	200

Chapter 6. Secondary Data	202
Learning Objectives	203
Tracking a Global Pandemic	203
Quantitative Data Forms and Structures	204
Quantitative Data Versus Quantitative Variables	204
Structures of Quantitative Data	205
Micro, Aggregate, and Multilevel Data	205
● Box 6.1: Unit of Observation Versus Unit of Analysis	206
Time Dimension of Data	207
Metadata	210
Where Do Quantitative Data Come From?	210
Administrative Records	210
Adapting Administrative Data for Research	211
● Box 6.2: How Organizations Can Make the Most of Their Administrative Data	213
Vital Statistics, Crime Reports, and Unemployment Claims	213
Data for Purchase	214
Ethics of Administrative Record Data	214
Aggregate Data Tables	215
Where to Find Aggregate Tables	215
Aggregate Time-Series and Panel Data	217
Public Use Microdata	217
Know the Major Surveys in Your Field	217
Accessing and Analyzing Public Use Data	224
Data Archives	225
Ethics of Public Use Microdata	225
Secondary Qualitative Data	226
Ethics of Using Existing Qualitative Data	227
Big Data	227
Volume, Velocity, Variety—and a Lack of Structure	227
Analyzing Big Data	228
Ethics of Big Data	228

Linking Data	228
Some Limitations of Secondary Data	229
Does Data Availability Distort Research?	229
When to Collect Original Data?	230
Conclusion	230
● Box 6.3: Critical Questions to Ask About Secondary Data	230
● Box 6.4: Tips on Doing Your Own Research: Secondary Data	231
Exercises	231

Chapter 7. Surveys and Other Primary Data **234**

Learning Objectives	235
Taking the Nation's Economic Pulse	235
When Should You Do a Survey?	236
Do You Know Enough About the Topic?	236
Does the Information Exist Already in Another Source?	236
Can People Tell You What You Want to Know?	237
Will People Provide Truthful Answers?	237
Steps in the Survey Research Process	237
Clarify the Purpose	237
Identify the Population and Sampling Strategy	238
Develop a Questionnaire	238
Pretest Questionnaire and Survey Procedures	238
Recruit and Train Interviewers	239
Collect Data	239
Enter and Prepare Data for Analysis	240
Analyze Data and Present Findings	240
Modes of Survey Data Collection	240
Intercept Interview Surveys	240
Household Interview Surveys	241
Telephone Interview Surveys	242
Mail Self-Administered Surveys	244
Group Self-Administered Surveys	246
Online Surveys	247
Establishment (Business or Organization) Surveys	249
Panel or Longitudinal Surveys	249
Choosing or Mixing Modes	250
Crafting a Questionnaire	251
Starting Off	251
Closed-Ended Versus Open-Ended Questions	252
● Box 7.1: Questionnaire Composed of Open-Ended Questions	253
Question Order	253
● Box 7.2: Comparing Opening Questions	254
Some Advice on Question Wording	256
Some Advice on Response Formats	258
Physical and Graphical Design	260
Put Yourself in Your Respondent's Shoes	261

Ethics of Survey Research	261
Informed Consent	261
Pushing for a High Response Rate	262
Overburdening Respondents	262
Protecting Privacy and Confidentiality	262
Surveying Minors and Other Vulnerable Populations	263
Making Survey Data Available for Public Use	263
Other Ways to Collect Primary Data	264
Trained Observation	264
Scientific Instruments	266
Computer Code and Data Extraction Algorithms	267
Conclusion	267
● Box 7.3: Critical Questions to Ask About Surveys and Other Primary Data	268
● Box 7.4: Tips on Doing Your Own Survey	268
Exercises	269

PART III: STATISTICAL TOOLS AND INTERPRETATIONS

Chapter 8. Making Sense of the Numbers	272
Learning Objectives	273
“Last Weekend I Walked Eight”	273
Units, Rates, and Ratios	274
What Units?	274
Rates, or Why Counts Often Mislead	275
● Box 8.1: Relevant Comparisons—Are Anesthesiologists Prone to Addiction?	276
Percent Change and Percentage Point Change	276
The Strangeness of Percent Change on the Return Trip	277
Rates of Change	277
Odds	277
Prevalence and Incidence	278
Statistics Starting Point: Variables in a Data Set	279
Distributions	280
Distribution of a Categorical Variable	280
Distribution of a Quantitative Variable	281
Measures of Center: Mean and Median	283
● Box 8.2: Mean: The Formula	284
When to Use Median? When to Use Mean?	284
Measures of Spread and Variation	285
Standard Deviation	285
● Box 8.3: Standard Deviation: The Formula	286
Pay Attention to the Standard Deviation, Not Just the Mean	287
Standardized (z) Scores	287
Quantiles: Another Way to Measure Spread	288

Relationships Between Categorical Variables	289
Cross-Tabulation	289
Relative Risks and Odds Ratios: Another Way to Show Relationships in Categorical Data	291
Adjusted and Standardized Rates: When to Use Them	293
Relationships Between Quantitative Variables: Scatterplots and Correlation	293
Scatterplots	293
Correlation	295
● Box 8.4: Correlation: The Formula	296
Relationships Between a Categorical and a Quantitative Variable	296
● Box 8.5: Which One Is the Dependent Variable? Which One Is the Independent Variable?	297
Simple Regression: Best-Fit Straight Line	297
● Box 8.6: Simple Regression: The Equations	299
Interpreting the Regression Coefficient (Slope)	299
● Box 8.7: Steps for Interpreting a Regression Coefficient	300
Can a Regression Coefficient Be Interpreted as a Causal Effect?	300
Changes Versus Levels	301
R-Squared and Residuals: How Well Does the Line Fit the Data?	302
Practical Significance	303
Practical Significance Is a Matter of Judgment	304
Effect Size	304
Steps for Assessing the Practical Significance of Effects and Differences	305
Statistical Software	305
Spreadsheets	306
Statistical Packages: SAS, SPSS, Stata, and R	306
Specialized Modeling and Matrix Language Programs	306
Conclusion: Tools for Description and Causation	306
● Box 8.8: Tips on Doing Your Own Research: Descriptive Statistics	307
Exercises	308

Chapter 9. Making Sense of Inferential Statistics	314
Learning Objectives	315
But Is It Significant?	315
Statistical Inference: What's It Good For?	316
The Sampling Distribution: Foundation of Statistical Inference	317
What a Sampling Distribution Looks Like	317
The Standard Error (of a Proportion)	319
The Standard Error (of a Mean)	320
Confidence Intervals	321
Univariate Statistics and Relationships Both Have Confidence Intervals	321
Confidence Intervals Reflect Only Some Sources of Error	323
Calculating a Confidence Interval (Margin of Error) for a Proportion	323
Calculating a Confidence Interval (Margin of Error) for a Mean	324
How Big Does the Sample Size Need to Be? Getting the Precision You Want	326

Significance Tests	328
Falsification and the Logic of Significance Testing	329
Running a Significance Test	330
p Values	330
Significance Tests for Simple Regression	332
Chi-Square Test of Cross-Tab	334
Other Test Statistics	335
Statistical Significance, Practical Significance, and Power	336
Combinations of Statistical and Practical Significance	336
● Box 9.1: Sources of Statistical Significance and of Statistical Insignificance	339
Failing to Recognize a Difference: Type II Errors	339
Power	340
Multiple Comparison Corrections	341
Sample Size Calculations for Significance Tests	341
Adjusting Inference for Clustering and Other Complex Sampling	342
Issues and Extensions of Statistical Inference	343
Inference With a Nonprobability Sample: What Does It Mean?	343
Bootstrapping: Inference for Statistics With No Standard Error Formulas	344
Equivalence and Noninferiority Tests	344
Bayesian Inference	345
Conclusion	345
● Box 9.2: Tips on Doing Your Own Research: Inferential Statistics	346
Exercises	347

Chapter 10. Making Sense of Multivariate Statistics	350
Learning Objectives	351
Multiple Regression: The Basics	351
Multiple Regression for Prediction	353
● Box 10.1: How to Run a Multiple Regression Using Software	354
● Box 10.2: Steps for Predicting With Regression	354
The Danger (and Necessity) of Out-of-Sample Extrapolation	355
R -Squared and Adjusted R -Squared	355
All Else Held Constant: A Bit More Mathematics	356
Multicollinearity	356
Standardized Coefficients: The Relative Importance of Independent Variables	358
Inference for Regression	359
Standard Error of the Coefficient	359
Confidence Intervals in Regression	360
Confidence Interval of a Predicted Value	361
Significance Testing in Regression	361
Influences on Inference in Multiple Regression	362
Categorical Independent Variables	363
Dummy Variables in Regression	363
Categorical Variables With More Than Two Possible Values	364

● Box 10.3: Representing a Categorical Variable With More Than Two Categories: Diabetes Example	365
Interpreting the Coefficient of a Dummy Variable	366
Analysis of Variance (ANOVA)	366
● Box 10.4: Interpreting the Coefficient of a Dummy Variable	367
Interactions in Regression	368
How to Use and Interpret Interaction Variables	368
Interactions With Quantitative Variables	370
Always Include Both Main Effects	370
Functional Form and Transformations in Regression	370
How to Fit a Curved Relationship	371
How to Interpret Coefficients When a Variable Is Logged	371
The Value of Robustness and Transparency	373
Categorical Variables as Dependent Variables in Regression	373
Linear Probability Model	373
Logistic and Probit Regression	374
What If the Dependent Variable Has More Than Two Categories?	375
Beware of Unrealistic Underlying Assumptions	375
Which Statistical Methods Can I Use?	375
Other Multivariate Methods	376
Path Analysis	376
Factor Analysis	378
Structural Equation Modeling	379
Multilevel Models	380
Time Series and Forecasting	382
Panel Data Methods	383
Spatial Analysis	383
Limited Dependent Variables	383
Survival Analysis	384
Machine Learning	384
More Multivariate Methods Not Covered	385
Conclusion	386
● Box 10.5: Tips on Doing Your Own Research: Multivariate Statistics	386
Exercises	387

PART IV: STRATEGIES FOR CAUSATION

Chapter 11. Causation	390
Learning Objectives	391
Family Dinners and Teenage Substance Abuse	391
Correlation Is Not Causation	391
Alternative Explanations of a Correlation	392
● Box 11.1: Children Who Have Frequent Family Dinners Less Likely to Use Marijuana, Tobacco, and Drink Alcohol	393
Reverse Causation	393
● Box 11.2: Directed Acyclic Graphs (DAGs)	394
Common Causes	394

Bias From a Common Cause	395
Bias From Reverse Causation: Simultaneity Bias	396
Some More Correlations That May—or May Not—Imply Causation	396
● Box 11.3: Get in the Habit of Thinking of Alternative Theories	397
● Box 11.4: Recent Evidence on Family Dinners and Teen Substance Abuse	399
Causal Mechanisms	399
Indirect and Direct Causal Effects	400
Context and Moderators	401
Arrows, Arrows Everywhere	401
Why Worry About the Correct Causal Model?	402
● Box 11.5: How to Talk (or Write) About Causation and Correlation	403
Evidence of Causation: Some Critical Clues	403
There Is a Correlation (Association)	404
The Cause Happens Before the Effect	404
The Correlation Appears in Many Different Contexts	404
● Box 11.6: Prominent Epidemiologists Discuss Replication and Causation	405
There Is a Plausible Mechanism	405
There Are No Plausible Alternative Explanations	406
Other Influences Are Accounted for in the Analysis	406
There Is Qualitative Evidence of a Mechanism	407
The Correlation Is Not Just a Chance Coincidence	408
Detective Work and Shoe Leather	408
Self-Selection and Endogeneity	408
Self-Selection	409
Endogeneity	409
Aggregation Bias and the Ecological Fallacy	410
The Counterfactual Definition of Causation	410
Potential Outcomes	411
If We Only Had a Time Machine	411
Can Really Good Prediction Replace Causal Inference?	412
Experimentation and Exogeneity: Making Things Happen	412
Can Exercise Cure Depression?	413
Why Experimentation Beats Passive Observation	413
Exogeneity: Intervening in the World	414
● Box 11.7: Exogenous or Endogenous? It Depends on the Dependent Variable	415
● Box 11.8: The Meaning of Exogeneity and Endogeneity in Structural Equation Modeling	416
Control: Holding Things Constant	417
● Box 11.9: The Many Uses of the Term <i>Control</i>	417
Experimentation: The Basic Logic	418
Ethical Limitations of Experiments	418
Experimentation, Policy, and Practice	419
Conclusion: Tools to Probe Causation	419
● Box 11.10: Critical Questions to Ask About Causation	420
● Box 11.11: Tips on Doing Your Own Research: Causation	420
Exercises	421

Chapter 12. Observational Studies	424
Learning Objectives	425
Private Versus Public Schools	425
What Is an Observational Study?	426
The Gold Standard for Description—But Not for Causal Estimation	426
Limitations of an Observational Study	427
Control Variables	427
How Control Variables Help Disentangle a Causal Effect	427
Why These Control Variables?	428
How Did Control Variables Change the Estimate of a Causal Effect?	429
Matching	429
Individual-Level Matching	429
Aggregate Matching	431
Control Variables: An Empirical Example	431
Step 1: Speculate on Common Causes	432
Step 2: Look for Differences	433
Step 3: Stratify by Control Variables	433
Omitted Variable Bias	435
● Box 12.1: Are the Police Fair, or Not? Layered Cross-Tabs for Categorical Dependent Variables	436
Expanding the Choice of Control Variable	437
● Box 12.2: Omitted Variables—and the Bias They Cause— by Any Other Name	438
How to Choose Control Variables	440
What's Driving the Independent Variable?	440
Causal Diagrams as a Guide for Choosing Control Variables	442
Beware of Using Intervening Variables as Controls	443
Colliders: Bias in Causal Estimates From Sample Selection	444
Empirical Approach to Choosing Controls	446
Causes That Can Be Ignored—Without Bias	446
Unmeasured Variables, Proxies, and Data	447
Choosing Good Control Variables Depends on Your Question	447
Various Purposes of Control Variables	448
Owning Your Interest in Causation— But Not Overclaiming	448
Epidemiological Approaches to Observational Studies	449
Prospective and Retrospective Cohort Studies	449
Case-Control Studies	451
Conclusion: Observational Studies in Perspective	453
● Box 12.3: Critical Questions to Ask About Observational Studies With Control Variables	453
● Box 12.4: Tips on Doing Your Own Research: Observational Studies With Control Variables	454
Exercises	454

Chapter 13. Using Regression to Estimate Causal Effects 458

Learning Objectives	459
Cigarette Taxes and Smoking	459
From Stratification to Multiple Regression	460
Using More Than One (or Two) Control Variables	460
Control Variables That Are Quantitative	460
From Description to Causation: The Education-Earnings Link Reconsidered	461
Multiple Regression: Brief Overview and Interpretation	463
How Multiple Regression Is Like Stratification: An Illustration	463
Specification: The Choice of Control Variables	465
Does Greenery Affect Birth Outcomes?	467
Step 1: Speculate on Common Causes	468
Step 2: Examine the Relationship Between the Independent Variable of Interest and Potential Common Causes	469
Step 3: Implement Control Variables Through Multiple Regression	470
Interpreting Multiple Regression Coefficients as Effects of Interest	471
Practical Significance: Is the Effect Big Enough to Care About?	472
Further Topics in Regression for Estimating Causal Effects	473
How Controls and Omitted Variables Influence Estimated Effects	473
● Box 13.1: Predicting the Direction of Omitted Variables Bias	474
Interactions, Functional Forms, and Categorical Dependent Variables	475
A Focus on One Causal Effect or Many	476
When Is Low R -Squared a Problem?	476
Software Doesn't Know the Difference, But You Should	477
Control Variables With Exogenous Independent Variables:	
The Gender Earnings Gap	477
● Box 13.2: The Life Expectancy of Taxi Drivers: Prediction Versus Causation	478
The Gender Earnings Gap	478
The Gender Earnings Gap Depends on What Is Held Constant	479
Can Control Variables Analyses Show Discrimination?	482
● Box 13.3: Tips on Interpreting Results Tables	483
Other Multivariate Techniques for Observational Studies	483
Propensity Score Matching	483
Machine Learning	485
Conclusion: A Widely Used Strategy, With Drawbacks	486
● Box 13.4: Critical Questions to Ask About Studies That Use Multiple Regression to Estimate Causal Effects	486
● Box 13.5: Tips on Doing Your Own Research: Multiple Regression to Estimate Causal Effects	486
Exercises	487

Chapter 14. Randomized Experiments 492

Learning Objectives	493
Time Limits on Welfare	493
Florida's Family Transition Program: A Randomized Experiment	494

Random Assignment: Creating Statistical Equivalence	495
Random Assignment in Practice	496
● Box 14.1: True Randomization or Haphazard?	497
Statistical Equivalence: A Look at the Data	497
Why Random Assignment Is Better Than Matching or Control Variables	499
Findings: What Happened in Pensacola	499
● Box 14.2: Nobel Prize for Experimental Approach to Alleviating Global Poverty	501
The Logic of Randomized Experiments: Exogeneity Revisited	502
Statistical Significance of an Experimental Result	503
The Settings of Randomized Experiments	504
Lab Experiments	505
Field Experiments	505
● Box 14.3: Practical Difficulties in a Field Experiment About Online Education	506
● Box 14.4: Social and Policy Research Organizations That Specialize in Randomized Field Experiments	507
Survey Experiments	507
Generalizability of Randomized Experiments	509
Random Assignment Versus Random Sampling	509
Volunteers and Generalizability	511
The Ideal Study: Random Sampling, Then Random Assignment	511
● Box 14.5: Time-Sharing Experiments for the Social Sciences (TESS)	512
Limited Settings	513
Generalizability of the Treatment	513
● Box 14.6: The RAND Health Insurance Experiment	514
Support Factors and Causal Cakes	515
Generalizability in the Long Run	516
Variations on the Design of Experiments	517
Cluster Randomization	517
Arms in an Experiment	518
Levels of a Treatment: Probing a Dose-Response Relationship	519
Factors in an Experiment: Probing Interactions	520
Within-Subjects (Crossover) Experiments	521
Matching and Stratifying (or Blocking)	521
Artifacts in Experiments	522
The Hawthorne Effect and Demand Characteristics	522
Placebo Effect and Blinding	522
● Box 14.7: The Perry Preschool Study	524
Contamination	524
Demoralization and Rivalry	524
Noncompliance and Attrition	525
Analysis of Randomized Experiments	525
Balancing, Control Variables, and Covariates	526
Sample Size and Minimum Detectable Effects	527
Heterogeneous Treatment Effects	528
Preregistration of Analysis	528
Intent to Treat and Treatment of the Treated Analyses	529

● Box 14.8: The Moving to Opportunity Demonstration	531
Ethics of Randomized Experiments	532
Something for Everyone: The Principle of Beneficence	532
Informed Consent When the Stakes Are High	533
Is Randomization Itself Unethical?	533
Qualitative Methods and Randomized Experiments	534
Conclusion: A Gold Standard, With Limitations	535
● Box 14.9: Critical Questions to Ask About a Randomized Experiment	536
● Box 14.10: Tips on Doing Your Own Research: Randomized Experiments	536
Exercises	537

Chapter 15. Natural and Quasi Experiments 542

Learning Objectives	543
A Casino Benefits the Mental Health of Cherokee Children	543
What Are Natural and Quasi Experiments?	544
Natural Experiments: Finding Exogeneity in the World	544
Quasi Experiments: Evaluating Interventions Without Random Assignment	547
Labeling Natural and Quasi Experiments	550
● Box 15.1: Oregon's Health Insurance Lottery—Is It an RCT?	552
How to Create Good Quasi Experiments When Planning and Implementing Programs	552
Internal Validity of Natural and Quasi Experiments	553
Exogeneity and Comparability	554
How Did People Get the Treatment?	554
Nothing's Perfect	554
Generalizability of Natural and Quasi Experiments	555
Will It Work in Other Populations and Settings?	555
Who Actually Got Randomized?	556
Types of Natural and Quasi Experimental Studies	556
Before-After Studies	557
Interrupted Time Series	558
● Box 15.2: Probing Assumptions: Placebo Tests	560
Cross-Sectional Comparisons	560
● Box 15.3: Statistical Analysis of Basic Natural and Quasi Experiments	563
Prospective and Retrospective Studies	564
● Box 15.4: Longitudinal Data and Longitudinal Analysis	565
Difference-in-Differences Strategy	565
Do Parental Notification Laws Reduce Teenage Abortions and Births?	566
What Does a Difference-in-Differences Study Assume?	567
● Box 15.5: Difference-in-Differences Analysis in a Regression Framework	569
Panel Data for Difference-in-Differences Studies	570
Instrumental Variables and Regression Discontinuity	572
Instrumental Variables	572

● Box 15.6: How to Determine If an Instrument Is Valid	573
Regression Discontinuity	574
Ethics of Quasi and Natural Experiments	575
● Box 15.7: Analysis of Regression Discontinuity Studies	576
Conclusion	577
Estimating Causal Effects in Perspective: A Wrap-up to Part IV	577
● Box 15.8: Critical Questions to Ask About Natural and Quasi Experiments	578
● Box 15.9: Tips on Doing Your Own Research: Natural and Quasi Experiments	578
Exercises	579

PART V: CONTEXT AND COMMUNICATION

Chapter 16. The Politics, Production, and Ethics of Research	584
Learning Objectives	585
Risking Your Baby's Health	585
From Research to Policy	586
Rational Model of Policy	586
● Box 16.1: The Effects of Breastfeeding: Many Studies to Choose From	588
How Many Studies?	589
Dealing With Uncertainty, Costs, and Benefits	589
Pathways of Influence	590
Politics and Other Factors	591
Moving From Research to Policy: The U.S. Poverty Definition	593
How Can Research Have More Influence?	595
The Production of Research	595
Who Funds Research?	595
How Time and Cost Shape Research	597
Where Is Research Conducted?	597
Research Cultures and Disciplines	599
Which Research Questions Should Be Studied?	600
Making Research Ethical	602
The Ethical Review Process	602
When You Don't Need an Informed Consent Form	604
● Box 16.2: Template for Informed Consent Form	605
Research Ethics Procedures: It Depends Which Country You're In	607
How to Keep Data Anonymous or Confidential	607
Ethical Authorship and Collaboration	608
Additional Issues in Research Ethics	609
Making Research Open and Transparent	612
Preregistration	612
Open Materials and Data	612
Open-Access Journals	613

Conclusion	613
Exercises	613

Chapter 17. How to Find, Review, and Present Research 616

Learning Objectives	617
Where to Find Research	617
Journals	617
Open-Access Journals	620
Books	621
Conferences and Seminars	621
Reports	622
Working Papers and Preprints	622
Journalism, Social Media, Blogs, and Podcasts	622
How to Search for Studies	623
Google Scholar	623
● Box 17.1: About Google Scholar	624
Electronic Resources: Indexes, Full-Text Databases, and Aggregators	624
<i>Wikipedia</i>	626
● Box 17.2: About Wikipedia	626
Browsing and Following Citation Trails	627
Citation Software	627
How to Write a Literature Review	627
What a Literature Review Should Not Do	628
What a Literature Review Should Do	629
The Literature Review as Context for Your Own Study	630
How to Communicate Your Own Research	631
The Importance of Rewriting	631
Know Your Audience	631
Organization of a Research Article or Report	632
Writing About Numbers	635
Tables and Figures	637
Tips for Creating Good Tables	638
Tips for Creating Good Figures	639
How to Communicate Qualitative Research	644
Making a Presentation: How It Is—and Is Not—Like Writing	647
How to Publish Your Research	648
Conclusion	649
Exercises	650

Glossary G-1

References R-1

Index I-1

PREFACE

This book began on a Saturday morning in the spring of 2004, when Dahlia came to visit one of Gregg's executive master of public administration classes. It was a chance simply to observe, get feedback, and share ideas about how to teach research methods. We had each taught this kind of course for years in different programs, but this opportunity arose because we were about to become members of the same faculty in the fall.

We are rather different from each other. Dahlia is an economist with a keen interest in economic theory and causal research. Gregg is a psychologist by training with a background in survey research and program evaluation. Dahlia works on issues related to health care and more recently poverty measurement. Gregg works on issues related to public administration and people's attitudes toward government. Our teaching and writing styles—even our personalities—are quite different.

But we hit it off immediately. We realized that our differences in training and experience complemented and reinforced each other. We discovered that we both had a deep commitment to trying to teach research methods well—with clarity, rigor, and purpose. We shared a strong belief that research methods matter—not just to those who plan to become researchers but to decision makers and practitioners preparing to tackle some of society's toughest problems. We also shared a belief in the value of interdisciplinary research. And we were both increasingly disappointed in the books available to assign to our students.

The standard research methods books we were using had an academic social science flavor, yet our students came from diverse fields and had more policy- and practice-related interests. We wanted a more interdisciplinary approach and more examples of applied social and policy research across various substantive areas (such as public management, education, criminal justice, public health, urban planning, social work, and other areas).

Some of the standard textbooks also seemed to be missing important new developments. Research methods and statistics have advanced very rapidly over the past few decades—not only technologically but intellectually—with important influences coming from economics, psychology, political science, epidemiology, statistics, and various other disciplines. We wanted a book that better reflected current thinking.

We also found that the books we were using did not cover causation sufficiently—despite the fact that causal research is essential to understanding the origins of social problems and the effectiveness of proposed solutions. When books did discuss causation, they focused heavily on experiments rather than the observational studies (with control variables or matching), quasi experiments, and natural experiments that modern social and policy researchers mostly depend on to examine causal questions in the real world. We wanted a book that would help students think seriously about causation and recognize and assess the actual research strategies used most often to try to get at it.

Many books describe the abstract concepts of the scientific method and the technicalities of specific methods, but we wanted a book that also gave a feel for the realistic

trade-offs, uncertainties, habits, and also excitement that constitute the research experience. To do so, the book we envisioned would contain plenty of in-depth, real-world examples of a wide range of studies that would serve not only to illustrate key methods and ideas but also to demonstrate the value of research to public policy and practice. Research is not perfect—often far from it. Still, we believe that it provides one of the best tools we have for fixing many of society’s most pressing problems.

Finally, we also wanted a book that worked for our diverse students, who differ tremendously in their quantitative and research backgrounds—and vary a great deal in what they want to use research for. Some students already have experience doing research, while others have no prior knowledge at all. Some students have backgrounds in quantitative fields like engineering or finance, while others have backgrounds in humanistic fields like history or the arts. Yet all of our students—indeed, we would argue all practitioners and even all citizens—face a deluge of research, analysis, and statistics and must learn to interpret findings, recognize misrepresentations, and make judgments about the strength and relevance of the evidence.

One of the challenges in writing about research methods for such a diverse audience is whether and how to introduce some of the more advanced or technical topics. Rather than leave out important topics, we decided to provide conceptual introductions, avoiding the technical details and emphasizing a more intuitive approach. This way, readers would be able to recognize such techniques when used in studies, and those learning to do their own research would have some initial ideas about the aims and possible applications of more advanced techniques. That is just one of the ways we tried to design a book that will be useful for our readers for years to come as they develop in their careers.

By the end of that morning (probably it was the early afternoon by the time we finished our coffee and discussion), we decided to begin writing our own research methods textbook. We started gradually, using a few draft chapters as supplements to the standard textbooks we were using. As we wrote and taught with our emerging book, we found new ways to explain key ideas, experimented with the best order of topics, dug up interesting examples, and worked to clarify and simplify the often confusing terminology of research methods. As the full book took shape, we had many discussions and debates about ideas and worked long hours revising and rearranging the chapters into a logical, clear, and coherent whole.

We have been extremely gratified by the positive reactions—from students, instructors, and independent readers—to the prior editions. Perhaps most gratifying is to discover that those who appreciate our book seem to range so widely in their fields of interest and especially their backgrounds, from experienced researchers to students just starting their training in—and perhaps a little fearful of—research methods.

We both learned a tremendous amount in the process of writing this book and in making revisions for this new edition. We hope that the book helps students and others learn a great deal as well.

How the Book Is Organized—and Why

We organized the book broadly around what we see as the two main kinds of research: strategies for description (Chapters 4 to 7) and strategies to get at causation (Chapters 11 to 15). Descriptive research questions ask about *what is*—the characteristics and patterns that exist in the social world. Causal research questions ask about *what if*—how things in the social world would be different if we made a change. Both are essential in most basic

and applied fields, yet it is critical to recognize this distinction when doing or assessing studies (and not, for example, assume that a descriptive study demonstrates causation).

Before getting into the details of descriptive and causal research, we present some foundational concepts and tools (Chapters 1 to 3). These include the nature of research and of the scientific method and, importantly, the foundational role of theory, the tool of causal diagrams, and core concepts (such as variables and relationships) that appear in almost all forms of research. We also cover qualitative research (Chapter 3) as foundational because it often serves as an exploratory method and because it helps generate theory and identify causal processes. Introducing qualitative methods early also allows later, more quantitative chapters to incorporate and integrate the qualitative perspective so that we can present more of a mixed-methods approach to most topics.

Although we kept the order of topics fairly traditional, similar to that of other research methods books and courses, we have situated some chapters differently and introduced novel ones. We put the chapter on qualitative research early in the book for the reasons just mentioned. We cover sources of secondary data (Chapter 6) before primary data (Chapter 7) because many students will work mostly with secondary data (both in their classes and in their careers) and because of the burgeoning availability of secondary data.

We placed the chapters on statistical analysis (Chapters 8 to 10) between Part II (Strategies for Description) and Part IV (Strategies for Causation) because the tools of statistical analysis (including statistical inference) are largely descriptive—statistics alone do not establish causation—and because certain statistical tools are needed for some of the most widely used strategies for causation (such as control variables). We have given the statistical analysis chapters their own part (III) also to emphasize that they are tools that can be used for many purposes, separate from the conceptual and methodological issues covered in other parts of the book—and to give readers and instructors flexibility in how much statistics to delve into. For those with a background or recent course work in statistics, Part III can be used for review or even skipped entirely. For those needing to learn statistics along with research methods, the chapters of Part III provide a choice of learning levels from basic data analysis and interpretation (Chapter 8) to statistical inference (Chapter 9) and more advanced multivariate techniques (Chapter 10). Although we envision most readers as having had at least some prior course work in basic statistics, the book is nonmathematical and written to be accessible to those without prior course work in statistics.

In Part IV on strategies for causation, we have a somewhat novel chapter at the start focused on the issue of causation itself (Chapter 11)—what it is, why it is important, and how to begin identifying it. We have found that probing these questions in depth provides motivation and background for learning the logic and methods of various real-world causal research strategies. Instead of presenting randomized experiments right away, the “gold standard” for determining causation, we first cover observational studies with control variables (Chapter 12, which provides the intuition) and how to implement this strategy using multiple regression (Chapter 13, which provides additional statistical details). We cover observational studies first because they are the most numerous in social and policy research and thus the ones students are most likely to encounter in their studies and in their careers. But more important, understanding the limits of observational studies illuminates the need for and logic of randomized experiments, which are covered next (Chapter 14). Following the chapter on randomized experiments, we have another somewhat novel chapter on natural and quasi experiments (Chapter 15) that covers a variety of

real-world strategies that emulate the advantages of experimental research for answering causal questions. Natural and quasi experiments, along with observational studies, represent the vast majority of research used to inform policy and practice. The order of chapters in Part IV aims to facilitate understanding of these types of studies.

In Part V, we conclude the book with some consideration of the broader context and communication of research, including the politics and production of research, ethical issues and procedures, and some practical advice on finding, reviewing, and communicating research.

We recognize, to be sure, that different instructors and programs have different styles and requirements. Some courses must be completed in just a quarter, for example, while others take place over a semester or even an academic year. So to the extent possible (in a linear medium such as a book), we have tried to allow the chapters to be used in a different order or to be taught in parts. For example, some instructors may wish to combine, or omit, selected chapters, in particular the chapters in Part III on statistics (which may not need to be covered in some courses) or Chapter 13 on using multiple regression to estimate causal effects (which is a bit more statistical). Still, we have put much thought and a good deal of class testing into this book, and so we encourage instructors to at least consider the general logic of presentation suggested by our table of contents.

What's New in the Third Edition?

In the years since the second edition was published, we have continued to gather insights and ideas about how to improve our book, not only from our reviewers and colleagues but also, importantly, from our many students. In classroom discussions, one-on-one interactions, and reading student work, we looked for what confused students—and incrementally honed ways to prevent that confusion. We stored up our knowledge in marked-up second editions, took photos of whiteboards with new examples and diagrams, and wrote down lots and lots of notes.

These insights and improved teaching approaches inspired important changes to the third edition. With some exceptions, they did not take the form of major reorganizations or new top-level sections. More often, they took the form of new short sections, new diagrams, or revised diagrams. Most frequently, they took the form of a clearer term or phrase, a new sentence of explanation, a rewritten paragraph, or reordered paragraphs within a section.

There are too many instances to list, but one example should give a flavor. In randomized experiments (Chapter 14), baseline descriptive statistics (balance) tables and results tables have the same structure and appearance. So students often confuse them. What avoids that confusion—and helps students understand the difference? In response, we now explicitly point out the resemblance between baseline descriptive (balance) tables and results tables, and we compare and contrast their purposes and what to expect when interpreting their contents. In this way, we hope to help students understand not only the chapter but also the published results of experimental studies.

This third edition also reflects advances in applied social research, some, but far from all, driven by technology. We are proud that our first edition (published in 2010) emphasized some methodological advances when they were only being discussed in much more technical venues. For example, our first edition emphasized diagramming common causes, reverse causation, and mechanisms to decide what variables make good or bad control variables. At the time, that content was only seen in more technical or specialized publications. Since then,

the use of causal diagrams has become much more widespread across the social sciences. Our book was also early in emphasizing practical versus statistical significance, an issue that has exploded not only in the social sciences but among science journalists as well. We have continued to refine and update our treatment of these and other advances in the third edition. And we are always on the lookout for new issues and methods at the cutting edge of the social sciences.

While we can't detail all the changes to this third edition, here are some of the highlights:

Part I: Foundations

- Chapter 1 on research in the real world includes a number of updates and new examples that illustrate how research methods matter to policy and practice. We also note some new developments that make knowledge of social research methods increasingly relevant, such as the burgeoning use of analytics to guide decision making in business, government, and nonprofits.
- Chapter 2 on theory, models, and research questions reflects a number of important changes. First, we did away with the “broken windows” theory of policing as the opening example and replaced it with “community policing” instead. But we kept a summary of the broken windows theory in a box for comparison and for consistency with prior editions, and we added another box about the growing controversy over this theory, its relationship to aggressive policing tactics, and some lessons relevant to applied social research. Second, we reorganized and restructured content based on our experiences of how students learn, for example, relocating the ideas of spurious correlation and the ecological fallacy to Chapter 11 (on causation). Third, we revised our discussion of interpretivist and grand theories and how they compare to the middle-range substantive theories we emphasize. Fourth, we now use the term *causal diagram* (rather than *path diagram*) to be more consistent with current causal theory and terminology. Since we return to causal diagrams often in the book, this change appears in subsequent chapters as well (especially Chapters 11 and 12). This chapter has quite a few other changes and additions.
- Chapter 3 on qualitative research has more discussion of social media and other online sources of qualitative data, which have become much more widespread. And we include various updates to qualitative methods and terminology. For example, we added new or revised coverage of virtual focus groups and big data (which is often text or other qualitative data). We also clarified some further topics, including interpretivist approaches and when to conduct focus groups rather than interviews.

Part II: Strategies for Description

- Chapter 4 on measurement includes some important conceptual clarifications and is reorganized, based on our experience teaching these ideas, to help with understanding measurement in the social sciences. For example, we added sample data set excerpts to illustrate types of variables and classical measurement theory. We also added new content on measuring race-ethnicity and gender, which has become an important issue in many government and social surveys.
- Chapter 5 on sampling incorporates a clearer distinction at the outset between representativeness and the broader notion of generalizability. We include some

important updates about online sampling, which is increasingly important but challenging. We added an explanation and illustration of likely voter models and new examples from polling errors in the 2016 and 2020 U.S. presidential elections. And we created a number of new figures that better illustrate various types of complex probability sampling, as well as some updated examples.

- Chapter 6 on secondary data starts with a new opening example—the use of secondary data to track and understand the COVID-19 pandemic. It includes updates to data archives and sources of public use microdata. And the chapter includes new coverage of big data from social media, online transactions, and smart devices.
- Chapter 7 on survey research and other primary data reflects the many changes in the field of survey research, which increasingly relies on online methods. Even the 2020 U.S. Census, which long relied on mail self-administered forms, employed a mixed-mode approach that used mailed forms but encouraged online responding. We also added new content on question ordering and response formats.

Part III: Statistical Tools and Interpretations

- Chapter 8 on descriptive statistics reflects some updates to various data examples, as well as to statistical software. And, importantly, we have added some more structure and new coverage on the interpretation of practical significance and effect size.
- Chapter 9 on statistical inference has fewer changes, overall, although it does include some important refinements as well as new or updated coverage of nonequivalence and noninferiority tests, as well as Bayesian inference.
- Chapter 10 on multivariate statistics has some updates and clarifications, as well as new material on machine learning.

Part IV: Strategies for Causation

- Chapter 11 on causation includes updates to the opening example from new research on family dinners and substance abuse, research that demonstrates the extent of bias in the results. We also added advice on writing about empirical evidence so as to distinguish correlation and causation. Importantly, the chapter now highlights key terms from contemporary causal inference, including direct acyclic graphs (DAGs) and potential outcomes.
- Chapter 12 on observational studies provides more advice on choosing control variables, and it better explains the various purposes of control variables. It incorporates a clarified discussion of matching methods and a reorganized coverage of epidemiological approaches. And it adds coverage of some new topics, such as colliders.
- Chapter 13 on regression analysis of causal effects features two new extended examples: first, the link between residential greenery and birth outcomes and second, the gender gap in earnings. These replace the breastfeeding example in the prior editions. These new examples allow us to explore not only omitted variables bias but also odds ratios, practical significance, and the role of controls

for exogenous independent variables of interest. We also added new and updated material on predicting the direction of bias from omitted variables, propensity scores, and machine learning for causal analysis.

- Chapter 14 on randomized experiments incorporates some new examples, including from lighter-touch (and lower-cost) nudge experiments, as well as advice on how to judge balance. It also presents some new material about generalizing experimental results, variants of randomized experiments, preregistration, and the analysis of experiments.
- Chapter 15 on natural and quasi experiments reflects some rethinking on our part of how to better define these types of studies, including emphasizing the different dimensions that help researchers to find and create exogenous variation for convincing causal studies. It also includes some new and revised examples that better illustrate the key features of such studies.

Part V: Context and Communication

- Chapter 16 on the politics, production, and ethics of research includes some subtle but important qualifications to the rational mode of research and policy. It incorporates updates to the IRB process for social and behavioral science research. And, importantly, it adds new material on the growing movement for open science.
- Chapter 17 on how to find, review, and present research incorporates new and updated material on open-access journals. It also includes new examples of the presentation of findings in the form of visualizations of both quantitative and quantitative data.

Finally, we and SAGE have revised the supplementary materials, which are available on SAGE's companion website for this book at edge.sagepub.com/remler3e. We have updated the instructor's manual for each chapter, including a description of key differences between editions. Importantly, the manual for each chapter provides in-class exercises for active learning. We also now list the key terms in the instructor's manual, rather than at the end of each chapter. The glossary contains both key terms (**color-bolded in the text**) and non-key glossary terms (*color-italicized in the text*). Key terms are those readers should learn to use, while non-key terms are those readers may need to look up. The test bank has also been improved and expanded, and the slides are now accessible to people with visual disabilities and are compatible with screen reader technology.

We began planning work on this third edition in 2018, shortly after the editor of our earlier editions, Vicki Knight, retired and our new editor, Leah Fargotstein, took over. We enjoyed brainstorming ideas with Leah as we began early work on revisions in 2019. But we did the majority of our revisions in 2020 during the COVID-19 pandemic. Perhaps we benefited from being stuck at home, like much of the rest of the world, and less distracted by meetings, travel, and other things. We were fortunate, amidst so much sorrow and difficulty, to lose ourselves in a project that we felt really good about. Our revisions took a lot longer than we had planned, but we are pleased with how they turned out. And we hope that instructors, students, and others will also appreciate and benefit from the improvements we have made in this third edition.

ACKNOWLEDGMENTS

The students who read draft chapters of the book in our various classes gave us comments, as well as the opportunity to observe directly what aspects of the chapters did and did not work. Their feedback was critical to the first edition of the book, and we thank them. We also thank our many students who used the first and second editions and provided more feedback.

We are very grateful to our editor at SAGE, Leah Fargotstein, who patiently guided us in our rather drawn-out effort to revise this book. It was a true pleasure working with her. We would also like to thank Vicki Knight, our previous editor at SAGE, who saw potential in our book at an early stage and shared with us her experience in the craft of textbook publishing. We thank Ivey Mellem at SAGE for her able editorial assistance and for her help with the ancillaries for our book. We extend a heartfelt thanks to Karen Taylor, our copy editor, for her exceptionally attentive and thoughtful editorial work on the manuscript. And we are very grateful to Rebecca Lee, our production editor, for her vision and skill in producing a beautiful new edition of the book. We also express our gratitude to the designers and others at SAGE who helped with the final production of our book.

Hanna Mandelbaum (HannaMandelbaum.com) created the original and inspiring cover art for this third edition, titled “Critical Masses,” as well as the cover art for the first and second editions. As always, her art was inspired by the meaning of figures in the book.

We are grateful to our professors, mentors, colleagues, and students who have furthered our thinking and learning about research methods over the years. Dahlia would particularly like to thank Deborah Balk, Gregory Colman, Allison Cuellar, David Cutler, Claudia Goldin, Jessica Greene, Michael Grossman, Katherine M. Harris, Nora Jacobson, Ted Joyce, Lawrence F. Katz, Joseph Newhouse, John Paul Orellana, Katherine Swartz, and especially Sherry Glied and Sanders Korenman. Gregg would like to thank those who have helped his understanding of social research, including Frank Andrews, Etienne Charbonneau, Steve Dietz, Donna Eisenhower, Martin Frankel, Ashley Grosso, Steven Immerwahr, Oliver James, Sebastian Jilke, Robert Kaestner, Mirae Kim, Sanders Korenman, Cecilia Lavena, Rom Litwin, John Mollenkopf, Doug Muzzio, Suzanne Piotrowski, Gregory Porumbescu, Leanne Rivlin, Susan Saegert, Ann Schnare, Carroll Seron, and Gary Winkel.

Finally, we would like to thank those who read and commented on parts of the book at all stages of all editions. For their careful reading and qualitative researchers’ perspectives on Chapters 2 and 3 for this third edition:

Nora Jacobson, *University of Wisconsin, Madison*

Eduardo Vianna, *LaGuardia Community College and The Graduate Center, City University of New York*

For individual chapters, the detailed outline, or in some cases the entire book for the first edition (affiliations are those at the time of review):

Philip Alberti, *New York City Department of Health and Mental Hygiene*

Howard Alper, *New York City Department of Health and Mental Hygiene*

Deborah Balk, *Baruch College and The Graduate Center, City University of New York*

Martin Frankel, *Baruch College and The Graduate Center, City University of New York*

Ted Joyce, *Baruch College and The Graduate Center, City University of New York*

Sanders Korenman, *Baruch College and The Graduate Center, City University of New York*

Cheryl Merzel, *Albert Einstein College of Medicine, Yeshiva University*

Matthew Neidell, *Columbia University*

Suzanne Piotrowski, *Rutgers University, Newark*

Pauline Rothstein, *New York University*

Alan Sadovnik, *Rutgers University, Newark*

Arloc Sherman, *Center on Budget and Policy Priorities*

Dorothy Shipps, *Baruch College, City University of New York*

Robert C. Smith, *Baruch College and The Graduate Center, City University of New York*

Jeanne Teresi, *Columbia University and Research Division, Hebrew Home at Riverdale*

We would also like to thank SAGE's outside reviewers who read and commented on the initial proposal and on drafts of the various chapters for the first and second editions (affiliations are those at the time of review):

Adam Atherly, *University of Colorado Denver, Colorado School of Public Health, Health Systems, Management, and Policy*

Sarah Baird, *George Washington University, Global Health*

Jim Banta, *Loma Linda University School of Public Health, Public Health*

Anthony Bertelli, *University of Southern California, Public Administration and Policy*

David Daniel Bogumil, *California State University, Northridge, Sociology*

Colleen Chrisinger, *University of Oregon, Planning, Public Policy, and Management*

Amita Chudgar, *Michigan State University, Educational Administration*

Matthew Cooper, *Ealing, Hammersmith & West London College, Business Administration*

Alaster Scott Douglas, *University of Roehampton, London, Education*

Michael D. Grimes, *Louisiana State University, Sociology*

Mara Fuertes Gutiérrez, *Leeds Metropolitan University, United Kingdom, Languages*

Kristen Hopewell, *University of Michigan, Sociology*

Osarumwense Iguisi, *London Millennium College/University of Benin, Nigeria, Business and Management*

Douglas Jackson-Smith, *Utah State University, Sociology, Social Work, and Anthropology*

W. Jake Jacobs and Sacha Brown, *University of Arizona, Psychology*

Mark Kovic, *Midwestern University, Health Sciences*

Gary Langford, *Naval Postgraduate School, United States, and the Defence and Systems Institute, University of South Australia, Australia, Engineering and Applied Science*

Sue Lillyman, *University of Worcester, Health and Society*

Nasser Mansour, *University of Exeter, United Kingdom, Education*

Dave E. Marcotte, *University of Maryland Baltimore County, Public Policy*

Khadijah O. Miller, *Norfolk State University, Interdisciplinary Studies*

Stephen S. Owen, *Radford University, Criminal Justice*

Chester Robinson, *Tennessee State University, Public Administration*

Michelle Rogerson, *University of Huddersfield, Applied Criminology*

Jennifer Shea, *San Francisco State University, Public Affairs and Civic Engagement*

Sevil Sönmez, *University of North Carolina Greensboro, Marketing, Entrepreneurship, Hospitality, and Tourism*

Richard Tardanico, *Florida International University, Global and Sociocultural Studies*

Craig Tollini, *Western Illinois University, Sociology and Anthropology*

Gwen Urey, *California State Polytechnic University, Pomona, Urban and Regional Planning*

Pavlos A. Vlachos, *The American College of Greece, Marketing*

Marc D. Weiner, *Bloustein Center for Survey Research, Rutgers University, Planning and Public Policy*

Xiaohe Xu, *University of Texas at San Antonio, Sociology*

Glenn A. Zuern, *Albany State University, Criminal Justice*

We would like to thank SAGE's outside reviewers who read and commented on the initial proposal and on drafts of the various chapters for this edition, as well:

Edith Barrett, *University of Connecticut*

Keosha Bond, *New York Medical College*

Saul Cohn, *San Jose State University*

Hector Cordero-Guzman, *Baruch College, City University of New York*
Crista Crittenden, *Penn State University*
Thomas Frederick, *California Baptist University*
Marcia Godwin, *SUNY at Binghamton*
Mirae Kim, *University of Missouri*
Steven Klein, *Capella University*
Arnaud Kurze, *Montclair State University*
Jacqueline Mack-Harris, *Loyola University Chicago*
Sundeepp Muppidi, *University of Hartford*
Okori Uneke, *Winston-Salem State University*

ABOUT THE AUTHORS



Dahlia K. Remler is a professor in the Marx School of Public and International Affairs at Baruch College and the Department of Economics at The Graduate Center, both of the City University of New York. She is also a research associate at the National Bureau of Economic Research and an affiliate of the CUNY Institute for Demographic Research.

Dahlia has been in an unusual mix of disciplinary and interdisciplinary settings. She received a bachelor of science in electrical engineering from the University of California at Berkeley, a doctorate in physical chemistry from Oxford University—while a Marshall Scholar—and a doctorate in economics from Harvard University. During the Clinton administration's health care reform efforts, Dahlia held a fellowship at the Brookings Institution to finish her dissertation on health care cost containment. She then held a postdoctoral research fellowship at Harvard Medical School, followed by assistant professorships at Tulane's and Columbia's Schools of Public Health, prior to joining the faculty at Baruch. She enjoys comparing and contrasting how different disciplines see the same issues.

Dahlia has published widely in a variety of areas in health care policy, including health care cost containment, information technology in health care, cigarette tax regressivity, simulation methods for health insurance take-up, health insurance and health care markets. Her recent research, joint with Sanders Korenman, has focused on incorporating health insurance into poverty measurement. Her work has appeared in the *Journal of Health Economics*, the *Journal of Policy Analysis and Management*, *Health Affairs*, the *Quarterly Journal of Economics*, the *American Journal of Public Health*, the *Social Service Review*, and many other journals.

Dahlia lives with her husband, Howard, in New York City, where they enjoy the city's theaters, restaurants, and parks—and Dahlia enjoys being a complete amateur dancer in some of the city's superb dance studios.



Gregg G. Van Ryzin is a professor in the School of Public Affairs and Administration at Rutgers University, Newark. He received his bachelor of arts in geography from Columbia University and his doctorate in psychology from the Graduate Center, City University of New York. During his doctoral training, he worked as a planner for a nonprofit housing and community development organization in New York City, and he completed his dissertation on low-income housing for the elderly in Detroit. He next worked in Washington, DC, for ICF Inc. and later Westat Inc. on surveys and program evaluations for the U.S. Department of Housing and Urban Development and other federal agencies. In 1995, he joined the faculty of the School of Public

Affairs at Baruch College, where he directed the Survey Research Unit for eight years. In that role, he helped develop and direct the New York City Community Health Survey, a large-scale behavioral health survey for the city's health department, and also played a key role in shaping and conducting the city's survey of satisfaction with government services. He spent time in Madrid, collaborating with researchers there on the analysis of surveys about public attitudes toward Spanish government policy. And at Rutgers, Gregg has directed the doctoral program in public administration and helped start a center that supports experimental and behavioral approaches to public administration.

Gregg has published many scholarly articles on housing and welfare programs, performance measurement and evaluation, and public opinion about government services and institutions. His work has appeared in the *Journal of Policy Analysis and Management*, the *Journal of Public Administration Research and Theory*, *Nonprofit and Voluntary Sector Quarterly*, *Public Administration Review*, *Public Management Review*, and other journals. He is editor, with Oliver James and Sebastian Jilke, of the book *Experiments in Public Management Research* (Cambridge University Press, 2017).

Gregg lives in New York City with his wife, Ada (a history professor at NYU), and has two grown daughters, Alina and Lucia. They enjoy the local culture in their Greenwich Village neighborhood, escaping on occasion to Miami, Maine, Spain, Cuba, and other interesting places in the world.

PART I

FOUNDATIONS

1. Research in the Real World
2. Theory, Models, and Research Questions
3. Qualitative Research

This first part of the book introduces you to research and its many uses in the real world, hopefully inspiring you to want to dig deeper and discover more. It also covers the theories, models, and research questions that guide researchers' thinking and that provide a foundation for creating and evaluating evidence. And this part of the book introduces you to qualitative research, which is an important starting point for exploring the social world as well as a useful method for developing theories, models, and research questions. Together, these chapters provide a foundation for understanding and applying research methods.

CHAPTER 1

RESEARCH IN THE REAL WORLD

Thousands of studies have looked at global warming.

iStock.com / Abril_



LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Recognize how research informs policy and practice
- Understand the character of research as a form of knowing
- Appreciate the limitations of research
- Distinguish causal and descriptive questions
- Describe key ethical principles of human subjects research

Overview: In this chapter, you will learn why research methods matter—not just for those who do research but for those who apply it to policy making, management, and other important decisions in life. Research provides a fact base for decisions and helps win arguments; and sometimes (if you’re not careful), research misleads. Knowing research methods also provides a foundation for understanding performance measurement, program evaluation, analytics, big data, and the push for evidence-based policy and practice

in many fields. You will see how descriptive (“what is”) questions differ from causal (“what if”) questions and what defines research and the scientific method more generally as a way of knowing about the world. And you will learn about the ethics of doing research with human participants—ethics that shape social and policy research. This chapter aims to expand your appreciation of research methods—and to help you approach the rest of the book with an open and informed perspective.

Do Methods Matter?

We want to do things in our lives and in our work to make a difference in the world—to educate children, treat or prevent sickness, reduce crime, promote the arts, develop innovative products, feed the hungry, house the homeless, satisfy clients, and improve our workplaces and our communities. We share a desire to do something meaningful, to leave our mark in the world. But doing so requires a base of evidence beyond our own personal knowledge and experience—evidence about how things really are and evidence about how to make things better.

We need such evidence not only to enhance our own understanding and decision making but also to convince others—those with the authority and resources that we need to accomplish our aims or those with opposing points of view who stand in our way.

Good Evidence Comes From Well-Made Research

The best evidence comes from good research. Good research can appear in the form of a study published in a journal, but it can also be an internal analysis of administrative data, a government or foundation report, a performance measurement brief, a program evaluation, a needs assessment, or a client or employee survey. Government agencies and international organizations collect and disseminate a great variety of empirical evidence on many important topics, such as health services and outcomes, educational attainment, labor market characteristics, crime victimization and punishment, housing conditions, environmental air and water quality, and so on.

Because of the internet and modern communications technology, we now live and work in a world in which an abundance of data, studies, and statistics surround us and hover within easy grasp—provided we know what to choose, how to make sense of it, and where to apply it.

Good research—just like a good car or a good piece of software—must be well designed and well made. But we cannot simply rely on brand names (although knowing that research comes from a respected scientific journal or reputable research institution does provide some assurance). Still, each study is unique, and each has its own strengths and weaknesses. So we need to understand how research is made—that is, research methods.

Research methods are the techniques and procedures that produce research evidence, such as sampling strategies, measurement instruments, planned comparisons, and statistical techniques. So we need to understand research methods to judge the quality of a study and the evidence it provides. Research methods are what this book is all about.

May the Best Methods Win

We also need an understanding of research methods to attack evidence that hurts our cause or defend evidence that helps it.

Consider the controversy over abstinence-only sex education for teenagers. Some communities feel strongly that teens should be discouraged as much as possible from engaging in sexual activity and that comprehensive sex education (which can involve distributing condoms and instructing teens in their use) sends the wrong signal. Others warn that the abstinence-only approach does little to change the reality of teenagers' lives, leaving them vulnerable to unwanted pregnancy and sexually transmitted diseases (including AIDS).

As is often the case with a controversial public policy issue, both sides can point to studies to bolster their arguments. A review by Douglas Kirby (2007) located 115 studies of various pregnancy prevention programs targeting U.S. teens, including abstinence and comprehensive programs. So neither side can win just by pointing to “a study” that supports its position.

Instead, we must struggle over how well made the conflicting studies are—meaning their methods. The argument may be won by having a better-made study—or lost by having a poorly made one. So although the war may start from a substantive policy disagreement, such as how best to provide sex education to teens, the battles often rage over research methods.

Research-Savvy People Rule

Some of you may be training to become researchers or analysts—so doing research will be (or already is) part of your job. Clearly, knowing research methods is important to you. But many of you are (or plan to be) practitioners, doers—implementing programs, delivering services, managing people, or leading organizations. Why do you need to know research methods? We've already suggested a few reasons: Good research provides a fact base for decisions and wins arguments, and the quality of research often hinges on the methods used. But knowing research methods can help your career more directly as well.

We live and work in an “information age” in which the ability to find, understand, and make use of complex sources of information—such as research—is an important skill. An explosion of data of all kinds—from governments, businesses, and virtually every other institution or activity in our lives—means that those who know how to handle, analyze, and interpret data have great value to organizations and employers. Organizations regularly generate analytics and commission studies, and so their top leaders or managers must know how to

make sense of and apply this information to improve policies and programs. Funding agencies and legislative bodies demand “evidence-based”—meaning research-based—programs and management reforms. To win funding for your program or organization, you need the ability to demonstrate an understanding of research in your field of policy or practice.

So without a grasp of research methods, you will be at a disadvantage in applying for jobs, advancing into leadership positions, and attracting financial and political support for your program or cause. With a good understanding of research methods, you can do more and go farther in your career.

Research, Policy, and Practice

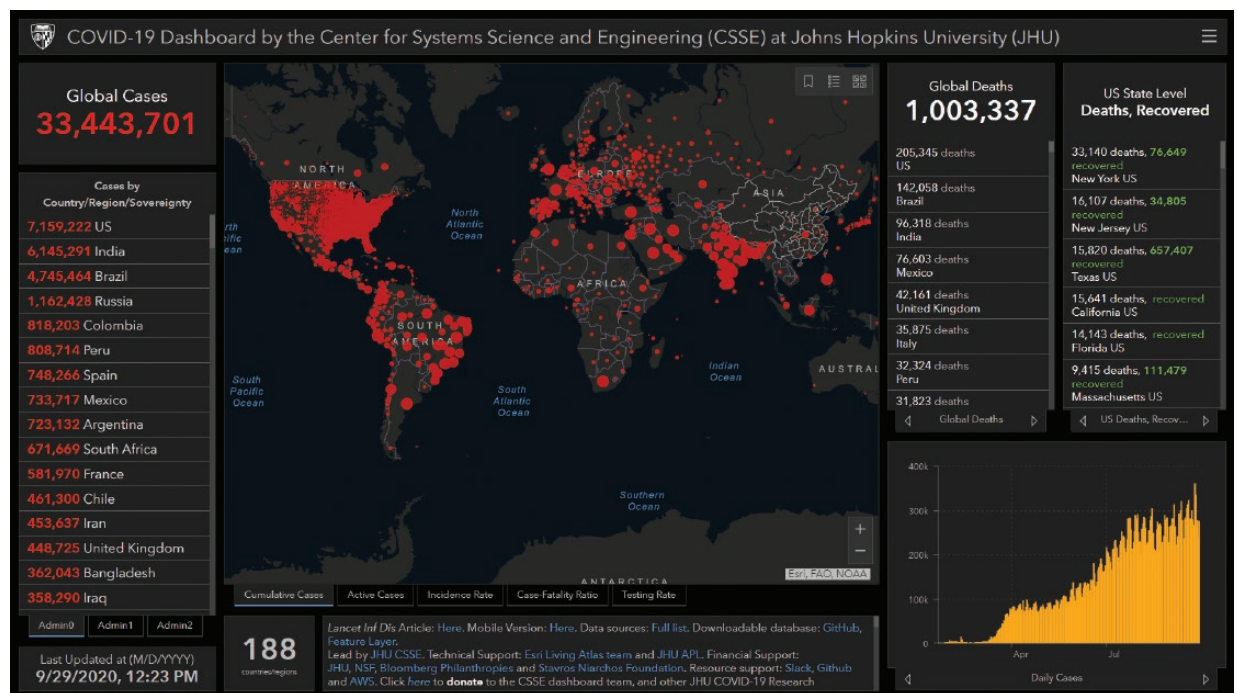
Research has become an essential element of modern public policy and management in the form of analytics, performance measurement, program evaluation, and the push for evidence-based policy and practices.

Analytics

The term *analytics* is everywhere: “Google analytics,” “business analytics,” “urban analytics,” and analytics for education, health care, human resource management, marketing, and other fields. Often people expect to see analytics in a dashboard or other visualization. For example, Figure 1.1 shows a coronavirus dashboard created by a team at Johns Hopkins University during the outbreak of the pandemic in Europe and the United States. Figure 1.2 shows a more everyday social media dashboard.

▼ FIGURE 1.1

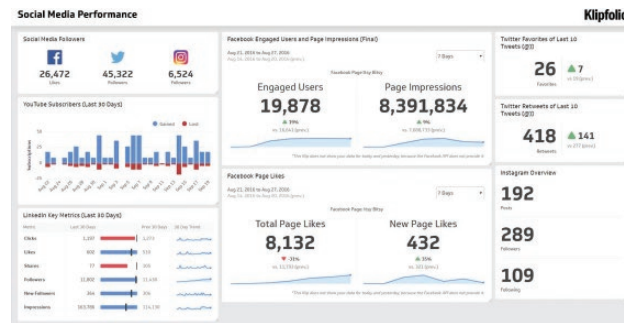
Coronavirus Analytics Dashboard



Source: Johns Hopkins University, retrieved from <https://coronavirus.jhu.edu/map.html> on September 29, 2020, at 1:30 PM EST, shortly after global deaths surpassed 1 million.

▼ FIGURE 1.2

Social Media Analytics Dashboard



Source: Klipfolio, retrieved from <https://www.klipfolio.com/resources/dashboard-examples/social-media> on March 24, 2020.

What are analytics—and how do they differ from more traditional research and analysis, the topic of this book? Although the term refers to a wide variety of things, **analytics** are usually real-time, frequently changing metrics and charts that describe an ongoing flow of activity or behavior, such as the coronavirus pandemic (Figure 1.1) or social media activity (Figure 1.2). The term also implies that the analytics—the numbers and charts—are displayed in ways that are readily available and useful for decision making. Analytics often appear intuitive and easy to use—no training required. But like more traditional research and analyses, analytics can be misinterpreted and may lead to wrong conclusions.

In this book, you will learn skills that can help you more effectively interpret and apply analytics on the job or in life. You’ll learn how to judge when trends over time or differences between groups represent real changes rather than just a transient blip or random fluke. And you will see how to use analytics and other evidence to figure out what works—and how well it works. You may even get some ideas from this book that help you employ analytics software to configure better and more useful analytics dashboards for your own needs.

Performance Measurement

Many fields these days emphasize **performance measurement** and performance management. The idea is sensible: We should measure how well we’re doing and ideally manage to improve it. New York City’s CompStat program—a data-driven effort to map and track crimes and hold police commanders accountable—is a well-known example that has spread to other policy areas (Behn, 2014). Indeed, the push to measure performance is now big in education, business, health care, and many other fields. The mass of data available today, thanks to the information revolution, fuels this trend. Performance measurement has now become a pillar of contemporary policy and practice in the public and nonprofit sectors (Hatry, 2007; Kaplan & Harvard Business School, 2009; Poister, Aristigueta, & Hall, 2014).

In the following chapters, you will see how logic models can help you figure out what to measure. You will learn what makes for valid and reliable measurements. And you will be introduced to various sources of data to measure outputs and outcomes, including both existing data and original surveys. All this material is critical to understanding and implementing performance measurement and management.

Evaluation Research

Much **evaluation research** aims to answer these questions: Did a program or intervention have an impact? Did it improve or change things? Other program evaluations seek to describe or fine-tune the implementation of the program; these are referred to as process or formative evaluations. Evaluation research is now a standard requirement of most government or foundation grants and contracts. Most new policy or management initiatives demand some form of evaluation as well. So evaluation research, too, has become a pillar of contemporary policy making and management in the government, the nonprofit sector, and even the business world (Rossi, Lipsey, & Freeman, 2003; C. Weiss, 1997).

But how can we know if a program or initiative is having its intended effect? Later chapters will introduce you to the basic ideas involved in thinking about cause and effect. They will cover strategies for estimating causal effects, including the use of control variables, randomized experiments, and various forms of what are called natural and quasi experiments. These are the major strategies for conducting evaluations of program impact.

Evidence-Based Policy and Programs

As suggested earlier, governments, businesses, and nonprofit organizations increasingly favor evidence-based policies and programs—strategies that have proven their effectiveness with research. It's not enough anymore to have a few heartwarming testimonials or a plan that just looks good on paper. The trend toward evidence-based policy and practice now permeates many fields (Davies, Nutley, & Smith, 2000). The rigorous testing of nudges, which are light-touch interventions aimed at changing health, social, or economic behaviors (Thaler & Sunstein, 2008), is an important example. Political campaigns now make much use of data and evidence-based approaches to gathering votes (Nickerson & Rogers, 2014).

Due to limited resources, policy makers and practitioners must often choose between effective programs. Therefore, comparing the effectiveness of different programs is crucial, as is comparing *cost-effectiveness*—the outcome obtained relative to the cost of the program. Such comparisons require evidence about the magnitude of a program's effect—how large an influence a program has on the outcome.

The chapters that follow will give you tools to identify and assess evidence that supports or can improve your program or initiative. And they will help you understand how to produce good research evidence to support your aims.

Evidence Can Mislead

On top of all that we've mentioned so far about the importance of research methods, it can be embarrassing to be wrong—and sometimes, if you're not careful, evidence can mislead.

QUESTION

What examples have you seen of performance measurement, program evaluation, or a focus on evidenced-based policy in your work or area of interest?

Misleading Measurements

No Child Left Behind (NCLB) was signed into law in 2002, setting in motion a wave of reform in schools all across the United States that became suddenly preoccupied with high-stakes testing, worried about closing the race gap, and apprehensive about the need to demonstrate rapid gains in test scores. NCLB won support in part because of the “Houston miracle,” the fact that this large, diverse city had itself demonstrated remarkable gains in reading and math scores, especially for Black and Hispanic students—at least according to scores on the Texas Assessment of Academic Skills (TAAS). If Houston could do it, so could the rest of the nation.

But scores on another test—the Stanford Achievement Test—taken by the same Houston students during the same school years showed a much different picture, according to an analysis by the *New York Times* (Schemo & Fessenden, 2003). Scores on the Stanford test, which is used nationwide, showed little or no gain overall in Houston and little or no narrowing of the race gap. Several well-known experts in education statistics, asked by the *New York Times* to review the discrepancy, concluded that the TAAS had considerably overstated the progress made by Houston students. Standardized tests do not necessarily provide a consistent measure.

Misleading Samples

As Pennsylvania considered legalizing marijuana, a PoliticsPA.com (2019) poll asked its readers “Should PA legalize recreational marijuana?” Marijuana legalization has become a major public policy issue facing many states with important health and financial implications. Nearly 1,500 people responded to the poll, and the results showed that fully 90 percent favored legalization. But the PoliticsPA reader’s poll relied on a voluntary sample—visitors to the online news site who found the poll and decided to participate.

A few weeks later, the Franklin and Marshall College Poll (2019) conducted a telephone survey that involved calling a random sample of 540 registered voters in the state. This poll found that only 59 percent favored marijuana legalization—a clear majority but still a finding that suggests a more divided view of the issue. Which survey do we believe? The Franklin and Marshall College Poll uses much better methods—including careful random sampling—to produce its results. And representativeness depends on the method of selecting the sample, not on how large the sample is. The



iStock.com/Daxus

Representative surveys show that a majority supports the legalization of marijuana.

true level of support for marijuana legalization in Pennsylvania is thus much closer to 59 percent than it is to the strikingly high figure of 90 percent, despite the larger sample in the PoliticsPA poll.

Misleading Correlations

A study of children less than two years of age found that those who slept with nighttime lighting were five times as likely to have myopia (nearsightedness) than those who slept in the dark (Quinn et al., 1999). In other words, the researchers found a correlation in their sample of small children between having night-lights and being nearsighted. Media articles reported on the study and suggested parents should stop using night-lights.

A later study, however, found that parents who themselves were nearsighted were more likely to use night-lights with their children, perhaps because of their own vision difficulties (Zadnik et al., 2000). If children inherit myopia from their parents and if parents with myopia are more likely to give their children night-lights, then the night-lights aren't causing the children to become myopic. This is an example of a **spurious relationship**: when two variables are correlated because both are a reflection of a third, underlying variable or common cause—in this case, the myopia of the parents. Thus, contrary to the media reports, the correlation is not a reason for parents to stop giving their children night-lights.

QUESTION

Can you think of any other examples of a misleading measurement, sample, or correlation?

What Is Research?

This book is about research methods—but what is research? We can define research as a social and intellectual activity that involves systematic inquiry aimed at accurately describing and explaining the world. But it helps to get a bit more specific.

Secondary and Primary Research

People often “research” a topic at the library or on the internet. Such information searches and syntheses are best referred to as **secondary research**—the search for published sources describing the results of research or information provided by others. While secondary research is an important skill that we cover in the last chapter (Chapter 17), it is not the focus of most of what we cover in this book, nor is it what we mean when we use the word *research*.

Rather, we use the term *research* to refer mostly to original research, or **primary research**—the original collection or analysis of data to answer a new research question or to produce new knowledge. In journals, such studies are referred to as original contributions. What gets confusing is that original or primary research can involve **primary data** collection—collecting *new* data to provide a description or explanation of the world. But it can also involve the original analysis of **secondary data**—data collected by others, such as existing government surveys, administrative records, or transcripts. Indeed, much primary research makes use of secondary data.

Unfortunately, the term *data* can also be a bit confusing. When we look up a few published facts or even a table of statistics online or in the library, we sometimes refer to this as finding “data” on a topic. But in this book, we use the term **data** to refer to largely unprocessed observations—a data set or raw data, they’re sometimes called.

QUESTION

In your own words, explain the differences between primary and secondary research and between primary and secondary data.

It Comes in Various Shapes and Sizes

As you will see from the many examples throughout the chapters in this book, research comes in a surprisingly wide variety of shapes and sizes:

- Large-scale studies of broad populations
- Small-scale studies of one locally situated group
- Snapshots in time
- Studies of outcomes or events that occur over many periods of time
- Laboratory experiments
- Naturalistic observations of real-world settings
- Carefully planned interventions
- Formal modeling or theoretical analyses
- Opportunistic discoveries of unplanned events
- Simulations
- Informal research conducted for the purpose of organizational strategy or management

One of the important points to realize about research, and about researchers, is that inventiveness and creativity are an important part of the process. Good research often involves the imaginative application of new methods, innovative techniques, or clever strategies to learn about the world.

It's Never Perfect

Research, like everything else that is human, is not perfect—far from it. Every study has weaknesses, as you will see in this book. It is important to spot these shortcomings and understand their implications.

But it is also important not to discard a study entirely because it has some methodological or other shortcomings. We don't want to throw the baby out with the bathwater. Every study has strengths, too—or at least most studies do. There is often something to be learned from almost any study, and the perfect study is just not possible—especially in social and policy research. A good consumer of research can both spot the weaknesses and recognize the strengths.

It's Uncertain and Contingent

Many think of research as providing certain and universal conclusions. But research evidence often includes a large dose of *uncertainty*, typically expressed in the form of

probability statements or qualified conclusions. Thus, researchers talk about the results “indicating” this or that, “suggesting” that something is true, or showing that an outcome was “likely” due to a presumed cause. In part, this comes from the language of modern statistics, which uses the laws of probability to make inferences about unknown populations or causes. But this way of speaking and writing also reflects the inherent uncertainties involved in making firm statements or conclusions about complex human and public affairs.

Social and policy research is also **contingent**—bounded in space, time, and context. A study that finds evidence for the effectiveness of an education reform in one school district, for example, may not hold true in other districts with different children, teachers, budgets, and administrative structures. A mental health intervention that is shown to be effective with affluent suburban adults may not have the same effect on poor, rural adults living very different lives. The motivations found to encourage productivity in one organization may not be the same as the motivations that matter in another organization.

It Aims to Generalize

Generalizability is the ability to take the results of research and apply them in situations other than the exact one in which the research was carried out. Although we just noted that research is often contingent, researchers nevertheless strive at the same time to make their work generalizable. This is quite important: If the research results only apply in the exact setting (time, place, circumstances) in which the study was conducted, then they cannot be used to inform policies or practices in other situations.

For example, a study might examine a policy of requiring out-of-pocket payments for emergency visits to the hospital and find no impact on health outcomes for patients. But say the study is done using data from one insurance plan that covers mostly younger, healthy workers with good incomes. Do the results apply to insurance plans that cover older, less healthy individuals with low incomes? Probably not: Such individuals might well behave differently if required to make payments for their emergency visits. So the study has limited generalizability. We might even worry that the study is only relevant for that one particular insurance plan and the population it serves, making it of little use to anyone else. While generalizability is always a goal, real-world research is often less generalizable than we would like.

This is not to say that social and policy research has little to offer—on the contrary. But you do need to be realistic and appreciate the limits, as well as the rewards, of research.

Bits and Pieces of a Puzzle

For these reasons, a single study is almost never definitive; rather, empirical evidence on a topic is cumulative. Research produces a *body* of evidence, and researchers talk about arriving at a scientific *consensus* within the bounds of what is likely to be true (or not).

Consider global warming—is the world really heating up, and if so, is global warming natural or attributable to humans? There have been thousands of individual studies of various aspects of global warming over the years, from tracking the melting of the polar ice caps to observing animal species, mapping storms and rainfall, sampling the level of CO₂ and other greenhouse gases in the atmosphere, and so on. None of these studies alone definitively proves that human activity is causing the earth to get hotter—indeed, some contradict this hypothesis. To help establish a consensus—particularly given the monumental economic costs and political complexities involved in responding to global warming—the United Nations (UN) and the U.S. federal government each established

scientific panels to review the research evidence. The UN's Intergovernmental Panel on Climate Change (IPCC, 2019) concluded that “human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C” (p. 4).

The U.S. Global Change Research Program (2017) similarly found that “it is extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century” (p. 10). But to arrive at these conclusions took many years of research and thousands of individual studies—not to mention much political debate. And the process goes on.

The same kind of process of accumulating evidence, engaging in scientific debate, and searching for consensus characterizes most areas of research. Of course, most topics of research do not inspire as many studies or the establishment of large national or multinational scientific panels to search for a consensus. Nevertheless, something similar happens on a smaller, quieter scale in the various journals, research conferences, and institutions where studies on a topic are presented and debated. But consensus is not always, or even often, possible: Too much is unknown, and more research remains to be done.

QUESTION

Explain in your own words the meaning of generalizability.

It Involves Competition and Criticism

The process of research is also one of continual competition and criticism—the continuous testing of the consensus. There are researchers who doubt aspects of the human-made global warming hypothesis, for example, and they are busy conducting and gathering evidence to challenge, or at least refine, the consensus. Conclusions that withstand this kind of competitive onslaught become what we consider to be established knowledge (for the time being).

The formal expression of this critical attitude is the process of **peer review**. Most research journals, as well as research funding programs, use a peer-review process in which the studies or proposals are reviewed and approved (or rejected) by a group of peers—other researchers in the same field—who render a judgment on the methods and worth of the paper or proposal. This process is usually blind (neither the researcher nor the reviewer knows who is who) to rule out favoritism and to encourage reviewers to be honest and forthright in their criticism. You, too, should think in this honest, critical way as you hear or read about research (although, of course, sometimes even the best and most experienced researchers struggle to keep an open mind).

It Can Be Quantitative, Qualitative, or a Mix of Both

Much research involves numerical measurement and statistics, but research can also involve language, images, and other forms of expressing meaning that researchers then interpret. The former is referred to as quantitative research; the latter, as qualitative research. Qualitative studies involving the interpretation of language can be done rigorously—despite the lack of scientific-looking tables and formulas. Numbers do not make a study good or scientific.

Social and policy research also uses mixed methods that combine the advantages of both quantitative and qualitative techniques. Because social phenomena are so difficult to pin down, researchers often use multiple methods to confirm a finding, a process sometimes referred to as triangulation.

Although most of the chapters in this book are devoted to topics typically thought of as part of quantitative research, we discuss the role and contribution of qualitative research in all of the chapters. And we devote an early chapter (Chapter 3) specifically to qualitative research because we consider it to be foundational. In an important sense, good quantitative research is based on good qualitative research. The two perspectives enhance one another.

It Can Be Applied or Basic

Research can be *applied*—done because we have a practical need to know. For example: How many people are currently unemployed? Would smaller classes improve learning? Does adding police officers reduce crime? **Applied research** typically has direct implications for policy and practice. Many of the examples in this book focus on applied research.

But research can also be *basic*—the pursuit of knowledge for its own sake rather than because of an immediate practical need. **Basic research** in a given field also tends to focus on more abstract or fundamental processes of nature or society. For example, we might be interested in studying how people make decisions involving uncertainty, how the human body responds to long-term exposure to stress, how children acquire a language, or the evolutionary basis of human cooperation. Basic research also advances policy and practice by providing a solid foundation of knowledge. But the link is less direct.

Descriptive and Causal Research

Research sometimes aims simply to describe the world—how things are. At other times, its goal is to provide a causal explanation—how would things be different if we changed something? This basic distinction is fundamental to thinking about and conducting research and provides a road map of sorts for the rest of this book.

QUESTION

In your own words, describe some of the defining characteristics of social science research.

Description: What Is the World Like?

Concern about autism has been growing for some time, and parents and other advocates have pressed for services to help autistic children and for more research about the disease. In evaluating how to react to autism, policy makers and practitioners need to know how many people (and particularly children) with autism there are in the population. They need to know if the rate of autism is growing—and, if so, how quickly. They need to know whether autism is more concentrated in certain places or groups in the population. They need to know the severity and forms of autism. In other words, policy makers and practitioners need a good *description* of autism to address the problem.

The goal of **descriptive research** is to paint an accurate picture of the way the world is. Descriptive research includes describing just one variable—such as the rate of autism in the population. It also includes describing **relationships**—how two different variables are related (see Chapter 2). Relationships are often referred to as associations or correlations. For example, autism rates have been growing, so time and autism are related. Or at least it seems so—researchers worry that perhaps we have simply gotten better over time at identifying people with autism and that this enhanced ability to identify the disease accounts for the upward trend. Autism and geographical region are also related—the disease is more common in California, for example, than in other parts of the United States. But it turns out that this description is not so certain—perhaps autism is not consistently identified everywhere. Descriptive research can be harder than you might expect.

Before figuring out what to do about a problem like autism, the problem must be described. Knowing the lay of the land is important before deciding where to go. But once practitioners have described the problem, the task of tackling and solving it has just begun. After all, we want to figure out how to make things better—not just sit around and watch things happen. In the case of autism, policy makers and practitioners want to figure out how to prevent and hopefully cure, or at least ameliorate, the disease.

Causation: How Would the World Be Different If Something Changed?

The goal of **causal research** is to answer “what if” questions, to find out how to make things happen. Specifically, causal research asks, If we change something, will other things (outcomes we care about, such as autism) change in response? And if they do change, by how much?

For example, what happens to the risk of autism if parents wait until they are older to have children? Would the risk change at all? If so, by how much? More generally, we want to know what factors have caused the growth of autism over time (if indeed the trend is real and not just an artifact of better identification techniques).

Descriptive and causal research are both important in practice, but answering causal questions is especially central to the work of practitioners. Public policies, social programs, and management initiatives aim to do things—to make something happen. So answering questions such as “What will happen if we do X?” is essential.

Description of a Correlation Is Not Proof of Causation

It is easy to confuse correlation, the description of a relationship, with causation. If more educated mothers are more likely than less educated mothers to have children with autism—a correlation—then it is easy to conclude that something about educated mothers causes autism. However, that may not be so. Think about the earlier example of night-lights and nearsightedness in young children. When researchers, policy makers, or practitioners naively assume that a correlation implies causation, grave errors can be made.

For example, because autism rose over the same period that vaccine use rose and because autism symptoms start at about the same time that toddlers receive many vaccines, people began to suspect that vaccines cause autism. Some parents even started to reject vaccines, resulting in outbreaks of previously suppressed illnesses. In fact, there is no evidence that vaccines cause autism and, indeed, significant evidence that they do not (CDC, 2020b).

One of the most important skills you will gain from this book is how to distinguish a correlation, the description of a relationship, from evidence of a causal effect. And you will learn how to better judge good causal evidence of what works, and how well it works.

Because distinguishing description from causation is so important, we have organized this book around that distinction. Part II of the book covers strategies for description while Part IV covers strategies for causation. We will stress again and again the distinctions between description and causation and between correlation and causation. We will also emphasize the many strategies and techniques for drawing causal conclusions, especially for learning what kinds of programs work and how well they work.

QUESTION

What is the difference between descriptive and causal research?

Epistemology: Ways of Knowing

How much do you weigh? How do you *know* that's how much you weigh? Probably you used a scale and remember the result. You measured your weight—an elementary act of research. How high is Mount Everest? If you know, how do you know? Did you measure it? If you don't know, how might you try to learn how high Mount Everest is? You will probably turn to other sources, perhaps searching the internet and examining a website that you trust (secondary research). But of course, you should consider how the website got its information.

We have many ways of knowing—what philosophers of science call **epistemologies**. Sometimes we directly learn something ourselves. But we can't do that about most things in the world. Often, we just accept what some trusted authority says is true. Sometimes, we rely on knowledge that comes from our cultural or religious traditions. We know other things through intuition or common sense.

The Scientific Method

There are many ways of knowing things, but in modern society the scientific method is a privileged way of knowing. Most of the ideas and techniques presented in this book are based on the scientific method.

Obviously, you cannot directly research everything you need to know on your own. So this book will teach you not only how to do research but how to critically assess and make use of the research produced and published by others. It will also help you judge knowledge that comes from authority, tradition, and common sense more effectively by using the standards of the scientific method.

The **scientific method** can be defined as an approach to acquiring and correcting our knowledge about the world. It has several key characteristics:

- Systematic observation—or measurement of various features or behaviors in the world (including qualitative observation).
- Logical explanation—in the form of a theory or model that makes sense according to basic rules of logic and accepted facts.

- Prediction—in the form of a hypothesis, based on a theory, of what we will observe if the theory is true. (This is seen as superior to after-the-fact, or ex post facto, explanations, which are not falsifiable.)
- Openness—meaning the methods used to produce evidence are clearly documented and made available for review. This allows for replication—repeating the study to see if the results hold (and in what contexts).
- Skepticism—researchers scrutinize and critique each other’s work, a process referred to as peer review, in search of possible shortcomings or alternative explanations.

In sum, the scientific method is a privileged form of knowing because it is generally transparent, logical, and fact based. But scientific evidence can be misrepresented or misused, so you still need to question scientific knowledge just as you would question common sense, tradition, or authority. There are also varying understandings of what constitutes the scientific method, and this understanding has changed over time and across scientific fields (Godfrey-Smith, 2003).

Are There Objective Truths in Social Science?

The scientific method originated with the natural sciences. Newton’s physics, Galileo’s astronomy, Lavoisier’s chemistry, and Mendel’s genetics are early examples. But the social world is different from the physical or biological worlds due to factors such as human consciousness, culture, history, and politics. And social phenomena vary by place and time much more than do physical or biological phenomena.

As a result, knowledge produced by the social sciences, such as how markets work or how children learn, is more contingent and less generalizable than is knowledge produced by the natural sciences. Moreover, how we interpret social phenomena is shaped in part by language and culturally constructed categories. These categories even influence the kinds of social objects or actions we observe, and our social constructions also vary from time to time, from culture to culture, and from political perspective to political perspective. So even when we try to be objective, our interpretations will be influenced by our categories of subjective experience and judgment.

Because social ideas and facts are constructed in this way, some people reject the relevance of the scientific method to the study of society and public policy. Indeed, others reject the idea that an objective truth, even a contingent truth, exists for social phenomena outside of our various subjective, socially constructed vantage points. This skeptical view is generally referred to as *antipositivism* because it is opposed to so-called *positivism*, the approach of social researchers who pattern their work after the natural sciences. However, positivism has a more precise meaning in the philosophy of science, where it refers to a rather strict form of empiricism (such as behaviorism in psychology). We acknowledge that ideas and even observations about social phenomena are inevitably influenced by social constructions, particularly by history and culture. Nonetheless, we believe that the scientific method, broadly defined, provides the most pragmatic approach to understanding and solving many of the pressing social problems we face today.

Our perspective in this book can be described generally as *scientific realism* (Bunge, 1993; Godfrey-Smith, 2003): “realism” because we believe that the social world,

although profoundly shaped by human history and culture, is still part of an objective reality that exists outside of our thoughts and perceptions, and “scientific” because we believe it is possible to use the scientific method—or methods modeled on the scientific approach—to learn about and understand the social world.

Induction and Deduction

There are several ways in which researchers employ the scientific method to tackle a problem or curiosity, as illustrated in Figure 1.3. One approach is to begin by doing systematic observation of the world and then developing a logical explanation (theory) to account for what is seen—an approach referred to as **induction**. In anthropology, for example, researchers typically observe people in a community for some time before developing an explanatory theory. Qualitative research, described in Chapter 3, is often inductive. Induction also happens in quantitative research when many possible relationships between variables are explored before an explanatory theory emerges from the observed patterns. With the proliferation of data, including big data, inductive research has grown.

The other approach is **deduction**: The researcher moves straight to the development of a logical explanation or theory and only later gathers evidence to test the theory. For example, rational choice theorists in economics and other fields approach many problems with the fundamental assumption that people or institutions will seek to maximize their gains and minimize their losses. Starting from this assumption, they then generate hypotheses and predictions about not only economic decisions but also such things as racial discrimination, marriage, and voting (Becker & Becker, 1998). In social research, some researchers called **structuralists** insist that social research must always start with theories and test these with empirical predictions.

Most researchers, however, practice a combination of induction and deduction. They have a theory in mind, gather data to test it, but then explore the data to refine their theory or even develop new theories.

Proof Requires Fresh Data

While most researchers practice a combination of induction and deduction, even in a single study, the structuralists have a point that applies broadly in research: *Data cannot be used to both develop a theory and definitively confirm it.*¹ Fresh data are required to truly test a theory or support a hypothesis. Think of your favorite detective novel. Detective X uses induction to come up with a theory of the crime that fits all the existing clues. The theory suggests some previously unknown and unsuspected fact—red clay on the perpetrator’s shoes, for example. If the prediction matches the fact, the perpetrator’s guilt appears much more likely. Prediction provides powerful proof.

In social and policy research, some studies strive to generate theory while others aim to test theories. Research is often an iterative process in which deduction and induction alternate (as Figure 1.3 illustrates).

¹We cover this issue in more detail in Chapters 9 and 10.