

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
<hr/>	
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

● Box 2.5: 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

Learning Objectives	62
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
<hr/>	
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-Tabs	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
Chapter 11: Tools to Probe Causation	
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 Control	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
Expt. 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
Wikipedia	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