

Brief contents

Summary 51

Preliminary Examination of the Data 51

Univariate Profiling 51
Distribution 51

Bivariate Profiling 51
Relationship Between Variables 52

1 Overview of Multivariate Methods 1

2 Examining Your Data 45

SECTION I

Missing Data 56

The Impact of Missing Data 56

Recent Developments 56

SECTION II

Interdependence Techniques 119

3 Exploratory Factor Analysis 121

4 Cluster Analysis 189

SECTION III

Dependence Techniques – Metric Outcomes 257

5 Multiple Regression Analysis 259

6 MANOVA: Extending ANOVA 371

SECTION IV

Dependence Techniques – Non-metric Outcomes 469

7 Multiple Discriminant Analysis 471

8 Logistic Regression: Regression with a Binary Dependent Variable 548

SECTION V

Moving Beyond The Basics 601

9 Structural Equation Modeling: An Introduction 603

10 SEM: Confirmatory Factor Analysis 658

11 Testing Structural Equation Models 699

12 Advanced SEM Topics 726

13 Partial Least Squares Structural Equation Modeling (PLS-SEM) 759

Suggested Readings and Online Resources 760
References 116

SECTION II

Interdependence Techniques 119

Prelims xii
Acknowledgments xvii

3 Exploratory Factor Analysis 121

Acknowledgments xvi
Acronyms and Symbols xvii

I Overview of Multivariate Methods

A Hypothetical Example of Exploratory Factor Analysis 122

Three Covariating Trends 4

Analysis Decision Process 4

Topic 1: Rise of Big Data 839

Topic 2: Spatiotemporal Geographical Information Models 8

Topic 3: Census Influence 9

Summary 9

Multivariate Analysis in Statistics 10

Variable Selection 131

Some Basic Concepts of Multivariate Analysis 101

Type V Sums 10

Measurement Scales 11

Variables 132

Measuring the Multivariate Model 11

Variable Selection and Measurement Issues 112

Sample Size 132

Measuring the Variable 11

Measuring Scale 132

Measurement Theory 132

Measurement Error 132

Measurement Issues 132

Measurement Techniques 132

Measurement Overall 132

Explanatory Factor Analysis 132

and Common Factor Analysis 132

Cluster Analysis 132

Multiple Regression 132

Logistic Regression 132

Structural Equation Modeling 132

and Causal Inference 132

Correlation Analysis 132

Interpreting a Factor Matrix 153

Stage 5: Validation of Explanatory Analysis 158

Guidelines for Multivariate Analysis 158

Use of Replication or a Confirmation 158

Assessing Factor Structure Stability 158

Establishing Practical Significance 158

Detecting Influential Observations 158

Significance 30

Summary 30

Conclusion v