

# Contents

Preface .....	ix
1 Variables, Research Problems, and Questions.....	1
Research Problems .....	1
Variables.....	1
Research Hypotheses and Questions .....	5
A Sample Research Problem: The Modified High School and Beyond (HSB) Study .....	7
Interpretation Questions .....	14
2 Data Coding, Entry, and Transformation.....	15
Plan the Study, Pilot Test, and Collect Data .....	15
Code Data for Data Entry .....	17
Problem 2.1: Check the Completed Questionnaires .....	19
Problem 2.2: Define and Label the Variables .....	22
Problem 2.3: Display Your Dictionary or Codebook .....	27
Problem 2.4: Enter Data .....	28
Alternative Problem 2.4: Downloading and Using Data Collected Online.....	29
Problem 2.5: Count Math Courses Taken .....	31
Problem 2.6: Recode and Relabel Mother's and Father's Education.....	33
Problem 2.7: Reverse Low Pleasure Items for Pleasure Scale Score .....	37
Problem 2.8: Compute Pleasure Scale with the Mean Function .....	39
Problem 2.9: Check for Errors and Normality for the New Variables .....	40
Describing the Sample Demographics and Key Variables.....	42
Using Figures to Help Describe the Data .....	44
Saving the Updated HSB Data File .....	45
Interpretation Questions .....	46
Extra SPSS Problems .....	46
3 Measurement and Descriptive Statistics .....	47
Frequency Distributions .....	47
Levels of Measurement .....	48
Descriptive Statistics and Plots .....	54
The Normal Curve.....	60
Interpretation Questions .....	63
Extra SPSS Problems .....	63
4 Understanding Your Data and Checking Assumptions .....	64
Exploratory Data Analysis (EDA).....	64
Problem 4.1: Descriptive Statistics for the Ordinal and Scale Variables .....	66
Problem 4.2: Boxplots for One Variable and for Multiple Variables.....	71
Problem 4.3: Boxplots and Stem-and-Leaf Plots Split by a Dichotomous Variable .....	75
Problem 4.4: Descriptives for Dichotomous Variables.....	79
Problem 4.5: Frequency Tables for Each Type of Variable.....	81
Interpretation Questions .....	84
Extra SPSS Problems .....	85
5 Selecting and Interpreting Inferential Statistics .....	86
General Design Classifications for Difference Questions.....	86

Selection of Inferential Statistics .....	88
The General Linear Model .....	93
Interpreting the Results of a Statistical Test .....	94
An Example of How to Select and Interpret Inferential Statistics .....	100
Writing About Your Outputs .....	102
Conclusion .....	104
Interpretation Questions .....	104
<b>6 Methods to Provide Evidence for Reliability and Validity .....</b>	<b>106</b>
Measurement Reliability .....	107
Measurement Validity .....	108
Problem 6.1: Cohen's Kappa to Assess Reliability with Nominal Data .....	109
Problem 6.2: Correlation and Paired $t$ to Assess Interrater Reliability .....	113
Problem 6.3: Exploratory Factor Analysis to Assess Evidence for Validity .....	116
Problem 6.4: Cronbach's Alpha to Assess Internal Consistency Reliability .....	124
The Use of Factor Analysis and Alpha to Make Summated Scales .....	132
Interpretation Questions .....	133
Extra SPSS Problems .....	134
<b>7 Cross-Tabulation, Chi-Square, and Nonparametric Measures of Association .....</b>	<b>135</b>
Problem 7.1: Chi-Square and Phi (or Cramer's $V$ ) .....	136
Problem 7.2: Risk Ratios and Odds Ratios .....	142
Problem 7.3: Other Nonparametric Associational Statistics .....	145
Problem 7.4: Eta .....	147
Interpretation Questions .....	149
Extra SPSS Problems .....	150
<b>8 Correlation and Regression .....</b>	<b>151</b>
Problem 8.1: Scatterplots to Check the Assumption of Linearity .....	153
Problem 8.2: Bivariate Pearson and Spearman Correlations .....	158
Problem 8.3: Correlation Matrix for Several Variables .....	161
Problem 8.4: Bivariate or Simple Linear Regression .....	165
Problem 8.5: Multiple Regression .....	168
Interpretation Questions .....	174
Extra SPSS Problems .....	174
<b>9 Comparing Groups with <math>t</math> Tests, Analysis of Variance (ANOVA), and Similar Nonparametric Tests .....</b>	<b>175</b>
Problem 9.1: One-Sample $t$ Test .....	177
Problem 9.2: Independent Samples $t$ Test .....	178
Problem 9.3: The Nonparametric Mann-Whitney $U$ Test .....	183
Problem 9.4: Paired Samples $t$ Test .....	186
Problem 9.5: Nonparametric Wilcoxon Test for Two Related Samples .....	188
Problem 9.6: One-Way (or Single Factor) ANOVA .....	191
Problem 9.7: Post Hoc Multiple Comparison Tests .....	195
Problem 9.8: Nonparametric Kruskal-Wallis Test .....	202
Problem 9.9: Two-Way (or Factorial) ANOVA .....	205
Interpretation Questions .....	212
Extra SPSS Problems .....	213

## Appendices

A. Getting Started and Other Useful SPSS Procedures	
Don Quick .....	214
B. Writing Research Problems and Questions .....	226
C. Answers to Odd Numbered Interpretation Questions	
Jessica Gerton.....	231
D. Glossary	
Jessica Bochert .....	240
For Further Reading .....	248
Index .....	250