

# *Detailed Contents*

---

|  |             |
|--|-------------|
| <b>Preface</b>   | <b>xiii</b> |
| <b>About the Author</b>  | <b>xxi</b>  |
| <b>SECTION 1: THE SAMPLE</b>   | <b>1</b>    |
| Introduction   | 1           |
| <b>Module 1. Checking the Representativeness of a Sample</b>                                       | <b>3</b>    |
| Data Files for This Module   | 3           |
| Key Learning Objectives  | 3           |
| Description of Researcher’s Study  | 3           |
| A Look at the Data   | 4           |
| Planning and Decision Making   | 7           |
| Using SPSS to Address Issues and Prepare Data  | 9           |
| <i>First Chi-Square Analysis—Weighted Approach</i>   | 9           |
| <i>Second Chi-Square Analysis—Standard Approach</i>  | 12          |
| Reflection and Additional Decision Making  | 15          |
| Writing It Up  | 16          |
| Reflective Questions   | 17          |
| Extensions   | 18          |
| <b>Module 2. Splitting a File, Selecting Cases,<br/>and Creating Standardized Values and Ranks</b> | <b>19</b>   |
| Data Files for This Module   | 19          |
| Key Learning Objectives  | 19          |
| Description of Researcher’s Study  | 19          |
| A Look at the Data   | 20          |
| Planning and Decision Making   | 22          |
| <i>Phase 1</i>   | 23          |
| <i>Phase 2</i>   | 23          |
| <i>Phase 3</i>   | 24          |

|   |    |
|---|----|
| Using SPSS to Address Issues and Prepare Data | 24 |
| <i>Phase 1: Creating Ranks</i>                | 24 |
| <i>Phase 1: Creating Standardized Values</i>  | 28 |
| <i>Phase 2: Using Split File</i>              | 30 |
| <i>Phase 3: Using Select If</i>               | 32 |
| Reflection and Additional Decision Making     | 35 |
| Writing It Up                                 | 36 |
| Reflective Questions                          | 37 |
| Extensions                                    | 37 |
| Additional Resources                          | 38 |

**SECTION 2: THE NATURE AND DISTRIBUTION  
OF VARIABLES** **39**

|              |    |
|--------------|----|
| Introduction | 39 |
|--------------|----|

**Module 3. Recoding, Counting, and Computing Variables** **41**

|   |    |
|---|----|
| Data Files for This Module                    | 41 |
| Key Learning Objectives                       | 41 |
| Description of Researcher’s Study             | 41 |
| A Look at the Data                            | 42 |
| Planning and Decision Making                  | 44 |
| Using SPSS to Address Issues and Prepare Data | 46 |
| <i>Recoding Variables</i>                     | 46 |
| <i>Counting Values Across Variables</i>       | 51 |
| <i>Computing New Variables</i>                | 54 |
| Reflection and Additional Decision Making     | 56 |
| Writing It Up                                 | 56 |
| Reflective Questions                          | 57 |
| Extensions                                    | 57 |

**Module 4. Determining the Scale of a Variable** **59**

|   |    |
|---|----|
| Data Files for This Module                    | 59 |
| Key Learning Objectives                       | 59 |
| Description of Researcher’s Study             | 59 |
| A Look at the Data                            | 61 |
| Planning and Decision Making                  | 62 |
| Using SPSS to Address Issues and Prepare Data | 64 |
| <i>Location and Program</i>                   | 64 |
| <i>Years of Experience</i>                    | 69 |
| <i>Reprimand</i>                              | 71 |
| <i>Aptitude</i>                               | 76 |
| Reflection and Additional Decision Making     | 77 |

|  |            |
|--|------------|
| Writing It Up  | 78         |
| Reflective Questions   | 79         |
| Extensions   | 80         |
| <b>Module 5. Identifying and Addressing Outliers</b>                                   | <b>81</b>  |
| Data Files for This Module   | 81         |
| Key Learning Objectives  | 81         |
| Description of Researcher's Study  | 81         |
| A Look at the Data   | 82         |
| Planning and Decision Making   | 83         |
| Using SPSS to Address Issues and Prepare Data  | 85         |
| <i>Motivation</i>  | 85         |
| <i>Job Satisfaction</i>  | 94         |
| Reflection and Additional Decision Making  | 98         |
| Writing It Up  | 98         |
| Reflective Questions   | 99         |
| Extensions   | 100        |
| Additional Resources   | 101        |
| <b>SECTION 3: MODEL ASSUMPTIONS</b>  | <b>103</b> |
| Introduction   | 103        |
| <b>Module 6. Evaluating Model Assumptions<br/>for Testing Mean Differences</b>         | <b>105</b> |
| Data Files for This Module   | 105        |
| Key Learning Objectives  | 105        |
| Description of Researcher's Study  | 105        |
| A Look at the Data   | 107        |
| Planning and Decision Making   | 108        |
| <i>The Assumptions</i>   | 108        |
| <i>What Dr. Novak Knows About the Assumptions<br/>    and Their Impact on Validity</i> | 108        |
| <i>How Dr. Novak Plans to Evaluate the Assumptions</i>                                 | 110        |
| <i>What Dr. Novak Plans to Do If Assumptions<br/>    Are Violated</i>                  | 111        |
| Using SPSS to Address Issues and Prepare Data  | 112        |
| <i>Evaluating Assumptions for t-Tests on Four Motivation<br/>    Subscales</i>         | 112        |
| <i>Evaluating Assumptions for a One-Factor ANOVA<br/>    on Hyperfemininity</i>        | 129        |
| <i>Evaluating Assumptions for a Two-Factor ANOVA<br/>    on Locus of Control</i>       | 138        |

|  |            |
|--|------------|
| Reflection and Additional Decision Making  | 141        |
| Writing It Up  | 142        |
| <i>Paragraphs for Methodology Section</i>  | 142        |
| <i>Paragraphs for Results Section</i>  | 143        |
| Reflective Questions   | 144        |
| Extensions   | 144        |
| <b>Module 7. Evaluating Model Assumptions<br/>for Multiple Regression Analysis</b> | <b>147</b> |
| Data Files for This Module   | 147        |
| Key Learning Objectives  | 147        |
| Description of Researcher's Study  | 147        |
| A Look at the Data   | 148        |
| Planning and Decision Making   | 149        |
| <i>The Assumptions</i>   | 150        |
| <i>Multicollinearity</i>   | 152        |
| <i>Outliers and Influential Data Points</i>  | 153        |
| <i>Now to Begin</i>  | 154        |
| Using SPSS to Address Issues and Prepare Data                                      | 154        |
| <i>Multicollinearity</i>   | 154        |
| <i>Assumption of Linear Relationships Among Variables</i>                          | 157        |
| <i>Evaluating Independence of Residuals</i>  | 160        |
| <i>Evaluating Normality of Residuals</i>   | 160        |
| <i>Evaluating Homoscedasticity of Residuals</i>                                    | 165        |
| <i>Outliers on the Residuals</i>   | 166        |
| <i>Outliers on the Set of Predictors</i>   | 169        |
| <i>Influential Data Points</i>   | 171        |
| Reflection and Additional Decision Making  | 173        |
| Writing It Up  | 174        |
| Reflective Questions   | 175        |
| Extensions   | 176        |
| Additional Resources   | 177        |
| <b>SECTION 4: MISSING DATA</b>   | <b>179</b> |
| Introduction   | 179        |
| <b>Module 8. Determining the Quantity and<br/>Nature of Missing Data</b>           | <b>181</b> |
| Data Files for This Module   | 181        |
| Key Learning Objectives  | 181        |
| Description of Researcher's Study  | 181        |
| A Look at the Data   | 182        |

|   |            |
|---|------------|
| Planning and Decision Making  | 183        |
| Using SPSS to Address Issues and Prepare Data                               | 185        |
| <i>Missing Data in the Application Tasks</i>                                | 185        |
| <i>Missing Data in the Survey Items</i>                                     | 190        |
| Reflection and Additional Decision Making                                   | 193        |
| Writing It Up   | 194        |
| Reflective Questions  | 195        |
| Extensions  | 195        |
| <b>Module 9. Quantifying Missing Data and<br/>Diagnosing Their Patterns</b> | <b>197</b> |
| Data Files for This Module  | 197        |
| Key Learning Objectives   | 197        |
| Description of Researcher’s Study   | 197        |
| A Look at the Data  | 198        |
| Planning and Decision Making  | 199        |
| Using SPSS to Address Issues and Prepare Data                               | 201        |
| <i>Quantity of Missing Data for Each Case</i>                               | 201        |
| <i>Quantity of Missing Data for Each Variable</i>                           | 202        |
| <i>Overall Quantity of Missing Data</i>                                     | 204        |
| <i>Evaluating the Support Variable</i>                                      | 205        |
| <i>Evaluating Item 3</i>  | 210        |
| Reflection and Additional Decision Making                                   | 212        |
| Writing It Up   | 214        |
| Reflective Questions  | 214        |
| Extensions  | 215        |
| Additional Resources  | 216        |
| <b>SECTION 5: WORKING WITH MULTIPLE DATA FILES</b>                          | <b>217</b> |
| Introduction  | 217        |
| <b>Module 10. Merging Files</b>   | <b>219</b> |
| Data Files for This Module  | 219        |
| Key Learning Objectives   | 219        |
| Description of Researcher’s Study   | 219        |
| A Look at the Data  | 220        |
| Planning and Decision Making  | 221        |
| Using SPSS to Address Issues and Prepare Data                               | 222        |
| Reflection and Additional Decision Making                                   | 227        |
| Writing It Up   | 228        |
| Reflective Questions  | 228        |
| Extensions  | 228        |

|  |            |
|--|------------|
| <b>Module 11. Aggregating Data and Restructuring Files</b> | <b>229</b> |
| Data Files for This Module                                 | 229        |
| Key Learning Objectives                                    | 229        |
| Description of Researcher’s Study                          | 229        |
| A Look at the Data   | 230        |
| Planning and Decision Making                               | 231        |
| Using SPSS to Address Issues and Prepare Data              | 232        |
| <i>Step 1: Merge</i>                                       | 232        |
| <i>Step 2: Recode</i>                                      | 233        |
| <i>Step 3: Aggregate</i>                                   | 235        |
| <i>Step 4: Restructure</i>                                 | 238        |
| Reflection and Additional Decision Making                  | 243        |
| Writing It Up  | 245        |
| Reflective Questions                                       | 245        |
| Extensions   | 245        |
| <b>Module 12. Identifying a Cohort of Students</b>         | <b>247</b> |
| Data Files for This Module                                 | 247        |
| Key Learning Objectives                                    | 247        |
| Description of Researcher’s Study                          | 247        |
| A Look at the Data   | 248        |
| Planning and Decision Making                               | 249        |
| <i>Path Taken to Merge Files</i>                           | 249        |
| <i>File Modifications Prior to Merging</i>                 | 249        |
| <i>Further Specification of Cohort</i>                     | 250        |
| Using SPSS to Address Issues and Prepare Data              | 251        |
| <i>Modify Variables</i>                                    | 251        |
| <i>Merge</i>   | 251        |
| <i>Identify Students in All Four Grades</i>                | 254        |
| <i>Identify Students Who Attended the Same High School</i> | 256        |
| <i>Final Preparation</i>                                   | 257        |
| <i>Merge Test and Math Course Data</i>                     | 257        |
| Reflection and Additional Decision Making                  | 258        |
| Writing It Up  | 259        |
| Reflective Questions                                       | 259        |
| Extensions   | 259        |
| Additional Resources                                       | 260        |
| <b>References</b>  | <b>261</b> |
| <b>Index</b>   | <b>263</b> |