Contents

Preface	xi
Chapter 1	
INTRODUCTION	1
1.1 Focus and Overview of Topics	
1.2 Some Basic Descriptive Statistics	
1.3 Summation Notation	
1.4 t Test for Independent Samples	
1.5 t Test for Dependent Samples	
1.6 Outliers	
1.7 SPSS and SAS Statistical Packages	
1.8 SPSS for Windows—Release 12.0	
1.9 Data Files	
1.10 Data Entry	
1.11 Editing a Dataset	
1.12 Splitting and Merging Files	
1.13 Two Ways of Running Analyses on SPSS	
1.14 SPSS Output Navigator	
1.15 SAS and SPSS Output for Correlations, De	scriptives, and t Tests
1.16 Data Sets on Compact Disk	
Appendix Obtaining the Mean and Variance on	the TI-30Xa Calculator
Chapter 2	
ONE WAY ANALYSIS OF VARIANCE	45
2.1 Introduction	
2.2 Rationale for ANOVA	
2.3 Numerical Example	
2.4 Expected Mean Squares	
2.5 MS_w and MS_b as Variances	

2.6	A Linear Model for the Data	
2.7	Assumptions in ANOVA	
2.8	The Independence Assumption	
2.9	ANOVA on SPSS and SAS	
2.10		
2.11	Tukey Procedure	
2.12		
2.13	Heterogeneous Variances and Unequal Group Sizes	
2.14	Measures of Association (Variance Accounted For)	
2.15	Planned Comparisons	
2.16	Test Statistic for Planned Comparisons	
2.17	Planned Comparisons on SPSS and SAS	
2.18	The Effect of an Outlier on an ANOVA	
2.19		
2.20	•	
App	endix	
Chapte	r 3	
	R ANALYSIS	105
1011L	N X I I I DI	103
3.1	Introduction	
3.2	t Test for Independent Samples	
3.3	A Priori and Post Hoc Estimation of Power	
3.4	Estimation of Power for One Way Analysis of Variance	
3.5	A Priori Estimation of Subjects Needed for a Given Power	
3.6	Ways of Improving Power	
3.7	Power Estimation on SPSS MANOVA	
3.8	Summary	
Chapte	- A	
	DRIAL ANALYSIS OF VARIANCE	100
racio	ORIAL ANALYSIS OF VARIANCE	123
4.1	Introduction	
4.2	Numerical Calculations for Two Way ANOVA	
4.3	Balanced and Unbalanced Designs	
4.4	Higher Order Designs	
4.5	A Comprehensive Computer Example Using Real Data	
4.6	Power Analysis	
4.7	Fixed and Random Factors	
4.8	Summary	
Appo	endix Doing a Balanced Two Way ANOVA With a Calculator	

REPEATED	MEASURES	ANALYSIS

181

- 5.1 Introduction
- 5.2 Advantages and Disadvantages of Repeated Measures Designs
- 5.3 Single Group Repeated Measures
- 5.4 Completely Randomized Design
- 5.5 Univariate Repeated Measures Analysis
- 5.6 Assumptions in Repeated Measures Analysis
- 5.7 Should We Use the Univariate or Multivariate Approach?
- 5.8 Computer Analysis on SAS and SPSS for Example
- 5.9 Post Hoc Procedures in Repeated Measures Analysis
- 5.10 One Between and One Within Factor—A Trend Analysis
- 5.11 Post Hoc Procedures for the One Between and One Within Design
- 5.12 One Between and Two Within Factors
- 5.13 Totally Within Designs
- 5.14 Planned Comparisons in Repeated Measures Designs
- 5.15 Summary

Chapter 6

SIMPLE AND MULTIPLE REGRESSION

219

- 6.1 Simple Regression
- 6.2 Assumptions for the Errors
- 6.3 Influential Data Points
- 6.4 Multiple Regression
- 6.5 Breakdown of Sum of Squares in Regression and F Test for Multiple Correlation
- 6.6 Relationship of Simple Correlations to Multiple Correlation
- 6.7 Multicollinearity
- 6.8 Model Selection
- 6.9 Two Computer Examples
- 6.10 Checking Assumptions for the Regression Model
- 6.11 Model Validation
- 6.12 Importance of the Order of Predictors in Regression Analysis
- 6.13 Other Important Issues
- 6.14 Outliers and Influential Data Points
- 6.15 Further Discussion of the Two Computer Examples
- 6.16 Sample Size Determination for a Reliable Prediction Equation
- 6.17 ANOVA as a Special Case of Regression Analysis
- 6.18 Summary of Important Points

Appendix The PRESS Statistic

Chapte	r <u>7</u> ISIS OF COVARIANCE	285
ANALI	SIS OF COVARIANCE	263
7.1	Introduction	
7.2	Purposes of Covariance	
7.3	-	
7.4	Reduction of Error Variance	
7.5	Choice of Covariates	
7.6	Numerical Example	
7.7	Assumptions in Analysis of Covariance	
7.8	Use of ANCOVA with Intact Groups	
7.9	Computer Example for ANCOVA	
7.10	Alternative Analyses	
7.1	An Alternative to the Johnson-Neyman Technique	
7.12	2 Use of Several Covariates	
7.13	Computer Example with Two Covariates	
7.14	l Summary	
Chapt	ar 8	
		201
HIEK	ARCHICAL LINEAR MODELING	321
8.1	Introduction	
8.2	Problems Using Single-Level Analyses of Multilevel Data	
8.3	Formulation of the Multilevel Model	
8.4	Two-Level Model—General Formulation	
8.5	HLM6 Software	
8.6	Two Level Example—Student and Classroom Data	
8.7	HLM Software Output	
8.8	Adding Level One Predictors to the HLM	
8.9	Addition of a Level Two Predictor to a Two Level HLM	
8.10	Evaluating the Efficacy of a Treatment	
8.1	Final Comments on Hlm	
Appen	div A	
DATA		365
DATA	SE13	303
A.1	Clinical Data	
A.2	Alcoholics Data	
A.3	Sesame Street Data	
A.4	Headache Data	
A.5	Cartoon Data	

A.6	Attitude Data			
A.7	National Academy of Sciences Data			
A.8	Agre	esti Home Sales Data		
Append	lix B			
STATIS	TICA	L TABLES	399	
Table	e B.1	Critical Values for F		
Table	e B.2	Percentile Points of Studentized Range Statistic		
Table	B.3	Critical Values for Dunnett's Test		
Table	B.4	Critical Values for F (max) Statistic		
Table	e B.5	Critical Values for Bryant-Paulson Procedure		
Append	lix C			
POWE	R TAE	BLES	413	
Table	e C.1	Power of F Test at $\alpha = .05$, $u = 1$		
Table	e C.2	Power of F Test at $\alpha = .05$, $u = 2$		
Table	e C.3	Power of F Test at $\alpha = .05$, $u = 3$		
Table	e C.4	Power of F Test at $\alpha = .05$, $u = 4$		
Table	e C.5	Power of F Test at $\alpha = .10$, $u = 1$		
Table	e C.6	Power of F Test at $\alpha = .10$, $u = 2$		
Table	e C.7	Power of F Test at $\alpha = .10$, $u = 3$		
Table	e C.8	Power of F Test at $\alpha = .10$, $u = 4$		
- 4			122	
Refe	rence	es e	423	
Ansv	wers 1	to Selected Exercises	431	
Auth	or In	dex	453	
Subj	iect Ir	ndex	457	