

contents

Preface v

Prologue

An overview of research design	1		
Variables and relationships	2	Interpreting research results	12
Research strategies	6		

PART 1

DESCRIPTIVE STATISTICS

1 The study of statistics	17		
Descriptive and inferential statistics	18	Measurement	22
Variability	20	Summation sign	30
Why study statistics?	21		
2 Frequency distributions and graphing	37		
Types of frequency distributions	38	Graphs of frequency distributions	48
Constructing frequency distributions with class intervals	43	How distributions differ	53
3 Characteristics of distributions	58		
Measures of central tendency	59	Estimation	76
Measures of variability	69		
4 Measures of relative standing	82		
Percentiles	83	Standard scores and the normal distribution	94
Changing the properties of scales	87		
5 Regression	108		
Linear relationships	109	Standard error of estimate	126
Regression constants and the regression line	118		

6 Correlation	131		
Derivation of the correlation coefficient	132	Sampling factors that change the correlation coefficient	147
Properties of the correlation coefficient	138	Causality and correlation	153
		Computational procedures	156

PART 2 INFERENCE STATISTICS

7 Topics in probability	161		
Set theory	162	Probability of complex events	171
Simple classical probability	167	Methods of counting	179
8 Introduction to hypothesis testing: sampling distributions and probability	187		
Sampling and sampling distributions	188	Probability and its application to hypothesis testing	198
9 Introduction to hypothesis testing: terminology and theory	207		
Statistical terminology	208	Hypothesis testing when $\sigma_{\bar{x}}$ is estimated by $s_{\bar{x}}$	221
10 Elementary techniques of hypothesis testing	231		
Inferences about the difference between means	232	A comparison of the difference between means and correlation	250
Inferences about correlation coefficients	243	The interpretation of significance	253
11 Simple analysis of variance	258		
Logic of the analysis of variance	260	The relationship between F and t	283
Computational procedures	275		

12 Two-factor analysis of variance	286		
Two-factor classification	287	Computational procedures	309
Logic of two-factor analysis of variance	292		
13 Nonparametric techniques	320		
Parametric and nonparametric tests	321	Tests on correlated samples	340
Tests on independent samples	324	Rank-order correlation	345
Appendix I			
Review of basic mathematics and algebra	355		
Appendix II			
Tables	369		
Answers to the exercises	401		
Glossary of symbols	413		
Index	417		