

Bivariate Analysis

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Variables to Be Tested		Examples	Appropriate Test or Tests of Significance
First Variable	Second Variable		
Continuous (C)	Continuous (C)	Age (C) and systolic blood pressure (C)	Pearson correlation coefficient (r); linear regression
Continuous (C)	Ordinal (O)	Age (C) and satisfaction (O)*	Group the continuous variable and calculate Spearman correlation coefficient (ρ)†
Continuous (C)	Dichotomous unpaired (DU)	Systolic blood pressure (C) and gender (DU)	Student's t -test
Continuous (C)	Dichotomous paired (DP)	Difference in systolic blood pressure (C) before vs. after treatment (DP)	Paired t -test
Continuous (C)	Nominal (N)	Hemoglobin level (C) and blood type (N)	ANOVA (F -test)
Ordinal (O)	Ordinal (O)	Correlation of care (O)* and severity of satisfaction with illness (O)	Spearman correlation coefficient (ρ); Kendall correlation coefficient (τ)
Ordinal (O)	Dichotomous unpaired (DU)	Satisfaction (O) and gender (DU)	Mann-Whitney U test
Ordinal (O)	Dichotomous paired (DP)	Difference in satisfaction (O) before vs. after a program (DP)	Wilcoxon matched-pairs signed-ranks test
Ordinal (O)	Nominal (N)	Satisfaction (O) and ethnicity (N)	Kruskal-Wallis test
Dichotomous (D)	Dichotomous unpaired (DU)	Success/failure (D) in treated/untreated groups (DU)	Chi-square test; Fisher exact probability test
Dichotomous (D)	Dichotomous paired (DP)	Change in success/failure (D) before vs. after treatment (DP)	McNemar chi-square test
Dichotomous (D)	Nominal (N)	Success/failure (D) and blood type (N)	Chi-square test
Nominal (N)	Nominal (N)	Ethnicity (N) and blood type (N)	Chi-square test

Table 11-1 Choice of Appropriate Statistical Significance Test in Bivariate Analysis (Analysis

*The following is an ex of One Independent Variable and One Dependent Variable)

ed, somewhat dissatisfied, and very

†Possibly use one-way analysis of variance (ANOVA, or F -test).

disatisfied. When such scales ask respondents to indicate how strongly they agree or disagree with a given statement, they are referred to as "Likert scales."

Multivariate Analysis

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Characterization of Variables to Be Analyzed		
Dependent Variable	Independent Variables [*]	Appropriate Procedure or Procedures
Continuous	All are categorical.	Analysis of variance (ANOVA)
Continuous	Some are categorical and some are continuous.	Analysis of covariance (ANCOVA)
Continuous	All are continuous.	Multiple linear regression
Ordinal	—	There is no formal multivariable procedure for ordinal dependent variables; treat the variables as if continuous (see above procedures), or perform log-linear analysis.
Dichotomous	All are categorical.	Logistic regression; log-linear analysis
Dichotomous	Some are categorical and some are continuous.	Logistic regression†
Dichotomous	All are continuous.	Logistic regression or discriminant function analysis
Nominal	All are categorical.	Log-linear analysis
Nominal	Some are categorical and some are continuous.	Group the continuous variables and perform log-linear analysis.
Nominal	All are continuous.	Discriminant function analysis; or group the continuous variables and perform log-linear analysis.

^{*}Categorical variables include ordinal, dichotomous, and nominal variables.

[†]If the outcome is a time-related dichotomous variable (e.g., live/die), proportional hazards (Cox) models are best.

Table 13-1 Choice of Appropriate Procedure to Be Used in Multivariable Analysis (Analysis of One Dependent Variable and More than One Independent Variable)