Which Statistical Test Should I Use? The Selection Table

Start from the wording of your research question, then identify the type of your variables, then check the assumptions. "Interval" includes scale scores averaged from several Likert items. Use the non-parametric alternative when normality fails in small groups, when the dependent variable is ordinal, or when influential outliers cannot be removed.

1. Level and description questions

Question wording	Variable type	Procedure	What to report
What is the level of (variable) among (sample)?	Interval scale score (averaged Likert items)	Descriptive statistics	M, SD, rank and a verbal level from a stated class-interval key
How is the sample distributed by (nominal variable)?	Nominal	Frequencies and percentages	n and % per category
Does the sample mean differ from a reference value (for example the midpoint 3)?	Interval	One-sample t-test	t, df, p, Cohen's d

2. Difference questions

Question wording	Independent variable	Parametric test	Non-parametric alternative	Effect size
Is there a difference in (DV) between (two groups)?	Nominal with two independent categories	Independent samples t-test (Welch if variances differ)	Mann-Whitney U	Cohen's d / r
Is there a difference in (DV) across (three or more groups)?	Nominal with three or more categories	One-way ANOVA + Tukey or Games-Howell	Kruskal-Wallis H + adjusted pairwise comparisons	η^2 / η^2H
Is there a difference between pre-test and post-test?	Two measurements of the same participants	Paired samples t-test	Wilcoxon signed-rank	d / r
Is there a difference across three or more repeated measurements?	Repeated measures	Repeated measures ANOVA	Friedman	Partial η^2 / Kendall's W
Do the differences depend on two factors together (gender × qualification)?	Two nominal independent variables	Two-way ANOVA (main effects and interaction)	No direct equivalent; rank transformation or ordinal models	Partial η^2
Is there a difference after controlling for a covariate (pre-test score)?	Nominal + continuous covariate	ANCOVA	–	Partial η^2

3. Relationship and effect questions

Question wording	Variables	Test	Alternative	What to report
What is the relationship between (A) and (B)?	Two interval variables	Pearson's r	Spearman's rho (ordinal or non-normal)	r or r_s, N, p, r^2

Question wording	Variables	Test	Alternative	What to report
Is there an association between (two nominal variables)?	Two nominal variables	Chi-square test of independence	Fisher's exact test for small 2 × 2 tables	χ^2, df, N, p, Cramér's V
What is the effect of (A) on (B)? What is the predictive power of (A)?	One or more interval predictors + interval DV	Simple or multiple linear regression	Bootstrap confidence intervals	Adjusted R^2, F, B, β, p, VIF
What is the effect of (A) on the probability of (B)?	Binary outcome (yes/no)	Binary logistic regression	–	Odds ratio, Nagelkerke R^2, Wald
What is the effect of (A) on (B) controlling for (C)?	Two interval variables + control	Partial correlation or hierarchical regression	–	Partial r or ΔR^2
Does (C) mediate the A-B relationship? Does (D) moderate it?	Latent constructs with several dimensions	SEM (AMOS), PLS-SEM (SmartPLS) or the PROCESS macro	–	Path coefficients, indirect effect with bootstrap CIs

4. Structure and measurement questions

Question	Procedure	Common thresholds
Do the items measure the intended dimensions? (new instrument)	Exploratory factor analysis (EFA)	KMO ≥ .60, Bartlett's test significant, loadings ≥ .40, eigenvalue > 1
Does the structure match the theory? (established instrument)	Confirmatory factor analysis (CFA)	CFI and TLI ≥ .90, RMSEA ≤ .08, SRMR ≤ .08, AVE ≥ .50, CR ≥ .70
How reliable is the instrument?	Cronbach's alpha (or McDonald's omega)	≥ .70 acceptable, ≥ .80 good; above .95 check for redundant items

Before any inferential test, check: (1) normality of the scale scores within each group, or of the residuals (Shapiro-Wilk with skewness and kurtosis within ±1 or ±2, plus histogram and Q-Q plot; with samples above 100 give more weight to the indices and plots); (2) homogeneity of variance (Levene's test); (3) outliers (boxplot, standardized score beyond ±3.29); (4) group size (preferably 30 or more per group); (5) the alpha level set in advance (.05). Report an effect size with every significant result, and write $p < .001$ rather than .000.

Prepared by the Mastermind PhD team · October 2026 · This table is general educational guidance and does not replace your supervisor's instructions or your faculty's regulations · Companion article: "Which Statistical Test Should I Use? A Decision Tree" on mastermindphd.com · Statistical analysis service (raw SPSS file and results report with every analysis): https://mastermindphd.com/statistical-analysis/ · References: Field (2018); Cohen (1988); Pallant (2020); Hu & Bentler (1999).