Analyses

Test		Brief description	Types of data	Assumptions
Correlation		Measures the extent to which two variables are related – change in one variable is accompanied & predicts a change in another	Pearson's correlation – two interval/ratio (continuous) variables Spearman – two ordinal (both consist of ranks); can use continuous but must be converted to ranks	• Independence • Normality • Linearity • Homoscedasticity • Outliers
Simple linear regression		Used to predict the value of one variable from another Linear – we describe the relationship using the equation of a straight line	Outcome must be continuous Predictors can be continuous or dichotomous (i.e. 0 and 1)	• Normality • Normality of errors • Outliers • Homoscedasticity • Independence • Independent errors • Non-zero variance • Linearity
Multiple Regression		Used to predict values of an outcome from several predictors. Model of the relationship between *several* variables	Continuous Can use categorical predictor variables but they must be dummy coded (to 0/1 variables)	• Normality • Outliers → Mahalanobis distance • Multicollinearity • Linearity • Homoscedasticity • Normality of errors • N:k ratio • Non-zero variance
Hierarchical regression		Used to examine the relations of sets of variables at a time. Each 'step' or model progressively includes more predictors, as well as the previous predictors.		
Logistical regression		Used to examine the probability of correctly predicting category membership on a nominal criterion (DV), based on one of more predictor (IV)	Requires a large sample size Binary outcome (e.g. 0 or 1) IV's can be either continuous or dichotomous	• Bernoulli distribution • Outliers on IVs (not a concern for DVs) • Separation • Independent errors • Link (logit) scale there is a linear relationship • Requires a large sample size
One-way ANOVA		Tests for statistically significant differences between three or more independent sample means	DV should be interval or ratio	• Normality → Kruskal-Wallis test • Homogeneity of variance → Welch or Brown-Forsythe • Independence • Interval or ratio data
Post Hoc		Compare each mean against all others to tell us where group differences lie		• Homogeneity of variance →Games-Howell
Factorial ANOVA	Two-way independent ANOVA	Used to test hypotheses about mean differences when there are two or more IVs As each participant appears in only one condition, this is called a between groups design A 2 x 2 design has 2 IVs with 2 levels	DV should be interval or ratio data	• Independence • Normality • Homogeneity of variance
	Repeated Measures ANOVA	Tests for statistically significant differences between three or more related sample means. Must comprise the same individuals who have provided data at multiple time points (repeated measures design). Or each individual must be matched with an individual in another sample (matched design)	Single repeated measures IV and DV should be interval or ratio (continuous)	• Normality • Homogeneity of variance • Interval or ratio data • Sphericity
	Mixed Effects ANOVA	Used to test hypotheses about differences between means when there are two or more IVs.	Has both repeated measures and between subjects IVs	

Correlations and partial correlations

Correlations

		Exam Performance (%)	Revision Time (Hours)
Exam Performance (%)	Pearson Correlation	1	.411**
	Sig. (2-tailed)		.000
	N	103	102
Revision Time (Hours)	Pearson Correlation	.411**	1
	Sig. (2-tailed)	.000	
	N	102	102

**. Correlation is significant at the 0.01 level (2-tailed).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	73.830	16.133		4.576	.000
	Revision Time (Hours)	.418	.189	.263	2.215	.029
	Exam Anxiety	-1.752	.920	-.226	-1.904	.060

a. Dependent Variable: Exam Performance (%)

Coefficients[a]

Model		Correlations		
		Zero-order	Partial	Part
1	(Constant)			
	Revision Time (Hours)	.411	.217	.199
	Exam Anxiety	-.398	-.188	-.171

a. Dependent Variable: Exam Performance (%)

	Brief description
Pearson's correlation (*r*)	• Measures the strength and direction of the linear relationship between two continuous variables. +/-1 indicate perfect relationship, 0 = no relationship. • Relationship must be linear • Both variables must be normally distributed & measures on interval/ratio scale • If normality is violated & central limit theorem is not relevant, OR relationship is monotonic you can use Spearman's correlation • Can apply transformation to achieve linearity
Coefficient of determination (r^2)	• Provides an estimate of the proportion of variability in one variable that can be attributed to variability in the other • % of the variance
Spearman's correlation (*rs*)	• Measures the relationship between two ordinal variables (X and Y both consist of ranks) • Look at the 'part' section of the table

Linear regression

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	43.909	3.707		11.844	.000
	Revision Time (Hours)	.652	.145	.411	4.503	.000

a. Dependent Variable: Exam Performance (%)

	Brief description
Unstandardised regression coefficient (B)	• Tells us that higher revision time has a positive relationship with exam performance
Standardised coefficients (Beta)	• The same as B but standardised so you can compare each one • Expected change in exam performance for a one SD change in revision time
Significance	• If p <.05 then it is a significant predictor of exam performance