Analysis of Covariance - ANCOVA Cheat Sheet

by Cerulean via cheatography.com/35405/cs/11131/

When to use ANCOVA in place of ANOVA

To reduce within-group error variance	Elimination of confounds
Reducing SS*residual* through covariates	Variables known to influence DV (and not IV)

ASSUMPTIONS

Additivity and Linearity	
	Is the relationship linear?
Normally Distributed Sampling Distribution of Means	
S-W and K-S tests	Q-Q plots and histograms
Homogeneity of Variance	
Levene's Test	
Independence of scores	
	Are the groups independent?
No Univariate Outliers	
Tested with Z-score conversion	Above or below +/- 3.29 (Field, 2013)
Independence of Covariate (CV) and Treatment Effect	
Tested using ANOVA or t-test for Covariate and Treatment	CV should not share variance with treatment IV
Homogeneity of Regression Slopes	
Tested using custom model, including interaction for CV and DV	Does the relationship CV and outcome apply to all treatment groups

Effect Size

Partial Eta Squared

= SS^{effect}/ (SS^{effect} + $SS^{residual}$)

= variance explained/ (variance explained + error variance)

Eta Squared uses SS^{total} in place of (SS^{effect} + $SS^{residual}$). Partial eta squared removes the variance explained by the covariate from SS^{total}

Contrasts

SPSS: *Contrasts* button in *Univariate* dialog box	Several possibilities

Post hoc Tests

Options button. *Display Means* for IV.

Tick *Compare main effects*

Confidence interval adjustment

Bonferroni (recommended); Sidak is conservative; LSD liberal (not recommended).

Contrast Effect Sizes

Contrasts are effectively *t*-tests

Can calculate *r*

$r^{contrast}$ = Square root [t^2/ (t^2 +*df*)]

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