Module 4 Symbols and Formulas

Chapter 11: Two Sample T-Tests

SYMBOLS

Symbol	*Stands For*
$s_{\overline{X}_1-\overline{X}_2}$	estimated standard error of the mean differences
$\overline{X}_1 - \overline{X}_2$	score in the sampling distribution of the differences
$\mu_1 - \mu_2$	mean of the sampling distribution of the differences
$t_{\overline{X}_1-\overline{X}_2}$	t score (t-comp) based on the sampling distribution of the differences
$\overline{X}_D$	mean of the differences
s_D	standard deviation of the differences
D	difference between a pair of scores

FORMULAS

Computational formula for the estimated standard error of the mean differences for independent samples

$$s_{\overline{X}_1-\overline{X}_2} = \sqrt{\left(\frac{(N_1-1)s_1^2 + (N_2-1)s_2^2}{N_1+N_2-2} \right)\left(\frac{1}{N_1} + \frac{1}{N_2} \right)}$$

This formula is used to compute the estimated standard error of the mean differences. N_1 and N_2 are the numbers of subjects in the first and second samples, respectively. s_1^2 and s_2^2 are the variances of the two samples.

Short equation for the two-sample t test for independent samples

$$t_{\bar{X}_1 - \bar{X}_2} = \frac{\bar{X}_1 - \bar{X}_2}{s_{\bar{X}_1 - \bar{X}_2}}$$

The t ratio for the two-sample t test for independent samples is the difference in sample means divided by the estimated standard error of the mean differences. When the computational formula for s is substituted in the denominator, the t ratio becomes...

Computational formula for the two-sample t test for independent samples

$$t_{\bar{X}_1 - \bar{X}_2} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2} \right) \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Computational formula for the t test for dependent (a.k.a., matched, within subjects, repeated measures) samples

$$\frac{\bar{X}_D \sqrt{N}}{s_D}$$

Chapter 12: One-Way, Independent Analysis of Variance

SYMBOLS

Symbol	Stands for
SS_{tot}	total sum of squares
SS_w	

within-groups sum of squares

$$SS_b$$ between-groups sum of squares

$$MS_b$$ mean square between groups

$$MS_w$$ mean square within groups

$$df_b$$ between-groups degrees of freedom

$$df_w$$ within-groups degrees of freedom

$$df_{tot}$$ *total degrees of freedom*

$$k$$ *number of groups*

$$F$$ *F ratio, ANOVA test*

$$F_{comp}$$ *your computed F ratio*

$$F_{crit}$$ *the critical value of F obtained from table of critical values*

$$LSD$$ least significant difference (Fisher's post-hoc test)

Chapter 13: Pearson's R Correlation And Regression

SYMBOLS

Symbol   Stands for

r	Pearson r, Pearson product-moment correlation coefficient
$z_x \ z_y$	z scores for the X and Y variables, respectively
cov_{XY}	covariance of X and Y
ρ	population correlation coefficient, read "rho"
r_{comp}	computed value of r
r_{crit}	critical value of r from the table of critical r values
y'	predicted values for Y based on the regression equation
b	regression coefficient, slope of the regression line
a	Y intercept, value of Y where the regression line crosses the Y axis
$s_x \ s_y$	standard deviation of the Y variable and the X variable, respectively
r^2	coefficient of determination
r_s	Spearman rank order correlation coefficient
r_{bis}	biserial correlation coefficient
r_{pbis}	point-biserial correlation coefficient

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Some content adapted from other's work. See home page for specifics.

LAST UPDATED: 2014-08-25 6:53 PM

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