

## Legend for Interpreting the Symbols in Statistical Formulas

$s^2$  = Variance

$s_1^2$  = Variance of group 1 (like the experimental group)

$s_2^2$  = Variance of group 2 (like the control or other comparison group)

$s$  = Standard Deviation

$s_x$  = Standard deviation of variable  $x$

$s_y$  = Standard deviation of variable  $y$

$\Sigma$  = Sum everything that follows

$n$  = Number of people in a group

$N$  = Number of people in the sample

$x$  = Individual's score for a variable

$\bar{x}$  = Mean of all of the individual's scores for a variable

$y$  = Individual's score on a second variable

$\bar{y}$  = Mean of all of the individual's scores for a second variable

Formula for the Calculation of Variance

$$s^2 = \frac{\sum(x - \bar{x})^2}{n}$$

Formula for the Calculation of Standard Deviation

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

Formula for the Calculation of the  
Pearson Product-Moment Correlation

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{N s_x s_y}$$

Formula for the Calculation of a 2-sample T-Test

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{(n_1 - 1) + (n_2 - 1)}}$$

### Steps and Formula for the Calculation of a Chi-Square Test of Association

First, create a frequency table. For ease, collapse your data into two groups – lower classmen (frosh and soph) and upper classmen (junior and senior)

	Use of Ratemyprof		
Class Standing	Yes	No	
Under	# of people (cell a)	# of people (cell b)	Sum of this row (a + b)
Upper	# of people (cell c)	# of people (cell d)	Sum of this row (c + d)
	Sum of this column (a + c)	Sum of this column (b + d)	Sum of all rows and columns (total n)

Formula:

$$X^2 = \frac{N(|ad - bc| - \frac{N}{2})^2}{(a + b)(c + d)(a + c)(b + d)}$$