

Steps for Computing a One-Way Within-Subjects ANOVA		
Terminology	Formula	Meaning
Participants	n	The number of participants per group (n)
Grand total	$\sum x_T$	The sum of all scores in a study
Sum of person scores	$\sum P$	The sum of scores for each person
Sum of squared scores	$\sum x_T^2$	The sum of all scores individually squared in a study
STAGE 2		
[1]	$\frac{(\sum x_T)^2}{k \times n}$	The correction factor
[2]	$\sum \frac{x^2}{n}$	The “uncorrected” between-groups variation
[3]	$\sum x_T^2$	The “uncorrected” total variation in a study
[4]	$\sum \frac{P^2}{k}$	The “uncorrected” between-persons variation
STAGE 3		
Sum of squares between groups	$SS_{BG} = [2] - [1]$	The sum of squared deviations between groups
Sum of squares between persons	$SS_{BP} = [4] - [1]$	The sum of squared deviations between persons
Sum of squares total	$SS_T = [3] - [1]$	The sum of squared deviations in all groups
Sum of squares error	$SS_E = SS_T - SS_{BG} - SS_{BP}$	The sum of squared deviations within each group
STAGE 4		
Mean square between groups	$MS_{BG} = \frac{SS_{BG}}{df_{BG}}$	The variance between groups. This is the numerator of the test statistic.
Mean square between persons	$MS_{BP} = \frac{SS_{BP}}{df_{BP}}$	The variance between persons averaged across groups
Mean square error	$MS_E = \frac{SS_E}{df_E}$	The variance within groups. This is the denominator of the test statistic.
F statistic formula	$F_{obt} = \frac{MS_{BG}}{MS_E}$	The obtained value of the test statistic for an ANOVA
Step 4: Make a decision.		
Decision criterion	—	When $F_{obt} < F_{crit'}$ retain the null hypothesis. When $F_{obt} \geq F_{crit'}$ reject the null hypothesis.