OneWay ANOVA

Descriptives

CI % : 95

Group	N	M	SD	SE	Lower	Upper
1	4	2.000	2.449	1.225	-1.898	5.898
2	4	6.000	2.449	1.225	2.102	9.898
3	4	7.000	2.449	1.225	3.102	10.898
Total	12	5.000	3.162	0.913	2.991	7.009

These values of the group statistics are calculated separately for each group. They are not identical to the values obtained from analyzing the variable as a whole.

A grand mean can be determined by taking the weighted average of all of the group means:

$$M_{TOTAL} = \frac{\sum n(M_{GROUP})}{N} = \frac{4(2) + 4(6) + 4(7)}{4 + 4 + 4} = 5.000$$

Tests of Between Subjects Effects

Source	SS	df	MS	F	p	Eta-Sq
Between	56.000	2	28.000	4.667	0.041	0.509
Within	54.000	9	6.000			
Total	110.000	11				

The "F" statistic is a ratio of the between and within group variance estimates:

$$F = \frac{MS_{BETWEEN}}{MS_{WITHIN}} = \frac{28.000}{6.000} = 4.667$$

An F with 2 and 9 df that equals 4.667 has a two-tailed probability (p) of .041, a statistically significant finding.

"Within" statistics are a function of the within group variabilities. Because SS for each group equals 2.00 ($SS = SD^2 \times df$):

$$SS_{WITHIN} = SS_1 + SS_2 + SS_3$$
$$= 18.000 + 18.000$$
$$+ 18.000 = 54.000$$

The degrees of freedom ("df") are a function of the number of people in each group:

$$df_{WITHIN} = df_1 + df_2 + df_3 = 9$$

The "Mean Square" is the ratio of the "Sum of Squares" to the "df":

$$MS_{WITHIN} = \frac{SS_{WITHIN}}{df_{WITHIN}} = \frac{54.000}{9} = 6.000$$

"Between" statistics are a function of the differences among the groups:

$$SS_{BETWEEN} = \sum n(M_{GROUP} - M_{TOTAL})^2$$
$$SS_{BETWEEN} = 4(2 - 5)^2 + 4(6 - 5)^2$$
$$+ 4(7 - 5)^2 = 56.000$$

The degrees of freedom ("df") are a function of the number of groups:

$$df_{BETWEEN} = \#groups - 1 = 2$$

The "Mean Square" is the ratio of the "Sum of Squares" to the "df":

$$MS_{BETWEEN} = \frac{SS_{BETWEEN}}{df_{BETWEEN}} = \frac{56.000}{2}$$
$$= 28.000$$

The "Eta-Squared" statistic is a ratio of the between group and the total group variability ("Sum of Squares") estimates:

$$\eta^2 = \frac{SS_{BETWEEN}}{SS_{TOTAL}} = \frac{SS_{BETWEEN}}{SS_{BETWEEN} + SS_{WITHIN}}$$
$$\eta^2 = \frac{56.000}{56.000 + 54.000} = 0.509$$

Thus, 50.9% of the total variability among all of the scores in the study is accounted for by group membership.