Post Hoc Comparisons

(Note that some aspects of this output have been rearranged/deleted for the sake of presentation!)

Descriptives – Outcome

group	Mean	SD	N
1	2.000	2.449	4
2	6.000	2.449	4
3	7.000	2.449	4

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.

"Mean Difference" is the difference between the means for the two listed groups.

Descriptives - Outcome

		Mean Difference	SE	t	p_{tukey}
1	2	-4.000	1.732	-2.309	0.106
	3	-5.000	1.732	-2.887	0.043
2	3	-1.000	1.732	-0.577	0.835

Tukey's HSD procedure is appropriate for all possible post-hoc pairwise comparisons between groups. The output lists all possible pairwise comparisons, excluding those that are redundant.

The "t" column provides an HSD value that is conceptually similar to a *t* statistic in that it is a function of the "Mean Difference" and the "Std. Error". For the first comparison in the example:

$$HSD = \frac{M_1 - M_2}{SE_{DIFF}} = \frac{-4.000}{1.732} = -2.309$$

The "p_{tukey}" column provides the probability of the HSD statistic. An HSD of -2.309 (with 2 $df_{BETWEEN}$ and 9 df_{WITHIN} like in the ANOVA source table) has a two-tailed probability (*p*) of .106, a finding that is not statistically significant.

These "Standard Errors" are for the difference between the two group means. The values are a function of the MS_{WITHIN} (from the ANOVA) and the sample sizes:

$$SE_{DIFF} = \sqrt{\left(\frac{MS_{WITHIN}}{n_{GROUP}}\right) + \left(\frac{MS_{WITHIN}}{n_{GROUP}}\right)}$$

$$SE_{DIFF} = \sqrt{\left(\frac{6}{4}\right) + \left(\frac{6}{4}\right)} = 1.732$$

In this case, because all groups are of the same size, the standard error for each comparison is the same.