Analysis of Variance (ANOVA)

For most paper publications including your capstone projects ANOVA tables are not included. These tables look like data in the results worksheet when you run an ANOVA in EZAnalyze, Excel, or SPSS. They include the degrees of freedom in the analysis, the within group and between group variance numbers, the calculated *F* value and the *p* value for the test. The assumption in a paper is that you are not going to talk much about an ANOVA analysis if it is not statistically significant and if it is, you will report the post hoc analysis of the group means. If an ANOVA is statistically significant report the *p* value of the test in the text and then include and describe a table that shows the post hoc analysis.

**ANOVA post-hoc analysis table**

Nicol and Pexman (2010) show two versions of how to do post hoc tables (Example tables 1 and 2). You will see many other solutions to post hoc tables as you read articles. Following APA’s mandate that actual *p* values are reported in tables when possible we provide Table 3 as an example. None of these work very well if you are comparing more than 4 groups.

Table 1

*ANOVA Comparisons of High School Proficiency Tests From Four Adjacent Years*

|  |  |  |  |
| --- | --- | --- | --- |
| Group | *n* | Mean | *SD* |
| 1998 | 256 b | 79.71 | 13.40 |
| 1999 | 307 b,c | 82.34 | 13.30 |
| 2000 | 287 a,b,c | 88.69 | 7.49 |
| 2001 | 292 a,b, | 92.23 | 6.57 |

Shared subscripts represent statistically significant differences: a = *p* < .05, b = *p* < .01, c = *p* < .001

Table 2

*ANOVA Comparisons of High School Proficiency Tests From Four Adjacent Years*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group | *n* | Mean | *SD* | Post hoc |
| 1998 (1) | 256  | 79.71 | 13.40 | 1<2<3<4 |
| 1999 (2) | 307  | 82.34 | 13.30 | 1<2<3<4 |
| 2000 (3) | 287  | 88.69 | 7.49 | 1<2<3<4 |
| 2001 (4) | 292  | 92.23 | 6.57 | 1<2<3<4 |

*Note.* The numbers in parentheses in group names refer to the numbers used in illustrating statistically significant differences.

Table 3

*ANOVA Comparisons of High School Proficiency Tests From Four Adjacent Years*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | Tukey’s HSD Comparisons |
| Group | *n* | Mean | *SD* | 1998 | 1999 | 2000 |
| 1998 | 256  | 79.71 | 13.40 |  |  |  |
| 1999 | 307  | 82.34 | 13.30 | .005 |  |  |
| 2000 | 287  | 88.69 | 7.49 | < .001 | < .001 |  |
| 2001 | 292  | 92.23 | 6.57 | < .001 | < .001 | < .032 |