Reporting Results of Descriptive and Inferential Statistics in APA Format

The Results section of an empirical manuscript (APA or non-APA format) are used to report the quantitative results of descriptive statistics and inferential statistics that were applied to a set of data. Results sections should avoid describing the outcome of a study as "good" or "bad," "unexpected" or "expected," and "interesting" or "uninteresting." Instead Results sections present the inferential analyses and descriptive statistics in as concise a way as possible so the reader knows exactly what evidence is being used to support or refute a hypothesis.

The numerical values that are reported as a descriptive statistic or inferential statistic are generally rounded to two decimal places; whereas the *p*-value (alpha level) is rounded to two or three decimal places, and sometimes even more. All statistical symbols that are not Greek letters should be italicized (*M*, *SD*, *t*, *r*, *p*); and Greek symbols are not italicized (χ, α, β).

Reporting Descriptive Statistics:

When reporting descriptive statistic from a variable you should, at a minimum, report a measure of central tendency and a measure of variability. In most cases, this includes the mean and reporting the standard deviation (see below). In APA format you do not use the same symbols as statistical formulas. Below are common APA formatting symbols for several descriptive statistics:

Descriptive Statistic	Statistical Symbol	APA Symbol (use these!)
Mean	$\bar{X}$	*M*
Median	*Md*	*Median*
Standard Deviation	$\hat{s}$	*SD*
Standard Error of the Mean	$\hat{s}_{\bar{X}}$	*SE* or *SEM*

You can report descriptive statistics in the text as I have done below, but if a study is complex it is good to present descriptive statistics as a table or a figure. (See Chapter 5 of the APA Manual.)

When reporting measures of central tendency and variability it is good to report the metric of the dependent variability, if applicable. For example, if you measured length in centimeters the mean might be reported as *M* = 33.21 cm. If you measured time in milliseconds (ms) the mean and standard deviation might be reported as *M* = 1250 ms, *SD* = 235 ms.

Examples[1]

The mean Beck Depression Inventory score in the drug group (*M* = 11.25, *SD* = 8.15) was...

The household income for families living in East Westernville (*Median* = $45,000) was...

The delayed response condition (*M* = 560 ms; *SE* = 25 ms) was greater than the immediate response condition (*M* = 450 ms; *SE* = 23 ms)...

1 Normally, Results sections are double-spaced, the pages have 1" margins, and the section begins with the title 'Results'. For brevity, this formatting is not included here and these examples should be viewed as reporting only the inferential statistics (not the hypotheses).

Reporting Inferential Statistics:

When reporting inferential statistics you should report the:

- test statistic (*F*-ratio, *t*-value, *z*-score, etc.)
- degrees of freedom
- error term (if necessary—non-parametric tests and correlations usually do not include this)
- *p*-value (a priori or a posteriori alpha level: α)

A point on *p*-values (alpha levels): You can report the *p*-value as the alpha level that was chosen and used to reject or retain the null hypothesis, that is, the a priori probability of incorrectly rejecting a true null hypothesis (generally .05 or .01). For example: $t(28) = 2.99$, $SEM = 10.50$, $p < .05$. Alternatively, you can report the exact *p*-value that is provided in an inferential test from a software program (SPSS), that is, the a posteriori probability that a result this extreme or more is consistent with the null hypothesis. For example: $t(28) = 2.99$, $SEM = 10.50$, $p = .0057$.[2] If you report the a posteriori probability and the value is less than .001, it is customary to report $p < .001$. When reporting non-significant results, the *p*-value is generally reported as the a posteriori probability of the test-statistic. For example: $t(28) = 1.10$, $SEM = 28.95$, $p = .268$.

Examples

In each example below, the numbers were completely made up and I reported the a priori *p*-value:

z-tests: $z = 4.56$, $SEM = 1.25$, $p < .05$

t-tests: $t(49) = 2.36$, $SEM = 0.42$, $p < .05$

Pearson Correlation: $r(31) = -0.63$, $p < .001$

F-Tests (ANOVA, Regression): $F(2, 57) = 5.00$, $MSE = 100.25$, $p < .01$

Tukey's Post-hoc Test: $CD = 2.50$

Chi-square: $\chi^2 (3, N = 2000) = 9.64$, $p < .01$

2 When reporting the a posterior probability you can report the p-value as being equal to the probability, as in the example here, or less than the probability when rounded to three places. In this case, the p-value would be written as $p < .006$.