

REPORTING STATISTICS IN APA STYLE

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RULES FOR APA STYLE RESULTS SECTIONS

Overview: The APA manual describes appropriate strategies for presenting statistical information. These guidelines “reflect both standards of content and form agreed on in the field and the requirements of the printing process” (p. 136).

Using Informationally Adequate Statistics: “The field of psychology is not of a single mind on a number of issues surrounding the conduct and reporting of what is commonly known as null hypothesis significance testing” (p. 21).

1. Be sure to include sufficient descriptive statistics (e.g., sample size, means, correlations, standard deviations) so that the nature of the effect being reported can be understood by the reader. (p. 22)
2. When reporting inferential statistics (e.g., t tests, F tests, chi square tests), include information about the obtained magnitude or value of the test statistic, the degrees of freedom, the probability of a value as extreme or more extreme than the one obtained, and the direction of the effect. (p. 22)
3. The reporting of confidence intervals (for estimates of parameters, for functions of parameters such as differences in means, and for effect sizes) can be an extremely effective way of reporting results. (p. 22)

The Use of Statistical Symbols: “Highlighting particular [descriptive statistics] data in the text may be helpful” (p. 139)

Symbols for population versus sample statistics. Population (i.e., theoretical) statistics, properly called *parameters*, are usually represented by lowercase Greek letters. A few sample (i.e., observed) statistics are also expressed by Greek letters (e.g., χ^2), but most sample statistics are expressed by italicized Latin letters (e.g., *SD*). (p. 139)

Symbols for number of subjects. Use an uppercase, italicized *N* to designate the number of members in a total sample (e.g., *N* = 135) and a lowercase italicized *n* to designate the number of members in a limited portion of the total sample (e.g., *n* = 30). (p. 139)

Reporting of Descriptive Statistics: “When using a statistical term in the narrative, use the term, not the symbol” (p. 139).

Means (with standard deviations in parentheses) for Trials 1 through 4 were 2.43 (0.50), 2.59 (1.21), 2.68 (0.39), and 2.86 (0.12), respectively. The *ns* for each trial were 17. (p. 139)

Trials 1 through 4 showed an increase in performance (*Ms* = 2.43, 2.59, 2.68, and 2.86, respectively) and the variability also differed across trials (*SDs* = 0.50, 1.21, 0.39, and 0.12, respectively). The *ns* for each trial were 17.

Reporting of Inferential Statistics: “When reporting inferential statistics (e.g., t tests, F tests, chi square tests), include sufficient information to allow the reader to fully understand the analyses conducted” (p. 138).

The mean is not statistically significantly different from the general population mean, $z = 1.23$, $p > .05$, 95% CI = -1.29 - 4.73.

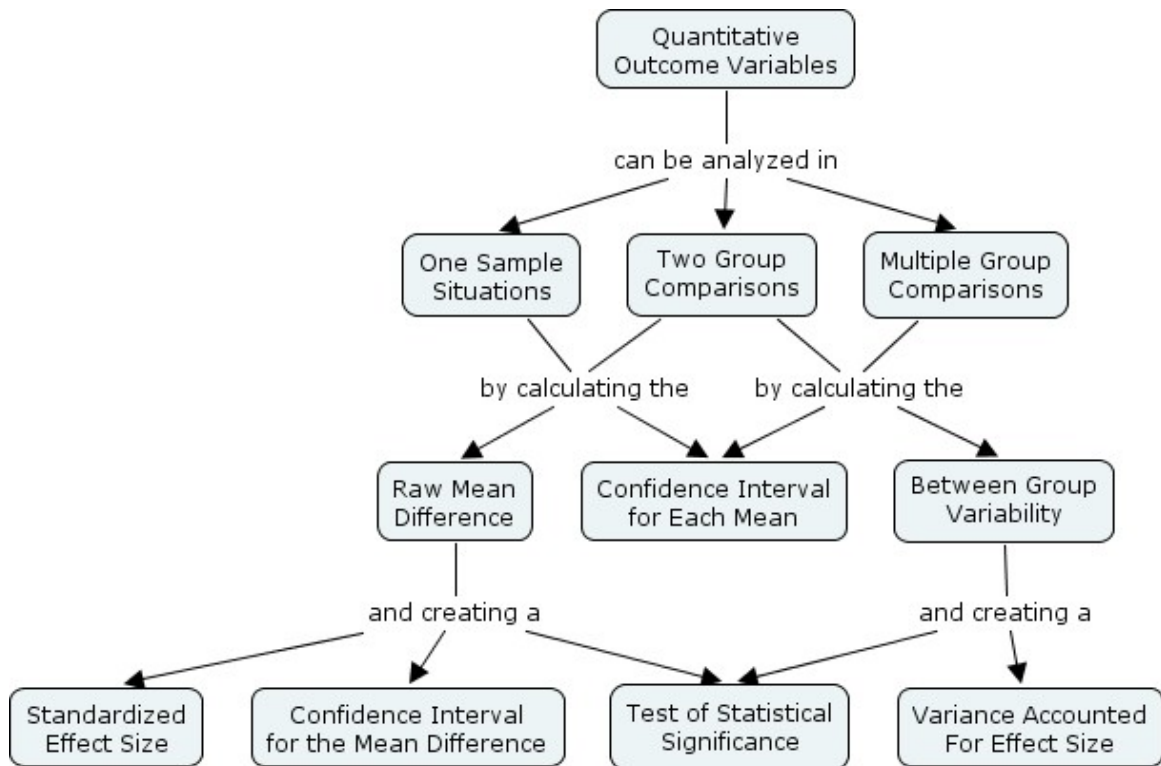
The difference between the means is statistically significant, $t(179) = 5.38$, $p = .026$. The 99% confidence interval ranged from 50.26 to 74.37.

The ANOVA for sentence format was statistically significant, $F(1, 177) = 4.37$, $p = .03$. The effect size was large ($\eta^2 = .50$).

All quotations are taken from: American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th Ed.). Washington, DC: APA.

SUMMARY OF ANALYSES FOR PARAMETRIC DATA

Overview: The correct analysis is a function of the research question to be asked. Importantly, however, there are many consistencies across the situations in the types of statistics that can and should be calculated.



Some Important Vocabulary Terms:

Quantitative Variable: A measured variable with either an interval or ratio scale of measurement. Allows for the use of parametric tests.

Raw Mean Difference: The difference between two sample or population means. Also called the unstandardized effect size.

Between Group Variability: A measure of the variability of among the group means. Indexed by Sum of Squares Treatment (or Between Groups).

Confidence Interval: Provides a range of means or mean differences that are likely to cover the true population mean or mean difference.

Outcome Variable: The measured outcome of study. This is referred to as the dependent variable in an experiment.

Standardized Effect Size: Standardizes the raw mean difference relative to the standard deviation within groups. Cohen's d is one example.

Variance Accounted For Effect Size: Standardizes the between group variability relative to within group variability. η^2 is one example.

Significance Test: Utilizes probability to determine the likelihood of the results given assumptions about the population. F and t are examples.

SUMMARY OF PARAMETRIC STATISTICS

Statistic	What Its Purpose Is	How To Report It	What It Indicates
Descriptive Statistics			
Mean	To provide an estimate of the population from which the sample was selected.	$M = \underline{\hspace{2cm}}$	Indicates the center point of the distribution and serves as the reference point for nearly all other statistics.
Standard Deviation	To provide an estimate of the amount of variability/dispersion in the distribution of population scores.	$SD = \underline{\hspace{2cm}}$	Indicates the variability of scores around their respective mean. Zero indicates no variability.
Measures of Effect Size			
Cohen's d	To provide a standardized measure of an effect (defined as the difference between two means).	$d = \underline{\hspace{2cm}}$.	Indicates the size of the treatment effect relative to the within-group variability of scores.
Correlation	To provide a measure of the association between two variables measured in a sample.	$r(df) = \underline{\hspace{2cm}}$	Indicates the strength of the relationship between two variables and can range from -1 to +1.
Eta-Squared	To provide a standardized measure of an effect (defined as the relationship between two variables).	$\eta^2 = \underline{\hspace{2cm}}$.	Indicates the proportion of variance in the dependent variable accounted for by the independent variable.
Confidence Intervals			
CI for a Mean	To provide an interval estimate of the population mean. Can be derived from both the z and t distributions.	$\underline{\hspace{1cm}}\% \text{ CI} = \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$	Indicates that there is the given probability that the interval specified covers the true population mean.
CI for a Mean Difference	To provide an interval estimate of the population mean difference. Can be derived from both the z and t distributions.	$\underline{\hspace{1cm}}\% \text{ CI} = \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$	Indicates that there is the given probability that the interval specified covers the true population mean difference.
Significance Tests			
One Sample t Test	To compare a single sample mean to a population mean when the population standard deviation is not known	$t(df) = \underline{\hspace{2cm}},$ $p = \underline{\hspace{2cm}}.$	A small probability is obtained when the statistic is sufficiently large, indicating that the sample mean significantly differs from the hypothesized value.
Independent Samples t Test	To compare two sample means when the samples are from a single-factor between-subjects design.	$t(df) = \underline{\hspace{2cm}},$ $p = \underline{\hspace{2cm}}.$	A small probability is obtained when the statistic is sufficiently large, indicating that the two means significantly differ from each other.
Related Samples t Test	To compare two sample means when the samples are from a single-factor within-subjects design.		
One-Way ANOVA	To compare two or more sample means when the means are from a single-factor between-subjects design.	$F(df_{EFFECT}, df_{ERROR}) =$ $\underline{\hspace{2cm}},$ $p = \underline{\hspace{2cm}}.$	A small probability is obtained when the statistic is sufficiently large, indicating that the set of means differ significantly from each other.
Repeated Measures ANOVA	To compare two or more sample means when the means are from a single-factor within-subjects design.		
Factorial ANOVA	To compare four or more groups defined by a multiple variables in a factorial research design.		

Note. Many of the statistics from each of the categories are frequently and perhaps often appropriately presented in tables or figures rather than in the text.