

Writing Results in APA Format

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The purpose of this document is to demonstrate and provide examples of how to format statistical results in accordance with the guidelines set forth by the American Psychological Association’s (APA) publication manual. In SPSS, the statistical program often used to calculate statistics, output is not provided in APA format. Once a student obtains output from SPSS, he or she needs to take the output and format it in APA style when writing a statistical results section.

Structure

Each section of an APA formatted manuscript begins with a header. There are 5 **heading levels** in APA, and a writer always begins with level 1. A description of the format of each level is found in Table 1.

Table 1.

APA headings.

Level	Format
1	Centered, Boldface, Uppercase and Lowercase Headings
2	Left-aligned, Boldface, Uppercase and Lowercase Heading
3	Indented, boldface, lowercase heading with a period. Begin body text after the period.
4	<i>Indented, boldface, italicized, lowercase heading with a period.</i> Begin body text after the period.
5	<i>Indented, italicized, lowercase heading with a period.</i> Begin body text after the period.

A document does not need to use all five levels of headers. For the purpose of the results sections, it is common to use only level one and level two headers.

Headings can provide organization and structure, and it is essential to have an organized structure when reporting statistical results for a course project or publication. If information is not presented in a logical manner, critical information may be missed.

Content and Structure of a Results Section

Introduction

It is good practice to begin the results section with a brief introduction. More specifically, the introduction of the results section includes a brief overview of the project, the research question, the alternative and null hypothesis(es), the identification of variables, the type of analysis conducted to evaluate each hypothesis, and the rationale for choosing the analysis.

An example of an introduction for a results section may be as follows: A factorial ANOVA was conducted to evaluate the effect of gender and type of course on the number of points students earned in their educational statistics course. The independent variable, gender, included two levels: (a) male and (b) female. The independent variable, type of course, included two levels: (a) online and (b) residential. The dependent variable was the mean of the students' final course points. There were three null hypotheses: (a) there is no statistically significant difference on the mean of the students' final course points based on gender, (b) there is no statistically significant difference on the mean of the students' final course points based on type of course, (c) there is no statistically significant difference on the mean of the students' final course points based on their gender and the type of course they participated in. A factorial ANOVA was chosen as the most appropriate analysis as the aim of the study was to simultaneously examine the two independent variables and one dependent variable (Warner, 2013).

Results

In statistics, writing about the findings of a study is just as important as the findings themselves. If a writer is unable to present findings to an audience, it is uncertain if the discovery will be acknowledged. When including statistics in written text, be sure to include

enough information for the reader to understand the study. Although the specific explanations given and the specific data included depends upon the study, APA does have guidelines and suggestions about what should be minimally included in a results section. Based upon the APA guidelines, it is recommended that the results section includes descriptive statistics, assumption testing, a restatement of the analysis used to evaluate each hypothesis result, the statistic, p value, effect size, observed power, and the decision made to reject or fail to reject the null.

Additionally, a brief interpretation of the results should be provided. Conventions and sources used for interpretations should be provided. An example interpretation may state, Males on average score statistically significantly better in educational statistics courses ($M = 38.54$, $SD = 4.16$, $n = 29$) than females ($M = 32.46$, $SD = 4.96$, $n = 29$). The p value was below the significance level set for the study. The effect size based on Cohen's (1988) conventions was small. The observed power was .85, which indicates that a Type I error may be possible, but is not likely. One of the best ways to learn how to write a results section using the correct terminology, scientific notations, and APA formatting is to read results sections in dissertations and publications that use APA formatting.

Writing about Statistics in APA Format

While many writers have experience writing manuscripts in APA format, many writers do not have a lot of experience writing about statistical analyses. Thus, many writers are not familiar with some of the specific guidelines related to reporting statistics. The APA manual sets forth the following guidelines about references and information that should and should not be included: (a) do not include references for the statistic unless it is uncommon, (b) do not describe the statistic or provide the formula for it, rather assume the reader is familiar with statistical analyses, (c) do not repeat statistics in both narrative and tabular format, rather choose

one format, and (d) enumerate a series of statistics by using terms such as *respectively* and *in order*.

Tables

Tables are often used to present statistics in an organized fashion. Tables included in APA results sections have to be **created in Microsoft Word** to meet APA format guidelines. Direct SPSS output does not meet APA guidelines. Table 2 illustrates an APA formatted Table. Table 2.

Descriptive Statistics for the Total Course Points (N = 105)

	Resident (n = 41)			Online (n = 64)		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Females	19	75	11.34	10	89.25	14.82
Males	19	96.43	12.23	10	99.38	13.14

Note. Total possible scores range from 0 to 100.

Notations and Punctuating Statistics

It is important to read chapters three to five of the APA manual, as there are a number of guidelines for notating and punctuating statistics. Some examples are discussed here. Statistics need to be reported using the proper notations as outlined in the APA manual. Table 3 adapted from Warner (2013) provides an example of this.

Table 3.

Statistic Notations.

<i>Name of Statistic</i>	<i>Sample Statistic*</i>
Mean	M (or \bar{X})
Standard deviation	s or SD (or \hat{s})
Variance	s^2 (or \hat{s}^2)
Distance of individual X score from the mean	$z = (X - M)/s$ or $(X - \bar{X})/SD$
Standard error of the sample mean	SE_M (or $SE_{\bar{X}}$)

When statistical values are being discussed, they can be placed in parentheses or placed within the sentence. For example, the researcher may state: The results suggested that statistically significant differences existed ($p = .01$) between males and females. The researcher may also state: The t test was significant, $t(82) = 6.49$, $p = .01$, $\eta^2 = .22$. The second example here illustrates that parentheses need to be used to enclose degrees of freedom and that *italics* need to be used for statistical symbols or notations (e.g. t , F , N). Use an *italicized*, uppercase N when referring to number of participants in the sample (e.g. $N = 687$), and use an *italicized*, lowercase n when referring to a part of the sample (e.g. $n = 42$). Standard typeface, however, needs to be used when writing Greek symbols. Italics are not used with Greek symbols. Limits of confidence intervals need to be enclosed in brackets (e.g. 95% CI [6.56, 3.9]). These are just a few of the important guidelines for writing about statistics; thus, it is important to read the APA manual. An additional resource on APA writing that may be helpful is:

<http://amandaszapkiw.com/artifacts/resources/tutorials/apa-grammar-lesson/>

References

American Psychological Association. *Publication manual of the American psychological association*. Washington, DC: APA.

RMIT University (n.d.). Online tutorial: Writing. Retrieved from <http://emedia.rmit.edu.au/learninglab/content/writing>.

Warner, R. M. (2012). *Applied statistics: From bivariate through multivariate techniques (2ed)*. Thousand Oaks, CA: Sage Publications.