Appendix B

Basics of APA Format (and How this Book Sometimes Deviates)

Introduction

One purpose of this book is to show how the results of investigations may be summarized according to the guidelines in the *Publication Manual of the American Psychological Association* (2010). For the sake of brevity, this book will refer to these guidelines simply as *APA format*.

To show how the results from advanced statistical analyses can be summarized, this book provides a large number of excerpts from the *Results* sections of fictitious articles. Although most of the conventions used in these excerpts are consistent with APA format, there are some exceptions. So that you will not be led too far astray, this appendix reviews the basics of APA format and then summarizes the ways that these excerpts sometimes deviate from the official format.
The Basics of APA Format

Since this is a book on advanced statistics (as opposed to elementary statistics), I began with the assumption that most readers are at least vaguely familiar with APA format. For those who have gotten rusty, the current section provides a quick review.

Format Used in Typing the Manuscript

We begin with the basics: the font to be used, double-spacing versus single spacing, and related issues.

- Not all journals require that manuscripts comply with APA format. To be sure, check the instructions for submissions page in a recent issue or at the journal’s website.
- In the page layout menu of your word processing application, use the default paper size of 8.5 × 11-inch (i.e., letter size).
- The journal will most likely request that the manuscript be submitted electronically, as an email attachment. If you need to print it on paper for any reason, use a good-quality printer (preferably a laser printer).
- The preferred font (i.e., typeface) is Times New Roman, and the preferred font size is 12-point. Do not use a compressed or narrow font, and do not use your word processing application to compress the font.
- When I was an undergrad and papers were typed using a typewriter, we were instructed to set the line spacing on double-space and leave it there. Period. For today’s writers there is one exception: It is now acceptable to use single spacing, 1.5 spacing, or double spacing within the body of a table or a figure. But everything else should be double-spaced.
- Each page of the manuscript should have margins of at least 1 inch at the top, bottom, left, and right. This means that no line of text should be more than 6 ½ inches in length.
- Text should be left-justified. This means that the left margin should line up smooth and straight and the right margin should be ragged (i.e., uneven). In other words, do not justify the lines so that both margins are smooth and straight.
- Begin each new paragraph (except the abstract) with an indentation of five to seven spaces.

Order in Which the Manuscript Parts Should Be Arranged

The various parts of the manuscript should be arranged in the order presented below. The page numbers should run consecutively (starting with the title page) through all sections of the manuscript.
• Title page
• Abstract
• Body of the manuscript (this is sometimes called the text of the manuscript or text of the article; most of the manuscript will consist of this section)
• Reference list
• Tables (each table should begin on a new page; very long tables may extend over more than one page)
• Figures (each figure should begin on a new page; the caption for a given figure should appear on the same page as the figure itself)
• Appendices (each appendix should begin on a new page)

Sections That Constitute the Body of the Manuscript

After the title page and abstract, comes the body of the manuscript. The specific sections that should be included in this part of the manuscript will be determined by the nature of investigation. Most articles describing empirical investigations will follow a format something like this:

• Introduction. In this section, you will introduce the general topic and the questions being investigated. Explain why this issue is important and summarize theory and previous research that is most relevant to the current investigation. State the hypotheses to be investigated and briefly explain why the current research design is appropriate for testing these hypotheses.

• Method. In the Method section, describe how the current investigation was conducted providing adequate detail so that other researchers can replicate it. This section is often divided into subsections such as Participants and Measures. In the Participants subsection, explain how the subjects were selected and describe their basic characteristics (e.g., age and gender). In the Measures subsection, provide operational definitions for the study’s variables. In the Research Design subsection, indicate whether the study was a true experiment, a correlational study, or some other type of investigation. If appropriate, provide details as to how the independent variables were manipulated.

• Results. In this section, describe the data analysis procedures used to investigate the study’s hypotheses, along with the results of those analyses. Traditionally, researchers have emphasized null-hypothesis significance tests, although the APA’s Publication Manual (2010, pp. 33-34) now strongly encourages the reporting of confidence intervals and indices of effect size.

• Discussion. In this section, interpret the meaning and importance of the current investigation’s findings. Draw conclusions as to the extent to which the current findings support (or fail to support) the hypotheses stated earlier in the manuscript. Review the limitations of the study, relate
the current findings to previous research, and discuss its implications for future research.

Levels of Headings in the Body of the Manuscript

APA format allows for up to five levels of headings in a manuscript, although most articles require fewer than five levels. This section illustrates the format that would be used in a manuscript that requires just three levels of headings:

**Level 1 is Centered, is in Boldface, and Includes**

**Uppercase and Lowercase Letters**

**Level 2 is Flush Left, is in Boldface, and Has Uppercase and Lower Letters**

**Level 3 is paragraph-indented, includes lowercase letters, and ends with a period.** The text of the paragraph itself appears next.

As an illustration, below is an example of the headings that might be used in the Method section, the Results section, and the Discussion section of an APA-format article that reports an empirical investigation. The actual headings would vary, determined by the specifics of the study, but the following headings are fairly representative of those often used:

**Method**

**Participant Characteristics**

The text of the paragraph appears here. The text of the paragraph appears here.

The text of the paragraph appears here.

**Questionnaire Scales and Other Measures**

**Summated rating scales on the questionnaire.** The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.
Other variables assessed. The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.

Results

Correlations Between Latent Variables

The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.

Results from the Path Analysis

Results from the sample of male participants. The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.

Results from the sample of female participants. The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.

Discussion

Implications for the Theory of Planned Behavior

The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.

Limitations of the Current Investigation

The text of the paragraph appears here. The text of the paragraph appears here. The text of the paragraph appears here.
Recommendations for Future Research

The text of the paragraph appears here. The text of the paragraph appears here.

The text of the paragraph appears here.

Fonts (Typefaces) Used in the Manuscript

The *Publication Manual of the American Psychological Association* (2010) recommends that researchers prepare their manuscript using a serif font, preferably Times New Roman? (a recommendation that this book did not follow). This section discusses the differences between serif fonts versus sans serif fonts and summarizes APA recommendations regarding their use.

Serif Fonts Versus Sans Serif Fonts

A serif font has very short lines extending at perpendicular angles from the main strokes that constitute a letter. For example, below is the upper-case letter “T” from a serif font (Times New Roman):

\[ T \]

Notice the very short lines that appear at the left and right side of the horizontal upper stroke of the letter? Those structures are called *serifs*. APA format recommends that researchers use serif fonts for the vast majority of their manuscripts, because serif fonts are generally easier to read in the text of a document. In this context, “vast majority” means everything except the text that appears in figures.

This book did not use a serif font in the fictitious article excerpts that it presented. Instead, it used a sans serif font: a font that does not include the short lines at perpendicular angles to the main strokes of letters. For example, below is the upper case letter T from a sans serif font called Phoenica Condensed Standard Office:

\[ T \]

Notice that the above letter does not have the short lines at the ends of the main strokes. That is how we know it is a sans serif font.
APA-Recommended Fonts Versus this Book’s Fonts

As was stated earlier, the *Publication Manual* of the APA recommends that researchers use Times New Roman for typing the vast majority of a manuscript, including tables. The current book did not comply with this guideline. Instead, the current book used the following fonts:

- Phoenica Condensed Standard Office was used for excerpts taken from the main body (text) of the fictitious articles.
- Phoenica Standard Mono was used for tables from the fictitious articles.

The two preceding fonts were used (instead of the font recommended by APA format) so that it would be easier for readers to distinguish between this book’s regular text versus the text of the fictitious article excerpts. This book’s regular text was set in a font called *Utopia Standard*, which is a serif font. I was concerned that if I set the fictitious article excerpts in *Times New Roman* (which is also a serif font), readers would have a difficult time distinguishing between the two.

**CONDENSED FONTS.** As long as we are talking about taboos, APA format recommends against the use of narrow or condensed fonts in the text or tables of manuscripts. This would be an additional reason to not use the Phoenica fonts that I used in a real manuscript, as they were both condensed fonts.

**SANS SERIF FONTS IN FIGURES.** The *Publication Manual* of the APA does not have a problem with sans serif fonts when they are used for the text that appears within the bodies of figures (such as the figures used to illustrate the path models in *Chapter 16*). This book generally used a sans serif font called *Myriad Pro Condensed* within the body of figures.

**SUMMARY: APA RECOMMENDATIONS FOR FONTS.** In summary: To be compliant with APA recommendations:

- Use a serif font (such as *Times New Roman*) for text and tables in your manuscript.
- Use a sans serif font (such as *Myriad Pro* or *Helvetica*) within the body of a figure.

Italicizing Symbols for Statistics

When I was a young man, APA format did not require that anything be placed in italic type. That’s because, when I was a young man, we prepared our papers using an ancient instrument called a *typewriter*—a device so primitive it could not even connect to Wikipedia.

Today’s students are both blessed and cursed. On the positive side, they can now prepare slick-looking research reports complete with tables, figures, and statistical symbols that did not even exist back during the Nixon administration.
That, too, is their curse. Should the symbol for the chi-square statistic be in italic type? Should the “F” in the “F_{\text{max}}” symbol be in italic? What about the “max” in the subscript?

No, this section will not answer all of your questions (that’s what Wikipedia is for). But it will touch on some of the more important guidelines for the use of italic type according to the *Publication Manual of the American Psychological Association 6th ed.* (2010).

**What, Exactly, is Italic Type?**

In your research report, words and symbols will typically be in one of three possible typefaces:

- **Standard typeface** is text that has not been set in italics or boldface (or anything else unusual).
- **Italic type** is text that is slanted and squiggly, like this.
- **Boldface** is dark and thick like this.

The majority of your manuscript will be in standard typeface. In the typical paper, just about nothing is in bold. However, many statistical symbols are in italics, as we shall see.

**Values to Place in Italics**

First, you may recall that **Latin letters** are the letters that constitute the alphabet that most of us learned in elementary school (e.g., A, a, B, b, C, c). Statisticians have traditionally used Latin letters as symbols for statistics (such as $M$ for the mean, $n$ for the number of participants in a subgroup, and so forth). To increase the likelihood that these Latin letters will stand out (and will be recognized as statistical symbols by the reader), APA format requires that they be placed in italics when used for certain purposes. This section and the following section summarize some of the dos and don’ts related to the use of italics.

**DO ITALICIZE LATIN LETTERS USED AS STATISTICAL SYMBOLS OR ALGEBRAIC VARIABLES.** When Latin letters are used as symbols for statistics or algebraic variables in research articles, they are usually placed in italics. For example, the following are statistics that represent various characteristics of samples and are, therefore, placed in italics: $M$, $SD$, $Mdn$, $n$, and $S^2$. The following symbols do not necessarily represent the characteristics of samples (strictly speaking), but they are statistical symbols represented by Latin letters, so they are also italicized: $t$, $F$, $df$, $d$, $r$, $R$, $p$. Finally, the following are algebraic variables represented by Latin letters, so they are placed in italics as well: $X$, $Y$.

**DO ITALICIZE LATIN-LETTER ABBREVIATIONS FOR STATISTICAL SYMBOLS.** If an abbreviation is being used as a symbol for a statistic, it should be italicized. For example, “MSE” is an abbreviation for “mean square error.” Since a mean square error is a statistic (i.e., a characteristic of a sample), the abbreviation “MSE” is placed in italics.
Similarly, “SD” is an abbreviation for the statistic “standard deviation,” so it is placed in italics as well.

**Values That Should Not Be Placed in Italics**

In general, APA format recommends that symbols should be placed in italics only if they (a) are Latin letters and (b) are being used as symbols for statistics or algebraic variables. Just because a set of Latin letters are being used as an abbreviation does not necessarily mean that they should be italicized (I mean, what cement-head would italicize “ACLU?”). This section gives examples of some of the terms that should not be placed in italics.

**DO NOT ITALICIZE LATIN-LETTER ABBREVIATIONS THAT ARE NOT STATISTICAL SYMBOLS.** Although it is okay to italicize Latin-letter abbreviations for statistics, it is typically not okay to italicize Latin-letter abbreviations for statistical procedures (i.e., data-analysis procedures). For example, “EFA” is the abbreviation for “exploratory factor analysis.” Since EFA is the abbreviation for a procedure but is not the abbreviation for a specific statistic, it is not placed in italics. In the same way, “ANOVA” is the abbreviation for the procedure “analysis of variance,” and it is not the abbreviation for a specific statistic. Therefore, ANOVA is not placed in italics.

**DO NOT ITALICIZE SUBSCRIPTS FOR TERMS THAT WOULD NOT OTHERWISE BE ITALICIZED.** If you type a statistic such as $F_{crit}$ (the symbol for the critical value of $F$), you know that you should put the “$F$” in italics because it is the symbol for a statistical test. However, you should not put the “crit” in italics because it is merely the abbreviation for the words “critical value,” and “critical value” is not a statistic. Therefore, the correct form would be $F_{crit}$, not $F_{crit}$.

**DO NOT ITALICIZE GREEK LETTERS, REGARDLESS OF WHAT THEY REPRESENT.** Greek letters include characters such as $\eta$, $\Phi$, $\chi$, $\Lambda$, and $\lambda$. Throughout this book, you saw that certain Greek letters are used to represent population parameters, specific results from a structural equation modeling analysis, and other concepts. Regardless of the purpose for which they are used, Greek letters are typically not placed in italics. Within the body of an article, Greek letters already stand out because, well, they are Greek letters and they already look kind of strange. Therefore there is no need to place them in italics.

**Preparing Tables**

When researchers have a large quantity of information to present, they often organize it as a table. This section reviews the conventions recommended for an APA-format table and summarizes the ways that the tables presented in this book sometimes diverge from APA format.

**An APA-Format Table**

In *Chapter 5* of this book, you read about a fictitious study in which a researcher randomly assigned each of 150 participants to be one of two treatment conditions. Each of the 75 participants in the high-caffeine condition consumed a relatively
large amount of caffeine each day, and each of the 75 participants in the no-
caffeine condition consumed no caffeine at all. At the end of a period of time, the
researchers obtained four separate measures of subject irritability (how
emotionally upset the participants felt or acted). The results are presented in
Table B.1.

Table B.1

Scores on Four Measures of Irritability as a Function of the Amount of Caffeine Consumed

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>High caffeine&lt;sup&gt;a&lt;/sup&gt;</th>
<th>No caffeine&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Difference between means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M_1$ ($SD_1$)</td>
<td>$M_2$ ($SD_2$)</td>
<td>$M_1 - M_2 [95% CI]$</td>
</tr>
<tr>
<td>Self-rated irritability</td>
<td>575.00 (35.49)</td>
<td>544.73 (36.13)</td>
<td>30.27 [18.71, 41.82]</td>
</tr>
<tr>
<td>Other-rated irritability</td>
<td>556.46 (35.86)</td>
<td>546.27 (36.10)</td>
<td>10.19 [-1.42, 21.80]</td>
</tr>
<tr>
<td>Self-reported outbursts</td>
<td>6.24 (2.67)</td>
<td>5.03 (2.69)</td>
<td>1.21 [0.35, 2.08]</td>
</tr>
<tr>
<td>Other-reported outbursts</td>
<td>5.24 (2.67)</td>
<td>4.99 (2.65)</td>
<td>0.25 [-0.61, 1.11]</td>
</tr>
</tbody>
</table>

Note. $N = 150$. CI = Confidence interval; $r_{pb}$ = Point-biserial correlation between the independent
variable and dependent variable.
<sup>a</sup>$n = 75$. <sup>b</sup>$n = 75$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table B.1 is generally compliant with the Publication Manual of the APA. Specifically:

- The table was prepared using the Times New Roman font.
- The table was single-spaced, although extra blank lines were inserted at
  strategic locations to improve its organization and clarity. APA format allows the table itself to be single-spaced or double-spaced (American Psychological Association, 2010, p. 141) For table titles, the line spacing may be set at single-space, 1.5 space, or double-space (Nicol & Pexman, 2010b, p. 9).
- APA format suggests that columns of numbers should be lined up by
  aligning the decimal points of the numbers in a given column, and this was
  attempted in the current table. Some word processing applications have
  tools which allow the writer to automatically line up columns of numbers
  according to the decimal points. I really must learn how to do this
  someday.
A Slightly Non-APA Format Table from this Book

For purposes of comparison, the following table (Table B.2) is more representative of the typical table that actually appears in this book. The information that it contains is the same as that presented in Table B.1, but there are a few differences with respect to format.

Table B.2

Scores on Four Measures of Irritability as a Function of the Amount of Caffeine Consumed

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>High caffeine</th>
<th>No caffeine</th>
<th>Difference between means</th>
<th>$M_1 - M_2\ [95% \ CI]$</th>
<th>$t(148)$</th>
<th>$r_{pb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-rated irritability</td>
<td>575.00 (35.49)</td>
<td>544.73 (36.13)</td>
<td>30.27 [18.71, 41.82]</td>
<td>5.18***</td>
<td>.39</td>
<td></td>
</tr>
<tr>
<td>Other-rated irritability</td>
<td>556.46 (35.86)</td>
<td>546.27 (36.10)</td>
<td>10.19 [-1.42, 21.80]</td>
<td>1.73*</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Self-reported outbursts</td>
<td>6.24 (2.67)</td>
<td>5.03 (2.69)</td>
<td>1.21 [0.35, 2.08]</td>
<td>2.77**</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>Other-reported outbursts</td>
<td>5.24 (2.67)</td>
<td>4.99 (2.65)</td>
<td>0.25 [-0.61, 1.11]</td>
<td>0.58</td>
<td>.05</td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 150. CI = Confidence interval; $r_{pb}$ = Point-biserial correlation between the independent variable and dependent variable.  
$a_n = 75. \ b_n = 75. \ *p < .05. \ **p < .01. \ ***p < .001.$

Here is a summary of the ways that Table B.2 diverges from strict APA format:

- It is typed using a sans serif font called Phoenica Standard Mono. APA format suggests that researchers should instead use a serif font such as Times New Roman.
- APA format discourages the use of condensed fonts, such as the one used here.
- The Table is numbered as “Table B.2,” and APA format requires simple, consecutive numbers such as Table 1, Table 2, and so forth.

Notes at the Bottom of an APA-Format Table

A table in an APA-format article may include one or more notes at the bottom, and these notes are used to explain the contents of the table. There are three types of notes that may be used:
**GENERAL NOTES.** A *general note* provides an explanation pertaining to the table as a whole. It may also include an explanation for any symbols or abbreviations that appear. Here is the general note that appeared at the bottom of Table B.1:

*Note.* $N = 150$. CI = Confidence interval; $r_{pb}$ = Point-biserial correlation between the independent variable and dependent variable.

**SPECIFIC NOTES.** A *specific note* is identified by a superscript lowercase letter such as $^a$, $^b$, or $^c$. A specific note explains some specific column, row, or other part of a table. Here are the specific notes that appeared at the bottom of Table B.1:

$a_n = 75$. $^b_n = 75$.

**PROBABILITY NOTES.** Probability notes are used to identify the significance levels that are used with null hypothesis significance tests. In most cases, one or more asterisk is used for probability notes. Here are the probability notes from Table B.1:

*$p < .05$. $**p < .01$. $***p < .001$.

**ORDER OF THE NOTES.** When more than one type of note appears at the bottom of a table, they should be presented in the following order:

- General notes come first.
- Specific notes come next.
- Probability notes come last.

**Conclusion**

And that’s it. You now know everything there is to know about APA format. Except for the 67,236 rules and guidelines that this appendix left out.

Seasoned researchers know that there are a lot of things to worry about when preparing a manuscript according to APA format. This appendix has barely touched the tip of the iceberg. If you plan to do much research in the social and behavioral sciences, there is really no substitute for buying a copy of the *Publication Manual of the American Psychological Association* (2010) and spending a lot of time between its covers.

Serious students and researchers should also consider purchasing two short books that focus on APA format as it applies to figures and tables:


Whereas the *Publication Manual* of the APA provides broad coverage of all aspects of the manuscript, the two books by Nicol and Pexman focus exclusively on tables, figures, and charts. They provide a multitude of examples of the ways that tables and figures can be prepared to illustrate results from empirical investigations according to APA format. The books address a wide variety of research designs and statistical procedures, from the most elementary (e.g., means and standard deviations) to the most advanced (e.g., structural equation modeling and meta-analysis). Both texts are concise, user-friendly, authoritative, and highly recommended.