

Editorial: Effective Use of APA Style in Manuscript Preparation

Larry G. Daniel

University of North Florida

Anthony J. Onwuegbuzie

University of South Florida

Manuscripts submitted for publication by educational researchers are frequently fraught with stylistic errors; however, these errors are avoidable when authors adhere closely to identified stylistic guidelines. Although there is not a uniformly accepted style guide for publications in education, the Publication Manual of the American Psychological Association (APA), one of the most commonly used guides, serves as the standard for Research in the Schools and many other outlets that publish educational research manuscripts. Following presentation of a brief history of the APA style guide, we offer guidelines for use of APA style in four specific areas: (a) basic writing style and mechanics, (b) referencing of sources, (c) methodological considerations, and (d) reporting of quantitative data.

One of the challenges for researchers in the social sciences is staying current in their fields of study. Several decades ago, Noland (1970) noted the difficulty of staying current, arguing that the social sciences literature was scattered throughout a variety of publication outlets. If staying current was a problem then, it is certain that today's technological advancements (e.g., creation of Internet-based materials), in addition to a general knowledge explosion within the social sciences, make currency a challenge for even the most astute of scholars. Researchers are also faced with changes in social policy that affect their ability to work with human subjects (i.e., participants) and regular shifts in the issues that are deemed worthy of research and/or for which external research funding is available. Finally, researchers must stay current with changes in research reporting and writing conventions. These changes may be as minimal as shifts in preferred terminology used within a given field or as sweeping as requirements that older vague or misleading language (e.g., stating that the test is reliable) be replaced with more methodologically accurate language (e.g., test scores are reliable) so as to avoid miscommunication or misunderstandings about research. Collectively, these trends and changes in

the field often result in the creation of standards governing the quality of research within a field of scholarship (e.g., American Educational Research Association, 2002, 2006).

Changes in research reporting are frequently captured in writing style guides. While publications featuring educational research use a variety of style guides, the *Publication Manual of the American Psychological Association* (APA) is one of the most commonly accepted standards within the discipline. Indeed, according to Henson (2001), 66.5% of educational journals use APA style. In this editorial we offer guidelines for use of APA style in preparing manuscripts for educational journals. Following a brief history of the evolution of the current *Publication Manual*, we offer guidelines for employing APA style in four specific areas: (a) basic writing style and mechanics, (b) referencing of sources, (c) methodological considerations, and (d) reporting of quantitative data. It is hoped that these guidelines will aid authors who desire to submit manuscripts to *Research in the Schools* and other educational journals.

A Brief History of the Evolvement of the APA *Publication Manual*

Six years ago, APA issued the fifth edition of its *Publication Manual* (APA, 2001b). The *Publication Manual* has an interesting history dating back to two early *Psychological Bulletin* articles (Anderson & Valentine, 1944; "Instructions," 1929) that

Correspondence for this editorial should be addressed to Larry G. Daniel, College of Education and Human Services, University of North Florida, 1 UNF Drive, Jacksonville, FL 32224. E-mail: ldaniel@unf.edu

established guiding principles for APA authors. The February 1929 *Psychological Bulletin* article contained seven pages that arose out of the concerns of a group of editors and managers of psychological and anthropological journals regarding the consistency and integrity of the articles they received. This article contained a set of recommendations for authors regarding procedures. The manual itself appeared some years later, in its initial form, as a supplement within *Psychological Bulletin* (APA Council of Editors, 1952) and then as a stand-alone volume (APA Council of Editors, 1957). The 1957 manual was published in a revised edition a decade later (APA, 1967), and four additional updated editions of the manual have been subsequently published (APA, 1974, 1983, 1994, 2001b), one for every decade that has elapsed since the manual's inception. Initially, the target audience for the *Publication Manual* was psychologists and researchers and authors from the field of psychology; however, over the years, its audience has broadened substantially—now being utilized throughout the social sciences, including the field of education. The *Publication Manual* has gradually increased both in girth—from 65 pages in the first (1967) edition to 208 in the third to 467 in the fifth—and in scope—from strict attention to formatting and referencing in earlier editions to a focus on “specificity and sensitivity” (APA, 2001b, p. xxiv) and socially correct language in the fourth edition and to firmer details about methodological considerations in the fifth edition. A comparison of various elements across the five editions of the *Publication Manual* is presented in Table 1.

It is quite interesting that all but one of the five editions of the *Publication Manual* have added almost exactly 70 pages of text to its predecessor. The exception to this rule was the fourth edition, which was nearly 200 pages heavier than the third edition. This was due both to changes in the physical format of the fourth edition and to the fourth edition's considerably expanded content. Perhaps the two largest changes in the manual over time are related to (a) APA's sense of an expanded audience for the *Publication Manual* and (b) the increasing complexity of the social sciences both in scope and methodology.

The Challenge of Stylistic Change

As previously noted, changes in style preferences create challenges for scholars. APA (2001b, p. xxvi) has both acknowledged the problems inherent in stylistic changes and provided a rationale for making changes: “Changes in requirements for manuscript preparation may initially be inconvenient and frustrating to authors submitting papers. Some

changes arise because of changes in APA policy, in production technology, in the economy, or in the state of science.”

Obviously, one may argue that tightened conventions regarding language usage and research reporting requirements are neither merited nor necessary. Some, for example, have suggested that requirements of this type border on policing of thought, noting that research that is poorly written will naturally be less likely to get into publication than will better written research. Conversely, others see the need for higher standards for research reporting such that analytical results clearly show what they are intended to, arguing that the field as a whole has had standards inadequate for assuring that research would regularly be of adequately high quality. At any rate, it has become commonplace for scholars and scholarly organizations to take a leadership role in ensuring that scholarship attains to high methodological standards, and the field should only expect that, as publication standards are modified, many organizations will take a firmer hand in assuring methodological purity of the research they sanction via publication and/or funding.

APA has made gallant efforts to assure that authors will comply with appropriate stylistic elements, including creation of a website specific to APA style issues (<http://www.apastyle.org>), to which users may subscribe to obtain regular updates in APA style (<http://www.apastyle.org/email.html>), and the development of excellent training materials (Gelfand & Walker, 2001a, 2001b) to assist students in the social sciences in becoming familiar with APA style. In addition to materials available from APA are a host of helpful volumes from other sources designed to assist the emerging social scientist with the research and writing process (e.g., Leedy & Ormrod, 2005; Pyrczak & Bruce, 2005; Rosnow & Rosnow, 2006; Smyth, 1996). Further, APA (2006) has developed its *APA-Style Helper* software tool that offers a Microsoft Word template for creating the basic components of an APA-formatted manuscript.

Periodic changes in the *APA Publication Manual* have the potential for affecting a large portion of the research in the social sciences. According to APA's own publicity materials (<http://www.apa.org/books/4200060.html>), APA is now the publication standard in at least six disciplines other than psychology, including “sociology, business, economics, nursing, social work, and justice administration” (APA, 2001a, ¶ 1). Because the general tone of the *Publication Manual* remains descriptive rather than prescriptive, it holds that researchers who incorporate the principles of APA style into their writing “will express their ideas in a form and a style both accepted by and familiar to

EDITORIAL: EFFECTIVE USE OF APA STYLE IN MANUSCRIPT PREPARATION

Table 1
Comparisons of Five Editions of the APA Manual

	First Edition (1952/1957/1967)	Second Edition (1974)	Third Edition (1983)	Fourth Edition (1994)	Fifth Edition (2001)
Pages	65 (61 + v)	136	208	400	467
New or Expanded Content Elements	Organization and Writing Writing Style Titles/Headings Tables and Figures References Manuscript Preparation	Expansion of typing and mailing details. Expanded section on Statistics.	Section on authorship ethics. Attention to standards for bias-free language. Increased coverage of tables and figures. Guidelines included on editorial management and journal review procedures.	Extension of bias-free guidelines to include sexual orientation, disabilities, and age. Increased information on ethical considerations of scholarship. Guidelines for referencing on-line and other electronic sources. New appendices on converting a dissertation to a manuscript and submitting electronic copies of a manuscript.	Inclusion of guidelines for non-empirical studies. Clarification of ethical issues; updated statistics section. Expanded section on referencing of electronic information.
Changes in Scope	Focused on helping authors write for APA journals.	Included sections on dissertation/thesis writing. Addressed applicability of Manual to non-APA sources (including appended list of non-APA journals).	Focused on becoming a style manual sensitive to the needs of the field.	Committed to principles of “specificity and sensitivity” (p. xxvi)—appealing to the scholar who desires to be precise in describing research while minimizing bias and pejorative references in language.	Focused on the needs of a community of scholars that is diverse in methodological approaches and that requires scientifically accurate presentation of information.
Interesting Features	Detailed though succinct; simpler style than other popular guides of the day.	Increased eye appeal of copy (wider left margins); first edition of Manual to include a sample paper; increased examples and inclusion of appendices; edition was followed up with general style change sheet (1975) and nonsexist language style change sheet (1977).	Use of tighter margins; use of darkened tabs to highlight pages containing reference examples; inclusion of sexual bias information from second edition style change sheets, along with information on ethnic bias; overt statements that goal of the Manual was to form guidelines based on descriptive use of language in the field, not prescriptive preferences of editors.	Much larger volume; return to more eye-appealing, less technical-looking copy via use of wider margins, two color text, and larger font; colored tabs utilized to flag pages for various sections (not just references); inclusion of a larger number of checklists for assisting in preparation and submission of manuscripts; switch from hanging indent to “paragraph style” indent in reference list.	Reduction in font size from previous edition, along with larger top and bottom margins; other eye-appeal features largely unchanged; return to hanging indent format in reference list; incorporation of some of material previously shown in appendices into the text coupled with new appendices on ethical principles and legal materials.

a broad, established readership in psychology [and other related disciplines]" (APA, 2001b, p. xxiii). Readers unfamiliar with APA style considerations or those needing to refresh their knowledge of the same would be wise to review the chapters on content and organization of a manuscript, expressing ideas/reducing bias, APA editorial style, reference lists, and manuscript preparation (Chapters 1-5).

Section 1.04 ("Types of Articles") is particularly useful for the neophyte social scientist who is just beginning to understand the nature of the literature. The 6-category typology of journal articles (i.e., reports of empirical studies, review articles, theoretical articles, methodological articles, case studies, and other) as described in the manual serves as an excellent schema for understanding scholarship. The latter three categories (methodological articles, case studies, and other) are nice additions to the already meaningful first three categories that were delineated in the fourth edition. Likewise, the fifth edition's sections on scholarly ethics, the parts of a manuscript, referencing of cited material, and correct formatting of tables and figures are equally utile for the graduate student and the seasoned scholar.

Guidelines for Using APA Style

The fifth edition of the *Publication Manual* (APA, 2001b) is a useful tool for students, practitioners, and researchers in the social sciences. Changes in the format from the fourth edition, especially those changes involving methodological and statistical issues, have the potential for improving the quality of research in psychology, education, and other disciplines. Like its predecessors, the fifth edition includes extremely useful general information about writing in the social sciences. While we cannot, in the present editorial, capture all of the complexities of APA style, our goal is to review guidelines in four specific areas in which we have found authors to make common errors with the hope of prompting authors to produce future manuscripts that more closely adhere to APA style. In our experience, many manuscripts are rejected largely because the author severely violates APA style, making the manuscript difficult to read and understand.

Basic Writing Style and Mechanics

Abstract. All manuscripts should include an abstract. Per APA guidelines (APA, 2001b, pp. 12-15), the abstract should be page 2 of the manuscript; it should be limited to 120 words; and it should be accurate, self-contained, concise, specific, non-evaluative, coherent, and readable.

Jargon. The *Publication Manual* requires for elimination of jargon words or phrases whenever

possible considering that jargon "grates on the reader, encumbers the communication of information, and wastes space" (APA, 2001b, p. 35). While we acknowledge that use of jargon may occasionally be necessary to reflect the evolution of terminology within a field of study, it is important that authors enclose jargon in quotation marks for emphasis and then include an explanation (often linked to a reference) explaining what the jargon means in more straightforward terms.

Use of "I" and "we." When referring to oneself, a manuscript author should freely use the pronoun *I*. Likewise, when two or more authors have written a manuscript, plural first person pronouns should be used (e.g., *we*, *our*). This method for referencing oneself is preferable to use of third-person references (e.g., "the researcher," "the authors"). However, when referring to generally-held assumptions, authors should avoid the editorial use of *we*.

Bias-free language. APA style (APA, 2001b, Chapter 2) includes a variety of guidelines for alleviating potential bias in language. Use of gender-specific pronouns is discouraged except when referring to the gender of a specifically identified (i.e., named) individual. For example, it would be correct to say, "John Dewey, in *his* work on principals of democratic education. . ." [italics added]; however, it would typically be incorrect to say, "A principal should prioritize *his* work. . ." (APA, 2001b, pp. 66-67). Likewise, those preparing manuscripts should take care to use appropriate terms when describing characteristics such as age, racial and ethnic identity, sexual orientation, or disability (APA, 2001b, pp. 67-69). Two principles are important here:

1. "Call people what they prefer to be called" (p. 63), recognizing that preferences will change over time.
2. Use "person first" language is appropriate so as to avoid labeling people (p. 64). For example, it is preferable to state "adolescents with learning disabilities" rather than "learning disabled adolescents."

Verb tenses. Those preparing manuscripts should always use the *past* tense when referring to any action that occurred in the past, including allusions to the work of other scholars or descriptions of one's own findings or research procedures (e.g., "Miller and Miller (2007) found that children with autism were unresponsive. . ."; "We gathered data from 27 participants. . .") (APA, 2001b, pp. 42-43).

Punctuation issues. APA style includes several rules regarding punctuation that remain confusing to many authors. Authors should use only one space

after a period, not the conventional two spaces at the end of a sentence to which many writers are accustomed (APA, 2001b, pp. 290-291). When using quotation marks, periods and commas should be included *inside* the closing quotation mark (APA, 2001b, p. 19).

Seriated lists. Per APA style, items in a seriated list occurring *within a paragraph of text* should be designated by lower case letters set off by parentheses—(a), (b), (c), and so forth (APA, 2001b, p. 116). Conversely, seriated lists consisting of indented items (paragraphs) should be designated by Arabic numerals followed by a period (APA, 2001b, pp. 116-117). In all cases, it is important that parallel structure be used in the wording of items within these seriated lists (APA, 2001b, p. 60).

Numbers expressed as words versus figures. The *Publication Manual* (APA, 2001b, pp. 122-130) includes a number of specific guidelines for reporting of numbers within text. These guidelines illustrate that some numbers are best represented in words; others are best expressed in figures. Although we recommend a thorough review of these guidelines, three specific rules we often see violated are included here: (a) numbers below 10 that do not represent precise measurements and that are not grouped for comparison with other similar numbers should be written as words (e.g., “interviews were conducted with six participants”); (b) all numbers 10 and above, with the exception of a number that begins a sentence, should be written in figures (e.g., “Smith (2001) identified 12 techniques for assessing student performance”); and (c) rounded large numbers should be written with a combination of figures and words (e.g., “18 million”).

Headings. A very common error is for authors not to use appropriately the levels of headings. The *Publication Manual* (APA, 2001b, pp. 113-114, 289-290) identifies the following five levels of headings: centered uppercase and lowercase heading (i.e., Level 1); centered, italicized, uppercase and lowercase heading (i.e., Level 2); flush left, italicized, upper and lowercase heading (i.e., Level 3); indented, italicized, lowercase paragraph heading ending with a period (i.e., Level 4); and centered uppercase heading (i.e., Level 5). Most manuscripts need three or four levels of headings.

Hanging indents. To the chagrin of those *Publication Manual* users who have lived through several editions of the manual, the fifth edition returned to the convention of the hanging indent for the first line of each reference in the reference list (as was used in the third edition), as opposed to the paragraph style indent used in the fourth edition. However, the fifth edition allows for exceptions to this rule, so long as a consistent format is used throughout a manuscript: “If a hanging indent is

difficult to accomplish with your word-processing program, it is permissible to indent your references with paragraph indents” (p. 299).

Judicious use of tables and figures. Whereas running text is the most dominant method for reporting research results, authors often find it useful to summarize large amounts of data using tables or figures. Authors should avoid overusing tables and figures; however, tables and figures allow for the author to condense large amounts of information and to make data more understandable. The *Publication Manual* (APA, 2001, p. 137) recommends the following rules of thumb for deciding when to use tables and figures:

- if you have 3 or fewer numbers, use a sentence;
- if you have 4 to 20 numbers, use a table; and
- if you have more than 20 numbers, consider using a graph or figure instead of a table.

Examples of tables for specific types of analyses are provided in Chapter 3 of the *Publication Manual*. General table formatting guidelines are also provided. It is important that tables and figures be produced according to APA format. Only horizontal lines are used (no vertical lines), and horizontal lines are only used at the top and bottom of the table, beneath rows containing table and column headings and between major divisions of the table. (See Table 1 for an example of a correctly formatted table.) When reporting numeric data, all decimal points should be lined up in each column, and a common number of decimal values should be used for all similar values. Although not mentioned in the *Publication Manual*, we suggest that authors use the wordprocessor’s automatic table creator to create tables because failure to do this often leads to format and spacing errors (Onwuegbuzie & Daniel, 2005).

Referencing of Sources

APA referencing includes both references in text and a reference list at the end of the manuscript. In-text referencing is used to indicate the source of specific ideas or information cited. In general, APA in-text reference style includes two elements: author surname(s) and date of publication. References should be strategically placed within text so that attribution of ideas is clear. A common error we have noted is the placement of a parenthetical reference (author and date) at the end of a lengthy paragraph, making it unclear whether all of the information in that paragraph, only the last sentence, or some other segment of the paragraph is attributable to the source. In the event of a direct quotation, care should be taken to quote the source precisely, and a page number (or, in the event of an online source,

paragraph or section number) should be provided. Another common error is that references in the parenthetical text citations and/or in the reference list are not ordered alphabetically by the authors' surnames.

The *Publication Manual* provides several stipulations for referencing the following five broad types of works: periodicals, nonperiodicals (e.g., books, technical and research reports, brochures, monographs, manuals, audiovisual media, papers presented at professional meetings, doctoral dissertations, master's theses, unpublished manuscripts, reviews, audiovisual media), parts of nonperiodicals (e.g., book chapters), online periodicals, and online documents. In particular, the following stipulations are made: (a) references are cited both in the text and in the reference list, (b) the text citations and reference list entries agree both in spelling and in date, (c) titles of works are spelled out fully, and (d) inclusive page numbers for all articles or chapters in books are provided in the reference list. A violation of any of these stipulations represents what is termed as a citation or bibliographic error (Onwuegbuzie, Waytowich, & Jiao, 2006). Unfortunately, citation errors appear to be rampant among articles submitted to journals for review. In particular, Onwuegbuzie et al. (2006) documented that the mean number of citation errors among articles submitted to *Research in the Schools* is 5.87. Even more importantly, the mean citation error rate is 28.6%, indicating that for approximately every three to four citations/references made (i.e., $100/28.6 = 3.49$) in articles submitted to *Research in the Schools*, one of them represents some type of citation error. Other journals have been found to have high levels of citation errors among articles submitted. For example, Onwuegbuzie, Waytowich, and Jiao (2005a), who examined a sample of articles submitted to *American Educational Research Journal*, a top-tier journal, found that the mean number of citation errors was 8.00 ($SD = 7.77$). Further, Onwuegbuzie, Waytowich, and Jiao (2005b) noted a mean citation error rate of 3.00 ($SD = 3.92$) for articles submitted to *Educational and Psychological Measurement*, another top-tier journal.

Citation errors can make it difficult for the reader to retrieve the cited works and to obtain, check, or verify information associated with a cited work (Onwuegbuzie et al., 2006). Errors such as misspelled author names and titles potentially could prevent important works from being retrieved, consulted, and acknowledged (Garfield, 1990). Certain errors such as incorrect publication year, journal name, volume number, or page number make it extremely difficult to locate the cited work and to complete a bibliographic database search because the

computer or search engine will not recognize such an error. Thus, authors should pay particular attention that accuracy, consistency, and completeness are obtained when making in-text citations and compiling reference lists.

According to the *Publication Manual* guidelines, a "masked review requires that the identity of the author of a manuscript be concealed from reviewers during the review process....Authors are responsible for concealing their identities in manuscripts that are to receive masked review" (p. 361). Unfortunately, as editors of *Research in the Schools* and editors, editorial board members, and reviewers of other educational journals, over the years, we have noticed that some authors grossly violate this really important stipulation either deliberately or accidentally. A common way of violating this rule is by including text citations of "my previous work" or "our previous work," especially when accompanied by a self-citation. This likely could be considered a deliberate violation. Another example is when an author when citing himself or herself (e.g., "Smith, 2007") replaces his or her name with the word "author" (e.g., "Author, 2007"); however, instead of only presenting "Author, 2007" in the reference list, the author accompanies this with complete source information (e.g., title of work, source) such that even without knowing the author's name, a reviewer who is knowledgeable of the body of literature in this area, or who uses the title or source information to conduct a literature search, could identify the author. Or, even if the reviewer was not able to identify the author from the information retained in the reference list, he or she might be unduly influenced by the quality of the source in which the article was published (e.g., top-tier journal vs. unpublished manuscript).

Other ways that authors might violate the concealment of their identities from reviewers during the review process is by (a) including the author note in the text; (b) specifying the institution, site, or location where the study took place; and (c) providing details of the funding source. A major role of many editorial assistants is to attempt to identify such violations before the manuscripts are sent out for external review; however, such violations—especially the most subtle ones—easily can be overlooked. And, making it possible for reviewers to reveal the identity of the author(s) of the manuscript prevents the manuscript from being completely blind, which severely undermines the integrity of the review process. Thus, authors should ensure that their manuscript is completely blind before submitting it to a journal wherein blind reviews are undertaken (i.e., refereed or peer-reviewed journals), which is the case for as many as 80% of education journals (Henson, 2001).

*Methodological Considerations**Selecting method of analysis and retaining data.*

As noted in the *Publication Manual*, “authors are responsible for the statistical method selected and for all supporting data. . . . To permit interested readers to verify the statistical analysis, an author should retain the raw data after publication of the research” (APA, 2001b, p. 137). Authors should make sure that the analyses they use honor the reality of the data. Likewise, authors should take care to use as parsimonious a set of procedures as possible to avoid misrepresentation of their data. For example, care should be taken to avoid use of multiple univariate analyses when a single multivariate procedure would have been possible. Similarly, authors should avoid methods of treating data that misrepresent the true nature of the data. Common *inappropriate* practices include converting interval data to nominal categories and using stepwise variable entry methods to determine variable importance. Onwuegbuzie and Daniel (2005) provided many more examples of inappropriate analytical practices. As to exactly how long to retain raw data, APA requires authors published in its journals to keep their data for at least five years. We would suggest a similar time frame.

References for methodological choices. Some statistical methods (e.g., Pearson correlation, *t*-test, χ^2) are used so commonly that almost any informed reader would be familiar with them. Other methods are less familiar to the reader. APA requirements call for the use of references when less common statistics are used or when statistics are used in a non-conventional manner.

Participants versus subjects. As was true in the fourth edition, the fifth edition of the *Publication Manual* includes guidelines delineating when the term “participants” is preferred over “subjects.” The former term identifies and credits persons in a study for what they have undertaken, whereas the latter identifies persons (or other studied entities) for purposes of statistical reporting only. Though the wording in the fifth edition is only minimally different in these sections, it is at least a little clearer. For example, page 65 states the following:

Write about the people in your study in a way that acknowledges their participation. Replace the impersonal term *subjects* with a more descriptive term when possible and appropriate—*participants*, *individuals*, *college students*, *children*, or *respondents*, for example. *Subjects* and *sample* are appropriate when discussing statistics, and *subjects* may also be appropriate when there has been no direct consent by the individual involved in the study (e.g.,

infants or some individuals with severe brain damage or dementia).

Despite this attempt to provide differentiation in terminology, it is quite possible that some descriptions of persons’ participation in a study will include statistics, making the decision as to which term (subjects or participants) to use not as clear cut as would be desirable.

Reporting of Quantitative Data

The *Publication Manual’s* fifth edition’s information on presentation of statistical material builds on the content of the same section as specified in the fourth edition and also makes references to recent calls for improved reporting of statistical results (e.g., Wilkinson & Task Force on Statistical Inference, 1999). The manual advocates the reporting of “informationally adequate [descriptive] statistics” (APA, 2001b, p. 23), including the reporting of the following “minimally adequate statistics” for multivariable analyses:

means(s), sample size(s), and the variance-covariance (or correlation) matrix or matrices. . . . For correlational analyses . . . the sample size and variance-covariance (or correlation) matrix are needed, accompanied by other information specific to the procedure used (e.g., variable means, reliabilities, hypothesized structural models, and other parameters).

These informational statistics should be appropriately precise so as to make comparisons of values meaningful, although it is important, as noted by Rosnow and Rosnow (2006, p. 66), that authors also avoid “false precision” (e.g., use of multiple decimal places for reporting data that are collected imprecisely) and “needless precision” (e.g., use of multiple decimal places when meaningful data interpretations do not require that level of precision). While the statistical requirements noted in the fifth edition could clearly have been stated more directly and strongly—see criticism by Onwuegbuzie, Roberts, and Daniel (2004) regarding limits of the fifth edition requirements—it is nevertheless clear that the fifth edition’s calls for information that will allow readers of research to make better judgments about the adequacy of findings are a step in the right direction.

Specific guidelines are also provided in the fifth edition of the *Publication Manual* for reporting the results of statistical significance tests, the statistical power of tests, and statistical effect sizes. In regard to statistical power, the manual notes, “you should routinely provide evidence that your study has sufficient power to detect effects of substantive

interest” (p. 24). Regarding tests of statistical significance, the fifth edition includes several new guidelines: (a) preference that the exact value of p -calculated be reported as opposed to a p less than alpha conclusion (e.g., $p = .036$ rather than $p < .05$), so as to allow for those researchers who disfavor *a priori* p -critical determinations; (b) strong recommendation that confidence intervals be reported along with parameter estimates; and (c) strong suggestion that effect sizes be reported along with findings of statistical significance tests.

While we are in agreement in general with Item (a) above (preference for exact p -calculated values), we would caution readers to be aware of the fact that probabilities are never zero even when “exact” p -calculated values yielded by statistical software might lead one to believe this to be the case. Hence, an “exact” value reported as “.000” by a statistical software package should be reported in text as “ $p < .001$.” While this convention would appear to violate the preference for precision included in the *Publication Manual*, it serves to alleviate another problem, namely the potential for the erroneous conclusion that the probability of a Type I error is zero.

Regarding Item (c) above (effect size reporting), the fifth edition includes a slight step up in the language of the fourth edition, which merely “encouraged” reporting of effect size estimates. Consistent with a call for more meaningful reporting of statistical results (e.g., Kirk, 2001), the fifth edition leans toward an imperative for reporting of statistical effects:

It is almost always necessary to include some index of effect size or strength of relationship in your Results section. You can estimate the magnitude of effect or the strength of relationship with a number of common effect size estimates, including (but not limited to) r^2 , η^2 , ω^2 , Cramér's V , Kendall's W , Cohen's d and κ , Goodman-Kruskal's λ and γ , Jacobson and Truax's (1991) and Kendall's (1999) proposed measures of clinical significance, and the multivariate Roy's Θ , and the Pillai-Bartlett V . (APA, 2001, pp. 25-26)

Despite the general usefulness of APA style, the present guidelines for statistical reporting are not as comprehensive as they should be. Although various shortcomings of the guidelines could potentially be pointed out, we will limit our comments to five issues. First, it has often been pointed out (e.g., Thompson & Vacha-Haase, 2000) that measurement characteristics, such as validity and reliability, are

characteristics of data, or scores, and not of test instruments. Nevertheless, it is also common that researchers misunderstand the nature of score characteristics, making statements such as, “This is a reliable test.” It is further interesting, despite great effort by APA and others to correct these common misperceptions about score characteristics, that the manual still utilizes poor models of language usage in this area. For example, in a list of questions the researcher might ask to judge the quality of a manuscript, the manual includes the following query: “Have the instruments been demonstrated to have satisfactory reliability and validity?” (p. 6).

Second, despite the increased attention the manual gives to the importance of routine reporting of effect sizes, it is interesting that the instructions for presenting data in analysis of variance (ANOVA) tables (p. 160) do not require that the author include any measure of effect size (e.g., η^2 , ω^2), even though these indices are relatively easy to compute given basic sum of squares and variance statistics. It is comforting, however to see that the ANOVA table provided in the manual as an example (p. 162) does include a column for eta (η) values.

Third, despite calls for interpretations of variable contributions in multiple regression analyses (and other similar correlational procedures) that honor the correlational logic of the technique (e.g., Courville & Thompson, 2001; Thompson & Borrello, 1985), it is discouraging to see that the example given for reporting regression results is limited to the presentation of regression (b and β) coefficients (p. 132). It is hoped that APA in future editions of the manual will address the importance of both weighting coefficients and structure (i.e., correlational) coefficients.

Fourth, APA contains a gross contradiction that, to date, no one seems to have noticed. Specifically, on page 209, the *Publication Manual* states that “When a work has six or more authors, cite only the surname of the first author followed by *et al.* (not italicized and with a period after ‘al’) and the year for the first and subsequent citations” [italics in original]. Yet, several pages later, on page 241, it is stated that “After the sixth author’s name and initial, use *et al.* to indicate the remaining authors of the article” [italics in original]. Clearly, “six or more” (p. 209) is not the same as “After the sixth.” Thus, this inconsistency needs to be resolved in future editions of the *Publication Manual*.

Finally, even though the *Publication Manual* classifies empirical studies—presumably including both quantitative and qualitative reports of original research—as representing one of five types of journal articles (the other four types being review articles, theoretical articles, methodological articles, and case

studies), an examination of the index (pp. 413-439) reveals a very heavy, if not exclusive, bias toward quantitative research. For example, there are multiple descriptors that pertain to the reporting of quantitative data (e.g., statistical and mathematical copy; statistical symbols; statistics; p. 435). This index also includes quantitative-based descriptors such as “alpha level” (p. 414), “ANOVA tables” (p. 414), “beta coefficients” (p. 415), “chi-square tests” (p. 417), “correlation analyses” (p. 418), “effect size” (p. 420), “*F* tests” (p. 421), “Factor analysis” (p. 421), “LISREL tables” (p. 425), “Means” (p. 426), “meta-analyses” (p. 426), “multiple regression analysis” (p. 427), “multivariate analyses” (p. 427), “nonparametric analyses” (p. 427), null hypothesis significance” (p. 428), “order statistics” (p. 428), “parametric tests of location” (p. 429), “population statistics” (p. 430), “probabilities” (p. 430), “regression analyses” (p. 433), “regression tables” (p. 433), “repeated measures designs” (p. 433), “*t* tests” (p. 436), “Tukey test” (p. 437), “unstandardized coefficients” (p. 438), and “variance-covariance matrix” (p. 438). Yet, the index section of the *Publication Manual* does not include corresponding descriptors for reporting qualitative methods, data, data analysis, and inferences. As noted in Zeller and Farmer (1999), who critiqued the fourth edition of the *Publication Manual*—and which still appears to be accurate for the latest edition of the *Publication Manual*—“Judging from its structure and content, it would seem that, at best, the *Manual* is indifferent to qualitative research or, at worst, inhospitable to qualitative research’s assumptions about knowledge and language” (p. 10). Nor are there any descriptors pertaining to mixed research. Thus, qualitative and mixed methods researchers have minimal explicit guidance for writing reports that are consistent with APA style.

Conclusion

The *Publication Manual of the American Psychological Association* serves as a guide for scholarship in education. It is important that those who use the manual understand its strengths as well as its limitations. It is encouraging that APA has become sensitive to the technological capabilities of the average author and is now making allowances for features such as the use of italics within manuscripts and has built its guidelines for displaying equations consistent with the equation editing capabilities available in today’s word processing programs. It is also encouraging to see that APA is paying attention to the larger discussion in the field regarding methodological reporting issues. It is disheartening, however, to find that there are still various inconsistencies in the manual that may lead to

misperceptions. Also, it is disappointing that APA does not include guidelines that are consistent with the assumptions, methods, and practices of qualitative researchers and mixed methods researchers. However, it would be unwise to rest the entire burden for monitoring scholarship on one publication; hence, extreme criticism of the *Publication Manual* is not justifiable. Standards are beginning to emerge governing the quality of educational research (American Educational Research Association, 2002, 2006), and these should have an impact on the scholarship within the field (Elmore, Camilli, Onwuegbuzie, & Mallette, 2007). When guided by good tutelage from other sources and high standards for research as proposed by AERA, the educational researcher would benefit greatly from reading of and strict adherence to the *APA Publication Manual*.

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