

Guidelines for Writing Physics Research Papers

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Abstract

The second page of your paper contains your abstract. An abstract is a brief, comprehensive summary of the contents of your paper. It should be accurate, self-contained, concise and specific, non-evaluative, coherent, and readable. It should reflect the purpose and content of your paper. It should be limited to about ½ page. It might contain the topic in one sentence; the purpose, thesis, or organizing construct, the scope (comprehensive or selective) and the conclusions.

Guidelines for Writing in APA Style

APA style is the style of writing specified in the Publication Manual of the American Psychological Association (4th ed., 1994). The Following is an adaptation from the APA style, and is only a suggested style for your physics research papers. With permission, you may vary from this document, and this document varies from the original APA document. This is meant to be used as a quick reference when writing papers and NOT as a substitute for any style guide itself. Remember that if you are writing a paper for class, your professor's specific instructions (e.g., headings with letters added) take precedence over those of the Publication Manual (p.334). The page numbers given at the end of each checkpoint reference where to find information on the specific topic in the Publication Manual.

Basic Format

1. Margins are to be 1" from top, bottom, and sides (except the manuscript page header; APA, 1994, pp. 240-241).
2. Double-spaced in all situations (p. 239).
3. Acceptable typeface is Courier or Times New Roman and in 12-point size (pp. 237-238).
4. Justification only on left side of paper. In other words, the right side of the paper should have ragged edges (p. 240).
5. Page numbers begin with title page (p. 241).
6. Paragraphs are to be indented five to seven spaces (p. 242).

Checkpoints for Manuscript

The manuscript page header (your last name) at the top right of the page (1/2 inch down) is followed by five spaces and then the page number. You may omit the page header if you

prefer. For the title page, in the middle of your paper, type and center the following information: Full title of the paper (recommended title is less than 10 to 12 words), your name, and institution affiliation (APA, 1994, pp. 248-250).

The abstract page should follow the title page. It should start on a new page and be your page number two. Type the word Abstract centered on the first line of the page. It should be in block form and left justified, in other words, DO NOT indent paragraph. The abstract is a brief, comprehensive, and specific summary of your paper (APA, 1994, pp. 8-11, 250). Not all professors will require you to write an Abstract page.

The text of your paper will begin on either page two or three, depending on whether or not you are including an abstract. Begin by typing the title of your paper and centering it. The next line should be indented five to seven spaces and begin your text (APA, 1994, p. 251).

All references should be of the endnote type. Within your paper, use consecutive numbers, either as superscripts¹ or in brackets [1] to identify your reference sources. All reference numbers belong within the punctuation [2]. In this document, the APA reference style is used, where more information is given in-text than just the reference number. For a scientific paper, use only a reference number in the text, with the full citation in the endnotes.

The reference page (endnotes) follows your text. Begin on a new page and type the word References and center it. If you only have one reference type Reference. If your references take up more than one page, DO NOT re-type the word references on sequential pages, simply continue your listings with the first line on the next page (APA, 1994, p.251).

Rules of APA

Quotation Marks

Use quotation marks to set off the title of an article or chapter in a periodical or book when the title is mentioned in text, to introduce a word or phrase considered slang, or as an invented or coined expression. An example would be the "high tolerance" variable (no quotation marks after the initial usage; APA, 1994, pp. 65-66).

Abbreviations

Abbreviations should be used sparingly throughout your paper. Always spell out what the abbreviation means the first time it is used. An example would be Minnesota Multiphasic Personality Inventory (MMPI). Thereafter, use the abbreviation.

Spacing

Space once after colons, commas, semicolons, after periods that separate parts of a reference citation, and after the periods of the initials of personal names (e.g., W. U. Borst). Do not space after internal periods in abbreviations (e.g., a.m., i.e.; APA, 1994, pp. 239, 244).

Numbers

Use the Arabic symbol with numbers 10 and above (12, 50, etc.) except if being compared with numbers 10 and below. For example, the 4th and 11th grades took a test. However, use the numerical symbol for all numbers in your Abstract page. Spell out the number when beginning a sentence and numbers below 10. To make plurals out of numbers add 's' only with no apostrophe (the 1990s). Use combinations of written and Arabic numerals for back-to-back modifiers: e.g. six 2-point scales (APA, 1994, pp. 99-105).

Underlining and Italicizing

Generally, do not use underlining. This document does, but replacing that with italics is preferred. Underlining and italicizing are synonymous, and italics are preferred. Do not

underline or italicize for mere emphasis. Underline for titles of books, introduction of new terms and labels (the first time only), statistical symbols (t test), and volume numbers in reference lists (APA, 1994, pp. 80-82).

Headings

Headings indicate the organization of the manuscript and establish the importance of each topic. The Publication Manual (4th ed., 1994) covers the specifics from pp. 90-93. The level of headings numbers from a Level 1 heading to a Level 5. Do not label headings with numbers or letters (unless instructions differ from professors).

The following are examples of how they are to be typed:

Level 1 Heading

Centered Uppercase and Lowercase Heading

Level 2 Heading

Centered, Underlined, Uppercase and Lowercase Heading

Level 3 Heading

Flush Left, Underlined, Uppercase and Lowercase Side Heading

Level 4 Heading

Indented, underlined, lowercase heading with a period.

Level 5 Heading

CENTERED UPPERCASE HEADING

In papers with: (a) 2 levels of headings use levels 1 and 2; (b) 3 levels of heading use levels 1, 3, and 4; (c) 4 levels use 1, 2, 3, and 4; and (d) 5 levels use 5, 1, 2, 3, and 4. (Within a

paragraph or sentence, identify elements in a series by lowercase letters in parentheses; APA, 1994, pp. 93-94).

In most cases, a level 1 heading can be used throughout your paper. Please note that this paper contains three levels of headings and therefore uses levels 1, 3, and 4. In general, follow the rules of making an outline. For example, if you are required to write a paper on depression the professor will more than likely want you to divide the paper using these headings: Overview of the topic, diagnostic criteria, treatment of the disorder, and personal commentary on the topic. Use a level 1 heading throughout your paper since each topic is of equal importance. Example:

Summary of Depression in Adults

Diagnostic Criteria for Depression

Treatment of Depression in Adults

Personal Commentary on Depression

Citation of Sources in Text (Example of a Level 1 Heading)

The citation of sources is a key point in writing in APA style format. The Publication Manual of the American Psychological Association (4th ed., 1994) states that "whether paraphrasing or quoting an author directly, you must credit the source. . . ." If any material is left out use three ellipsis points (. . .) within the sentence, use four ellipsis points (. . . .) when material is left out between two sentences. If inserting explanations in a direct quotation use brackets, not parenthesis. If any incorrect spelling, grammar, or punctuation in the source might confuse readers, insert the word *sic*, in brackets and underlined (i.e., [sic]), immediately after the error in the quotation (APA, 1994, pp. 95-96).

With quotations of 40 or more words, DO NOT use quotation marks. Set off the quotation in Block style format (Start quote on new line indented five spaces. Each subsequent line is also indented; APA, 1994, pp. 95-96).

In general, our findings support Piaget's view that perceptions as well as intelligence are neither entirely inborn nor entirely innate but are rather progressively constructed through the gradual development of perceptual regulations. The chapter has also attempted to demonstrate the applicability of Piaget's theory to practical issues by summarizing some research growing out of an analysis of beginning reading [3].

When paraphrasing someone else's material, you are required to cite it. For example, Smith (1996) found that test scores do not necessarily always correlate with IQ scores. If your paragraph is entirely taken from someone else's findings, thoughts, beliefs, etc., then at the end of the paragraph insert a reference number [4].

Citation of a work discussed in a secondary source. A primary source is the article, book, etc. that you have read and used to cite in your paper. In some cases you might wish use a citation from that work. This is called a secondary source. You should always try to consult the original source. However, if you cannot, you should cite the source in the text, and refer to the sources you actually read. In the reference section, include only the source that you actually consulted.

For example, suppose you read a paper by Borst (1997), and in that paper he refers to a paper by Weisenmiller (1996). If you DID NOT actually read Weisenmiller (1996) yourself, then in the text, you might say: Weisenmiller (as cited in [6]) recommends working in the computer industry. In the reference section, you would include a reference for [6], but NOT for Weisenmiller.

Examples of References

The Reference(s) page(s) begins on a new page. The references should be listed in the order that they were first referenced in the paper. All references should be double-spaced and numbered. The following reference formats are given as examples, and obviously do not cover

how to cite every type of reference.

Article in a journal: Authors, Journal Name **Volume**, First Page Number (Year).

1. P. A. Sheldon, R. B. Hallock and M. P. Lilly, *Physical Review Letters* **30**, 728 (1998).

Book: Authors, *Book Title* (Publisher, City, Year).

2. Abragam, *The Principles of Nuclear Magnetism* (Oxford University Press, London, 1961).

Dissertation: Author Thesis Type, University, Year.

3. K. S. Ketola Ph.D. Thesis, University of Massachusetts at Amherst, 1994.

Website: author, title, website address, (date posted, date accessed).