How (Not) to Write Lab Reports in APA Format for PSY 333, Learning & Behavior Lab

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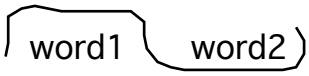
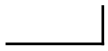
This manual is meant to be read (and re-read again and again) ... *before* you attempt to write each of your lab reports. It is in addition to—and consistent with—any APA manuals (e.g., the departmental one and the "APA Template") you might have been using otherwise. This manual contains a number of specific examples that should help you implement the APA format in our specific fields of experimental psychology: Experimental Analysis of Behavior (EAB) and Applied Behavior Analysis (ABA). For editorial purposes and for corrections, we use a specific notation, which simplifies providing you with useful feedback. The key to this notation is provided below under "Key to Comments on Your Manuscript". For example, rather than writing "This is not a complete, grammatically correct sentence", I might write "ns" for "Not a Sentence" in the margin of your paper, if in fact you had written a sentence that was not complete in a grammatical sense. Finally, I will provide you with a template paper (really a manual formatted in APA style) as a hard copy and as an electronic file, which you can copy off the lab computers. As the saying goes, one picture tells a thousand words. Read the text in the template paper, too.

As a general rule, every student has to use a spell-check before handing in his/her paper. Also, every student has to have another person, preferably not a student of this class, read the paper. A person who is not a student in this class will be the best judge of whether what you wrote is generally understandable or not. If not understandable, something is wrong with your paper, and you should revise it before you get a grade for it.

NOTE: Spelling, APA-format, and the general care you take to prepare your paper will be graded. No hand-written papers will be accepted. You have to use a word processor for your papers (e.g., Microsoft Word). Also, use a computer to prepare your graphs (e.g., Microsoft Excell). Only black-and-white, no color, is allowed anywhere in your manuscript. If you are not familiar with the appropriate programs, take the opportunity now to become computer literate. It's a benefit not just for this class, but also for the rest of your life. You could ask either classmates to help you, or you may contact the Office of Information Technology Help Desk (718.982-4357) to find out if any workshops are being offered. (You may even receive a free memory stick for participation!) Alternatively, you can call the Learning Assistance Resource Center (718.982-3963/4115).

Key to Manuscript Corrections

¶	Use new paragraph
	Delete this word (or words).
	Switch order of words.
	Indent this paragraph.
^	Insert the word or words above this symbol.
sp	Incorrect spelling. (Spelling will be graded.)
ns	Bad sentence. Not a complete, grammatically correct sentence.
frm	You used incorrect formatting. Reread the relevant section in your manuals or ask.

Complete Sentences and Grammar

Every sentence in the manuscript has to be grammatically correct and complete, EXCEPT the title, the running head, table headings, and the first sentence in a figure caption. (Even in the Abstract, sentences have to be complete, even though you might read chopped sentences in Abstracts you retrieved from the internet.)

Examples

Bad: White Carneau pigeon maintained at its 80% ad lib. weight.
Good: A White Carneau pigeon was maintained at its 80% ad lib. weight.

Bad: Even though Jones (1972) found that response rate was not a function of food amount.
Good: Even though Jones (1972) found that response rate was not a function of food amount, the present study suggests a direct relationship between these two variables. [You need to complete the sentence somehow.]

Bad: Response rate and response latency *is* a dependent variable (Jones & Smith, 1987).
Good: Response rate and response latency *are* dependent variable*s* (Jones & Smith, 1987).

Bad: Data *was* recorded for five sessions.
Good: Data *were* recorded for five sessions. ["Data" — a plural word!]

The Grammatical Comparative

A comparative is a word construction that expresses how one thing compares to another. Examples: "A VW is cheaper than a BMW", "Mary is taller than Bob" or "A pigeon flies faster than a rat." Note the "-er" ending and the "than" (not "then"!). On very rare occasions, you may deviate from this sentence structure. For example, if you had been talking about food and water reinforcers only—in other words, if it's absolutely clear what the two things are that you are comparing—, then you may write something like "Response rates were higher with the food outcome." (and not include "than with the water outcome"). But 99% of the time, you need to make reference to the two items of comparison.

Examples

Bad: Response latencies were shorter in the VR 20 condition. [missing "… than …"].
Good: Response latencies were shorter in the VR 20 condition than in the VI 30-s condition.

Bad: Jane is smarter.
Good: Jane is smarter than Bob.

Bad: Wheaties are more better. [Another problem: "more" is redundant here.]
Good: Wheaties are better than Grape Nuts.

The (Grammatical) Subject (= Topic, not the pigeon or child!) of a Sentence in Your Paper is Behavior (huh?)

In our field, the main subject of a paper is not the participant (human) or the subject (pigeon) but *behavior* ... only behavior (e.g., pecking, tantrumming, saying "Ah!", adding numbers, etc.). Grammatically speaking, in the sentence "The pigeon responded five times in the first minute", *pigeon* is the subject and *responded* represents the behavior we are interested in. In an EAB or ABA paper, this sentence should be rewritten to: "Five pecks occurred in the first minute" because *pigeon* is completely irrelevant for your behavior analysis. (That we are dealing with a pigeon is covered in the Subject section. See below. If you use "pecking" instead of responding, it's clear anyway that we are not talking about rats or children. Always be as specific and informative as you can.) The behavior analyst wants to hear about behavior (e.g., response rates), not about pigeons, people, mice, rats, or Ploog.

The only time the word "subject" should show up is in the Method section's subsection "Subjects". Here you specify, once, all characteristics of your subjects that might matter for the behavior in question (such as age, sex, deprivation schedule, learning history, disabililities, etc.).

Examples

Bad: The subject pecked three times at the key under Condition A.
Good: Three key pecks were recorded under Condition A.

Bad: The participant was lazy and responded only three times.
Good: Only three responses were observed.

Abbreviations

No abbreviations are allowed ever in the Abstract. In the other parts of your paper you may (and should) use abbreviations, after defining them first. Example: "Under a fixed ratio 20 (FR 20) schedule, every twentieth key peck is reinforced." From then on, you may simply write "Under the FR 20 schedule, responding increased …" (for example).

Other Abbreviations: fixed ratio 99 (FR 99); fixed interval three seconds (FI 3-s); variable ratio four (VR 4); variable interval two minutes (VI 2-min); seconds (s); minutes (min); centimeters (cm); grams (g).

Note, that the correct abbreviation for FR 3 schedule does not include a hyphen or any unit, while the correct abbreviation for FI 30-s schedule does include a hyphen and a unit of measurement (s). All interval schedules have to include a unit such as s (for seconds) or min (for minutes).

Cite Other Researchers' Work

Each paper has a "References" section at the end of the paper (start new page, type "References" centered, not underlined, not bold, not all in caps), which lists all work that was cited in the text (mostly in the Introduction, Results, and in the Discussion), complete with name, title, journal name, volume, and page numbers (see below). When you refer to others' work, you have to follow the proper format. Unless you are writing a text book, you should never write things like "In 1987, Joan Jones at the University of Jonestown discovered that food amount affected response rates." It's also not appropriate to even include the initials. For example, "B. O. Ploog and H. P. Zeigler (1996)" should be "Ploog and Zeigler (1996)".

Correct Examples

For one or two authors' names, if cited in a sentence (note placement of the "and" and the years in parentheses): "Dunn (1998) and Kutt and Dride (1970), for example, found evidence that in some cases large, delayed reinforcers may be preferred over small, immediate ones."

For one or two authors' names, if cited in parentheses (note the "&" symbol, commas, and semicolon): "Generally, large delayed reinforcers are preferred over small immediate ones (e.g., Dunn, 1998; Kutt & Dride, 1970).

For multiple authors, if cited in a sentence for the first time: "These findings are in agreement with the results reported by Smith, Jones, and Johnson (1989)." If additional references to this study are done later in your paper, write: "Smith *et al.* (1989) also found that …". The "*et al*." means "and others" in Latin. Note the italics and period after "al".

For multiple authors, if cited in parentheses for the first time: "Response rates are an estimate of response probability (Smith, Jones, & Johnson, 1989). Additional references to this study are done by writing: "Similar findings were reported by other investigators (e.g., Smith *et al.*, 1989)." Again, note the italics and period after "al".

You should never provide lengthy verbatim quotes (like copying two sentences out of another paper). Remember, this is not a literary piece of writing. The idea is to extract, in as few words as possible, what is relevant and crucial to make your point and to convey the information to the reader. … which leads to the next point:

Write to the Point

"Write to the Point" is the title of a book written by Bill Scott (Columbia University Press) and expresses, right to the point, what you should do in a paper. Be greedy with ink. Don't waste space with unnecessary words. If you can say something in two words, it's better than saying it in three words. If there is a common word for a concept use the common word, not the fancy one. Avoid useless words like "somewhat", "certain", and "dramatic". The point of an experimental paper is not to impress anyone by how fancy, literate, and learned you are, but to communicate most efficiently what needs to be said.

Examples

Bad: Response rates were high *due to the fact that* reinforcement magnitude was large.
Good: Response rates were high *because* reinforcement magnitude was large.

Bad: In certain conditions, one might be tempted to perhaps suggest that response rates decreased somewhat if at all. [Maybe this sounds cool, but it's real nonsense and won't impress me.]
Good: Response rates decreased by 5.2 % in the reinforcement condition.

Bad: Certain conditions produced low response rates.
Good: Conditions A and C produced lower response rates (23 resp/min) than Conditions B and D (47 resp/min). [Most of the time, "certain" in this context means that you can't be more specific. It does not mean that you are "certain" about an outcome. But you should be specific in your writing.]

Bad: The response rates increased dramatically in the second condition. [Is there really a "drama" going on? The curtain opens, the sword is drawn, and … the pigeon pecked seven times instead of once.]
Good: The response rate increased by a factor of seven in the second condition.

Bad: This outcome is somewhat consistent with others. [Is it or is it not consistent?]
Good: Response rates were consistent with response latencies but not with response topographies.

Bad: Three-D bar graphs (generally speaking) with 200 labels are bad. Everyone and his/her grandma know nowadays how to be fancy with a "plug-and-play" computer. Do not ever use color in your figures.
Good: Simple black-and-white bar or line graphs with clear legends and labels for the x and y axes. Don't use huge solid black areas. See "Figure 1" in the template paper.

Ploog's Pet Peeves

- Pigeons can be found here and *there* [NOT "*their*"].
- Students complained. *Their* complaints were legitimate [NOT "*There*"].
- *It's* (meaning "It is") time to be merry! [NOT "*Its*"]

- A White Carneau pigeon served in the present experiment. *Its* age was four years. [NOT "*It's*". I think the "its" is called a possessive pronoun.]
- Respon*s*e [NOT "respon*c*e"]
- Environment [NOT "enviornment"]
- The *e*ffect of aspirin was to reduce headaches. [NOT "*a*ffect"]
- Food amount *a*ffected response rates. [NOT *e*ffected]
- The President *e*ffected a radical change [NOT *a*ffected. "To effect" means to cause, to bring about. The President may "affect" an emotion, i.e., be phony about something.]
- Bob's *a*ffect was flat whenever he was depressed. [NOT *e*ffect]

→ Look up all those in a standard dictionary!

Specific Considerations for Each Section of an APA-Formatted Paper

(For each section, refer to the APA Template that I gave you in a separate document.)

General

All pages and parts of a manuscript should be typed, double-spaced, with about a one-inch margin on all sides. Throughout, use only one font type, one size, one style, and ragged right margin (i.e., not right-justified). The manuscript should not pretend to be a piece of work that has been published already. The point here is not to make it look pretty, but to make it functional (i.e., easily readable) for the reviewer and with clear instructions for the type setter, who will put the manuscript in its printed version. There are a few exceptions to the one-font-one-style rule. Certain headings (e.g., Subjects, Apparatus, Procedure in the Method section; journal name and volume in the References section) must be <u>underlined</u> or *italicized*. Be consistent. Either underline or italicize. Still, the font type and size has to be the same throughout the paper (but this rule does not apply to Figures. Still, keep all figures as simple, clear, and consistent in style as possible.)

A complete manuscript consists of Title Page, Abstract, Introduction, Method, Results, Discussion, Authors' Note, References, Table(s), Figure Caption(s), and Figure(s) ... in exactly this order. For more details, see the APA template.

Title Page

- Specify "Running Head". This is the short title that will appear on the top of every odd-numbered page of the published paper. The running head itself, as specified after "Running Head:" on the title page, should be typed all in capital letters.
- The title should contain, at a minimum, the independent variable, the dependent variable, and the subject/participant. Example: The effect of food amount [independent variable] on response rates [dependent variable] in pigeons [subject]. Or: Response rates [dependent variable] as a function of food amount [independent variable] in rats [subject]. Or: The use of tokens [independent variable] to reduce the rate of self-stimulation [dependent variable] in children with autism [participant].
- Include your name (centered under the title) and your affiliation (your college, university, institution, or employer). Do not write "by" as in "by Mark Twain" (which would be appropriate, if you were to write a screen play, novel, or fictional short story).

- In the upper right corner, repeat the first three or four words of your long title, exactly as they appear in the long title. (This is not going to be your running head. It's simply a label to keep all pages of a manuscript together, should the manuscript pages get separated when the type setter, editor, or reviewer is working on it.) To the right of these few words, include the page number. The words and page number should appear on each page of the manuscript EXCEPT on the pages with the figures.

Abstract

- A brief summary of not more than 200 words that should include all four main parts of the manuscript (Introduction, Method, Results, and Discussion). 200 words is about 3/4 of a page, if double-spaced with 12- or 14-point font size (depending on the font itself).
- The block of text of the Abstract is NOT indented. There are no paragraphs. Avoid using abbreviations or citations.

Introduction

- Do not label this section with the word "Introduction". You don't even repeat the title of your paper on the top (as was done with the old APA format).
- The introduction should, as the name implies, introduce the reader to the purpose of the study. You need to state your hypothesis and you also need to review work that was done and is relevant to your study. Remember the proper way of citing related work (see above). For stating your hypothesis, you might want to say something like "The present experiment was conducted in order to find out whether an increase in food amount would result in an increase in response rates." Don't say "My alternative hypothesis was …". This section is generally written in past tense, because mostly you report findings from experiments that have been completed by the time the reader gets to read about them. Universal truths may be stated in present tense (e.g., "Reinforcers strengthen responses.")

Method

- Write the label "Method" on top of this section. (Do not begin a new page.) The label is centered and not underlined (and not bold).
- The Method section contains all technical details that are important should another researcher want to replicate your study. Details that are most likely not important for the outcome of the study may be left out, but obviously this is a judgment call. (For example, was the time of the day when the experiment was conducted important? Maybe yes, maybe no. If in doubt, include the detail. The reviewers will edit it out, if it is unnecessary.)
- This section is generally written in past tense because by the time you write your paper, the Method was implemented in the past.

Examples

Bad: The experiment takes place in a ... [present tense is wrong here]
Good: The experiment was conducted in a ... [past tense is correct here]

Bad: A White Carneau pigeon serves in the experiment. [present tense is wrong here]
Good: A White Carneau pigeon served in the experiment. [past tense is correct here]

Results

- Write the label "Results" on top of this section. (Do not begin a new page.) The label is centered and not underlined (and not bold).
- The Results section is supposed to report all the important findings. Just state your observations (in terms of the dependent variables as functions of the independent variables) without interpretation. This section is generally written in past tense, because by the time you write your paper, the experiment was completed and is in the past. In other words, you already did your observations.

  Examples

  Bad: The pigeon *is* responding with high response rates. [present tense is wrong here]
  Good: High response rates occurr*ed* under the large-reinforcement condition. [past tense]

- Indicate in your manuscript where you would like the Figures and Tables included (see APA template, dotted lines in Results), with dotted line, "Insert Figure 1 about here", and dotted line again.
- Explain your figures, do not make assumptions that the reader can guess what you mean.

  Examples

  Bad: The response rates decreased from 12 to 7 resp/min.
  Good: Figure 1 shows response rates over sessions. The response rates decreased from ...

  Bad: The subject did not want to work hard because he only pecked four times. [This is bad for a number of reasons! Review the points above!]
  Good: Only four pecks were recorded for the entire duration of the test phase.

Discussion

- Write the label "Discussion" on top of this section. (Do not begin a new page.) The label is centered and not underlined (and not bold).
- The Discussion section should discuss the findings reported under Results in context of your hypothesis and of other work that has been done in the particular field of study. Here you are allowed to interpret the results. Wild speculations, however, are never good. You are supposed to base your arguments on data you obtained. Are the data in (dis)agreement with your hypothesis and other work? How so? Are there any plausible reasons for this particular outcome? Is there any literature that supports the peculiar aspects of your findings?

  Examples

  Bad: Response rates of 145.6 resp/min are clearly a sign for the excitement the pigeon was experiencing when it finally obtained food after working hard for two hours.
  Good: A response rate of 145.6 resp/min in this context is probably a good indicator that food reinforcement was very effective in generating high response rates after the long extinction phase.

Bad: The response rates in the present study were lower than those reported by Jones (1999). It may have had something to do with the fact that the pigeon just did not like the color red.

Good: The response rates in the present study were lower than those reported by Jones (1999). A possible explanation is that in Jones's study red key lights were employed whereas in the present study blue key lights were employed. There is some evidence that pigeons have a preference for warm colors (e.g., Somestudy, 1990).

- You may mix past tense and present tense in this section.

  Example

  The response rates were [past tense] higher under Condition A than under Condition B. This suggests [present tense] that response rates are [present tense] sensitive to food amount. [Perhaps a "universal truth" again, if it can be concluded that generally response rates correspond to food amount.]

References

- Here you list *all* work done by others, if it was cited in your manuscript.

  Example

  Allan, R. and Zeigler, H. P. (1984). Autoshaping the pigeon's gape response: Acquisition and topography as a function of reinforcer type and magnitude. *The Journal of the Experimental Analysis of Behavior*, *62*, 201-223.

  Brown, B. L., Hemmes, N. S., and Cabeza de Vaca, S. (1997). Timing of the CS-US interval by pigeons in trace and delay autoshaping. *The Quarterly Journal of Experimental Psychology*, *50B*, 40-53.

  [Note double-spacing, indentation, alphabetical arrangement, order (names, initials, year, title, journal name, volume, page numbers), and italics (or underline) for journal name and volume. There are no Issue/Number information (e.g., No 2, May, "pp.", or anything like that).

Author's Note

This is where you list the agency that paid the bills for the research (such as NSF, NIH, or Cure Autism Now Foundation). Here you may also thank anyone who has helped you in any way with your research, data analysis, or writing. No particular format required. But typically you would include a contact address if your readers would like to order reprints. Keep it short and do not make it too cute or silly. (In fact, I learned my lesson with that!)

Tables

- See the example that is given in the APA template. The page that contains a table (one table per page and after the Author's Note) has a page number and first few words of the manuscript's title in the upper right corner, just as any page of the manuscript (except the

sheets with the art work for the figures). Do not use a text editor to produce "Tables". Everything in a table should be possible to type with an old-fashioned typewriter. Therefore, there are no solid horizontal or vertical lines.

Figure Captions

- See the example that is given in the APA template. The page or pages that contain all captions (one caption for each figure) comes after the pages with the tables. Note that the first few words of the manuscript's title and a page number appear in the upper right corner. The first sentence of each caption does not have to be grammatically complete.

  *Example*s

  Figure 1. Response rates as a function of food amount. Broken lines indicate repeated 5-min interruptions.

  …

  Figure 7. Analysis of specific behavior classes by condition. Data points represent 2-min samples on 10 children each day. See notes under Fig. 1.

Figures

- Each figure has to be on a separate sheet of paper. No page number or title should be on this sheet ... Pure and simple. Just the facts, Ma'am —just the art work of the figure. (The reason is that for publication, all figures need to be reproduced photographically and often need to be reduced to fit the page format. Figures are not type set. No one is going to redraw your figures for you, should your manuscript get published. If you had "The effect of food 31" in the top right corner of a figure page (because your figure happened to appear on page 31 in your manuscript), these words would show up again in the published figure, in the type and font size that you had originally used. Most likely, the figure in the published version would not be printed on page 31 of the published version. Even though, as a student, you will probably not publish your lab report, your figures should be drawn professionally, as appropriate for students, who are receiving training for a profession or academic discipline. This means you have to use a computer, not a pencil to draw sketches. On the back of the sheet, which has the figure on it, you must write, IN PENCIL (now it *is* pencil!), "Name [your name], Figure 1". This will allow anyone to collate the figure with a particular manuscript, but it won't show up on the photographic reproduction in the printed article.
- Use bar graphs, histograms, and line graphs as appropriate. Generally, line graphs are appropriate for continuous variables, whereas bar graphs are appropriate for discrete variables. (Review your notes from a Statistics and/or Research Method class.) Usually, the dependent variable goes on the y-axis (ordinate) and the independent variable goes on the x-axis (abscissa).
- Sloppy work will cause lower grades than necessary (and in the real world, sloppy work is very likely to be rejected by reviewers, when you try to publish your experiment, even if it was a brilliant experiment).

This APA-Primer was prepared by Bertram O. Ploog, Ph.D., BCBA, Dept. of Psychology, 4S-105, CSI/CUNY, 2800 Victory Blvd, Staten Island, NY 10314. Please, let me know of any suggestions you might have or if you find inaccuracies or typos that should be corrected. — Last revision: January 10, 2005.