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PY-222: Stats & Research Methods II – Writing Manual

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# Welcome to PY-222: Stats and Research Methods-II

Welcome to Research Methods! This course is designed to help you learn the tools to become a conscientious, critical consumer and producer of psychological research. In the lecture portion of the course, you will learn how to critically evaluate psychological claims made in academic journals and the popular media. Learning how to critically evaluate claims about behavior from various sources (e.g., friends, internet, teachers, media, government, corporations, etc.) is arguably the most important and widely applicable skill of any you will learn in college. You will also learn details of various research methodologies. In the course lab, you will learn how to design and execute empirical studies, as well as write an APA-style paper. This course will provide the foundation for your career as a psychologist or for many other pursuits.

**Student Learning Outcomes: By the end of this course, you should be able to…**

* evaluate and critique the evidence presented for claims from an array of sources (e.g., psychology literature, media outlets, friends, etc.) using proper criteria. That is, apply the concepts from class to real life.
* discriminate between research designs and determine what claims each design can and cannot support.
* formulate sound research design decisions for problems based on maximizing and controlling variability.
* design and execute high quality scientific research, including properly analyzing data and accurately interpreting and reporting results.
* write a clear APA-style research paper and deliver a clear research presentation.
* describe and explain basic principles of science and evidential reasoning and how they apply to your everyday life and to the broader world.

There is not a better way to learn research design than by *doing* it, thus much of the course will be taught as “learning by doing.” This approach to teaching and learning requires certain commitments. First, you have to read all assigned material *before* coming to each meeting. The reading will offer you a first pass understanding, which is the foundation that will enable us to *do* research design in classes and labs. You should be prepared to be an active learner – not a passive spectator. Second, your preparation beforehand will only be useful if you are willing to make class activities a serious component of your learning. Among other things, this means you will need to stay on task during group work and be willing to openly and freely participate at all times. Lastly, you’ll want to become comfortable with making mistakes in public. When you engage in hands-on activities without ready-made ask-and-find answers, you will learn a lot from the mistakes you make. Think of it this way, when is the last time you saw an app or game that came with detailed instructions or directions? Never. You learn the app or games by engaging with it and making mistakes! Mistakes are an important part of learning – they are not signs of incompetence. They should not be a source of embarrassment – they are a sign of your engagement and courage!

We have committed to structuring the course so that you can take small steps to scaffold toward more substantial projects. You will get ample practice and have many opportunities for feedback. If we ever falter in that you do not understand our feedback, please come and see us! Sometimes talking things over can help more than written feedback.

# Tabular Overview of Course Assignments/Exercises

*This is a good way for you to keep track of your work and your grades. Enter your scores in the rightmost column. To know your grade at anytime, simply tally the points you have earned to date and divide that by the total points that have been made available to date (and multiply by 100 to put on a familiar 100-point scale)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Learning Opportunities: Exercises / Assignments** | **Due Dates** | **Points** | **My Score** |
| PG/IT 1 | 2/3 | 6 |  |
| Quiz 1 | 2/4 | 3 |  |
| PG/IT 2 | 2/8 | 6 |  |
| Article Notes 1-3 for Project 1 | 2/10 | 3.75 |  |
| Quiz 2 | 2/11 | 3 |  |
| Exercise 1 | 2/13 noon | 15 |  |
| Quiz 3 | 2/15 | 3 |  |
| PG/IT 3 | 2/17 | 6 |  |
| Exercise 2 | 2/18 | 15 |  |
| Plagiarism Certificate | 2/20 noon | ns |  |
| PG/IT 4 | 2/22 | 6 |  |
| *\*Visit the Writing Center before turning in paper 1 draft\** | 2/22 | ns |  |
| **Polished Draft of Paper 1 (due by midnight)** | 2/22 | 20 |  |
| Quiz 4 | 2/24 | 3 |  |
| Sample experiment results and output (optional) | 2/24 | ns |  |
| Exercise 3 | 2/25 (end) | 15 |  |
| **Project 1 Final Paper** | 2/27 noon | 75 |  |
| PG/IT 5 | 3/1 | 6 |  |
| **Mid-Term Exam (material through 2/25)** | 3/6 noon | 100 |  |
| Quiz 5 | 3/8 | 3 |  |
| Choices for Replication Study | 3/8 (end) | ns |  |
| Article Notes 1-3 for Project 2 | 3/10 | 3.75 |  |
| Exercise 5A (This one is very important) | 3/10 (end) | ns |  |
| Exercise 5B (This one is very important) | 3/11 | 15 |  |
| Article Notes 4-5 for Project 2 | 3/11 | 2.5 |  |
| PG/IT 6 | 3/15 | 6 |  |
| Quiz 6 | 3/17 | 3 |  |
| PG/IT 7 | 3/18 | 6 |  |
| Exercise 4 (complete any time before 3/18) | 3/18 noon | 15 |  |
| Quiz 7 | 3/31 | 3 |  |
| PG/IT 8 | 4/1 | 6 |  |
| **Polished Draft of Methods & Results for Project 2** | 4/8 (end) | 15 |  |
| Quiz 8 | 4/12 | 3 |  |
| Quiz 9 | 4/14 | 3 |  |
| *\*Visit the Writing Center before turning in paper 2 draft\** | 4/14 | ns |  |
| **Polished Draft of Intro & Discussion for Project 2 (due by midnight)** | 4/14 | 25 |  |
| Quiz 10 | 4/19 | 3 |  |
| Quiz 11 | 4/26 | Bonus |  |
| PG/IT 9 | 4/28 | 6 |  |
| PG/IT 10 | 5/3 | 6 |  |
| **Final Paper 2 (due by noon)** | 5/5 | 100 |  |
| PG/IT 11 | 5/6 | Bonus |  |
| **Final Exam (due by noon)** | 5/13 | 100 |  |
| COURSE TOTAL |  | 610 |  |

**NOTE:** We will do many other in-class activities that we believe are important for your learning. Please take them seriously. We generally won’t ask that you turn those in, but if you do and want feedback on them, we will provide it.

From the Syllabus:

**Grades:** 610 total points. PG/ITs (10 of 11 @ 6 pts. each = 60), Quizzes (10 of 11 @ 3 pts. each = 30); Exercises (5, @ 15 pts. = 75); Mid-Term and Final Exams (2 @ 100 = 200); Article Notes (8 @ 1.25 = 10); Paper 1 Draft (20); Final Paper 1 (75); Paper 2 Draft-1 (15); Paper 2 Draft-2 (25); Final Paper 2 (100). About 27% of the points come from “preparation,” about 33% from exams, and about 40% from papers. Please keep track of your own grades. The standard BSC +/- system will be used for final grades. I typically do *not* round averages (e.g., 89.9% is a B+), *but attendance, timeliness, professional behavior, and level of engagement may result in exceptions to that policy.*

*Note:* Failure to turn in the plagiarism assignment will result in zeros on all papers. Failure to turn in drafts on time will result in a zero on the draft and the point value of that draft(s) deducted from the final paper grade. We will not grade any parts of Paper 2 unless the Protocol assignment (Exercise #5A and B) is completed on time. Similarly, you must visit the Writing Center prior to the submission of ALL paper drafts or we will not grade the drafts or the final papers – they will be zeros. The Writing Center will e-mail me the name of visitors and the date they visited and what was discussed.

# The Skills That Pay the Bills

You not only learn “boring” details about research designs in this course, but you will learn easily transferable skills; ones that employers look for all the time. What do employers want from college graduates? In one survey (The Conference Board, Inc., 2006), the five most frequently reported skills considered “very important” were:

1. Oral communication skills
2. Teamwork and collaboration
3. Professionalism and work ethic
4. Written communication skills
5. Critical thinking and problem-solving skills

Employers value people who can think critically, solve complex problems, and apply their knowledge and skills to real-world settings (Hart Research Associates, 2013). These skills are also highly desired by employers of psychology majors (Landrum & Harrold, 2003). Having some proficiency with handling data (as a type of problem-solving) is an ever-increasing skill widely appreciated by many employers.

Fortunately, this course will help you develop these skills so that you, like the Beastie Boys, can pay those bills!

|  |  |
| --- | --- |
|  | **Our Work** |
| Oral communication | ITs, in-class exercises, Research group work |
| Teamwork and collaboration | In-class activities, Research projects and group work |
| Professionalism and work ethic | Project management for your research projects, in-class activities and group work |
| Written communication | Research projects, all homework and other writing assignments |
| Critical thinking and problem solving | All exercises, exams, papers, the research projects, in-class activities, and many of our readings |

# Writing APA-Style Research Papers

The remainder of this manual focuses on providing advice for writing your papers. Specifically, the focus is on writing clear, compelling, even exceptional papers. The focus is not on the formatting or specifics of APA-style. That information is available elsewhere.

It is difficult to learn to write by reading about writing or merely hearing a lecture about it. The best way to improve writing is to read a lot of journal articles and emulate those and to practice, practice, practice. Still, without a solid foundation as is supplied on the following pages, it is hard to know on what to work on with ones writing. With this understood, if you read this manual carefully, take it to heart, apply it carefully, and practice as much writing as possible, you will improve your writing and craft solid, if not great research papers.

## Of Paraphrasing and Plagiarism

In psychology (and many other disciplines): PARAPHRASING IS PLAGIARISM *"What do you mean by paraphrasing?"* *"But I learned that paraphrasing is the right way to use sources in a research paper!"*

You may have learned in some settings that paraphrasing is the appropriate way to use reference material. It isn't, except in a few, specific cases. For example, in some English or literature classes, you might be asked to reflect on a passage or text by **lifting** **sentences from the text and re-phrasing them by substituting synonyms for the** **words that the author used.** That activity is "**paraphrasing**." In the context of that sort of literary analysis, paraphrasing is a technique, and the reader of your paper probably understands that you are using that technique.

In psychological writing (and writing in many other disciplines), the reader assumes you are using your **own words and sentence structures.** Thus, even when discussing someone else's ideas, the reader still assumes that you wrote your own unique sentences (even if you include citations). Doing otherwise, then, is implicitly trying to take credit for someone else's work.

Also in psychological writing, you are typically explaining or defending a point by using *evidence* gathered by other authors - often multiple authors. Because the ultimate point you want to make is not dependent on the particular *wordings* those other authors used, the entire paper you write needs to be in your **own words** - even in those places where you are discussing someone else's research.

Paraphrasing or using more than a few direction quotations interferes with the "flow" of your own writing. It is often difficult for the reader to see how those other, paraphrased or quoted, ideas fit with your broader discussion because they have not read the same source material you have.

Thus, in psychological writing, **paraphrasing is considered bad writing** **practice.** If you reach a point where you feel the particular wording another author used is important to your point, that is one of the rare places where you should use a direct quotation (and, as with all information that you learn from another source, include a citation). *But, as a general rule, your papers should contain no quotes.*

A USEFUL EXAMPLE *courtesy of Professor Paul C. Smith*

Paraphrasing, in the sense that most people do it, is, essentially, plagiarism. When you use information from a source, the goal is to put it entirely in your own words, in the larger context of YOUR paper. Most direct paraphrasing (that is, substituting, deleting or re-arranging words from the original work) is obvious to the readers of a paper because it does not fit with the overall flow of YOUR work. Below is an example of what constitutes inappropriate paraphrasing versus appropriate use of a source.

Here is an **example paragraph** from a source: "Long-term memory, that immensely complex storehouse, has also been most extensively studied with the use of verbal materials, usually presented in the form of long lists. As we shall see, this approach has resulted in some extremely important findings, but it has also been a bit misleading. After all, remembering lists of words is somewhat different from remembering a conversation, a recipe, or the plot of a movie" (Klatsky, 1975, p.17).

* Here is an **inappropriate** paraphrase: Long term memory is a complex storehouse that has been studied extensively using verbal materials presented in the form of long lists. While this approach has resulted in some important findings, it has been misleading. Remembering a list is not like remembering a discussion or a movie (Klatsky, 1975).
* Here is an **appropriate** summary of that information to be included in a paper: Researchers usually study long term memory by having subjects attempt to recall aloud items from long lists. Because such a task is different in important ways from the kinds of tasks long term memory is usually called upon to perform, our findings are somewhat questionable (Klatsky, 1975).

You should first notice that in both of the above example paragraphs, the reference was provided (Klatsky, 1975). This work is still the source of the ideas, even if not directly quoted. (if you are unsure, see the APA manual or your text or ask me or the TFs for more information about in text citations). The inappropriate paraphrase is not really the student's own words, but rather just Klatsky's words rearranged a bit (with a few words omitted). If you were to turn in a paper containing this paragraph, I’d have to turn that over to the Honor Council as plagiarism. It should be apparent that a person could write such a paragraph without really understanding the original paragraph at all. The author of the appropriate summary, on the other hand, must have understood Klatsky's original paragraph. The meaning of that paragraph is captured in the summary, but the words used to express that meaning are the author's own. An appropriate summary indicates to the reader that the author understood the original material. Authors should not include material that they do not understand.

*Here is another example:* If you were to try to paraphrase the following quote:

“Detailed analyses revealed that with increased age adults in this time management activity were less likely to perform self-paced tasks and to attempt difficult auditory discrimination judgments.” (Salthouse, Hambrick, Lukas, & Dell, 1996, p. 305).

It is possible that you might try the following paraphrase: Results showed that older adults in the time management activity were less likely to perform self-paced tasks (Salthouse, Hambrick, Lukas, & Dell, 1996).

This paraphrase is **incorrect,** even if you attach the appropriate citation. In other words, this constitutes plagiarism! Instead you should try to summarize the information in your own words.

The following example is more appropriate: Researchers found that age inhibited willingness of participants to initiate difficult tasks (Salthouse, Hambrick, Lukas, & Dell, 1996).

You will notice that this information has been summarized and that this is a better example of a correct paraphrase. It is important to realize that this paraphrase must still be appropriately referenced.

## Strategies for Avoiding Plagiarism

The best way to avoid plagiarism in the form of inappropriate paraphrasing is to never, ever type your paper while looking at an article! Ever! After reading the article you intend to summarize, put it completely away and *do not look at it*, ever how tempting that may be. Then no sooner than an hour or so later, write the summary in your own words. You can then go back to the article to double-check that your summary is accurate and not plagiarized. This procedure makes it much less likely that you’ll accidentally plagiarize the author via inappropriate paraphrasing. As Szuchman (2014) notes, “never try to paraphrase one sentence at a time” (p. 7). She suggests reading an entire section, then paraphrasing it without looking back.

One efficient technique that I’ve used for years and one that students tell me works well for them is to create a system of note taking as you read articles (thus, your article notes assignments). Article notes are an excellent way to keep track of articles you’ve read and how they relate to your emerging ideas for your research projects. They help reduce your workload in the long run, in part, because you can use the notes to write your paper, rather than having to go back to an entire journal article and read it all over again or struggle to find the parts that are applicable to your paper. A particularly *awesome* side benefit of article notes is that if you take care to write them using your own words rather than copying or too closely paraphrasing from the articles, *you’ll already have written much of your article along the way*!

*Dana Dunn offers the following excellent advice (2011, p. 46)*

*“*Students often struggle to write summaries. They feel compelled to continually compare their writing against the original, and what they have to say never sounds as good or seems quite right. To combat this problem and the larger issue of plagiarism, ask yourself the following questions before you draft a summary. Write down some quick answers to these questions, which will help to shape the summary and prompt you to remember details.

1. What is the article about?

2. What is the main idea in the article?

3. Is some position, assertion, or hypothesis stated? If so, what is it?

4. Do you agree with the position, assertion, or hypothesis?

5. Is any supporting evidence provided? What, specifically?

6. Did anything surprise you in the text?

7. What questions do you still have?

Armed with your answers to these questions, you can now start to draft a summary with less fear of committing plagiarism.”

## Writing Introductions

***HELPFUL READINGS:*** Kail, Chps. 1-5, especially chapters 4 and 5. Heath Ch. 14 (342-348) and the sample paper in Heath and papers on Moodle. *See the paper checklist in Heath, pp. 362-364,*

*Do not write so that you can be understood; write so that you cannot be misunderstood. --Epictetus*

Complex scientific writing should be clear, tell a good story, and make a great argument. Yes, crafting a well-written empirical article ultimately boils down to good story telling by convincing readers of your arguments (Bem, 2001). You will see that there are a number of rules to follow as you write an APA-style paper. It may seem odd at first to have to follow so many rules, but the upside, similar to the formula for a good romantic comedy or any story, is that once you know what goes where in an APA-style paper the writing (and reading) becomes much easier.

Although your language will remain formal and you must attend to the proper content and formatting required by APA-style, your papers will turn out better if you keep this idea of *story-telling* and *argument building* in mind as you write. The bottom line in writing an empirical article is clarity. Flair and style can be nice in journal articles, but they are no substitute for crystal clear communication. As alluded to by the opening quote, always err on the side of clarity. The hallmark of good scientific writing is brevity and clarity. Flair and style are distance seconds.

**Tone:** Beginning science writers often struggle with getting the correct tone (the language you use to write) and the correct context (to whom you are writing) down. As just described, clarity is paramount and one way to achieve clarity is to write intelligently (use formal language), but plainly. Do not use more words than you must to make a point. Later in this manual, I offer advice on how to write economically but smartly. Next, know your audience. Your audience is not only me, and it’s not other students either. Your audience is other scientists who may be interested in your topic. Assume an understanding of research methodology concepts and statistics in your writing (e.g., you won't explain to the reader what an independent variable is or note that you have rejected the null). However, do not assume your reader is already an expert on your topic. You will need to provide some background for them to give them the context for your study. In short, you are writing for a general scientific audience who understand methodology but may not be intimately familiar with the variables of literature on your specific topic.

**Overall Organization:** A well-written article should be shaped like an hourglass (see below). The introduction begins broadly by introducing the topic and defining terms, and then begins to narrow to more specifically focus on the variables in your study. It provides a review of the relevant research, identifies a gap in our understanding, and at the end of the introduction, the paper narrows down to the specific hypothesis under investigation. The paper then gets more specific by describing the exact procedures used to test the hypothesis (Method section) and the precise statistical findings (Results). The Discussion begins by reviewing your specific findings, but then proceeds to slowly broaden out again as the implications are discussed. By the end of the Discussion, the paper has become as broad in focus as it was at the beginning of the Introduction - thus, an hourglass shape.

**Introduction Organization.** This hourglass metaphor also pertains to the introduction itself. From Bem (2001): It begins with broad general statements, progressively narrows down to the specifics of your study, and then broadens out again to more general considerations. Thus:

|  |  |
| --- | --- |
| The introduction begins broadly: | “Individuals differ radically from one another in the degree to which they are willing and able to express their emotions.” |
| It becomes more specific: | “Indeed, the popular view is that such emotional expressiveness is a central difference between men and women. But the research evidence is mixed. ” |
| And more so: | “There is even some evidence that men may actually...” |
| Until you are ready to introduce your own study in conceptual terms: | “In this study, we recorded the emotional reactions of both men and women to filmed...” |
| The method and results sections are the most specific, the “neck” of the hourglass: | (Method) One hundred male and 100 female undergraduates were shown one of two movies...”  “(Results) Table 1 shows that men in the father-watching condition cried significantly more...” |
| The discussion section begins with the implications of your study: | “These results imply that sex differences in emotional expressive- ness are moderated by two kinds of variables...” |
| It becomes broader: | “Not since Charles Darwin’s first observations has psychology contributed as much new...” |
| And more so: | “If emotions can incarcerate us by hiding our complexity, at least their expression can liberate us by dis- playing our authenticity.” |

This closing statement might be a bit grandiose for some journals—I’m not even sure what it means—but if your study is carefully executed and conservatively interpreted, most editors will permit you to indulge yourself a bit at the two broad ends of the hourglass. Being dull only appears to be a prerequisite for publishing in the professional journals.

|  |  |
| --- | --- |
| The introduction starts out broad, introducing the reader to the topic.  Then a *focused* review of the literature is presented, both *analyzing and synthesizing* the *relevant* research.  After reviewing the literature, you will have identified a gap in the literature, or an unanswered question, that needs to be answered. Your introduction now shifts focus to this gap or question.  Now state your research question or thesis statement. Why are you filling this gap?  Provide a brief overview or snapshot of what is about to happen in your research. Think of this as a brief “coming attractions.”  Conclude your introduction with your specific hypotheses to be tested on the topic. |  |

***Figure.*** As you see here, within the introduction, one begins broadly and ever so carefully gets more and more specific.

**Major Goals of an Introduction: It’s an Argument:** The major goals of the introduction are to introduce the research problem, to *provide context for your study* by describing past research *relevant* to your question, and to outline the specific hypotheses that were tested. Your goal is for the reader to understand the need for more research in the area (i.e., your proposed study), and to be able to clearly see the reasoning for your hypothesis. You should organize this section of your paper in such a way that you logically build to your study. *Again, this is worth extensive repetition – an introduction is an argument for your study; nothing more, nothing less.*

One way I like to think about writing an introduction is to pretend I am a prosecutor and I am trying to present evidence to convince the jury to come back with a verdict of guilty. *(I am arguing my case).* It is my job to present only the most relevant evidence and to use that to weave tightly together a compelling story that inevitably leads the jury to an easy and inescapable guilty verdict. Similarly, your sole task in an introduction is to build a case for your hypothesis. By the time you get close to your hypothesis, your reader should think, “Well, of course, that makes perfect sense, what else could I possibly conclude?” Your reader should be able to “see” your hypothesis coming long before they actually get to it.

**In the Beginning… the Dreaded First Paragraph***. Kail pp. 67-69*

Here, I begin at the beginning, but I encourage you to *not* begin at the beginning when writing your paper. I’ll tell you why momentarily. For now, be aware that there is excellent advice for how to begin empirical articles in Kail, pp. 67-69. Please read that. You will want to capture the readers’ interest right away in the first few statements, but take great care not to use flowery, empty language or statements that are overly broad (e.g., do not ever refer to “in today’s society,” etc.).

While opening statements are important for grabbing your reader’s attention, many writers struggle with papers because they begin at the beginning. *I never do that and don't recommend you doing it either. It is often easiest to write the opening paragraph after you've made progress on other parts of the paper.* With that said, below you will find advice on how to write an opening for your paper.

*The Opening Statements*. The first task of the article is to introduce the background and nature of the problem being investigated. Here are four rules of thumb for your opening statements:

1. Write in English prose, not psychological jargon.

2. Don’t plunge unprepared readers into the middle of your problem or theory. Take the time and space necessary to lead them up to the formal or theoretical statement of the problem step by step.

3. Use examples to illustrate theoretical points or to introduce unfamiliar conceptual or technical terms. The more abstract the material, the more important such examples become.

4. Whenever possible, try to open with a statement about people (or animals), not psychologists or their research (This rule is almost always violated. Don’t use journals as a model here.

Authors typically structure the Introduction section so that broad, more general ideas appear first, with details specific to the author’s research coming later. You will be more successful in engaging your reader if you begin with a compelling and original opening statement; you will be less successful if you make an uninspired statement. For instance, suppose you want to study people’s sense of humor. You might begin your introduction in one of the ways given below.

-67-

* Just about everybody claims to have an above average sense of humor. This is impossible because although some people possess a clear sense of humor, one can spot a great many humor-impaired people.
* Researchers have conducted many studies concerning people’s sense of humor. The present study will investigate that trait in individuals.
* Humor is an important part of people’s social lives. Consequently, psychologists have studied this trait extensively.

How effective would they be? The first example is the most enticing. It states the general topic of the paper (sense of humor), and the idea of somebody being humor-impaired might pique a reader’s interest. The second example establishes the general topic, but it is not very interesting. The third example might not draw the reader to the topic. After reading it, the reader would know the article is about humor, but not about what aspect of the broad topic of humor; furthermore, the writing is not particularly engaging. As another example, if your research were about prejudice you would **not** want to write, “In today’s society, prejudice still remains ever present.” That may be ok for a paper in your composition course, but not for a research article. However, it would be perfectly acceptable to begin with a brief example of a recent news event, such as the Michael Brown shooting in August, 2014.

From Bem (2001):More Examples of Opening Statements:

*Wrong*: Several years ago, Ekman (1972), Izard (1977), Tomkins (1980), and Zajonc (1980) pointed to psychology’s neglect of the affects and their expression. [Okay for somewhere in the introduction, but not the opening statement.]

*Right*: Individuals differ radically from one another in the degree to which they are willing and able to express their emotions.

*Wrong*: Research in the forced-compliance paradigm has focused on the effects of predecisional alternatives and incentive magnitude.

*Wrong*: Festinger’s theory of cognitive dissonance received a great deal of attention during the latter part of the 20th Century.

*Right*: The individual who holds two beliefs that are inconsistent with one another may feel uncomfortable. For example, the person who knows that he or she enjoys smoking but believes it to be unhealthy may experience discomfort arising from the inconsistency or disharmony between these two thoughts or cognitions. This feeling of discomfort was called *cognitive dissonance* by social psychologist Leon Festinger (1957), who suggested that individuals will be motivated to remove this dissonance in whatever way they can.

Note how this last example leads the reader from familiar terms (*beliefs, inconsistency, discomfort, thoughts*) through transition terms (*disharmony, cognitions*) to the unfamiliar technical term *cognitive dissonance*, thereby providing an explicit, if nontechnical, definition of it. The following example illustrates how one might define a technical term (*ego control*) and identify its conceptual status (a personality variable) more implicitly:

*The need to delay gratification, control impulses, and modulate emotional expression is the earliest and most ubiquitous demand that society places upon the developing child. And because success at so many of life’s tasks depends critically upon the individual’s mastery of such ego control, evidence for life-course continuities in this central personality domain should be readily obtained.*

And finally, here is an example in which the technical terms are defined only by the context. Note, however, that the technical abbreviation, *MAO*, is still identified explicitly when it is first introduced.

*In the continuing search for the biological correlates of psychiatric disorder, blood platelets are now a prime target of investigation. In particular, reduced monoamine oxidase (MAO) activity in the platelets is sometimes correlated with paranoid symptomatology, auditory hallucinations or delusions in chronic schizophrenia, and a tendency towards psychopathology in non-clinical samples of men. Unfortunately, these observations have not always replicated, casting doubt on the hypothesis that MAO activity is, in fact, a biological marker in psychiatric disorder. Even the general utility of the platelet model as a key to central nervous system abnormalities in schizophrenia remains controversial. The present study attempts to clarify the relation of MAO activity to symptomatology in chronic schizophrenia.*

This kind of writing would not appear in *Newsweek*, and yet it is still comprehensible to an intelligent layperson who may know nothing about blood platelets, MAO activity, or biological markers. The structure of the writing itself adequately defines the relationships among these things and provides enough context to make the basic idea of the study and its rationale clear. At the same time, this is introduction is not condescending nor will it bore the technically sophisticated reader. The pedagogy that makes this introduction accessible to the nonspecialist will not only be transparent to the specialist, but will enhance the clarity of the article for both readers.

Remember, your goal in the opening paragraph is to *introduce your topic*. It is mostly a *stylistic paragraph to orient the reader* to the general topic and your question. It is *not* the place to discuss your specific hypothesis. The best way to learn to write opening paragraphs is to: (a) know your story well, (b) have an outline, and (c) read others’ published work and emulate their style.

## The Literature Review

The major part of the introduction is the **literature review**, which outlines theory and past findings that are *relevant* to the research goals and hypotheses. A literature review is ***not*** merely a summary of articles you have read, but importantly, it is an integrated resource that both *analyzes and synthesizes* the literature into a coherent and clear status report (Landrum, 2012). The literature review consists entirely and only of the evidence upon which you are building your argument for your study. More details on what is meant by “analyze and synthesize” are presented momentarily.

The literature review of a research paper is not meant to be exhaustive. The goal is to describe seminal (key, important) work and up-to-date work *related to your hypotheses*. You should include descriptions of past research *only* to the extent that it helps to explain what you studied and why. Your responsibility does not entail describing or citing every publication dealing with the issues in your paper. A literature review is not a history lesson. Only prior studies that relate to the current work should be cited and discussed, and that relationship must be clear. As you choose what to include in the paper, remember that your goal is to provide the reader with information about the variables or ideas from other studies that will help them understand *your* study. When these studies are reviewed, only their main findings, conclusions, relevant methods, measures, or techniques should be presented. Details, such as the number of participants, where and when the research was performed, and so on, are generally avoided because they typically are not relevant for your hypotheses. Each study cited in your literature review is cited for a specific purpose. And that purpose is to build a rationale for your hypothesis. ).

**Pro-tip:** *I write my hypothesis(es) on a sticky note and put it on my computer so that it is in full view at all times. It serves as a constant reminder of the entire purpose of the article.*

Most important is that *the ideas* from the previous studies should be the primary focus of your writing, not the specifics of their methodology, unless the reason you are conducting your study is directly about correcting a methodological issue in previous studies). As Kail (2019) notes, “**put issues, and findings in the foreground and studies and scientists in the background**” (p. 71). For example, notice how this is done in the passage from Senko & Fyffe, 2010, pp. 649-650 reprinted below. You will see that they are focused on the *ideas* found in the literature they are citing, not the researchers or even the details of the studies they cite.

Of course, women do sometimes engage in short-term mating as well. Short-term mating may have been evolutionarily adaptive in settings where ecological factors made long-term relationships untenable (e.g., environmental pathogens reducing the availability of men; see Schmitt, 2005). In such cases, it would have been profitable to seek “good genes” to pass along to the potential newborn, thus aiding its health and viability in the absence of a long-term investment from the father (Gangestad & Simpson, 2000). Women may have therefore evolved preferences for short-term relationship partners who demonstrate “honest” signals of heritable fitness.

Given the modest link between physical attractiveness and health (Shackelford & Larsen, 1999), attractiveness may be one such signal. This may explain why women seeking short-term mates elevate the importance of attractiveness and diminish the importance of trustworthiness, status-resources, romance, and other qualities that they would seek in long-term mates (Fletcher et al., 2000; Fletcher, Tither, O’Loughlin, Friesen, & Overall, 2004; Gangestad & Thornhill, 1997; Kenrick, Sadalla, Groth, & Trost, 1990; Li & Kenrick, 2006; Scheib, 2001). Similarly, women who have greater openness toward short-term sexual relationships tend to favor an attractive yet disloyal (i.e., untrustworthy) man over an average-looking yet loyal man when asked to choose between the two (Simpson & Gangestad, 1992).

Here is another example, conveniently from one of my papers (Pitts, Wilson, & Hugenberg, 2014, pp. 550-551). (If I had it to do over, I would not have written the paragraph in quite this way. I would have made it into two paragraphs. I also think the first sentence is a bit tortured. Poor sentence….) In any event, here you go:

To be in a position to socially reconnect with others, it behooves us to be sensitive to cues indicative of potential reaffiliation. However, despite the complex downstream consequences of rejection, only a handful of recent studies have investigated how social rejection influences basic perceptual processes. One theory that addresses this gap in the literature posits that humans have a social monitoring system (Gardner, Pickett, & Brewer, 2000) that constantly monitors and regulates our level of social inclusion. This system is vigilant for the experience of rejection, and when activated, it redirects attention, cognitive resources, and memory to cues that may facilitate reaffiliation (Pickett, Gardner, & Knowles, 2004). For example, rejection causes perceivers to become more sensitive to signals of inclusion, with participants showing crisper distinctions between in-groups and out-groups (e.g., Sacco, Wirth, Hugenberg, Chen, & Williams, 2011), increased selective attention toward signals of acceptance (e.g., smiles; DeWall, Maner, & Rouby, 2009), and increased accuracy at discriminating between genuine and fake smiles (Bernstein, Young, Brown, Sacco, & Claypool, 2008). Other work has shown that rejection leads to a general activation of social bonds, such that group-related constructs become more accessible and the perceived entitativity and importance of groups is heightened (Knowles & Gardner, 2008). In sum, those with whom shared social interaction is possible become important to those who have been rejected.

\*One thing to note from the above paragraph… You’ll see that I reviewed the literature from ***six*** different studies in that one paragraph, all in about 220 words. Again, I used only those aspects (ideas or findings) from the previous studies that were relevant to the point I was trying to make at that time. That is what *synthesis* means.

And the next paragraph from that same paper where I describe specific studies a bit differently (again, I now think the paragraph is too long):

In the face of social rejection, could such perceptual sensitivity for reaffiliative cues actually bias perception of the physical world? In the current research, we address just such a question. From the New Look perspective, perception is influenced not just by the objective qualities of the environment but also by one’s mental representations of and motives toward the environment (see Dunning & Balcetis, 2013). For instance, desired objects often appear to loom closer than they actually are. Impoverished children see coins as larger than do wealthy children (Bruner & Goodman, 1947), a bottle of water appears closer to the thirsty than to the satiated perceiver (Balcetis & Dunning, 2010), and beloved locales seem closer than disliked locales (Alter & Balcetis, 2011). Similarly, climbers who lack the physical stamina to climb estimate a hill’s incline as steeper than do those with sufficient energy or capability (Proffitt, Stefanucci, Banton, & Epstein, 2003; Bhalla & Proffitt, 1999), whereas hills are seen as less steep when a socially supportive friend is nearby (or imagined) relative to those who are alone (Schnall, Harber, Stefanucci, & Proffitt, 2008). Taken together, these numerous demonstrations reliably establish that our current motivational states and physical capacities can bias our perceptual experience often in the service of pursuing our goals and needs.

*\*\*I did not use these papers or these examples because they are the best writing I’ve ever seen in an article or because it is perfect; far from it. I used them because (a) they were convenient and (b) I think they illustrate how to write about past research effectively and convincingly, even if the writing isn’t perfect. There is always room for improvement, whether in my studies and writing or yours.\*\**

From Bem (2001): The *Publication Manual* also urges authors not to let the goal of brevity mislead them into writing a statement intelligible only to the specialist. One technique for describing even an entire study succinctly without sacrificing clarity is to describe one variation of the procedure in chronological sequence, letting it convey the overview of the study at the same time. (You can use the same technique in your own method section.) Here, for example, is a description of a complicated but classic experiment on cognitive dissonance theory (Festinger & Carlsmith, 1959):

*Sixty male undergraduates were randomly assigned to one of three conditions. In the $1 condition, the participant was first required to perform long repetitive laboratory tasks in an individual experimental session. He was then hired by the experimenter as an “assistant” and paid $1 to tell a waiting fellow student (a con- federate) that the tasks were fun and interesting. In the $20 condition, each participant was hired for $20 to do the same thing. In the control condition, participants simply engaged in the tasks. After the experiment, each participant indicated on a questionnaire how much he had enjoyed the tasks. The results showed that $1 participants rated the tasks as significantly more enjoyable than did the $20 participants, who, in turn, did not differ from the control participants.*

This kind of condensed writing looks easy. It is not, and you will have to rewrite such summaries repeatedly before they are both clear and succinct. The preceding paragraph was the eighth draft.

**NOTE:** You would only ever need even that much detail about a given study if it were absolutely central to YOUR study. That is, you would provide this much detail when not only are the findings relevant to your study, but perhaps the methodology they used is similar to yours so you are giving your reader a preview of that as well. Much of the time, this would be too much detail about a given study. Remember, use only those aspects of a previous study that are 100% relevant to helping your reader understand *your* eventual study (by “eventual”,” I mean the reader has not yet gotten to your idea in the article.)

*Citations*. The standard journal format permits you to cite authors in the text either by enclosing their last names and the year of publication in parentheses, as in A below, or by using their names in the sentence itself, as in B.

1. MAO activity in some individuals with schizophrenia is actually higher than normal (Tse & Tung, 1949).
2. Tse and Tung (1949) report that MAO activity in some individuals with schizophrenia is actually higher than normal.

In general, you should use form A, consigning your colleagues to parentheses. Your narrative line should be about MAO activity in individuals with schizophrenia, not about Tse and Tung. Occasionally, however, you might want the focus specifically on the authors or researchers: “Theophrastus (280 B.C.) implies that persons are consistent across situations, but Montaigne (1580) insists that they are not. Only Mischel (1968), Peterson (1968), and Vernon (1964), however, have actually surveyed the evidence in detail.” The point here is that you have a deliberate choice to make. Don’t just intermix the two formats randomly, paying no attention to the narrative structure.

In review, you are not citing a list of past research in an introduction; you are crafting a line of reasoning which leads to your research question. Avoid simply summarizing each of the different studies you read in a "list" type format (see examples on next pages). You must present information in a coherent way that moves from the broad to the specific, and in a way that leads the reader to the gap or question in the literature that you've noticed.

*Ok, so that’s all well and good, Dr. Pitts, but how do I know what parts of others’ research to use? Well, there is no formula for this, but read on my friend, read on.*

## Extracting Useful Nuggets from Articles and Your Article Notes

So, you have done a lot of library research and gathered sources you think are relevant and useful for your paper. Now what? It is now time to critically read and *analyze* what information in those sources is the most relevant for your paper. Later, you will need to *synthesize* that information into a coherent overview of the state of affairs within the literature as it relates directly to your study. That is, you need to build your argument step-by-step in a concise and logical manner.

The key to writing a great research paper is to structure the way you gather information so as to facilitate it use in your paper. The better you organize your information up front, the easier composition will seem. Ok – so, how do I do that you ask? *Having a system of note taking as you read your articles is key, and we have used a lot of ink and time spelling out how to do those earlier in this manual, so I won’t reiterate that here (i.e., article notes).*

What I will say here is that the reason I tend to type my article notes in a Power Point is that they are then easy to put together and easy to rearrange in the order I want them. When they are in separate Word documents it is a little less convenient, though certainly doable (simply print them off and physically arrange them how you like). I’ll say more about this later when we get to how to outline an introduction. For now, let’s assume you have a lot of article notes and you have a plan (an outline) for how your introduction should be organized. Armed with this, let’s proceed with how to put it all together.

## Synthesis: Reassembling the Pieces of the Story

As noted earlier, analysis and synthesis are keys to a good literature review. Optimally, while writing your article notes you have already *analyzed* each of the articles you think should be included in your article, as well as what ideas from those articles are most relevant. But that is not enough. You must then *synthesize the main ideas* presented in the literature, with a critical, evaluative viewpoint. This is a skill that takes practice, time, and more practice. ***Synthesis means that you seek out underlying themes and see connections across studies.*** Various ideas within a variety of studies are used in the service of your idea – they do not stand on their own.

There is no one-size-fits-all formula for **organizing your literature review**, but there are a few things to avoid. Students often review a lot of literature, but ultimately find themselves with no good reasons for how to sequence a particular set of studies. When this happens, writers introduce paragraphs with phrases such as “Smith (1990) found that . . .” or “Jones (2001) also did a study that…” But this type of writing introduces a common problem: *failing to show the connections among the studies in the review*. Knowing *why* you are including a particular study will give you a much better idea of *where* to include it. In this way, your paragraphs will begin with more natural transitions and have appropriately clear topic sentences.

**Transitions** between paragraphs must link the last idea in the previous paragraph to the first idea in the next paragraph. Good transitions are critical for writing a coherent, stylish paper. Generally, studies and paragraphs should be linked together with *ideas (entire sentences);* not with single words. *Whatever you do, do not assume that your reader can “see” the logic of why one paragraph followed from the previous one in the same way that you do.*

To clarify what is meant by “synthesis,” check out the two examples below from Dr. Celia Reaves. In the first example, the author has written a paragraph about each source – no synthesis is present. Do ***not*** do this! *The second example is much better*. Notice that the text is much shorter, and most importantly, the references about a particular theme or idea have been grouped together. That is what you want to do throughout your entire literature review. It is not an exaggeration to say that the more you know about psychological topics and issues, the better your paper will be. That means you will need to read many more articles than you actually end up using, but realize that every article you digest, the more you’ll become familiar with your topic. When you are widely read on a given topic, you can tie various threads / ideas together in ways that others have not yet done.

EXAMPLE 1:

Weinburger (1997) did a study on the benefits of giving Ritalin to very young children. One of the results was that these children made friends more easily, and got along better in the classroom. Weinburger studied 50 children diagnosed with ADHA in a variety of preschool settings.

Franklin (1998) wrote a paper expressing her concerns about using stimulant medications on very young children. She says the long-term effects of these drugs haven’t been studied in children that young. She says, “We are giving powerful drugs to children whose nervous systems are not developed yet. We don’t know what can happen” (p. 32).

Another researcher (Jones, 1998) pointed out some advantages of using the medications. He says that the children are more compliant, which means that they go along with what the class is doing and the teacher likes them better.

According to Noloko (1999), when very young children with ADHD are given Ritalin they are less likely to be asked to leave their daycare or preschool setting. This not only makes life easier for their parents, it also allows them the opportunity to interact successfully with other children.

Andrews (1999) pointed out in an article that the FDA has never given its approval to use stimulant medication for very young patients. This is because there is not enough evidence that they are free of long-term complications.

Two researchers (Ngau & Mostomi, 1999) also conducted a study in a variety of daycare and preschool settings. They found similar results, showing that teachers were less likely to ask that ADHD children be taken out of the setting if they took Ritalin or other stimulant medications.

Smith (2000) did another study showing that children with ADHD who took medication were more likely to remain in daycare or preschool, without being asked to leave. They also had more friends during the time of the study.

A similar study by Castillo (2001) found the same basic result. They looked at children who were not specifically diagnosed with ADHD but showed some of the same symptoms. Once again, children who were taking stimulant medication were able to stay in the facility, while those who were not were often asked to leave.

EXAMPLE 2:The second example is so much better than the first, and I hope you can see why ☺

Giving stimulant medication such as Ritalin to very young children has some advantages. It makes them more compliant in school (Jones, 1998; Smith, 2000) and they are less likely to be asked to leave their daycare or preschool setting (Noloko, 1999). In addition, they make friends more easily (Smith, 2000; Weinburger, 1997).

However, some research has pointed out serious drawbacks to this use of medication in very young children. Several researchers (Andrews, 1999; Castillo, 2001; Ngau & Mostomi, 1999) argue that these medications have never received FDA approval for such young patients because there is insufficient evidence that they are free of long-term complications. As Franklin (1998) suggests, we are delivering powerful drugs to children whose nervous systems are not yet developed, and thus it is uncertain what can happen.

In review, *one effective way to synthesize your review of research is to keep similar ideas together*. Research reports with similar findings (or methodologies) should usually be cited together. Notice in the example below from Tarasenko, Miltenberger, Brower-Breitwieser, & Bosch (2010, p. 220) that three references are cited in a single, cohesive paragraph dealing with one topic.

Contrary to popular belief, most abductors do not use physical force to seize their victims (Finkelhor, Hotaling, & Sedlak, 1990; Poche, Brouwer, & Swearingen, 1981). Instead, they establish rapport with the child, using verbal lures to convince the child to willfully leave with them. In one investigation, an alarming 90% of 3 to 6 year olds who were approached by a stranger left with the stranger after he or she asked them to leave (Poche et al., 1981). Most children do not know an appropriate and effective way to resist enticement from potential abductors.

***Lastly, make sure to review the example on the following pages in this manual.***

**Use examples.** As you review literature and present your ideas, try to ***use examples*** to illustrate your points. There is an analogy between the good teacher and the good writer here: A good teacher uses many examples to illustrate important points, and so does a good writer. Too often, however, less experienced writers assume that good writing is exemplified by the use of abstract ideas, and the more abstract they are, the better. *Actually, a hallmark of good writing is the frequent use of concrete examples to support and demonstrate ideas*. When you introduce and define a concept, an example should accompany it:

*“Cognitive dissonance is a state of psychological tension that arises when one is aware of two or more inconsistent cognitions (Festinger, 1957). People who smoke cigarettes, for example, are usually all too aware that smoking is a cause of cancer. To reduce the tension created by these two dissonant thoughts, many smokers justify their actions by suggesting that the medical evidence is questionable or by pointing out that they smoke few cigarettes on a daily basis. By appealing to these or other reasons, the smokers are engaging in a form of dissonance reduction  . . .”*

The examples may be brief if that works better: For example, in a paper on how being socially rejected might influence visual perception, one might write, “Just as those who are thirsty might see a glass of water as closer to them than it really is, so too might those who have been rejected see others with whom they might socially reconnect as being physically closer to them than they actually are.”

The appropriate use of examples within a piece of writing educates readers and also allows you to determine whether you fully understand the concepts you are writing about. If you cannot provide examples to illustrate your points, then you may not have a good working knowledge of the topic. Lastly, if you can do so, using the same example or two throughout your paragraph can add a nice coherence and style to your writing. Of course, don’t strain to do this – it’s a more advanced writing tactic.

Ultimately, **the entire purpose of your work is that you are filling in a gap in understanding that exists in the current scientific literature**. Be sure to say what that is – what is unique/original about your research. For example, (1) You might find a contradiction in the literature that leads to your study; (2) You might find a reason why the conclusions reflected in the reviewed literature might be wrong; (3) Perhaps there is a gap in the literature – something you consider important that has not been studied; (4) or, you might notice a point that, although it is dealt with in the reviewed literature, ought to be extended further in some other direction. An explicit mention of the novelty of your research is often included near the end of the literature review, just before your hypothesis, but not always. It should be included where it makes the most sense. Below is an example where Zajacova & Burgard (2010, p. 93) point out a gap in research on self-rated health:

“Relatively few studies have examined the effect of excess body weight on self-rated health (Ferraro & Booth, 1999; Ford et al., 2001). This is a crucial gap in the literature because self-rated health is an excellent comprehensive indicator of individual and population health status (Idler & Benyamini, 1997).”

You would then go on to note how your research is designed to fill that gap. You may even want to point out exactly how your research differs from previous studies: “All the studies reported previously relied on self-reports by adolescents as the source of the data. In the current study, reports by the parents of adolescents were used.”

**The Final Paragraph of your Introduction. *See Kail, pp. 75-76!***

Your literature review should lead readers to your Introduction’s climax: your hypothesis. Even before you state the hypothesis, the reader should be able to guess what the hypothesis is, how your hypothesis follows logically from past research and theory, and why it is important to test your hypothesis.

To introduce your hypothesis, use words such as, “In view of [the logic and research findings I outlined earlier], I predicted that [my hypothesis],” or “If [the logic I spelled out earlier] is the case, it should follow that [my hypothesis].” Hypothesis can always be expresses in “if-then” statements – If X (your IV), then Y(your DV). When you state your hypothesis, be specific about which variables are involved and about whether you are making a cause-effect hypothesis.

Finally, keep in mind that in order to understand your hypothesis, you will have to introduce very briefly your methodology – not too many details; just enough to make your hypothesis intelligible. See Bem’s (2001) advice below.

*Ending the Introduction*. End the introduction with a brief overview of your own study. This provides a smooth transition into the method section, which follows immediately. From Bem (2001):

*Because this sex difference remains elusive, it seemed desirable to test Zanna’s parental-role theory of emotional expression in a more realistic setting. Accordingly, in the study to be presented here, we exposed men and women to filmed scenes designed to evoke either negative or positive emotions and assessed their emotional reactions when they thought they were being observed by one or both of their parents. We also sought to examine the relation of emotional expression to self-esteem.*

\*\*Remember, the beginning of your paper is the hook, the anecdote or example that illustrates the basic problem. The end is a clear statement of purpose, a summary of the specific goals and hypotheses of the research. Everything in between should create a logical, smooth transition from the hook to the hypotheses. ***Check out the example on the following pages in this manual. Also look over the peer-review checklist, as it will summarize what should be in your introduction.***

**Quick Summary and Formatting Reminders for the Introduction:**

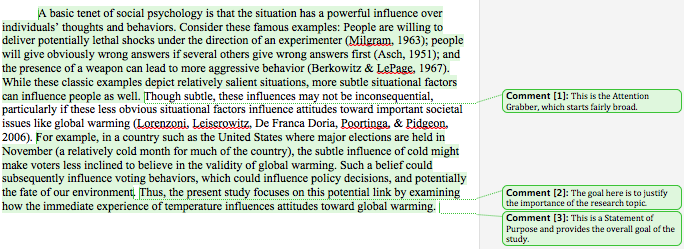
* *READ Kail, Chs. 1-5; This manual; See the example on the following pages; The peer-review checklist; the Writing appendix in this manual.*
* The Introduction begins on the third page of the document. It does NOT include the word Introduction.
* The paper’s title is double-spaced and centered at the top of page 3, the page where the introduction begins.
* An introduction is usually written in past tense because it reports on published research and your own research, which has (presumably) already been conducted.
* The introduction contains three main elements: an overview of the topic, a literature review, and the hypothesis (with brief mention of the anticipated results and the methodology employed).
* Each paragraph should contain ONLY ONE idea and a few supporting statements.
* Each paragraph is about an IDEA, not a researcher or an article.
* Most paragraphs should contain a synthesis of past research, wherein you weave together the relevant ideas or findings from several studies all in support of the main idea in that paragraph.
* Don't spend a lot of time fretting over your opening sentence – come back to it later.
* After you have written several paragraphs, go back through them and ask yourself over and over, “does this really need to be here?” “Does this help me make the case for my study?” If your answer is “no” or “I don't know,” delete it or rewrite until you do know.
* Use concrete examples to illustrate your points.
* Avoid using quotes (except when 100% necessary)!
* Refer to the writing appendix in this manual for many more important details.

***Note:*** Some of this part of the lab manual was extracted directly or in part from Bem (2001) and from Beins & Beins, (2014)

## From Article Notes and Outlines to a Literature Review

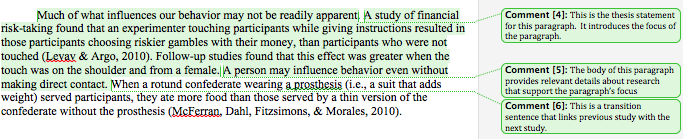
This brief example literature review provides a notated example of how to use notes and/or summaries from articles and your outline to build a cohesive introduction. In this example, the research question focused on how situational factors may influence attitudes toward climate change. Notice, however, this is merely an example and *as such is a bit brief relative to your introduction*. The smaller-sized indented sections with the comments represent the literature review while the other pieces in blue offer guidance about what those sections are attempting to do.

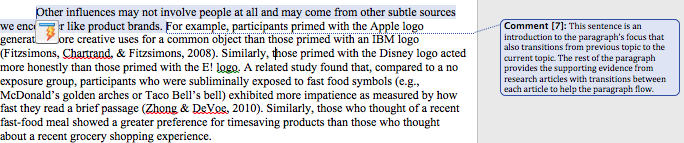
In any literature review or introduction, it is customary to start with a lead-in of the topic. For example, we begin here by demonstrating the topic’s relevance in the larger literature, introduce the basic research question, provide some rationale for asking it, and provide a sense of where the author will go with the introduction. (I’ve used images to insert so that the comments function would not affect the remainder of this manual.)



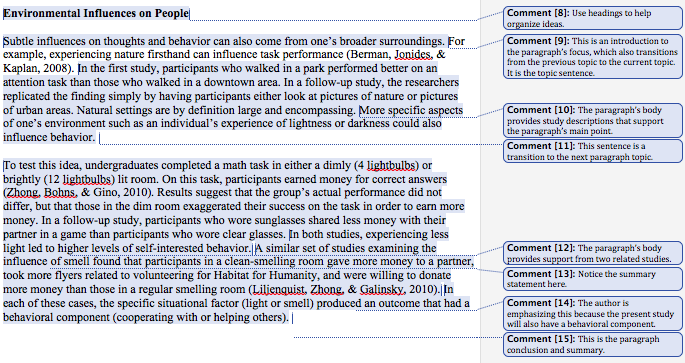
First, we will focus on subtle influences.

**Subtle Influences on Behavior**

****Since your topic (temperature) does not involve people or an interpersonal component, you will want to quickly shift focus by emphasizing specific situations or settings that do not directly involve people.

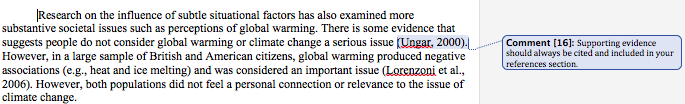


Now, we will want to narrow our literature review’s focus toward general situational factors that are more environmentally based on the surroundings (i.e., like temperature).

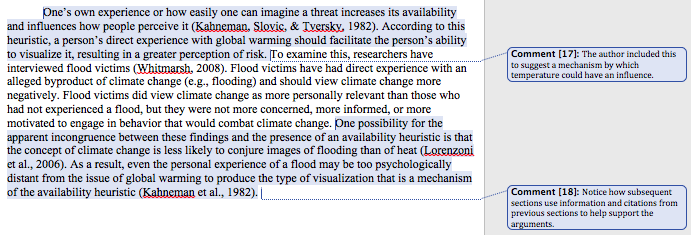
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At this point, we should begin to make the connection between how a situation or experience can influence perceptions of a broad social issue like global warming. One strategy might be to start with some general information about what people think about climate change.

**Environmental Influences on Perceptions of Climate Change**

****

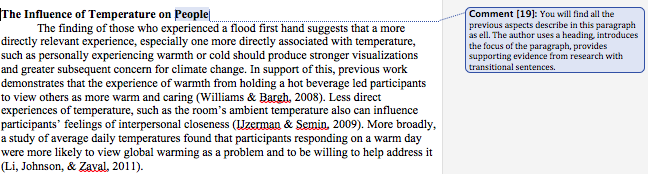
With a general introduction of global warming established, let’s focus on why an individual experience might influence attitudes toward climate change.

****

As we focus on why individual experience might influence attitudes, we should be sure to address and explain any potentially incongruent findings.

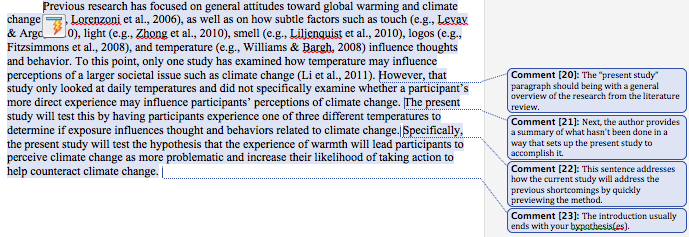
However, if a person could be induced to have a more salient and immediate experience, perhaps the availability heuristic would produce greater perceptions of risk. In support of this, compared to a control group, participants who were led to experience more negative emotion had greater perceptions of risk about living in a flood prone area (Keller, Siegrist, & Gutscher, 2006).

Here we continue to funnel our review of the literature toward our specific research question while reminding the reader how this question follows logically from previous research findings.

****

Finally we set up the logic for our study.

**The Present Study**

****

## Writing a Method Section

***HELPFUL READINGS:*** *Heath, pp. 348-350 and the sample paper in Heath and on Moodle. See the paper checklist in Heath, pp. 362-364,*

As you’ll recall, the method section is divided into at least two, sometimes more, subsections. Participants and Procedure are the required sections.

Any method section is a blueprint for readers who want to evaluate what was done in a study or to replicate it from start to finish. A thorough method section allows readers to mentally walk through a study, to imagine the experience of research participants who took part in it. A method section is like a script for a play: Lines are recited by some actors (i.e., experimenters) and listened to by other actors (i.e., participants), and all action is coordinated by stage directions. These directions include identifying which variables are measured or manipulated; what the experimenters and participants do; what stimuli, personality inventories, surveys, or questionnaires are employed; and when the participants’ debriefing occurs.

The trick for a Method section is to write enough detail so that the study could be replicated, but to avoid writing superfluous, largely irrelevant detail.

**Participants.** First describe the participants in a “Participants” subsection. Include the total number, the distribution of men and women, mean age, and other characteristics relevant to your study. Also include how they were selected and/or compensated for their participation.

**Procedure.** It is helpful to lead the reader through the sequence as if he or she were a participant. First give the usual overview of the study, including the description of participants, setting, and variables assessed, but then describe the experiment *from the participant’s vantage point*. Provide summaries or excerpts of what was actually said to the participant, including any rationale or “cover story” that was given. Show sample items from questionnaires, labels on attitude scales, copies of stimulus materials and/or pictures of apparatus. If you administered a standard personality test or attitude scale, describe its general properties unless it is very familiar (e.g., the MMPI or the F scale). For example: “Participants then filled out the Marlowe-Crowne Social Desirability Scale, a true-false inventory that measures the degree to which persons describe themselves in socially desirable terms (e.g., ‘I have never lied’).” You may not always be able to describe the method from the participants’ point of view, but do so as often as feasible. Using the active voice rather than passive voice will help with this. For example:

*Worse:* Researchers told participants to press the Z key when the green target appeared and the M key when the red target appeared.

*Better:* Participants pressed the Z key when the green target appeared and the M key when the red target appeared.

This is a subtle, but important difference. The participant is the actor / object in the second sentence.

**Conditions and Variables.** Name all groups, variables, and operations with easily recognized and remembered labels. Don’t use abbreviations (the AMT5% group) or empty labels (Treatment 3). Instead, tell us about the success group and the failure group, the father-watching condition and the mother-watching condition, the teacher sample and the student sample, and so forth. It is also better to label groups or treatments in operational rather than theoretical terms. It is difficult to remember that it was the high dissonance group that was offered the small incentive and the low dissonance group that was offered the large incentive. So tell us instead about the $1 group and the $20 group. You can remind us of the theoretical interpretation of these variables later when you discuss the results.

Be careful with the terms group and condition. They are related and almost equivalent in the researcher’s mind, but they are not linguistically equivalent. People can be in groups; they cannot be in conditions. Thus, groups can perform tasks, but conditions cannot. In other words, participants are assigned to conditions, not the other way around. People can’t be in conditions and conditions can’t perform tasks.

When DVs consist of responses using scales, for example, where participants respond to something on a scale from 1 to 7, there is a special format for writing what are termed, scale anchors. The high and low points (1 and 7 in the current example) are called the anchors of the scale. There are two points of punctuation to learn about scales: There is a hyphen between the number and the word point (e.g., 7-point scale), and the anchors are italicized. For example, “Participants indicated their response on a 7-point scale from 1 (*strongly agree*) to 7 (*strongly disagree*).

**Design.** Explicitly state how groups were formed or conditions administered. In other words, if participants were randomly assigned, you must indicate so. If the procedure for doing so was elaborate, mention it as well. Describe the experimental treatment in detail such that someone reading the paper could envision being a participant and so that another research could replicate your study. However, take care not to include every trivial detail (see below):

* Do not belabor the ordinary. Some things do not need to be mentioned because they are implied by the demands of the situation. If participants are completing a survey, there is no need to indicate whether they used pens or pencils (number 2 at that!) or where the writing instruments came from.
* There is *no need to explain standard experimental design, terms, or methodology*. Assume that your readers are familiar with psychological research. For example, you do not need to explain how counterbalancing works or what it controls for, etc.

Describe any control procedures used to minimize error variance, demand characteristics, and/or experimenter effects. Again, there is no need to use those words. You could simply write that, “Researchers were naïve to condition…” This tells the reader that you have controlled for experimenter effects.

When something is used more than once, do not describe it again. When anything is mentioned more than once in a Method section, such as rating scales, instructions, surveys, or instruments, refer back to the original description. If an experimenter repeats the same instructions several times, and those instructions are crucial (as in they are part of the independent variable), provide the verbatim instruction once, referring back to it as needed (Dunn, 2011).

If you used a manipulation check, the results can be a good place to describe it and the data from it. This can wait until the beginning of the results if you deem it works better there. It’s a judgment call.

Lastly, look for economies in words and phrases. Omit *unnecessary* details. If participants were told to read a passage as fast as possible without making any mistakes, simply indicate in the Method section that the instructions stressed speed and accuracy (Szuchman, 2002).

|  |
| --- |
| REMINDER BOX:  -Include enough detail so that the study could be replicated, but avoid unnecessary details.  -Write as much as possible from the participants’ point of view. |

**Quick Summary and Formatting Reminders for Writing the Method Section:**

* The Method section immediately follows the introduction.
* As a section heading, “Method” is centered and appears in boldface.
* The Method section contains subsections, which are labeled with left-justified boldface subheadings, including **Participants** (for humans) or **Subjects** (for animals), **Apparatus** or *Materials*, and **Procedure**; where necessary, novel subheadings can be created and remember that not all papers need a material or apparatus section.
* The research design is usually explained early in the Procedure subsection.
* Always indicate the unit of measure.
* Racial and ethnic labels are proper nouns and should be capitalized.
* Be specific enough, but not superfluously so. Do not tell readers more than they need to know. Assume common sense and familiarity with research methodology.

## Writing a Results Section

***READINGS:*** *Kail, Ch. 6 is excellent! Also see Heath, pp. 351-352, and pp. 375-376. See the paper checklist in Heath, pp. 362-364,*

You will already have had lots of practice with these, but here we provide more details to help.

Many students are most apprehensive about writing results sections. Fear not. I assure you, it is perhaps the easiest section of a paper to write once you have a little practice!

The most important thing to understand about writing a Results section is the that words should be your primary focus; not the numbers. *A well-written results section should be completely clear and intelligible by reading only the words and completely ignoring the numbers.* The numbers are there to support the words, not the other way around.

*Setting the Stage*. Before you can present your results, there are two preliminary matters that need to be handled, though their order is not set in stone – put them where it flows best. First, you need to describe any overall procedures you used to convert your raw observations into analyzable data. How were responses to your survey coded for analysis? How were observers’ ratings combined? Were all measures first converted to standard scores? Were items reverse scored? Related, if you created a composite variable, here is a good place to describe the reliabilities and how you combined them (e.g., Cronbach’s alphas, etc.). Second, if any participant’s data was excluded from the analyses, you need to describe that here, telling the reader why and how many, etc.

Next, tell us about the statistical analysis itself. If this is standard, describe it briefly (e.g., “All data were analyzed by two-way analyses of variance with sex of participant and mood induction as the independent variables”).

*Presenting the Findings*. The general rule in reporting your findings is to give the forest first and then the trees. This is true of the results section as a whole: Begin with the central findings, and then move to more peripheral ones. It is also true within subsections: State the basic finding first, and then elaborate or qualify it as necessary. Similarly, discuss an overall measure of aggression or whatever first, and then move to its individual components. Beginning with one of your most central results (test of your hypothesis), proceed as follows:

1. Remind us of the conceptual hypothesis or the question you are asking: “It will be recalled that men were expected to be more emotionally expressive than women.” Or, “We ask, first, whether the men or the women were more emotionally expressive?” Note that this is a conceptual statement of the hypothesis or question.
2. Remind us of the operations performed and behaviors measured: “In particular, the men should produce more tears during the showing of the film than the women.” Note that this is an operational statement of the hypothesis or question.
3. Tell us the answer immediately and in English: “As Figure 1 reveals, men do, in fact, cry more profusely than the women.” Or, “As shown in an independent-samples t-test, men did cry more than women, t(#) = ###).”
4. Now, and only now, speak to us in numbers. (Your grandmother can now skip to the next result in case she has forgotten her statistics or her reading glasses.): “Thus the men in all four conditions produced an average of 1.4 cc more tears than the women, *F* (1,112) = 5.79, *p* < .025.”
5. Now you may elaborate or qualify the overall conclusion if necessary: “Only in the father-watching condition did the men fail to produce more tears than the women, but a specific test of this effect failed to reach significance, *t(112)* = 1.58, *p* < .12.”
6. End each section of the results with a summary of where things stand: “Thus, except for the father-watching condition, which will be discussed below, the hypothesis that men cry more than women in response to visually-depicted grief appears to receive support.”
7. Lead into the next section of the results (if you need one) with a smooth transition sentence: “Men may thus be more expressive than women in the domain of negative emotion, but are they more expressive in the domain of positive emotion? Table 2 shows they are not...” (Again, the “bottom line” is given immediately.) As the results section proceeds, continue to summarize and “update” the reader’s store of information frequently. The reader should not have to keep looking back to retrieve the major points of your plot line.

By structuring the results section in this way, by moving from forest to trees, by announcing each result clearly in prose before wading into numbers and statistics, and by summarizing frequently, you permit a reader to decide just how much detail he or she wants to pursue at each juncture and to skip ahead to the next main point whenever that seems desirable.

A Results section should be a factual account of what was found, not why. The writing should be clear and declarative, focusing on what did or did not happen behaviorally. Interpretation, speculation, or commentary regarding any findings is saved for the Discussion section. Whether a hypothesis was supported is mentioned, for example, but not explored further until the Discussion section. As highlighted earlier, above all, a well-written results section should be understandable to most anyone without the need to actually look at the numbers involved. One should be able to read a results section and know what was found while skipping every number in the paragraph.

Here, I offer you an example of this strategy in action. A good example of a research report that describes support for a hypothesis involved testosterone level and aggression (Klinesmith, Kasser, & McAndrew, 2006). The investigators noted that previous researchers had discovered that insults or challenges to status can be associated with increases in testosterone levels in males. So Klinesmith et al. hypothesized that the presence of a gun (compared with a child’s toy) would increase testosterone levels in men. The researchers created a task in which participants handled for 15 min either a child’s toy or a pellet gun that resembled an automatic handgun. The investigators measured testosterone level before and after the 15-min period. The data confirmed their hypothesis. As they reported,

“Our first hypothesis was supported: Participants who interacted with the handgun showed a greater increase in testosterone from Time 1 to Time 2 than did those who interacted with the children’s game. Thus, interacting with the gun increased testosterone levels.” (Klinesmith et al., 2006, p. 571).

This verbal presentation of the results is clear and straightforward. After reading it, you know what happened. The researchers mentioned that they tested a hypothesis, how they tested it, the pattern of results, and the fact that the data confirmed their hypothesis. You don’t need statistics to understand their point. In a research report, though, a reader expects the technical, statistical information that supports their conclusion. Here are how those researchers included the statistical information:

“Our first hypothesis was supported: Participants who interacted with the handgun showed a greater increase in testosterone from Time 1 to Time 2 (*M* change = 62.05 pg/ml, *SD* = 48.86) than did those who interacted with the children’s game (*M* change = 0.68 pg/ml, *SD* = 28.57), *t*(28) = −4.20, *p* = .001, *d* = 1.53. Thus, interacting with the gun increased testosterone levels” (Klinesmith et al., 2006, pp. 571–572). (Note – these days, you’d also need to include confidence intervals.)

As you can see, the technical information supports the verbal statement, but you don’t need the statistics to understand the authors’ point. When you create your own Results section, you should try to make your point using words. Then insert the technical part. This advice is a little simplistic, but as a strategy, starting with ideas instead of numbers is a good plan. In addition, it often helps (but isn’t necessary) to begin your presentation of the data with descriptive statistics. The authors who studied testosterone level presented the means and standard deviations, then the inferential statistic, a t-test.

*Figures and Tables.* Figures and tables help tell the story of your data in a quick and compelling manner. In that respect, they are crucial. Within the text itself, lead the reader by the hand through a table or figure to point out the results of interest: “As shown in the first column of Table 2, men produce more tears (2.33 cc) than women (1.89 cc). Of particular interest is the number of tears produced when both father and mother watch (rows 3 and 4).” Don’t just wave in the general direction of the table and expect the reader to ferret out the information. F or a Figure, you can be a bit more hand-off in that you don’t need to orient your reader to what’s on the x and y-axes, because you will do that in the figure caption.

**A few important reminders:**

* The Results section should open by restating the main hypothesis for readers. If there is more than one hypothesis, each is reviewed in turn.
* Report results in the order that corresponds to the order of hypotheses as presented in the introduction.
* Whenever an effect is significant, report the direction of that effect. For example, *Participants in Group A scored significantly higher than those in Group B* is better than *The scores of the two groups were significantly different*. You must report actual means and standard deviations (or some other measure of variability) whenever you report that means differed. Always include effect sizes and confidence intervals.
* Use *nonsignificant* rather than *insignificant* if an analysis does not yield an acceptable level of significance.
* Capitalize interaction terms but not main effects. For example, The Age × Instructional Condition interaction was sig, *F…*
* Refer to all tables and figures at least once in the body of the results section

*Useful Rules*

* As a section heading, “Results” is centered and appears in boldface. It begins immediately after the Method section, not on a separate page.
* Letter symbols (e.g., *N*, *p, F, M, SD, d*) are italicized.
* Letters that are abbreviations (e.g., *M*, *SD*) should be used only in parentheses. In the narrative, use the word (e.g., mean, standard deviation).
* Use spaces between symbols and within equations as if each term were a word (e.g., *p* = .05).
* Use numerals for 10 and above; use words for nine and below. Exceptions:
  + Never begin a sentence with a numeral. Look up spellings for numbers in the dictionary and pay attention to hyphen use. Try not to begin a sentence with a number.
  + Use numerals below 10 in an abstract.
  + Use numerals below 10 that immediately precede a unit of measurement (e.g., 5 ml)
  + Use numerals below 10 to represent times, dates, ages, scores, points on a scale, sums of money, and points on a graph (e.g., a 5-point scale or a 5-year-old child).
* Use a zero before a decimal point when the value of a number is less than 1, unless it can never be more than 1 (e.g., levels of significance, proportions, correlation coefficients).
* Rounding off: Use two decimal places when reporting inferential statistics. Use exact *p* values to two or three decimal places and use < .001 when that is the fact. For means, use two decimal places as long as relevant differences can be seen with two decimal places. Otherwise, try to rescale, for example, converting centimeters to millimeters.
* Abbreviations for any measurement you are likely to need are listed in the *Publication Manual*. Note that most, but not all, abbreviations for units of measurement are neither capitalized nor followed by a period. Leave a space between the numeral and the abbreviated unit of measurement.
* The plural of *analysis* is *analyses*.
* *Between* is used for two things: Correlations were computed *between* two variables. *Among* is used for three or more: Correlations were computed *among* three variables.

## Writing a Discussion Section

***READINGS:*** *Kail, Ch. 7; Heath pp. (353-357), and the sample paper. See the paper checklist in Heath, pp. 362-364*

Discussion sections can be the trickiest part of the paper to write, so it is important to create enough time to complete this section. Kail offers excellent advice on common mistakes made in writing discussions (pp. 101-102). **NOTE:** However, you do ***not*** have to follow his advice of using subheadings in the discussion because that is rarely, if ever, done. For another difference between Kail’s advice and how I think discussions should be written, go to Kail, p. 103. Look at the description in (1). This is perfectly fine, *except the last sentence*. It is not typical in shorter empirical articles to engage in meta-commentary about what you plan to write about. Don’t do that in your paper. You should, however, heed the advice about what to write in most of the sections Kail outlines, but you should not need to be labeled them, nor do they need to appear in that same order.

The Discussion forms a cohesive narrative with the introduction, and you should expect to move materials back and forth between these two sections as you rewrite and reshape the report. Topics that are central to your story will appear in the introduction and probably again in the discussion. More peripheral topics may not be brought up at all until after the presentation of the results. The discussion is also the bottom of the hourglass-shaped format and thus proceeds from specific matters about your study to more general concerns (about methodological strategies, for example) to the broadest generalizations you wish to make. The sequence of topics is often the mirror image of the sequence in the introduction. The Discussion section comes at the end of the APA-style paper, yet it is something of a beginning: What does it all mean, anyway? Discussion sections serve the important purpose of reflecting on an entire study, from reviewing the hypothesis and results to thinking about the “big picture,” the implications of the findings for existing and future scholarship.

It is also appropriate at this point to compare your results with those reported by other investigators and to discuss possible shortcomings of your study, conditions that might limit the extent of legitimate generalization or otherwise qualify your inferences. Remind readers of the characteristics of your participant sample, the possibility that it might differ from other populations to which you might want to generalize; of specific characteristics of your methods that might have influenced the outcome; or of any other factors that might have operated to produce atypical results.

There are five things you must do when writing a Discussion section:

*1. Summary.* You should refresh your reader at the beginning of the discussion about what you discovered. Briefly restate the hypotheses or questions and indicate whether the data support the hypotheses, and how so. You do this with words – not with numbers or statistics as in the results section.

To put it another way, begin the discussion by telling us what you have learned from the study. Open with a clear statement on the support or nonsupport of the hypotheses or the answers to the questions you first raised in the introduction. But do not simply reformulate and repeat points already summarized in the results section. Each new statement should contribute something new to the reader’s understanding of the problem. Preview inferences that may be drawn from the findings.

For instance, Kaiser, Vick, and Major (2006) studied whether people pay attention to different environmental cues when they expect to experience prejudice. In the Discussion section of their research article, they began their comments by noting that,

“we hypothesized that individuals who chronically anticipate being a target of prejudice, or who find themselves in a situation in which these concerns are salient, are vigilant for cues that their social identity is under threat. Our research findings were consistent with this hypothesis. We found that individuals with chronic or situationally induced concerns about prejudice preconsciously screen their environment for signs of identity devaluation.” (Kaiser et al., 2006. p. 337)

You will be doing your reader a favor if you present each of your research findings separately, perhaps reserving a paragraph or two for each finding or closely related group of findings. Begin with your most interesting and important results. The reiteration of the results should not include statistics. Rather, give a verbal description that encapsulates the critical findings. If the reader is interested in the statistics, they are available in the Results section; there is no need to repeat them here. When you describe your results, connect them to your hypotheses, which you should have developed in the Introduction. That is, did your results provide support for your hypotheses? A simple statement often suffices.

If you have developed multiple hypotheses, deal with each one individually. There is nothing wrong with reporting that the results did not match your expectations. As we all know, human behavior is complex and not easy to predict. So your data might confirm a hypothesis entirely, partially, or not at all. Research is a process of finding out the limits to our theories and our predictions.

*2. Compare your results with those of others (i.e., with those that you described in your literature review or other applicable research) & attempt to reconcile any differences.*

**Summary:** Now that you know something about behavior, what does it mean? What else does it tell us about behavior? This second feature of the Discussion section is much more creative than the first.

After you draw the connection between your results and your hypotheses, you can take the opportunity to link your research to previous studies. Indicate how your findings qualify or extend existing theory, and *how* they relate to past results. Your ideas will have greater credibility if you connect them well to the work of other psychologists. As an example, consider one paragraph from McCreary and Sadava (2001, p. 113):

“A significant proportion of normal-weight men felt they were underweight, and an even larger percentage of overweight men thought they were normal weight. The opposite emerged for women: A large number of normal-weight women felt they were overweight. These findings support those from research with adolescents and university students, suggesting that weight misperceptions evident in early through late adolescence are also found in adults (Boris & Waller, 2000; Owens & Bergman, 2000).”

Put another way, it is appropriate at this point to compare your results with those reported by other investigators and to discuss possible shortcomings of your study, conditions that might limit the extent of legitimate generalization or otherwise qualify your inferences. Remind readers of the characteristics of your participant sample, the possibility that it might differ from other populations to which you might want to generalize; of specific characteristics of your methods that might have influenced the outcome; or of any other factors that might have operated to produce atypical results.

**Handling Inconsistencies:** (*Note how Kail recommends handling these issues – see pp. 104-105.*)

Just as your results might or might not conform to your hypotheses, they might or might not be similar to those of previous researchers. Try to *reconcile any inconsistencies* between your findings and past findings. There are different reasons for such inconsistencies. The other research might have had methodological limitations or yours might have. Different types of participants in the studies or different species of subjects might have led to different outcomes. Still, it is important to try and determine why your replication did not achieve the same results. Wang (2006) investigated people’s first memories from their childhoods and generally obtained results very similar to expectations and to previous research. However, there was one element of the findings that differed from earlier work; Wang’s research involved a slightly different memory task, which may have accounted for the difference.

“The ages of earliest memories were substantially later in the current study than in previous studies using free-recall tasks … or asking participants to answer questions about targeted events such as the birth of a sibling…. The differences between the current study and previous studies … are particularly interesting…. This issue merits further investigation, and examination of both the accessibility and the content of early memories elicited in different experimental paradigms will be necessary to unravel the puzzle of infantile amnesia.” (Wang, 2006, p. 713)

Below is another example that offers a well-thought through possible explanation for unexpected findings. Alfaro, Umana-Taylor, & Bamaca (2006, p. 288) offer an explanation for the finding that Latina mothers’ support was associated only with their daughters’ academic motivation, while Latino fathers’ support was associated only with their sons’ motivation.

“A possible explanation for this unexpected finding comes from research that has found that mothers are more likely to spend time with their daughters and fathers are more likely to spend time with their sons.... This may be especially true in Latino populations, as researchers have documented that parents are more likely to engage in gender role socialization with same-sex adolescents…”

*3. Limitations: Acknowledge what did not work or whether any problems exist.* *See Kail, p. 104*

There should be a discussion of limitations in the study. No study is the last word on a topic; no research, no matter how well done or how good the results, is perfect. Good researchers are up-front and honest about a study’s shortcomings. There is virtually always some limitation associated with the methodology, its execution, or possibly the pattern of the findings. Are there interpretational ambiguities? Were there unexpected results that are not easily fit into your theory? If there are alternative explanations for your results, acknowledge the alternatives and appropriately qualify your conclusions. But recognize the difference between *possible and plausible* alternatives. There are always possible alternative explanations. You are not obliged to document every far-fetched possibility. But acknowledge plausible alternatives. If you do not, critics will.

As you write this section, you should imagine yourself trying to outfox potential critics of your study and acknowledge its shortcomings yourself. If your study addressed those potential limitations, indicate how so. If it did not address the limitations, suggest how one could do so in the future. One good place to look for alternative explanations for your outcome is to take another hard look at your data – perhaps it will provide clues.

***IMPORTANT: Avoid mentioning trivial problems.*** Many studies can be criticized for relying on relatively non-diverse, homogeneous populations (i.e., the proverbial white, middle-class college sophomore; see Dawes, 1991; Sears, 1986). On the other hand, a restricted sample size can be worth mentioning when it probably had an effect on the statistical power in a study. This section should not be a big part of any Discussion section, however. After all, if the experiment were truly weak, you would not have undertaken it.

*4. Consider the wider implications of the study’s findings. For excellent advice, see Kail, p. 105!*

After the summary (number 1 above), explain how your findings extend past research. In the introduction, you outlined the goals of your experiment in relation to past findings. Now remind readers of those goals, and how well your results met them. What distinguishes your study and findings from past research in the area? Do your findings help to resolve conceptual ambiguities in past findings? If so, say so. Did you identify conditions under which an established effect no longer holds? Note that too.

*5. Look ahead—what’s next?* Far too many Discussion sections end with a vague call for “more research” on a topic. Such a conclusion adds little, as few topics in psychology do not require additional research. Be specific and provide a short but sensible direction for future research, particularly when your study’s results imply what comes next. The limitations you have identified can suggest further studies that could clarify matters. What questions remain unresolved? Do your findings raise new issues that haven’t previously been considered? To the extent that your results differ from past findings, could further research help explain these discrepancies? No matter how impressive your findings might be, they are not the end of the story. Science is a cumulative enterprise, with new studies building on past work. Inspire readers with possibilities of where to go next. Suggest novel contexts in which your findings could be further tested. Are there theoretical implications of your findings that could be tested? Can your theory or findings be applied to other areas of study? Do your findings suggest possible resolutions to any practical problems? (You don’t need to do ALL of that, of course).

Sometimes students, feeling the need to suggest some future research, suggest something arbitrary. Be careful about this. For example, following a discussion of results related to a reaction time test of color naming, it is not appropriate to suggest that future research be done on color-blind people or people who speak other languages. A sure sign that you are falling into the trap of suggesting irrelevant future research is a sentence that begins, “It would be interesting to see whether . . .” Suggest future research *only* if you can suggest what the next *logical* research question would be.

*Conclusions.* The hourglass shape of an article implies that your final words should be broad general statements of near-cosmic significance, not precious details of interest only to psychologists. Thus the statement, “Further research will be needed before it is clear whether the androgyny scale should be scored as a single continuous dimension or partitioned into a 4-way typology,” might well be appropriate somewhere in a discussion section, but, please, not your final farewell.

You should probably settle for more modest injunctions: “If gender schema theory has a political message, it is that human behaviors and personality attributes should no longer be linked with gender, and society should stop projecting gender into situations irrelevant to genitalia. The feminist prescription, then, is not that the individual be androgynous, but that the society be gender-aschematic” (S. Bem, 1985).

But in any case, end with a “reasonable” bang, not a whimper.

***Quick Summary for Writing the Discussion Section***

* As a section heading, “Discussion” is centered and appears in boldface.
* Start any Discussion section by reviewing the main hypothesis and whether the results support it (additional hypotheses and findings should also be considered).
* Compare your findings to those of others’ research. Note how they are consistent, and if inconsistent, offer a well thought out plausible reason for why.
* Discuss the larger implications of the findings, if any, and acknowledge problems associated with the study (avoid trivial ones).
* Maybe identify a future specific direction for research (don’t bother if you can only be general)

# More Essentials on Writing in APA Style

Scientific/Psychological Writing differs in important ways from writing in other fields. Here, I outline some of the most fundamental differences. Understanding and implementing these in your reading and writing will give you a tremendous head start.

**APA formatting.** Of course, one big difference is that writing research in psychology is guided by the rules and guidelines offered by the APA manual – how to cite, what details go where, margins to use, when to italicize and not, and much more. This is actually nice in that you’ve got everything you need written in a book right in front of you.

**APA style.** Beyond formatting, following APA style leads to an organized paper. For example, subheadings are used more frequently in psychological works than in other fields. Subheadings organize the writing process, inform the reader of the section topic, and decrease the need for transitions. The hourglass format is embedded in writing psychology by design – because the format itself helps organize the writing.

**Wording and Language**. First, psychological writing is scientific, straightforward, and unembellished. It limits use of strong, definitive words and conclusions, compared to the frequent use of hedge words (e.g., *tend, suggest, may*). Hedging acknowledges that several interpretations are possible, that statistical analyses should be interpreted with caution, and that future work could disprove or support current findings; in general, this makes conclusions more palatable to readers.

**No quotes – lots of paraphrasing**. Another characteristic of psychological writing is the use of fewer direct quotations and footnotes (usually none) but more paraphrasing. Because this characteristic is different from other areas (such as history; Madigan et al., 1995), students may not be used to paraphrasing, which is why we devote time to practicing that skill in class/lab exercises.

**Writing for Evaluation, Analysis, and Synthesis**. Students must analyze past research and discuss why their ideas improve on previous ones or show how their study will expand either our theoretical or practical understanding. Your task is to not only become knowledgeable about a topic but also may weave that understanding together in a way that helps your argument. You cannot do this in a historical or study-by-study manner. Likewise, research papers sometimes also require writers to evaluate the strengths and weaknesses of previous research as a way of making a good case for their own.

## Composing Clear Sentences and Engaging Paragraphs: General Information

*Below I primarily refer you to the excellent advice on writing each section of an APA paper that is available to you in Kail and Heath. Occasionally you will notice that I offer additional instruction and often refer to specific parts of readings in order to draw your attention specifically to those areas*.

***READINGS****: Kail, Chp. 1-4*

**Writing Clearly:** The first several chapters of the Kail text offer exceptional advice on how to craft a solid, engaging APA-style paper. The first chapter is about writing clearly – the gold standard of scientific communication. The chapter offers very specific and useful strategies for writing clear sentences. If you are not familiar with or have forgotten common grammatical terms, don’t worry about memorizing the names. Focus on the message.

**Emphasis: Word Choice and Sentence Structure.** Kail chapter 2 teaches you how to add flair to your writing through choosing your words wisely and through carefully structuring your sentences. Pay special attention to the message about hedge words (p. 18-19). In my experience, writers new to scientific communication tend to overstate their argument. The proper use of hedge words *may* help you avoid that rookie mistake. Kail also walks you through how to put the most important information at the end of your sentences to better emphasize your points.

**Writing Concisely.** The first part of chapter 3 is about how to write more concisely. This is a very important chapter. As in all his chapters, Kail offers specific strategies for how to accomplish that important goal. The second part of the chapter is a bit less important, but adding spice to your writing can go a long way towards making a fair paper good and a good paper excellent.

**The Art of Fine Paragraphs.**  Chapter 4 in Kail *is among the most important one in the book.* I urge you to read it carefully. Mastering the advice in this chapter will have you well along the way to an excellent paper. Recall the important advice provided earlier in the manual on how to synthesize your coverage of others research and on the effective use of transitions.

## Title and Abstract

***READINGS:*** *Heath in Chapter 14; Kail, p. 118-119*

The title and abstract of your article permit potential readers to get a quick overview of your study and to decide if they wish to read the article itself. Titles and abstracts are also indexed and compiled in reference works and computerized databases. For this reason, they should accurately reflect the content of the article and include key words that will ensure their retrieval from a database. You should compose the title and abstract *after you have completed the article and have a firm view of its structure and content*.

The recommended length for a title is 10 to 12 words. It should be fully explanatory when standing alone and identify the theoretical issues or the variables under investigation. Because you will not be able to mention all the features of your study in the title (or even in the abstract), you must decide which are most important.

The abstract is a crucial aspect of any paper because it will determine whether anyone will want to read the remainder of your paper. The abstract of an empirical article should not exceed 120 -150 words, making it a brutal exercise in economy of expression. To begin drafting an Abstract, include about one sentence each from the Introduction, Results, and Discussion sections, and up to two from the Method section. From the introduction, extract key elements from the portion devoted to the purpose of the study and reduce it as much as you can. This information is usually contained in the first sentence of the abstract. For the Method aspect of the abstract, write only about the essential features of the procedure that are connected with the hypothesis. For example, “*Participants watched a 5-min frightening or neutral film clip and then viewed a list of emotional or non-emotional words. They later completed a surprise recognition test*.” State the major findings, but do not include numbers. For example, “*Participants in the frightening-movie condition recalled more emotional words than those in the neutral-clip condition*.” Finally, include one sentence about the conclusions or implication (from the Discussion section). For example, “*Our results extend theory on arousal-inducement via media and have broad implications for the U.S. movie-rating system.”*

Clearly the abstract must be very compact, and this requirement leads many inexperienced writers to make it unintelligible. Remove unnecessary words and eliminate less important details of method and results. But then let it breathe. In particular, allow yourself the space to make the problem under investigation clear to a casually browsing reader. Often you can plagiarize and abbreviate key statements from the article itself. Here is an example:

*When are men more emotionally expressive than women? One hundred male and 100 female undergraduates were individually shown a sad or a happy film, while being observed by one or both of their parents. Judges blind to condition rated participants’ facial expressions, and a Lachrymeter measured their tear volume. Men cried more during the sad movie but laughed less during the happy movie than did the women (interaction, p < .02). However, men in the father-watching condition with low self-esteem (Darley Self-Concept Scale) cried less than all other participants. Sex differences in emotional expression are moderated by the valence of the emotion and—for men—by self-esteem and conditions of being observed.*

## Rewriting and Editing

For many authors revising an article is unmitigated agony. Even proofreading is painful. And so they don’t. So relieved to get a draft done, they send it off thinking that they can clean up the writing later. Alas, that day rarely comes. Moral: Don’t expect your reviewers to discern your brilliance through the smog of polluted writing. Revise your manuscript. Polish it. Proofread it. Then submit it.

Rewriting is difficult for several reasons. First, it is difficult to edit your own writing. You will not notice ambiguities and explanatory gaps because you know what you meant to say, and you understand the omitted steps. One strategy for overcoming this difficulty is to lay your manuscript aside for a while and then return to it later when it has become less familiar. Sometimes it helps to read it aloud. But there is no substitute for practicing the art of taking the role of the non-specialist reader, for learning to role-play grandma. As you read, ask yourself, “Have I been told yet what this concept means?” Has the logic of this step been demonstrated?” “Would I know what the independent variable is at this point?” This is precisely the skill of the good lecturer in Psychology 101, the ability to anticipate the audience’s level of understanding at each point in the presentation. Good writing is good teaching.

But because this is not easy, you should probably give a fairly polished copy of the manuscript to a friend or colleague for a critical review. If your colleagues find something unclear, do not argue with them. They are right: By definition, the writing is unclear. Their suggestions for correcting the unclarities may be wrong, even dumb. But as unclarity detectors, readers are never wrong.

Rewriting is difficult for a second reason: It requires a high degree of compulsiveness and attention to detail. The probability of writing a sentence perfectly the first time is vanishingly small, and good writers rewrite nearly every sentence of an article in the course of polishing successive drafts. But even good writers differ from one another in their approach to the first draft. Some spend a long time carefully choosing each word and reshaping each sentence and paragraph as they go. Others pound out a rough draft quickly and then go back for extensive revision. Although I personally prefer the former method, I think it wastes time. For your papers in particular, I think most students should get the first draft done as quickly as possible without agonizing over stylistic niceties. But once it is done, compulsiveness and attention to detail become the required virtues (before you turn it in to us)

And finally, rewriting is difficult because it usually means restructuring. Sometimes it is necessary to discard whole sections of an article, add new ones, go back and do more data analysis, and then totally reorganize the article just to iron out a bump in the logic of the argument. Don’t get so attached to your first draft that you are unwilling to tear it apart and rebuild it. (This is why the technique of crafting each sentence of a first draft wastes time. That beautiful turn of phrase that took me 40 minutes to shape gets discarded when the article gets restructured. Worse, I get so attached to the phrase that I resist restructuring until I can find a new home for it.) A badly constructed building cannot be salvaged by brightening up the wallpaper. A badly constructed article cannot be salvaged by changing words, inverting sentences, and shuffling paragraphs.

Which brings me to the word processor. It’s very virtuosity at making these cosmetic changes may tempt you to tinker endlessly, encouraging you in the illusion that you are restructuring right there in front of the monitor. Do not be fooled. You are not. A word processor—even in conjunction with a fancy “outline mode”—is not an adequate restructuring tool. Moreover, it can produce flawless, physically beautiful drafts of wretched writing, encouraging you in the illusion that they are finished manuscripts ready to be submitted. Do not be fooled. They are not. If you are blessed with an excellent memory (or a very large monitor) and are confident that you can get away with a purely electronic process of restructuring, fine, do it. But don’t be ashamed to print out a complete draft of your manuscript, spread it out on table or floor, take pencil, scissors, and scotch tape in hand, and then, all by your low-tech self, have at it.

In summary,

* Write your drafts sooner rather than later. Just write something. You can edit later.
* Read out loud. Because you cannot skip over words, this can help you see awkward grammatical constructions and typos.
* Other peer reviews. Get people unfamiliar with psychology to read your papers. If they have trouble understanding something – especially something that is non-technical– that is a clue that you have not been clear.
* Reverse outline. Re-do your outline with the paper you’ve written. This can help you work on tough paragraphs. Outlines make you put all your ideas into relationship with each other, so you can more clearly see what is not needed and where you might need more support
* List paragraph main ideas. Listing the main idea of each paragraph, first, asks you to make sure each paragraph has only one main idea and, second, makes it easier to address how each main idea helps support your thesis
* As a unit, a paragraph works somewhat similarly to your whole paper: there is a topic sentence (like a thesis) making a claim about what you will do in the paragraph, and you spend the paragraph offering support for the idea (as the body of your paper supports your thesis). Therefore, in your revisions you can ask the question: How does this sentence help support the topic sentence of this paragraph? Do the same for each paragraph.
* As you read, ask yourself, “Have I been told yet what this concept means?” Has the logic of this step been demonstrated?” “Would I know what the independent variable is at this point?”

## APA Writing: Some Matters of Style

**Omit Needless Words (Economy of Expression or Conciseness)**

Virtually all experienced writers agree that any written expression that deserves to be called *vigorous writing*, whether it is a short story, an article for a professional journal, or a complete book, *is* characterized by the attribute of being succinct, *concise*, and to the point. *A sentence*—no matter where in the writing it occurs—*should contain no unnecessary* or superfluous *words*, words that stand in the way of the writer’s direct expression of his or her meaning and purpose.

In a very similar fashion, *a paragraph*—the basic unit of organization in English prose—should contain *no unnecessary* or superfluous *sentences*; sentences that introduce peripheral content into the writing or stray from its basic narrative line. It is in this sense that a writer is like an artist executing a drawing, and it is in this sense that a writer is like an engineer designing a machine. Good writing should be economical *for the same reason that a drawing should have no unnecessary lines, and* good writing should be streamlined in the same way that *a machine* is designed to have *no unnecessary parts*, parts that contribute little or nothing to its intended function.

*This* prescription to be succinct and concise is often misunderstood and *requires* judicious application. It certainly does notimply *that the writer* must *make all* of his or her *sentences short* and choppy *or* leave out all adjectives, adverbs, and qualifiers. Nor does it mean that she must *avoid* or eliminate *all detail* from the writing *and treat* her *subjects only in* the barest skeleton or *outline* form. *But* the requirement does imply *that every word* committed to paper should *tell* something new to the reader and contribute in a significant and non-redundant way to the message that the writer is trying to convey.

You have just read a 303-word essay on brevity. It is not a terrible first draft, but a good writer or copy editor would take its message to heart and, by crossing out all the non-italicized words, cut it by 81%. Savor the result:

Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all sentences short or avoid all detail and treat subjects only in outline, but that every word tell. [59 words]

*This* essay on brevity was written by Strunk and White (2000, p. 23) under the heading: “Omit Needless Words.” Obey their injunction, for it is the most important piece of advice in this article. Journal articles should also omit needless concepts, topics, anecdotes, asides, and footnotes. Clear any underbrush that clutters your narrative. If a point seems peripheral to your main theme, remove it. If you can’t bring yourself to do this, put it in a footnote. Then when you revise your manuscript, remove the footnote.

Copy editing other people’s writing is good practice for improving your own. It is also less painful than editing your own and much easier than actually writing. Any piece of prose will do.

To maintain the vigor of your prose, try to spend at least 15 minutes each day omitting needless words. Your goal should be to reach at least 30% of all words encountered. (Copy edited versions of this article will be returned ☺.)

**Avoid Metacomments on the Writing**

Expository writing fails its mission if it diverts the reader’s attention to itself and away from the topic; the process of writing should be transparent to the reader. In particular, the prose itself should direct the flow of the narrative without requiring you to play tour guide by commenting on it. Don’t say: “Now that I have discussed the three theories of emotion, we can turn to the empirical work on each of them. I will begin with the cognitive account of affect...” Instead, move directly from your discussion of the theories into the literature review with a simple transition sentence like, “Each of these three theories has been tested empirically. Thus, the cognitive account of affect has received support in studies that...” Don’t say: “Now that we have seen the results for negative affect, we are in a position to examine men’s and women’s emotional expression in the realm of positive affect. The relevant data are presented in Table 2...” Instead use a transition sentence that simultaneously summarizes and moves the story along: “Men may thus be more expressive than women in the domain of negative emotion, but are they also more expressive in the domain of positive emotion? Table 2 shows that they are not...” Any other guideposts needed can be supplied by using informative headings and by following the advice on repetition and parallel construction given in the next section.

If you feel the need to make metacomments to keep the reader on the narrative path, then your plot line is probably already too cluttered, the writing insufficiently linear. Metacomments will only oppress the prose further. Instead, copy edit. Omit needless words; don’t add them!

**Use Repetition and Parallel Construction**

Inexperienced writers often substitute synonyms for recurring words and vary their sentence structure in the mistaken belief that this is more creative, stylish, or interesting. Instead of using repetition and parallel construction, as in “Men may be more expressive than women in the domain of negative emotion, but they are not more expressive in the domain of positive emotion,” they attempt to be more creative: “Men may be more expressive than women in the domain of negative emotion, but it is not true that they are more willing and able than the opposite sex to display the more cheerful affects.”

Such creativity is hardly more interesting, but it is certainly more confusing. In scientific communication, it can be deadly. When an author uses different words to refer to the same concept in a technical article—where accuracy is paramount—readers will justifiably wonder if different meanings are implied. The example above is not disastrous, and most readers will be unaware that their understanding flickered momentarily when the prose hit a bump. But consider the cognitive burden carried by readers who must hack through this “creative” jungle:

The high-dissonance participants were paid a small sum of money while being given a free choice of whether or not to participate, whereas the participants we randomly assigned to the large-incentive treatment (the low-dissonance condition) were not offered the opportunity to refuse.

This (fictitious) author should have written:

High dissonance participants were paid a small sum of money and were not required to participate; low-dissonance participants were paid a large sum of money and were required to participate.

The wording and grammatical structure of the two clauses are held rigidly parallel; only the variables vary. Repetition and parallel construction are among the most effective servants of clarity. Don’t be creative, be clear.

Repetition and parallel construction also serve clarity at a larger level of organization. By providing the reader with distinctive guideposts to the structure of the prose, they can diminish or eliminate the need for metacomments. Here, for example, are the opening sentences from three of the paragraphs in the earlier section on rewriting:

2nd paragraph: “Rewriting is difficult for several reasons. First...” 5th paragraph: “Rewriting is difficult for a second reason:”

6th paragraph: “And finally, rewriting is difficult because it...”

If I had substituted synonyms for the recurring words or varied the grammatical structure of these opening sentences, their guiding function would have been lost, the reader’s sense of the section’s organization blurred. (I try so hard to be helpful, and I bet you didn’t even notice. That, of course, is the point.)

And finally, repetition and parallel construction can serve style and creativity as well as clarity. They can provide rhythm and punch: “A sentence should contain no unnecessary words, a paragraph no unnecessary sentences for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts.” They can establish metaphor: “A badly constructed building cannot be salvaged by brightening up the wallpaper. A badly constructed article cannot be salvaged by changing words, inverting sentences, and shuffling paragraphs.” They can add humor: “The word processor encourages you in the illusion that you are restructuring. Do not be fooled. You are not. The word processor encourages you in the illusion that your drafts are finished manuscripts. Do not be fooled. They are not.”

**Jargon**

Jargon is the specialized vocabulary of a discipline, and it serves a number of legitimate functions in scientific communication. A specialized term may be more general, more precise, or freer of surplus meaning than any natural language equivalent (e.g., the term *disposition* encompasses, and hence is more general than, *beliefs, attitudes, moods*, and *personality attributes*; *reinforcement* is more precise and freer of surplus meaning than *reward*). And the technical vocabulary often makes an important conceptual distinction not apprehended by the layperson’s vocabulary (e.g., *genotype* versus *phenotype*).

But if a jargon term does not satisfy any of these criteria, opt for English. Much of our jargon has become second-nature to us and serves only to muddy our prose for the general reader. (I once had to interrogate an author at length to learn that a prison program for “strengthening the executive functions of the ego” actually taught prisoners how to fill out job applications.) And unless the jargon term is extremely well known (e.g., *reinforcement*), it should be defined—explicitly, implicitly, or by example—the first time it is introduced. (See the sample opening statements earlier in this article for ways to do this.

**Voice and Self-Reference**

In the past, scientific writers used the passive voice almost exclusively and referred to themselves in the third person: “This experiment was designed by the authors to test ...” This practice produces lifeless prose and is no longer the norm. Use the active voice unless style or content dictates otherwise; and, in general, keep self-reference to a minimum. Remember that you are not the topic of your article. You should not refer to yourself as “the author” or “the investigator.” (You may refer to “the experimenter” in the method section, however, even if that happens to be you; the experimenter *is* part of the topic under discussion there.) Do not refer to yourself as “we” unless there really are two or more authors. You may refer to yourself as “I” but do so sparingly. It tends to distract the reader from the topic, and it is better to remain in the background. Leave the reader in the background, too. Don’t say, “The reader will find it hard to believe that ... “or “You will be surprised to learn...” (This article violates the rule because you and your prose *are* the topic.) You may, however, refer to the reader indirectly in imperative, “you-understood” sentences: “Consider, first, the results for women.” “Note particularly the difference between the means in Table 1.”

In some contexts, you can use “we” to refer collectively to yourself and your readers: “We can see in Table 1 that most of the tears...” The *Publication Manual*, however, emphasizes that the referent of “we” must be unambiguous; for example, editors will object to the sentence “In everyday life, of course, we tend to overestimate...” because it is not clear just who is meant by “we.” They will accept “In everyday life, of course, we humans tend to overestimate...” or “In everyday life, of course, human decision makers often make errors; for example, we tend to overestimate...”

**Tense**

Use the past tense when reporting the previous research of others (“Bandura reported...”), how you conducted your study (“Observers were posted behind...”) and specific past behaviors of your participants (“Two of the men talked...”). Use the present tense for results currently in front of the reader (“As Table 2 shows, the negative film is more effective ...”) and for conclusions that are more general than the specific results (“Positive emotions, then, are more easily expressed when...”).

**Common Errors of Grammar and Usage**

The following errors seem to me to be the most frequent in journal writing (listed alphabetically):

*Compared with* versus *Compared to*. Similar orders of things are compared *with* one another; different orders of things are compared *to* one another: “Let me not compare thee *with* previous lovers I have had; rather, let me compare thee *to* a summer’s day.” “Mischel’s articles are often compared *with* Bandura’s articles; Bem’s articles are often compared *to* Mozart’s sonatas.”

*Data*. The word *data* is plural: “Analyze those data thoroughly.”

*Different from* versus *Different than*. The first is correct, the second, incorrect (although, alas for us purists, very common and gaining respectability). The confusion arises because *than* correctly follows comparative adjectives. Thus, you are correct to suppose that life is more *than* psychology, that living a good life is harder in many respects *than* writing a good article, and that living well requires broader skills *than* does writing well. Just remember that life is different *from* psychology, that living a good life is different in many respects *from* writing a good article, and that living well requires skills different *from* those required for writing well.

*None, No one*. These words are singular: “None of them is likely to obtain data that are more convincing.”

*Since* versus *Because*. *Since* means “after that.” It should not be used as a substitute for *because* if there is any ambiguity of interpretation. *Wrong (but at least not ambiguous*): “Since the study of motivation is a high and hazardous undertaking, I wish fewer people would meddle with it.” *Better*: “Because the study of motivation is a high and hazardous undertaking, I wish fewer people would meddle with it.” *Ambiguous*: “Since I read Montaigne, I have been tempted to abandon the study of motivation.” This last case is correct if the writer is using *since* in the temporal sense: “Ever since reading Montaigne, I have been tempted...” It is incorrect if the writer means *because*.

*That* versus *Which*. *That* clauses (called restrictive) are essential to the meaning of the sentence; *which* clauses (called nonrestrictive) merely add further information. The following example illustrates the correct use of both words: “Dissonance theory, *which* has received major attention, is one of the theories *that* postulates a motivational process. Thus, if a person holds two cognitions *that* are inconsistent...” Most *which’s* in journal writing are incorrect. You should go on a *which* hunt in your own manuscripts and turn most of them into *that’s*.

*While* versus *Although*, *But*, *Whereas*. *While* means “at the same time” and in most cases cannot substitute for these other words.

*Wrong*: “*While* inferential statistics are important, descriptive statistics are the heart of your narrative.” *Right*: “*Although* inferential statistics are important, descriptive statistics are the heart of your narrative.”

Or, “Inferential statistics are important, *but* descriptive statistics are the heart of your narrative.” *Wrong*: “*While* I like personality traits, Mischel prefers a social learning approach.”

*Right*: “*Whereas* I like personality traits, Mischel prefers a social learning approach.”

Interestingly, the following usage is correct: “*While* I like personality traits, I find merit in Mischel’s social learning approach.” This can be seen by substituting “at the same time” for “while”: “I like personality traits; at the same time, I find merit in Mischel’s social learning approach.”

# Additional Resources

* See the Sample APA-Style paper on Moodle or here: <http://www.apastyle.org/manual/related/sample-experiment-paper-1.pdf>
* See the formatted APA-style document I have on Moodle
* ***The University of Washington’s Psychology Writing Center contains a number of excellent, concise resources***: <http://www.psych.uw.edu/psych.php#p=339>

From this site, I especially recommend:

* For citations and references:
* <http://www.psych.uw.edu/writingcenter/writingguides/pdf/citations_condensed.pdf>
* http://www.psych.uw.edu/writingcenter/writingguides/pdf/citations.pdf
* For summarizing articles:
* <http://www.psych.uw.edu/writingcenter/writingguides/pdf/summarizing.pdf>
* For reporting statistical results:
* <http://www.psych.uw.edu/writingcenter/writingguides/pdf/stats.pdf>
* How to make an outline:
* <http://www.psych.uw.edu/writingcenter/writingguides/pdf/outline.pdf>
* See the APA-style cite at Purdue University’s OWL: <https://owl.english.purdue.edu/owl/section/2/10/>
* See APA help center – very useful: <http://www.apastyle.org>

**For detailed guidelines on APA-style, visit the following cites:**

* <http://www.apastyle.org>
* <https://owl.english.purdue.edu/owl/section/2/10/>

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