CHAPTER OBJECTIVES

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Writing is not like painting where you add. It is not what you put on the canvas that the reader sees. Writing is more like a sculpture where you remove, you eliminate in order to make the work visible. Even those pages you remove somehow remain.
—Elie Wiesel

Introduction

The goal of any research project is a report in which you tell others why and how you conducted the research and the implications of your findings. This does not mean you should wait to write any details down about your study until it is finished! On the contrary, writing is first and foremost a process that takes time. This is why we are taking this chapter to introduce you to the process of preparing a high-quality research report. One caveat before we dig in: Given our backgrounds and the structured nature of reports within the field of psychology, we will emphasize the guidelines of the American Psychological Association (APA), a guideline used by most of the social sciences.

In many ways, writing a research report requires you to tell a story with a clear beginning, middle, and end. You begin the report with a description of an important and at least partially unresolved question. Then you turn to details that you uncovered regarding your hypotheses and use those clues to help steer the review toward a set of logical deductions (i.e., the hypotheses). In the next part of the report, you tell the reader how you went about collecting the data for the study. Remember, good science can be repeated by others and you want others to know exactly how you tested your hypotheses. After discussing the results of the project, the last portion of this type of report is space for you to pull information together and
explain how this study has answered or addressed the initial question or issue of interest.

Writing is a unique, intellectual challenge. Your goal is to influence the behavior or thinking of anyone who might choose to read what you have written. In most cases, you write to share information and persuade the reader that your interpretation of the facts is correct, or at least logical and defensible. The same is true in a good research report. At the start of your paper, you introduce the readers to the purpose of your research, and then convince them that you are asking an important and interesting question. By the end of the paper, you will have convinced the reader that your analysis and interpretation of the data were the correct ones and have answered the questions.

There is no mystery to becoming a good writer. Similarly, there are no excuses for why any intelligent person cannot write well. Writing is a craft learned and refined through practice guided by self-discipline, and by attention to detail and a willingness to seek help from others. Good writers write well because they write often. Good writers also write well because they have learned from experience and have received useful and constructive critiques of their own writing. Good writers also tend to be those people who read a great deal of what other good writers write. Reading exposes you to many styles of writing and can help you pick up good writing habits. Within the social sciences, you can learn a great deal about how to present your research findings and ideas by learning from the example set forth by other good writers in your field (yes, we’re telling you that it’s a good idea to read journals not just for content, but also for style and form).

Finally, good writers never work in isolation; they have others read drafts of their work, and they seek constructive or helpful criticism. Many students seem to believe that no one should read their paper until they submit it to the instructor. Nothing could be farther from the truth. In fact, all of us really hate it when we receive a “first-draft paper” from our students; they are never as good or polished as they should be. Asking someone you trust to read a draft of your paper and provide feedback will help you become a better writer. This can help to ensure that your work is as clear and concise as possible. For example, as we wrote this book, each of us reviewed the others’ work and offered extensive comments, corrections, and constructive criticism. In addition, other social scientists read drafts of all the chapters and offered their critical comments before a final draft was submitted to the publisher. Certainly there were times when the feedback from these reviews was frustrating and less-than-positive, but overall these comments helped us to fix areas that were confusing and strengthen areas that were weak (at least we think we have succeeded in doing this).

This being the case, we hope you can see that this textbook cannot teach you how to be a good writer any more than a textbook can teach an artist how to paint like Picasso. What we can do is highlight several of the core elements and characteristics of good writing in the social sciences. Studying these characteristics will help you to critically evaluate your own writing. For this reason, we hope to achieve two things in this chapter. First,
we will review general stylistic conventions that are central to good writing. Second, we will introduce you to the editorial guidelines developed by the APA, focusing on the basic details that you will need to prepare a standard research report.

What Do Readers Appreciate in Good Writing?

Good writing, especially scientific writing, involves three essential elements: focus, organization, and integration. It may be difficult to believe, but it is not a requirement of scientific writing that it be dull and boring. On the contrary, there is no reason why writing or reading a scientific report must be an exercise in tedium. In truth, writing about complicated technical and theoretical issues is difficult and this is what prevents many researchers from allowing their storytelling abilities to shine through in their writing. With time, practice, attention, and multiple drafts, we are confident that anyone can prepare a research-based report that captivates the interest and attention of serious readers.

Focus means that there is a clear purpose for the writing and definite boundaries established for what you will and will not discuss. Some writers fall into the trap of covering too many topics. Consequently, their papers are rambling expositions of many unrelated topics. For a research report, you should focus on your research questions.

In addition to being focused, good writing is organized. Readers working through a well-written paper will experience a logical presentation of ideas that lead to a series of reasonable conclusions. Along the way, each paragraph leads smoothly into each subsequent paragraph—there is a sort of flow from section to section that does not disrupt the reader’s attention.

Finally, with focus and organization in place, a good writer is able to integrate the information into a coherent message. All writing, even of research reports, requires storytelling. Your job as a writer is to bring together a series of facts and observations and show the reader with words how this puzzle fits together. Listing all the means, standard deviations, and results of the inferential statistics from your statistical analyses is not integration. Far more interesting is learning how the results of your research address your specific and well-supported and introduced hypotheses.

Elements of APA Style

The APA developed its editorial style to promote good scientific writing and to establish a consistent format for presenting the results of research for the behavioral sciences (APA, 2009). The editorial style and format are extremely popular and used by most professional journals in education, psychology, sociology, and even some areas of business management. In this section, we will review several of the fundamental features of APA style.
Issues of Style

Writing a research report requires that you strive for accuracy, brevity, and clarity. You will find that writing a research report is much different from other forms of writing. We do not wish to imply that one form of writing is better than another, only that different styles serve different purposes. Consider an example from the opening pages of Mark Twain’s (1876) *The Adventures of Tom Sawyer*, wherein Twain describes Aunt Polly:

> The old lady pulled her spectacles down and looked over them about the room; then she put them up and looked under them. She seldom or never looked through them for so small a thing as a boy; they were her state pair, the pride of her heart, and were built for “style” not service—she could have seen through a pair of stove-lids just as well. (p. 9)

In this vivid passage, Twain used metaphor and other literary devices to introduce the reader to Aunt Polly. Twain used the glasses to describe Aunt Polly’s personality and her relation to Tom.

Although these and many other techniques make for good literature, they are not commonly appropriate for technical, research-based writing. In research reports, literary techniques such as ironic use of words and intentional ambiguity are distractions. These literary devices require too much inference and subjective interpretation on the part of the reader and should, therefore, be avoided unless clearly explained. Therefore, you should avoid using vague and colloquial expressions (e.g., “After quite a long time, the effects of the independent variable kicked in”) and opaque jargon and euphemistic phrases (e.g., “The individual’s behavior created much collateral disruption among interrelated members of the domestic unit”).

Compare the passage from *Tom Sawyer* with the opening paragraph of an article by Allumbaugh and Hoyt (1999):

> Over 2 million people die in the United States every year (U. S. Bureau of the Census, 1995). For each person who dies, there are numerous people left behind to grieve, many of whom seek help from a therapist. Loss and grief are universal human experiences. The recently bereaved represent a large at-risk population, with higher overall death and suicide rates than age-matched control participants and with an increased incidence of depression, substance abuse, and certain medical disorders. (p. 307)

This paragraph is clear and direct. The authors presented a series of facts that make clear that they have selected an important topic. Furthermore, it does not take a vivid imagination to interpret the meaning of this paragraph. The authors made clear that the death of a person creates grief that can have severe psychological and medical consequences.

Writing for an Audience

You may have learned in a composition course that you should always consider your audience when writing. This advice applies to writing a research report as well. So, who is your audience? Usually it is the course
instructor who has assigned you a research report. This is not a very
detailed or clear understanding of your audience. As a general rule, you
should think of your reader as a behavioral scientist who understands
general principles in the discipline, but who may not be an expert on the
topic you chose to study (yes, we are still talking about your course
instructor).

Knowing your audience ahead of time should help you determine
what elements of your report will require the most detailed explanation. For
most research-related publications, the likely immediate audience is fellow
researchers. This being the case, you can typically assume that these
individuals will understand general issues in the discipline, basic research
design, and statistical tests. For example, if you use a factorial ANOVA to
analyze the data, you will not have to explain the difference between a main
effect and an interaction. You can also assume that the reader understands
the logic of conventional statistical tests. It is important to point out,
however, that your research may be interesting to a secondary audience
as well, especially if your findings have potential practical implications
within society, families, or workplaces. For this reason, it is also important
for you to provide clear and accurate discussion of the logic leading to your
hypotheses and of the findings and their practical implications. If you can
successfully do this, you will greatly increase your chances of making your
research useful to the largest number of people.

Although most immediate readers of research reports may understand
basic social science and research principles, you cannot assume that the
reader knows the history and the important questions that are a part of your
research as well as you do. Look again at the Allumbaugh and Hoyt (1999)
paragraph from before. They have few preconceived notions concerning
what the reader knows about grief or grief therapy. Although some readers
may find the authors' comments obvious, we appreciated that they clearly
stated that grieving can have serious mental and physical health conse-
quences. Reading their introduction teaches you many things about the
history of grief therapy and how different therapies help people overcome
the emotional trauma wrought by a loved one's death.

Value-Free Descriptions of Others

The APA has long discouraged biased descriptions of people or groups of
people. Writing is considered to be "biased" when it includes any descrip-
tion of an irrelevant characteristic of a group of people or of a person. A bias
(sexism), for example, can emerge when one draws attention to a particular
sex for no particular reason. Doing so implies that there is a meaningful
difference between men and women when one may not exist. Consider the
word mothering. One connotation of the word refers to caring for others;
another connotation is being overly protective. Mothering is a sexist term
because both men and women have the capacity to care for others and to be
overly protective. Unless the author's intent is to focus on women, better
words to use here might be parenting, nurturing, or protectiveness. All three
words are value-free, because they describe the target behavior and do not link the behavior to one sex.

There is no need to refer to a characteristic of a person or group of people unless that trait is the focus of the research. In these instances, the descriptive terms used should be objective. The best strategy is to write with words and phrases that describe the relevant characteristic of the individual’s behavior, rather than the person. Therefore, it is preferable to replace the terms fireman, mailman, and waitress with firefighter, mail carrier, and server. The second set of words describes the work of the individuals in that group without implying their sex.

Writing sex-neutral sentences is not as easy as it may seem at first. There are traps you should avoid. For example, some writers use complicated combination terms such as s/he, he/she, or him/her to avoid sexist language. Although well-intentioned, such terms are awkward, making writing very difficult to read smoothly. Fortunately, there are two relatively simple ways you can avoid this type of lexical faux pas. First, you can convert a single noun to a plural noun (e.g., change “Each participant received his . . .” to “The participants received their . . .”). This option has the advantage of being simple to implement and does not change the meaning of the sentence. Second, you can use the singular noun and use “his or her,” “he or she,” or an equivalent. The only time you should use a gender-specific noun, pronoun, or adjective is when the behavior is clearly sex specific (e.g., “Each woman completed the survey soon after learning that she was pregnant”).

We also extend the editorial policy regarding sexist language to the people who participate in our research or who are afflicted with a psychological or medical condition. Therefore, the APA editorial guideline recommends that we use descriptive nouns when detailing the people involved with our research. This is one reason why all the people who are involved with a study are referred to as participants. You can also use nouns such as children, college students, parents, clients, individuals, and respondents to refer to the participants of a study. Similarly, a diagnosis of a psychological or medical disorder describes the condition of a person, not the person. For example, people are not “schizophrenic,” “autistic,” or “depressive.” Rather, people receive a diagnosis of schizophrenia, autism, or depression based on their cognition and behavior. Just as we avoid sexist language by describing the behavior, we are challenged to avoid biased language by describing the disability itself, rather than the person. Consequently, researchers refer to “people diagnosed with schizophrenia,” “individuals with low self-esteem,” or “individuals who are developmentally delayed.” People are not “senior citizens” or “elderly”; they are people “over the age of 65” or “over the age of 85.”

**Integrating Numbers and Text**

Table 5.1 presents the general rules governing the use of numbers. Most of the rules are straightforward. A few, however, require special comment. For
Table 5.1 General Rules for Reporting Numbers in an APA-Style Paper

- Use numbers to express values equal to or greater than 10:
  “Of the people responding, five were engaged to be married.”
  “Each questionnaire contained 15 questions.”
- Use numbers when the value precedes a unit of measurement:
  “The dimensions of the floor were 4.5 m × 5.2 m.”
- Use numbers when the value is a part of a noun:
  “The extinction session began on Trial 5.”
  “Table 1 and Figure 1 present the results of Experiment 1.”
- Use words when the sentence begins the sentence:
  “Fourteen people refused to complete the task.”
- Use numbers when the sentence contains several related numbers and at least one is equal to or greater than 10:
  “Participants received reinforcement on the first and fifth trials.”
  “We used the 5th, 8th, and 15th sessions as probe trials.”
- To make a number plural, add s or es as necessary. Do not use an apostrophe:
  “Skinner’s perspectives became popular in the late 1960s and early 1970s.”
  “Many people believe that tragedies come in threes.”
- Use numbers to represent statistical results, fractions, mathematical functions, or the results of mathematical equations:
  “Of the responding participants, 63% indicated favoring Option 1.”
  “We multiplied each score by 4 to equate the groups.”
- If a number cannot exceed 1.00, do not use a leading 0 before the decimal point:
  “The average reaction times for the two groups were 0.85 s and 1.03 s.”
  “X and Y were significantly correlated, r(57) = −.76, p < .05.”

example, APA style recommends using the metric system and the International System of Units for reporting specific quantities. Table 5.2 includes a short list of common measures and the method of converting from traditional to metric units.

Special Grammatical Issues

For the most part, the APA editorial guidelines follow conventional rules of grammar. Thus, what you learned in English composition courses concerning subject–verb agreement, dangling modifiers, and other elements of grammar apply to writing a research report. The APA editorial guidelines also emphasize several grammatical conventions that require extra attention.

Active versus Passive Voice

Active and passive voice refers to the order of the subject, verb, and object of the sentence. Active voice sentences place greater emphasis on the
Table 5.2  Common Measurement Scale and Conversion from Traditional to Metric Units

<table>
<thead>
<tr>
<th>Scale</th>
<th>Traditional Unit</th>
<th>Metric Equivalent (Abbreviation)</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot</td>
<td>Meter (m)</td>
<td></td>
<td>$m = 0.3048 \times \text{foot}$</td>
</tr>
<tr>
<td>Inch</td>
<td>Centimeter (cm)</td>
<td></td>
<td>$\text{cm} = 2.54 \times \text{inch}$</td>
</tr>
<tr>
<td>Fraction of inch</td>
<td>Millimeter (mm)</td>
<td></td>
<td>$\text{mm} = .254 \times \text{inch}$</td>
</tr>
<tr>
<td>Yard</td>
<td>Meter (m)</td>
<td></td>
<td>$m = 0.9144 \times \text{yard}$</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square foot</td>
<td>Square meter (m$^2$)</td>
<td></td>
<td>$m^2 = 0.09290304 \times \text{foot}^2$</td>
</tr>
<tr>
<td>Square inch</td>
<td>Square millimeter (mm$^2$)</td>
<td></td>
<td>$\text{cm}^2 = 645.16 \times \text{inch}^2$</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ounce</td>
<td>Gram (g)</td>
<td></td>
<td>$g = 28.34952 \times \text{ounce}$</td>
</tr>
<tr>
<td>Fraction of ounce</td>
<td>Milligram (mg)</td>
<td></td>
<td>$\text{mg} = 2.834952 \times \text{ounce}$</td>
</tr>
<tr>
<td>Pound</td>
<td>Kilogram (kg)</td>
<td></td>
<td>$\text{kg} = .45359237 \times \text{pound}$</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cubic foot</td>
<td>Cubic meter (m$^3$)</td>
<td></td>
<td>$m^3 = .02831685 \times \text{foot}^3$</td>
</tr>
<tr>
<td>Cubic inch</td>
<td>Cubic centimeter (cm$^3$)</td>
<td></td>
<td>$\text{cm}^3 = 16.38706 \times \text{inch}^3$</td>
</tr>
<tr>
<td>Fluid ounce</td>
<td>Milliliter (ml)</td>
<td></td>
<td>$\text{ml} = 29.57353 \times \text{f. ounce}$</td>
</tr>
<tr>
<td>Quart</td>
<td>Liter (L)</td>
<td></td>
<td>$\text{L} = .9463529 \times \text{quart}$</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>Fahrenheit (°F)</td>
<td></td>
<td>$°C = (°F - 32) \times 5/9$</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>Hours (h)</td>
<td></td>
<td>$\text{ms} = 1/1000 \text{ s}$</td>
</tr>
</tbody>
</table>

subject, or the actor, of the sentence than the object of the sentence. In an active voice sentence the subject precedes the verb. Consequently, active voice sentences make clear who or what is responsible for the outcome. In contrast, passive voice sentences place the object before the verb. Passive voice sentences are, therefore, more difficult to interpret.

In an active voice sentence you are also able to identify yourself using personal pronouns (e.g., I or we). The goal of active voice is to make clear who did what to whom. For example, we can revise the passive voice in the following sentence: “The experiment was designed using the Solomon four-group control procedure,” to be active voice: “We used the Solomon four-group control procedure for the experiment.”

Examples of active voice sentences are:

“Mary(subject) caught(verb) the football(object).”

“The participants completed the questionnaire during the first phase of the study.”

Examples of passive voice sentences are:

“The football(object) was caught(verb) by Mary(subject).”

“The questionnaires were completed by the participants during the first phase of the study.”
The APA editorial style manual recommends using active voice for two main reasons. First, active voice sentences clearly identify who or what is responsible for the outcome. In passive voice sentences, the cause is either hidden at the end of the sentence or missing. Second, active voice sentences tend to use fewer words and are therefore easier to read and understand.

**Past and Present Tense**

The APA editorial style manual requires the past tense when referring to the work of another author and the data presented in the current report. As an example, you might write, “Freud (1917/1957) believed . . .” or “Freud (1917/1957) argued . . .,” because Freud expressed his beliefs long before you began to write your paper. Similarly, you would use the past tense to describe the data you collected. Accordingly, you might write:

“The current results confirmed the hypothesis.”

or

“As expected, there was a significant interaction among the treatment conditions.”

When you describe an event or action that did not occur at a specific time, or if the condition remains, you may use the present perfect tense. Examples of the present perfect tense are:

“Since the late 1940s, psychologists have used the ANOVA and other inferential statistical techniques for their research.”

“Psychologists have long had an interest in the biological foundations of behavior.”

**Proper Use of Pronouns**

The APA editorial style manual emphasizes specific rules concerning the use of pronouns. Other editorial guidelines (e.g., of the Modern Language Association) do not emphasize these same conventions. Therefore, you should pay special attention to this section of your APA publication manual when writing.

**Who versus That**

When speaking of humans, and especially individual people, use pronouns such as who, him, or her. When speaking of nonhumans, use the neuter pronoun that. To illustrate the difference, you would write, “The children who participated in the study . . .,” or “The dogs that Pavlov studied. . . .”
Similarly, you should write, “The psychologist who administered the test . . . ,” because a psychologist is a person, not a thing.

**That versus Which**

*That* and *which* are relative pronouns that have specific uses. Use *that* in clauses essential to the meaning of a sentence. In the sentence, “Much of the research that psychologists conducted in the past 30 years emphasized the social-cognitive perspective of personality,” the reference to the past 30 years is essential to the meaning of the sentence and is, therefore, a restrictive clause. Use the relative pronoun *which* when the clause is not essential to the meaning of the sentence. For instance, “Gestalt therapy, which focuses on the client’s emotions, became popular in the 1970s.” The nonrestrictive clause adds information to the sentence, but does not change its meaning. If you can remove the clause without changing the meaning of the sentence, the clause is nonrestrictive (cf., “Gestalt therapy became popular in the 1970s”). Many people tend to use *which* and *that* indiscriminately. Consequently, Strunk and White (1979) recommended that authors go on a “which hunt” when proofreading their work.

**Vague Pronouns**

All style guides warn against the use of vague pronouns. Unfortunately, many people continue to use the pronouns *this*, *that*, *these*, and *those* without an obvious referent. Consider the following passage:

> Many surveys have consistently demonstrated that most people endorse the stereotype that men make better leaders than women. This may prevent women from being promoted to positions of authority. That is an example of the “glass-ceiling” phenomenon.

What do *this* and *that* refer to in the second and third sentences? Does the second sentence mean that the results of the survey prevent women’s promotions, or is it the stereotype that creates the barrier? For both sentences, the pronoun has no clear referent. Consequently, the object, or referent, in the sentences is vague. A few simple modifications can clarify these sentences:

> Several surveys of people’s attitudes have consistently demonstrated that most people endorse the stereotype that men make better leaders than women. Belief in these stereotypes may cause employers to promote men, but not women, to positions of authority. This discrimination is an example of the “glass-ceiling” phenomenon.

**Commonly Misused Words**

Some authors use specific words indiscriminately and incorrectly. Box 5.1 lists many of these commonly misused words and indicates their correct use. As you proofread your manuscript, look out for these problem terms; many spelling and grammar checkers built into word processors overlook these words.
### Box 5.1 Commonly Misused Words

**Affect vs. Effect**
- *Affect* means to influence or to cause a change
  - "The independent variable affected the participants' behavior."
- *Effect* represents the result or the consequence of something
  - "There were large treatment effects in the experimental groups."

**Among vs. Between**
- Use *among* when discussing more than two people or objects
  - "There were minor differences among the 30 participants."
- Use *between* when discussing only two people or objects
  - "There are minor differences between Hull's and Spence's theories."

**Amount vs. Number**
- Use *amount* to refer to a general quantity
  - "The amount of reinforcement each participant received depended on the schedule of reinforcement."
- Use *number* to refer to countable items
  - "The number of clients seeking treatment decreased after six months."

**Data**
- *Data* is the plural form of the word *datum*. As a rule, nouns ending with "a" are plural (e.g., phenomena is the plural form of phenomenon; criteria is the plural form of criterion). "The data are consistent with the theory."

**Ensure vs. Insure vs. Assure**
- *Ensure* refers to procedures that minimize the occurrence of some event
  - "We called all participants to ensure that they would return for the second part of the experiment."
- *Insure* refers specifically to the protection against financial loss
  - "We instructed the clients to save 10% of their weekly income to insure against possible layoffs from the factory."
- *Assure* means to convince, persuade, or to affirm a pledge
  - "The researcher assured the participants that the results of the study would be confidential."

**Few vs. Little**
- *Few* refers to a countable quantity of objects
  - "Few people continue to question the importance of this theory."
- *Little* refers to a general quantity
  - "The research attracted little attention when first published."

**Its vs. It's**
- *Its* is a possessive pronoun
  - "The value of this theory is its ability to make novel predictions."
- *It's* is a contraction of "it is." Never use contractions in technical writing.

**That vs. Which**
- *That* is a relative pronoun used in clauses essential to the meaning of the sentence
  - "The author reviewed the evidence that supports Miller's theory."
- Use *which* in clauses that are not essential to the meaning of the sentence, but provide additional information.
  - "The real purpose of the experiment, which the researcher did not tell the participants, was to determine the degree to which people will conform to behavior of a role model."

**Utilize vs. Use**
- *Utilize* is a transitive verb that adds little to a sentence; *use* is sufficient in most cases.

**While vs. Since**
- *While* refers to the simultaneous passage of time for two or more linked events
  - "While the participants were involved in filling out the questionnaire, the confederate began to perform various distracting behaviors."

(Continued)
Since refers to the passage of time between the past and present
"Since Snyder published his paper in 1974, many researchers have become
interested in the self-monitoring construct."

Although refers to a contradiction with a statement or fact
"Many people believe in extrasensory perception, although psychologists
have long questioned the existence of the phenomenon."

Use because to indicate the reason for some condition or event
"The external validity of the experiment is questionable because the re-
searcher did not use a random selection procedure."

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**Academic Integrity**

Academic integrity means that you give complete and fair credit to the
sources of the ideas you incorporate in your paper. As a rule, if you state a
fact, share an observation, or report the conclusion of another writer, you
need to acknowledge the origin of that idea. Following this rule allows you
to avoid accusations of plagiarism. *Plagiarism* comes from a Latin word
meaning to kidnap. Thus, someone who plagiarizes steals ideas from
others. Most colleges have strict rules against and penalties for plagiarism.
Depending on your college’s academic policies, you may receive a failing
grade for the assignment or the course if the instructor discovers that you
have plagiarized. This issue is becoming increasingly apparent as colleges
and universities increasingly make use of new software programs that
automatically cross-check student work against massive electronic libraries
of journal, book, and other manuscript publications from all over the world.
Now is definitely the time to learn how *not* to plagiarize.

There are many forms of plagiarism. The most obvious is copying
word-for-word another author’s words and presenting them as yours. Other
forms of plagiarism may not be as obvious, but are just as wrong. For
example, presenting another person’s ideas or logical arguments as yours
without citing the source is also considered plagiarism. We can use the
following passage to look at different forms of plagiarism.

Allumbaugh and Hoyt (1999) wrote:

*It is commonly assumed in the psychotherapeutic community that for at least some
bereaved individuals, some form of psychotherapy is useful or even necessary to assist in
recovering from loss, and numerous theoretical frameworks have been proposed for
psychotherapists working with bereaved clients.* (p. 370)

What if a student wrote the following sentence?

*Many psychologists believe that some form of psychotherapy is useful and necessary to
assist bereaved clients to recover from the loss. Consequently, there are many psycho-
therapies designed to help bereaved clients.*
This passage is an example of plagiarism for several reasons. Although the writer changed a few words and phrases, many of Allumbaugh and Hoyt’s (1999) original words remain in the sentence. All the writer has done is a form of editorial recycling. Furthermore, the writer has not credited Allumbaugh and Hoyt’s work. To avoid the accusation of plagiarism, the writer should write something like the following sentence:

According to Allumbaugh and Hoyt (1999), many psychologists believe that psychotherapy can help some people overcome bereavment grief and have created special therapies for this condition.

This sentence gives clear credit to the origin of the idea and is a major revision of the original text.

Citations of Sources in the Text

From the preceding examples, you can see that the APA editorial guidelines require that you credit other people’s work directly in the body of the text by listing the authors of the source and the date of publication. There are two general methods for citing a source. The first is to include the author’s name in the sentence. For this procedure, list the name or names of the authors; include the date of the citation within parentheses: “Braver and Braver (1988) recommended a meta-analytic procedure for examining the data of a Solomon four-group research design.”

The alternative is to treat the citation as a parenthetical statement: “Some authors (e.g., Braver & Braver, 1988) have argued that psychologists too often overlook the Solomon four-group design.” Note that the ampersand (&) replaces the and when placing the references within parentheses. Box 5.2 presents examples of how to incorporate citations in the text.

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Box 5.2 Examples of Citations within the Text of a Manuscript

Single author/single citation

- List the author’s last name followed by the date of publication.
  “Smith (1998) examined the effects of delayed reinforcement.”
  “A recent study of delayed reinforcement (Smith, 1998) demonstrated . . . .”

Single author/multiple citations

- List the author’s last name followed by the dates of the individual publications
  “Recent research on this topic (Smith, 1996, 1998, 1999) . . . .”

(Continued)
(Continued)

**Two or more authors/single citation**
- If there are two authors, list both names followed by the date of publication. Use an ampersand (&) when the citation is within the parentheses.
  - “Allumbaugh and Hoyt (1999) examined the effectiveness of . . . ”
  - “In a recent review of grief therapies (Allumbaugh & Hoyt, 1999) . . . ”
- If there are three to five names, list all the names in the first citation. On subsequent citations, list the name of the first author followed with “et al.” and the date.
  - *First citation:* “Gutek, Bhappu, Liao-Trough, and Cherry (1999) examined . . . ”
  - “Recent research examining relationships (Gutek, Bhappu, Liao-Trough, & Cherry, 1999) . . . ”
  - *Subsequent citations:* “The Gutek et al. (1999) study indicated . . . ”
  - “Several tests of this construct exist (Gutek et al., 1999).”
- If there are six or more names, list only the first name followed by “et al.” and the date.

**Multiple citations**
- If you include several citations from different authors in the same parentheses, list the citations alphabetically by the authors’ names. Separate the citations with a semicolon.

**Transcribed work**
- If the original work was translated into English, list the author’s name, the date of the original publication, and the date of the translated publication.
  - “Freud (1913/1952) developed the theory of screen memory . . . ”

**Corporate author**
- List the name of the organization followed by the date of publication.
  - “Sleep disorders are a common symptom of depression (American Psychiatric Association, 1994).”

**Newspaper or magazine article with no author**
- List a short version of the title followed by the date of publication.
  - “The popular press often sensationalizes psychological research (IQ tests measure nothing, 1999).”

**Use of et al.**
When the reference includes between three and five names, list all the names the first time you refer to the source. For subsequent references to the same source, list the name of the first author followed by the phrase “et al.” (which means “and others”). If there are six or more authors in the source, list the first name followed with et al. for all references to the citation. Then in your reference section, list the first six authors followed by et al. for the remaining authors.

**Listing Dates of Citations**
When you refer to a citation, you must include the date of publication. This practice helps the reader keep track of the different sources you use. The
exception is if you refer to the same citation more than once within a paragraph. If you refer to the same citation more than once in a paragraph, include the date with the first citation only. For example:

Kohn (2000) is a critic of standardized testing commonly used in primary and secondary education. Kohn’s primary concern is the emphasis on test scores rather than . . .

Much of the research that Kohn (2000) cites reflects . . .

The first paragraph begins with a citation of the date of Kohn’s book. The next sentence refers to the same book, but does not include the date. In the second paragraph, however, we include the date of Kohn’s book in keeping with the editorial rule.

Additional Comments on Quotations

Ralph Waldo Emerson quipped, “I hate quotations. Tell me what you know.” You should adopt the same attitude when you write a scientific research report. Researchers rarely use quotations because the focus of the research paper is on their analysis of ideas, not just on how the original authors might have expressed those ideas. Your responsibility, as the author of a paper, is to read the work of others and then synthesize that work into a concise statement that supports your argument.

That said, there are at least two instances when you can and should use quotations. First, use a quotation when it is impossible to paraphrase a passage without losing its meaning. For example, you may find that you cannot paraphrase another author’s definition of a particular term or concept without altering its meaning. These instances are rare, and you should avoid the temptation of assuming that you cannot put complex ideas into your words. The more appropriate occasion for using a quotation occurs when the author’s ideas and expression of those ideas is the focus of your argument. Imagine that you are writing a paper wherein you examined the effects of positive reinforcement on intrinsic motivation. As a part of your paper, you want to illustrate how another author expressed his or her opinion. You could write something like the following:

By contrast, some authors believe that positive reinforcement reduces intrinsic motivation. These authors typically make the unqualified claim that reinforcement has detrimental rather than beneficial effects. For example, Kohn (1993) asserted, “But the use of rewards for reading, writing, drawing, acting responsibly and generously, and so on is cause for concern. Extrinsic motivators are most dangerous when offered for something we want children to want to do” (p. 87). This sentiment is common . . .

In this case, the quotation is evidence that supports your argument. Using the quote allows you to share with the reader Kohn’s tone and sentiment regarding the effects of reinforcement. If you must use a quotation, try to keep it short. We selected only a few sentences from Kohn’s book to illustrate the point we wanted to make. In addition, you should reproduce
the quotation exactly as it appeared in its original form. In this example, several words are italicized because they were italicized in the original text. If we had added the italics, we would have included the following note after the italics: "[italics added]". If you drop words or sentences from the original text, replace the missing words with ellipsis points ( . . . ). If the length of the quotation is fewer than 40 words (about four lines in your word processor), include the quotation as a part of the sentence. For longer quotations, set the material off as a separate indented paragraph. As an example:

"By contrast, some authors believe that positive reinforcement reduces intrinsic motivation. These authors typically make the unqualified claim that reinforcement has detrimental rather than beneficial effects. For example, Kohn (1990) asserted,

But not only are rewards less effective than intrinsic motivation—they actually undermine it. You started out doing something just because you found it fun. But once you were rewarded for doing it, you came to see yourself as working mostly to get the reward. Your fascination with the task mysteriously vanished [italics added] along the way and now you can’t be bothered to do it unless there’s some reward at stake. (p. 32)"

We indented the longer quote and separated it from the rest of the paragraph. The example also shows how you can add emphasis to the quotation to draw the reader’s attention to a specific phrase in the passage. Whenever you add one of these editorial notes, place them within brackets. For example, to indicate a misspelling in the original text, use "[sic]".

Bottom line: Keep your use of quotations to a minimum. Most professors do not like to read papers that read like a grocery list and are nothing more than a long collection of quotations embroidered together with a few transitional sentences from the student. Tell the reader what you know, how you would synthesize the information you have read. Your work is far more interesting to read than a string of quotations.

**Parts of the Research Report**

Each research report contains the same elements, including the title page, abstract, introduction, method section, results section, discussion section, and references section. In the following pages, we will review the material that goes into each of these sections, along with several additional issues related to APA editorial style. There are several conventions for formatting a research report in APA style. Box 5.3 lists the general rules for formatting your paper. Most people now use word processors to prepare their papers and find it easy to use the program’s basic setup and formatting options to prepare an APA-style paper. An example of an APA-style research report, a template to use when formatting your own work, and supplemental materials can be found in the APA manual (APA, 2009).
Box 5.3 Checklist for Formatting and General Construction

- Set all margins to 1 inch.
- Left justify all text except the title of the paper and the words identifying the start of the major sections.
- Double-space everything. All the text, regardless of section, is double-spaced.
- Running heads and page numbers begin on the title page and run throughout the entire text.
- The only pages that do not have the running head and page numbers are the figures.
- Print all text in the same font and size (10 pt. or 12 pt.). Use an easy to read font (e.g., Courier or Times New Roman).
- Insert a single space after each word and punctuation mark including commas, semicolons, and periods.

Title Page

The title page includes four elements: (1) the running head, (2) the title of the paper, (3) the names of the researchers, and (4) their professional affiliations. The running head, or header, is a short version of the title of the paper and appears at the upper-right corner of each page along with the page number. Most word processors allow you to include a running head or header. In addition, the program will allow you to insert the page number as a part of the header. The first line on the title page consists of the phrase “Running head:” and a short version of the title printed in CAPITAL LETTERS. Typically, the running head is an abbreviated version of the title. According to APA style guidelines, the running head cannot be more than 50 characters counting letters, spaces, and punctuation. Most titles are between 10 and 12 words. Writing a good title requires careful planning.

You can get a good impression of how to write your title by looking at the titles of the articles you use in your reference section. Your title should be a short and self-explanatory description of the research. For example, the title “A Study of Human Memory” tells the reader nothing about the purpose of the research, as it describes almost any research project on memory. By contrast, the title “A Study Showing That Writing Essays about Traumatic Events in One’s Life Helps Reduce Feelings of Anxiety and Guilt among College Students Who Were Abused as Children” is very descriptive, but far too long. Examples of better titles are “Proactive Interference in the Memory of Pictures” and “Writing as a Means for Reducing Anxiety and Guilt.”

Center the title horizontally on the title page. Capitalize the first letter of each major word in the title (you do not need to capitalize smaller words and articles such as the, and, is, in, of, and similar words). Do not use abbreviations in the title. On the line immediately following the title and centered horizontally on the page is your name. Use your full given name,
rather than nicknames. The following line, also centered, contains the name of your college or university.

Abstract

The abstract is a short (no more than 120 words) description of the research. Readers use the abstract of a research article to determine whether the article interests them and deserves their attention. Therefore, useful abstracts briefly describe the purpose of the research, the population under study, the method used to collect the data, the primary findings, and the researcher's primary conclusions. The best model for you to follow when writing your own abstract is a published abstract from the research articles you read in peer-reviewed journals.

Introduction

The introduction to a standard APA-style manuscript begins on the third page. The objectives for writing the introduction are to capture the reader's interest and offer a compelling overview and a rationale for the research. As we noted previously, you should consider the reader to be a well-informed behavioral scientist who may or may not know much about the phenomenon that you chose to study. Consequently, your introduction must help the reader understand the phenomenon and why there is a need for more research. Although there is no set formula for writing an introduction, you can follow some useful guidelines. Figure 5.1 presents such a guide. Think of your introduction as an inverted triangle. The paper begins with a broad

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Figure 5.1
Inverted Triangle
Model of the Introduction

BROAD STATEMENT OF GENERAL PROBLEM

LITERATURE REVIEW

HYPOTHESIS

Questions to address within the introduction
- What is the general purpose of the research?
- What is already known about the topic: Conclusions from previous research, conflicting results, and unresolved questions?
- What new questions need to be answered?
- What questions will this study answer?
statement of the general problem. As you progress through the introduction, you should focus the text on issues directly related to your research project. In the literature review section, you can describe the findings and conclusions drawn from previous research. This portion of the introduction allows you to help the reader learn about the focus of your study and the necessity for the research. Finally, you should end the introduction with a review of the hypothesis or hypotheses that you will examine.

We can use a published article to illustrate the application of this inverted triangle. Eisenberger and Armeli (1997) conducted a set of experiments that examined the effects of positive reinforcement on intrinsic motivation. The opening sentence of their introduction was, "Over the past quarter century, the view that reward reduces task interest and creativity (Eisenberger & Cameron, 1996) has become widely accepted" (p. 652). This sentence is a broad introduction to a familiar topic in psychology. In the paragraphs that followed, Eisenberger and Armeli showed the reader that many psychologists and educators believe that positive reinforcement has many negative effects on intrinsic motivation and creativity. After establishing this fact, Eisenberger and Armeli narrowed the focus of their paper by stating, "Despite these limitations of the behavioral studies, the generally accepted conclusion that reward has inherent detrimental effects on creativity may be premature" (p. 653). This sentence makes clear that Eisenberger and Armeli do not accept the negative effects of reinforcement as a foregone conclusion. With this transition, the authors began a review of research that suggests that reinforcement does increase creativity and does not harm intrinsic motivation.

Another transitional sentence that narrowed the focus of the introduction for Eisenberger and Armeli (1997) was, "Learned industriousness theory holds that if an individual is rewarded for putting a large amount of cognitive or physical effort into an activity, the sensation of high effort acquires secondary reward properties that lessen, to some degree, effort's innate aversiveness" (p. 654). With this sentence, Eisenberger and Armeli introduced the theory of learned industriousness and summarized that the theory predicts that reinforcement will increase rather than decrease creativity. The authors then devoted several paragraphs to describing the theory and the supporting research.

In these paragraphs, the authors narrowed the scope of the paper to where they could state the purpose of the research. The concluding paragraph of the introduction was:

In sum, the present research tested two implications of learned industriousness theory: (a) that making explicit the requirement of novel performance for obtaining a large monetary reward in one task should increase the subsequent creativity of performance in an entirely different task and (b) that a decremental effect of reward on intrinsic creative interest should occur with reward for uncreative performance, but not with reward for creative performance. (p. 655)

In 26 paragraphs, Eisenberger and Armeli led the reader through a broad introduction of the problem and a review of previous research and
current theory and delivered the reader a concise statement of the purpose of the research and their predictions.

**Method Section**

The method section provides the reader with a detailed description of how you collected the data for your research. The goal of writing the method section is to allow the reader to evaluate the appropriateness of your data collection techniques. This information will help the reader understand how the data relate to the research hypothesis and evaluate the internal and external validity of your conclusions. Most method sections have three subsections in which you describe (1) how you identified and obtained the sample you studied, (2) the materials, equipment, and measures you used to collect the data, and (3) the specific procedures you followed during the research.

**Participants/Subjects**

The first method subsection pertains to your participants or subjects. If your population is humans, then the title of the subsection is *participants*. By contrast, if you use nonhuman animals, then the title of the section is *subjects*. Whatever its name, you will use this subsection to tell the reader the relevant details of your sample and how it was created. As you will learn in Chapter 7, sampling is a critical component of any research project. Consequently, you need to define the sampling population and the procedures for creating the sample. Similarly, you need to define the relevant characteristics of the sample. The purpose of your research usually dictates the characteristics of the sample that you should describe. At the very least, you need to indicate the number of men and women in the study as well as the average age of the participants. If your research depends on specific subject variables (e.g., ethnicity, level of education, annual household income), then you should summarize those characteristics as well.

In addition to indicating how you recruited and selected the participants, you should describe whether and how you compensated or rewarded them. Similarly, you should indicate whether and why you lost the data for any member of the original sample. Mistakes happen. Sometimes the equipment does not work, the researcher makes a mistake, or the participant does not understand the instructions or refuses to complete the study. Report errors like these if they occur. For example, you may have to write, “Of the 120 surveys distributed, 5 could not be scored due to incomplete responses,” or, “The data for three participants could not be used because of a malfunctioning computer.” If you used nonhuman subjects, report the relevant subject variables including the genus and species name, strain number (if appropriate), supplier or breeder of the animals, and a detailed description of the housing and handling procedures. As with human research, you should then describe additional subject variables that related to the purpose of your research.
**Materials/Measures/Apparatus**

The materials or apparatus subsection includes the description of the devices you used to collect the data. As with all parts of the method section, your description of the materials must be sufficient for another researcher to repeat the research. Because the research report is a short document, you cannot describe every nuance of the materials. Rather, this section should offer the reader a short account of the materials and where you acquired them:

*Specialized apparatus:* There is no need to describe standard laboratory equipment (e.g., videotape recorders, stopwatches, or projectors) readily available to any researcher. By contrast, if the equipment is highly specialized, then you should indicate the name of the manufacturer and model number of the device.

Similarly, if you built a special apparatus for the research, you should offer a brief description of the equipment. Depending on the sophistication of the device, you may want to include a scale drawing or picture of the apparatus.

*Tests and questionnaires:* You can treat tests and questionnaires the same way you treat a piece of equipment. If you used a published test, then you should include a brief overview of the test (e.g., number of questions and measurement scale used) as well as a reference to the original source of the test. Most researchers also include a reference to research that has evaluated the reliability and validity of the test.

Although it is preferable to utilize existing and validated measures, sometimes researchers need to create their own scales to gather the necessary data for testing specific hypotheses. If you develop your own test or questionnaire for a particular study, you should make sure to describe the general nature of the questions included in the survey in this section of your manuscript. When describing the measures used in your study, it is helpful to the reader if you clearly state what a high score on each scale represents. In addition, it is common to report reliability and validity information for each scale whenever it is available (e.g., Cronbach’s $\alpha$).

**Design and Procedure**

The final part of the method section describes the design of your study and details the sequence of significant events all participants experienced during the study. Consequently, you should describe how you assigned participants to various conditions of the research as well as your control procedures. You should also describe the specific instructions you gave the participants. In some cases, the procedure section may indicate that you distributed a questionnaire to randomly selected classes of students after you had described the purpose of the research. In other cases, the procedure section will be long if there were a series of important stages in the research that require careful description. Remember, the goal of the method section
is to provide sufficient detail so that interested readers can evaluate the quality of your data collection procedure and repeat the study if they so choose.

**Results Section**

The results section presents your summary of the data and a description of the statistical tests you used to examine the data. This section, like the method section, should be based on the facts of your specific study. Specifically, you will use this section to lay before the reader the major findings of the research. You can save a more complete interpretation and evaluation of the implications of these findings for your discussion section. The outline of the results section should follow the outline you used to describe the research questions in your Introduction. Begin your results section with the general predictions (hypotheses) you made for your study. For each hypothesis, you can then provide a general description of the results followed by the specific statistical tests used to test your hypothesis.

As a side note, there is no reason why you must absolutely stick to the path implied by your introduction. If, after carefully examining your data and testing your hypotheses you find interesting patterns in the data that you did not initially expect, you may need to share these insights with readers. These serendipitous results can often reveal interesting perspectives on the phenomenon that you are studying and raise important questions for additional research. These departures from your core proposed study, however, should not cloud your clear testing of your stated hypotheses. For this reason, it is common to reserve such exploratory analyses for the discussion section.

As you prepare your results section, there are a number of editorial issues you must address, including the best way to summarize the data, the level of detail to include, and the best strategy for presenting results from specific statistical tests. By now you should have read a sufficient number of research articles to know that there are many ways to summarize data. Most researchers use a combination of narrative, simple and descriptive statistics, and graphs/figures and tables. Combining these techniques will help the reader quickly understand your primary findings and how the data relate to your research questions. The narrative is relatively straightforward. You describe in words the primary findings of the study with respect to each hypothesis. In many cases, you will find that a table or a graph will do much to augment your description of the data and help the reader visualize the results.

As a general guideline, the use of graphs/figures and tables is reserved for times when you cannot present the same information as efficiently in the narrative text. Another general guideline to keep in mind is that any graph/figure or table should be able to stand on its own. This means that the title, labels, and descriptive notes provided with each graph/figure or table should be sufficiently detailed that a reader can examine this component
and understand it without having to refer back to other portions of the manuscript.

**Graphs**

Most statistics textbooks have extensive reviews of how to prepare good-quality scientific graphs. Therefore, we will only highlight the essentials of a good graph. Figure 5.2 presents a prototype of a good graph. Graphs for research reports have several distinguishing features. The first significant feature is simplicity. Good graphs contain only essential visual information and are free of distracting and unessential information. For example, many popular computer programs allow you to use three-dimensional effects, fancy shading, and other features that add little information to the graph and can make the graph difficult to interpret.

Consider also Figure 5.3, which contains many unnecessary and distracting elements. Tufte (1983) called much of the unnecessary graphic elements in this graph *chartjunk*. Chartjunk refers to anything in the graph that adds nothing to the interpretation of the data.

**Figure 5.3**

*Graph with Much Chartjunk*

The 3-D effect, shading, and background grid are unnecessary elements of the graph that are distracting and should not be used.
For example, the three-dimensional effect adds nothing to the display of the information. We find Figure 5.2 far easier to interpret than Figure 5.3. In general, APA-style graphs/figures should be drawn in two dimensions and be as simple as possible. Other conventions include that the vertical or Y-axis presents the dependent variable, whereas the horizontal or X-axis presents an independent variable. The lines or bars in the graph should clearly represent the pattern of the data and not be confused with distracting information. There is considerable art and science in constructing good graphs, far more than we can present here. If you want to learn more about preparing good scientific graphs, we strongly recommend that you check out Kosslyn (1994), Tufte (1983, 1990), and Wainer (1997). These authors make clear that graphs have a grammar, syntax, and style of their own.

The most commonly used graphs are bar graphs, scatter plots, and line graphs. Figure 5.4 presents an illustration of each. Use bar graphs when the independent variable represents a nominal or categorical scale. Scatter plots present the correlation between two variables. Finally, line graphs present the relation among two or more quantitative variables that are typically

**Figure 5.4**
(a) Bar Graph, (b) Scatter Plot, and (c) Line Graph

For the bar graph, the heights of the bars represent the statistic used to describe the dependent variable. The lines extending from the bars are optional and represent the standard error of the mean or some other measure of variability that helps the reader interpret the difference among the means. For the scatter plot, each dot represents the two observations recorded for each participant. The regression line drawn through the data is optional. If you include the regression line, you should also include the equation that defines its intercept and slope. For the line graph, each point on each line represents the statistic used to describe the dependent variable. The lines extending from each point are optional and represent the standard error of the mean or some other measure of variability that will help the reader interpret the difference among the groups.
continuous in nature. For scatter plots, each dot represents the two scores measured for each participant. In Figure 5.4(b), we have added a regression line to help the reader see the relation between the two variables. This addition is optional. Use the option only when you believe that it helps the reader understand the data. For the bar graph and the line graph, the data represent the descriptive statistic used to summarize the dependent variable. If the reported statistic is the mean, you can add error lines that represent the standard error of the mean. This additional information can help the reader determine which group means are statistically different from other means.

**Tables**

Graphs and figures present pictures that allow us to quickly interpret the results of the data. Although graphs are useful as a research tool, there are many times when we need to present numbers. Constructing useful and easy-to-read tables is like constructing good graphs. There are some simple rules to follow that will help you present your data well; for starters we will highlight Ehrenberg's (1977) six basic features for constructing good tables.

First, round the numbers in your table to a meaningful value. In APA style, it is a convention to round most numbers to two decimal points, unless additional precision is necessary. Second, if possible, include row and column averages or totals. These summary statistics help the reader discern general trends in the data and differences among groups. A third consideration is to orient the most important data within the columns. Readers find it easier to scan a column of numbers than to scan a row of numbers. Another helpful tip is to rank the data from largest to smallest or smallest to largest, if appropriate. Ranking the data helps the reader find the extremes in the data. The fifth recommendation is to keep row-and-column spacing relatively constant. This is easy to do within most popular computer word-processing or spreadsheet programs. Remember also that all the text in your APA-style manuscript should be double-spaced. This rule generally applies to tables as well (although some journals are relaxing this thanks to the powers of current word-processing and graphics programs and their influence on current publishing techniques). Finally, use tables only when it is essential to present the quantitative data or when there is no alternative for presenting the data.

Table 5.3 presents an example of an APA-style table. The table presents the proportion of men and women who reported different forms of cheating. Each row represents the target behavior. The table includes the proportions and the result of the test for the difference between the proportions. This table allows the researcher to present much information in a concise format.

**Reporting Statistics**

Once you have described the general results, you then need to present the statistical tests that justify your observations. Because your audience
Table 5.3 APA-Style Table

<table>
<thead>
<tr>
<th>Form of Cheating</th>
<th>Men&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Women&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Difference Between Proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheat on a test</td>
<td>0.28</td>
<td>0.16</td>
<td>( z = 1.75, p &lt; .05 )</td>
</tr>
<tr>
<td>Plagiarize in a paper</td>
<td>0.21</td>
<td>0.24</td>
<td>( z = -0.32, p &gt; .05 )</td>
</tr>
<tr>
<td>Copy homework</td>
<td>0.38</td>
<td>0.33</td>
<td>( z = 0.58, p &gt; .05 )</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>n = 48, <sup>b</sup>n = 124.

consists of fellow researchers, you need only indicate which statistical tests you conducted and the results of the analysis. As with all other parts of the paper, you will present the statistical results in narrative form. The general format is to indicate the statistic that you used and then describe the outcome.

Consider the following example from an experiment conducted by Eisenberger and Armeli (1997):

> The average originality of each group's drawings is shown in Figure 1. . . . Planned comparisons revealed the large monetary reward for high divergent thought produced more creative drawings than either no reward or a small reward for high divergent thought, \( t(281) = 2.57, p = .005 \), and \( t(281) = 2.25, p = .025 \), respectively. Further, the large reward for high divergent thought produced subsequent drawings of greater originality than did the same reward for low divergent thought, \( t(281) = 3.32, p = .001 \). (p. 657)

Notice how the authors stated their conclusion and then indicated the statistical test that supported their claim. Eisenberger and Armeli used a \( t \)-ratio for the inferential statistic. The report of the statistic included the degrees of freedom (281 in this example), the observed \( t \)-ratio, and the probability of the \( t \)-ratio being due to chance. They did not explain the meaning of the \( t \)-ratio as they assumed that the reader understands how to interpret this statistical test.

Another important characteristic of the Eisenberger and Armeli (1997) passage is that they chose to report the exact probability of the statistic (e.g., \( p = .025 \)). This is a common practice among many researchers. The alternative is to establish a universal criterion for defining statistical significance and report this if the statistical test meets the criterion. For example, an author may include a sentence similar to the following early in their results section:

> "I used the criterion \( \alpha = .05 \) to establish statistical significance for all inferential statistics."

Later, in the results section, the writer will use \( p < .05 \) if the test is statistically significant. Specifically, the author would write, ""\( t(281) = \)
Table 5.4  Commonly Used Statistics and the Format for Presenting Them in the Text of the Results Section

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Presentation in Text*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>$M = 25.67$</td>
</tr>
<tr>
<td>Median</td>
<td>$Md_n = 34.56$</td>
</tr>
<tr>
<td>Mode</td>
<td>$mode = 45.00$</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>$SD = 1.23$</td>
</tr>
<tr>
<td>Standard error</td>
<td>$SE = 12.01$</td>
</tr>
<tr>
<td>Standard error of measurement</td>
<td>$SEM = 0.98$</td>
</tr>
<tr>
<td>Inferential</td>
<td></td>
</tr>
<tr>
<td>ANOVA</td>
<td>$F(2,25) = 9.32, p &lt; .05$</td>
</tr>
<tr>
<td>Chi-square</td>
<td>$\chi^2 (4, N = 55) = 34.10, p &lt; .05$</td>
</tr>
<tr>
<td>Mann-Whitney U</td>
<td>$U(12, 15) = 5.67, p &lt; .05$</td>
</tr>
<tr>
<td>Pearson’s $r$</td>
<td>$r(98) = .87, p &lt; .05$</td>
</tr>
<tr>
<td>Spearman’s $r$</td>
<td>$r_s(74) = -.95, p &lt; .05$</td>
</tr>
<tr>
<td>Student’s $t$-ratio</td>
<td>$t(123) = 2.31, p &lt; .05$</td>
</tr>
</tbody>
</table>

*Use italics to present the abbreviation for the statistic (as illustrated here).

2.25, $p < .05$ rather than "$t(281) = 2.25, p = .025$," even if the statistics software output indicated a $p$-value of .025.

The APA editorial guidelines encourage authors to include measures of effect size, such as $\eta^2$ or $\omega^2$, along with the results of the inferential statistic. Reporting the effect size helps the reader interpret the relation between the independent and dependent variables. Table 5.4 presents a list of commonly used descriptive and inferential statistics and the format for reporting them in the text of the results section. For the inferential statistics, the general format is to use a letter associated with the statistic (e.g., $t$ for a $t$-test ratio and $F$ for an ANOVA), the degrees of freedom, the observed statistic, and the probability of the result being due to chance. Note that you should italicize the letter representing the statistic.

**Discussion Section**

During the introduction of the paper, you explain why your research questions were important. In the discussion section, you tell the reader whether your research answers the research questions, and you discuss the implications of your research for future researchers. The following passages come from the discussion section of an article written by Eisenberger and Armeli (1997). The authors began the discussion section with:

*The present findings indicate that the explicit reinforcement of novel performance for salient rewards enhances generalized creative performance without any loss of intrinsic...*
creative interest. . . . [T]he specific requirement of novel performance in one task (generating uses for physical objects) produced greater subsequent creative performance in an entirely different task (drawing a picture) when a large reward, rather than either no reward or a small reward, was used. (p. 659)

This passage complements the closing sentence of their introduction, wherein Eisenberger and Armeli (1997) described the purpose of their research. Moving on, the scope of the discussion broadens to review the implications of the research. Midway through the discussion section, the authors wrote:

The results contradict the view that any increase in performance that is due to salient reward produces a countervailing decrease in intrinsic creative interest (e.g., Condry, 1977; Hennessey & Amabile, 1988). According to the overjustification hypothesis (Lepper, et al., 1973), expecting reward for creative thinking would change the perceived cause of one's own performance from an interest in creativity to an interest in the reward. (p. 660)

As you can see, the authors revisited the issues they raised in the introduction. This passage makes clear that the data do not support the consensus view regarding the deleterious effects of reinforcement. By the end of the discussion, Eisenberger and Armeli (1997) concluded:

Texts in education and business often express the view that creative performance can be increased if course work and jobs are made more intrinsically interesting. This is a laudable goal; however, even the most interesting creative activities require long periods of difficult and unpleasant effort that is necessary for meaningful achievement. The use of periodic salient reward may provide an effective way to help individuals sustain their creative efforts when success comes slowly and with great difficulty. (p. 661)

We have presented only a glimpse of a longer and tightly reasoned set of arguments. Nevertheless, these passages illustrate the editorial triangle illustrated in Figure 5.5. The first portion of the discussion provides a narrative review of the results as they related to the original research question. Specifically, Eisenberger and Armeli (1997) concluded that their research supported the hypothesis that positive reinforcement will enhance, not reduce, intrinsic interest and performance. Midway through the discussion section, Eisenberger and Armeli (1997) showed how their research contradicts the work of other researchers and theories concerning reinforcement. During this portion of the discussion, the authors presented arguments to convince the reader that their research and conclusions are superior to those of other studies and to show why their results do not agree with other studies.

The closing paragraph makes clear that the results of the research extend well beyond the laboratory. Eisenberger and Armeli (1997) believed that positive reinforcement has many useful applications in many settings. As we noted at the start of the chapter, reading many research articles will help you see how other authors construct their discussion sections as well as other parts of the research reports. When you read research reports, pay
The discussion begins by focusing on how the analysis of the data relates to the original research questions. Depending on the outcome of the study, the scope of the discussion broadens to consider alternative explanations of the data, potential limitations of the current results, and lingering questions. The discussion ends by considering the reasonable conclusions that one may draw from the research.

attention to the information the authors present in the paper. At the same time, examine how the authors present their ideas. You can learn a lot by studying the writing style of others.

**References Section**

The references section identifies the source of each citation you presented in the paper. Box 5.4 presents reference style guidelines and examples for common types of sources used in APA-style papers. The APA manual provides a much more extensive treatment, and updates to common formatting are also posted on the APA main website (www.apa.org). Regardless of the type of source, the order of references is alphabetical, based on authors' last names. You should use the hanging indentation function in your word processor to ensure that the first line of each reference begins at the left margin of the page, but each subsequent line for that reference begins indented .5 inch (as with new paragraphs). The references section, as all other parts of the text, is double-spaced, and there are no extra lines between the citations.
Box 5.4 Common Reference Section Entries for an APA-style Research Report

Journal Articles

*Single author:*


*Multiple authors:*


*Notes:*

- Capitalize the first letter of the first word in the title of the article and of the first word following a colon.
- Capitalize the first letter of each word in the name of the journal.
- Italicize the title of the journal, the volume number, and commas.
- If there are six or more authors, use the first author’s name and “et al.” even with the first citation in the text (e.g., “Hatano et al. (1993) examined . . . ”).

Books

*Single author:*


*Multiple authors:*


*Notes:*

- Capitalize the first letter of the first word in the title of the article and of the first word following a colon.
- Italicize the title of the book.
- If the location of the publisher is not well known (e.g., Newbury Park), list the state.

Electronic sources:

APA published an addendum to the standard style manual in 2007, focused entirely on electronic sources (i.e., those that are available mainly through the internet). This document is freely available via the internet and includes specific guidelines for citing documents using Digital Object Identifier (DOI) codes when available, as well as proper format for citing electronic books and journal articles retrieved from online. Here are a couple of general examples:

(Continued)

**Notes:**
- Include a doi if the article has one and is therefore considered final. Otherwise, report the url from which you downloaded the source.
- If the article is not final, or if its status is unclear, include the date on which you accessed it, as well as the full url for the download.

**Reprint of a classic text:**


**Translation of a book:**


**Notes:**
- For the text citation, indicate the original and new publication dates. For example, use Locke (1690/1964) or Freud (1930/1961).

**Book chapter:**


**Corporate author:**


**Magazines and Newspapers**

**Magazine:**


**Newspaper article**


**Newspaper article, no author:**


**Other Sources**

**Computer program:**


**Internet website:**

Appendix

The appendix is an optional portion of the paper and is used to present detailed information that is not appropriate for presentation in the main body of the manuscript. For example, if you created a specialized survey or questionnaire for your research, you might want to include a copy of the instrument in the appendix.

Author Note

The author note serves several functions. It includes your mailing address and other information indicating how readers can correspond with you. You can also use the author note to acknowledge grants or fellowships that may have funded your work, and the help you received from colleagues who helped you with portions of the research. In addition, if the manuscript includes material that you have presented in other venues, you should acknowledge that presentation. For example, many authors present portions of their research at professional conferences before they attempt to publish the results in a journal. The exact location of this information usually depends on the specific journal or outlet, but in general, APA guidelines suggest that it fall here in the placement of other sections of the text.

Tables

Unless the manuscript is a finished draft, for example, a thesis or dissertation, we do not include tables in the body of the text. Instead, each table is printed on a separate page that is included after the author note section. Be sure that you double-space the entire text of the table and make them as legible as possible. It is also a good idea to avoid too many vertical lines as they can be difficult for publishers to recreate.

Figures

The figures section contains two parts. The first part is a listing of the figure captions or descriptions that pertain to each figure. This page contains the text for the figure caption of each figure. The individual figures are then included, one per page, following the figure captions, in the order in which the figure captions are presented. The pages containing the figures are the only pages that do not include the running head and page number. Traditional APA guidelines suggest that to identify the figure you should print on the reverse side of the figure a short version of the title, the figure number, and the word TOP at the top of the page. This is a good habit to practice, though as with some of the other details regarding tables, figures/ graphs, and appendices, you will need to check with each journal or publisher for any special instructions or other options.
Proofreading

Few of us can sit down and write a perfect article on our first try (or ever, for that matter). Most authors write and revise their papers several times before they are satisfied with the work. Therefore, proofreading is an essential component of good writing. Now, for the bad news and the good news: The bad news is that proofreading is difficult. It is easy to overlook mistakes in your own writing. The good news is that there are many resources you can use to proofread and correct your work.

Computer Programs

Most word processors have built-in spelling and grammar checkers. These are useful features, but they have many limitations. For example, spell-checking programs will identify any word as misspelled if it is not in the software’s dictionary. This is a problem with many of the field-specific terms associated with any social science discipline. In addition, although this feature can help you to ensure all basic words are spelled correctly, it cannot determine whether you used the correct word in the correct way. For example, you could correctly spell chose when you should have written choose.

The same advantages and disadvantages apply to software-based grammar checkers. Grammar checkers catch obvious errors and often skip others. For example, my word processor’s grammar checker quickly catches passive voice, subject–verb agreement problems, and other common errors. The program also ignores some real whoppers. Consider the following sentences:

"The green bachelor's wife snored furiously against the winter of our discontent."

"May grammars checker does no catch errors a frequently an I wants it too."

Our grammar checkers found no problem with either sentence, and indicated that they were easy to read. You, by contrast, should see immediately that both sentences are gibberish. The implications of this example are clear. Spelling and grammar checkers can help you as long as you recognize the limits of these tools and that there are superior methods for proofreading your work.

One very helpful, but underused, tactic is to read your paper aloud to yourself or whomever else might listen. Read it as if you were giving a speech. In most cases, you will quickly hear the faults. Missing words will become apparent, awkward phrases will stand out, and vague language will sound obscure. As you read your paper, mark and revise any awkward phrases or words. Another tactic is to ask someone else you trust to read your paper. Most colleges and universities have a writing resource center. Typically, the staff will gladly proofread your paper for clarity and style. Although they may know nothing about your topic, they can adopt the role
of your intended audience. Therefore, they will point out parts of your paper that are not clear and that require refinement.

Chapter Summary

This chapter provided an overview of the writing process for technical research reports. The guiding framework was APA style, which is the norm for all psychological and most social science publications. We worked through basic elements of APA style, including the various components of a complete research report. Also discussed were issues of integrity in reporting of research. Finally, tips were provided to improve basic proofreading abilities prior to the finalization of any research report. Embedded examples can be mimicked when producing your own research report, to ensure you are in line with appropriate reporting style.

Chapter References