Chapter 6: Reporting in APA format

In this chapter, we look at how to write an APA-style empirical research report, an article that presents the results of one or more new studies. Recall that the standard sections of an empirical research report provide a kind of outline. Here we consider each of these sections in detail, including what information it contains, how that information is formatted and organized, and tips for writing each section.

The overall goal of scientific writing is to communicate the results of a research project to a wider audience. One a successful study has been conducted, the researchers now know a new scientific fact about psychology and how the human mind works. The primary goal is now to disseminate this information to others. A secondary goal is to explain everything about how the study was run so that it can be evaluated with a more critical eye to look for challenges to the internal validity of the study. The challenge of effective scientific writing is to balance these two goals well without neglecting either of them.

## The audience

Writing effectively in any context requires an understanding of the audience for whom the writing is intended. In a laboratory carrying out active research, this question is often raised around different kinds of journals a research report might be published in. Some journals aim for a broad audience (e.g., Psychological Science) and the description of the research needs to be kept accessible to the whole range of psychological researchers. Some journals are more specialized (e.g., Memory & Cognition) and the writing can assume some more familiarity with some parts of the background theory. Audience is an even more important consideration when planning other kinds of research presentations such as conference posters, colloquium talks or short “brown bag” research presentations.

For classroom projects, a common challenge is to avoid writing for the lecturer or the teaching assistant in the class. While classroom writing is generally evaluated by teachers, the style of writing to that audience often leads the writing style in the wrong direction. For example, students are aware that other people in the class are fully aware of all the methodological details of the research and then omit proper descriptions of the procedure. Better is to aim to describe your work to students outside the class. With that audience in mind, the overall writing style is generally more effective.

## Writing with style

Writing to APA format is somewhat more formal that other types of prose. It is generally a good idea to avoid use of the first person, although it is not specifically prohibited. If there is an opportunity where first person is more effective than to use passive voice, it will generally be the first person plural – virtually no scientific work is ever done alone in modern science.

Citations to previous research are strongly encouraged to ground the results being presented in prior peer-reviewed research. This is always done by listing the authors by last name and the year, e.g., Craik & Tulving (1975). First names of the authors, their affiliations and the title of the published work are never included in the manuscript text. These go exclusively in the References section at the end of the report. This is an important distinction with more journalistic styles of writing but an important stylistic aspect of APA format to do correctly.

When referencing prior work, the preferred method is cite the authors’ work and paraphrase their findings. Avoid long quotes or frequent short quotes. In other forms of prose, you may cite authors by page number but in general for scientific writing you should not need to cite by page (page numbers are not included in standard APA citation style). You should be connecting your theoretical ideas to the major ideas, claims, constructs and hypotheses in the previously published work. There will be rare exceptions to this rule, but these are infrequent.

Scientific writing in general tends to be very compact, concise, and precise. Some sections, like the Results of a study, will be very short but must be written and proofread extremely carefully. Unlike other types of writing, the best scientific writing often takes very few words overall but can take much longer to prepare than more verbose forms.

## Writing out of order

The major sections of a research report are included in the order listed below. However, there is no requirement to write them in that order. One approach to building a manuscript is to start with the description of the results and any data visualizations used to present these (Results and Figures). Then the Methods section, which precedes that section in the manuscript, is written. As noted below, the goal of the Methods section is to provide enough detail for a reader to replicate the research project and the important findings of the Results section highlights the key methodological techniques to explain. Then, having those sections drafted, write the Discussion section and summarize the major conclusions of the report. Only then, when the major points to communicate about the findings are clear, write the Introduction to the whole paper with a clear idea in mind of the audience for whom the manuscript is intended. Lastly, after the rest of the paper is drafted, write the Abstract.

Writing the sections in the above order is not a requirement but illustrates an important aspect of scientific writing distinct from many other forms of writing in that it is not prepared with a top-to-bottom overall flow. After the sections are written, it is critical to read and proofread the paper in order from Abstract to Conclusions, but effective scientific writing has a formality in the report that is very different from other kinds of writing. In contrast, scientific journalism is written with a very different style that is more focused on flow of the writing and the story behind the research. Journalism is not written to meet the second major goal of scientific writing: to provide enough detail to allow for a critical review of the validity of the research. The APA format is designed to meet that criterion and completeness of description is required. As an example, the audience for a media report of a scientific finding would not need the statistical reports written to include the type of test, degrees of freedom and p-value. All of those details are critical for the scientific audience of a report written to APA format.

## Learning Objectives

1. Identify the major sections of an APA-style research report and the basic contents of each section.
2. Plan and write an effective APA-style research report.

# Sections of a Research Report

## Title Page

An APA-style research report begins with a title page. The title is centered in the upper half of the page, with each important word capitalized. The title should clearly and concisely (in about 12 words or fewer) communicate the primary variables and research questions. This sometimes requires a main title followed by a subtitle that elaborates on the main title, in which case the main title and subtitle are separated by a colon. Here are some titles from recent issues of professional journals published by the American Psychological Association.

Sex Differences in Coping Styles and Implications for Depressed Mood

Effects of Aging and Divided Attention on Memory for Items and Their Contexts

Computer-Assisted Cognitive Behavioral Therapy for Child Anxiety: Results of a Randomized Clinical Trial

Virtual Driving and Risk Taking: Do Racing Games Increase Risk-Taking Cognitions, Affect, and Behavior?

Below the title are the authors’ names and, on the next line, their institutional affiliation—the university or other institution where the authors worked when they conducted the research. As we have already seen, the authors are listed in an order that reflects their contribution to the research. When multiple authors have made equal contributions to the research, they often list their names alphabetically or in a randomly determined order.

  For articles that are being submitted for publication, the title page also includes an author note that lists the authors’ full institutional affiliations, any acknowledgments the authors wish to make to agencies that funded the research or to colleagues who commented on it and contact information for the authors. For student papers that are not being submitted for publication—including theses—author notes are generally not as detailed but should include at least the lead authors email address.

# Abstract

The abstract is a summary of the study. It is the second page of the manuscript and is headed with the word Abstract. The first line is not indented. The abstract presents the research question, a summary of the method, the basic results, and the most important conclusions. Because the abstract is usually limited to about 200 words, it can be a challenge to write a good one.

As a general heuristic, the abstract will have sentences that attempt to encapsulate each of the sections of the main report. The first sentence or two is generally a summary of the key ideas from the Introduction. For example, one sentence to introduce the key constructs that the experiment is about and one sentence to describe the hypothesis. For a report of a single experimental study, there will be one sentence summarizing methods and one sentence summarizing the results. In a typical 200-300 abstract, that leaves one sentence to summarize the main conclusions drawn from the findings.

Compactly summarizing the major sections of the report is not an easy task. It is often a good idea to write the Abstract last when preparing a research report (note that it still goes on page 2). Once you have written the other sections effectively, that shows how to prepare concise one to two sentence versions of the major sections for inclusion in the abstract.

# Introduction

The introduction begins on the third page of the manuscript. The heading at the top of this page is the full title of the manuscript, with each important word capitalized as on the title page. The introduction includes three distinct subsections, although these are typically not identified by separate headings. The opening introduces the research question and explains why it is interesting, the literature review discusses relevant previous research, and the closing restates the research question and comments on the method used to answer it.

## The Opening

The opening, which is usually a paragraph or two in length, introduces the research question and explains why it is interesting. To capture the reader’s attention, researcher Daryl Bem recommends starting with general observations about the topic under study, expressed in ordinary language (not technical jargon)—observations that are about people and their behavior (not about researchers or their research; Bem, 2003). Concrete examples are often very useful here. According to Bem, this would be a poor way to begin a research report:

Festinger’s theory of cognitive dissonance received a great deal of attention during the latter part of the 20th century (p. 191)

The following would be much better:

The individual who holds two beliefs that are inconsistent with one another may feel uncomfortable. For example, the person who knows that they enjoy 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 (p. 191).

After capturing the reader’s attention, the opening should go on to introduce the research question and explain why it is interesting. Will the answer fill a gap in the literature? Will it provide a test of an important theory? Does it have practical implications? Giving readers a clear sense of what the research is about and why they should care about it will motivate them to continue reading the literature review—and will help them make sense of it.

## Breaking the Rules

Researcher Larry Jacoby reported several studies showing that a word that people see or hear repeatedly can seem more familiar even when they do not recall the repetitions—and that this tendency is especially pronounced among older adults. He opened his article with the following humorous anecdote:

A friend whose mother is suffering symptoms of Alzheimer’s disease (AD) tells the story of taking her mother to visit a nursing home, preliminary to her mother’s moving there. During an orientation meeting at the nursing home, the rules and regulations were explained, one of which regarded the dining room. The dining room was described as similar to a fine restaurant except that tipping was not required. The absence of tipping was a central theme in the orientation lecture, mentioned frequently to emphasize the quality of care along with the advantages of having paid in advance. At the end of the meeting, the friend’s mother was asked whether she had any questions. She replied that she only had one question: “Should I tip?” (Jacoby, 1999, p. 3)

Although both humor and personal anecdotes are generally discouraged in APA-style writing, this example is a highly effective way to start because it both engages the reader and provides an excellent real-world example of the topic under study.

## The Literature Review

Immediately after the opening comes the literature review, which describes relevant previous research on the topic and can be anywhere from several paragraphs to several pages in length. However, the literature review is not simply a list of past studies. Instead, it constitutes a kind of argument for why the research question is worth addressing. By the end of the literature review, readers should be convinced that the research question makes sense and that the present study is a logical next step in the ongoing research process.

Like any effective argument, the literature review must have some kind of structure. For example, it might begin by describing a phenomenon in a general way along with several studies that demonstrate it, then describing two or more competing theories of the phenomenon, and finally presenting a hypothesis to test one or more of the theories. Or it might describe one phenomenon, then describe another phenomenon that seems inconsistent with the first one, then propose a theory that resolves the inconsistency, and finally present a hypothesis to test that theory. In applied research, it might describe a phenomenon or theory, then describe how that phenomenon or theory applies to some important real-world situation, and finally suggest a way to test whether it does, in fact, apply to that situation.

Looking at the literature review in this way emphasizes a few things. First, it is extremely important to start with an outline of the main points that you want to make, organized in the order that you want to make them. The basic structure of your argument, then, should be apparent from the outline itself. Second, it is important to emphasize the structure of your argument in your writing. One way to do this is to begin the literature review by summarizing your argument even before you begin to make it. “In this article, I will describe two apparently contradictory phenomena, present a new theory that has the potential to resolve the apparent contradiction, and finally present a novel hypothesis to test the theory.” Another way is to open each paragraph with a sentence that summarizes the main point of the paragraph and links it to the preceding points. These opening sentences provide the “transitions” that many beginning researchers have difficulty with. Instead of beginning a paragraph by launching into a description of a previous study, such as “Williams (2004) found that…,” it is better to start by indicating something about why you are describing this particular study. Here are some simple examples:

Another example of this phenomenon comes from the work of Williams (2004).

Williams (2004) offers one explanation of this phenomenon.

An alternative perspective has been provided by Williams (2004).

We used a method based on the one used by Williams (2004).

Finally, remember that your goal is to construct an argument for why your research question is interesting and worth addressing—not necessarily why your favorite answer to it is correct. In other words, your literature review must be balanced. If you want to emphasize the generality of a phenomenon, then of course you should discuss various studies that have demonstrated it. However, if there are other studies that have failed to demonstrate it, you should discuss them too. Or if you are proposing a new theory, then of course you should discuss findings that are consistent with that theory. However, if there are other findings that are inconsistent with it, again, you should discuss them too. It is acceptable to argue that the balance of the research supports the existence of a phenomenon or is consistent with a theory (and that is usually the best that researchers in psychology can hope for), but it is not acceptable to ignore contradictory evidence. Besides, a large part of what makes a research question interesting is uncertainty about its answer.

## The Closing

The closing of the introduction—typically the final paragraph or two—usually includes two important elements. The first is a clear statement of the main research question and hypothesis. This statement tends to be more formal and precise than in the opening and is often expressed in terms of operational definitions of the key variables. The second is a brief overview of the method and some comment on its appropriateness. Here, for example, is how Darley and Latané (1968) concluded the introduction to their classic article on the bystander effect:

These considerations lead to the hypothesis that the more bystanders to an emergency, the less likely, or the more slowly, any one bystander will intervene to provide aid. To test this proposition it would be necessary to create a situation in which a realistic “emergency” could plausibly occur. Each subject should also be blocked from communicating with others to prevent his getting information about their behavior during the emergency. Finally, the experimental situation should allow for the assessment of the speed and frequency of the subjects’ reaction to the emergency. The experiment reported below attempted to fulfill these conditions. (p. 378)

Thus the introduction leads smoothly into the next major section of the article—the method section.

# Method

The method section is where you describe how you conducted your study. An important principle for writing a method section is that it should be clear and detailed enough that other researchers could replicate the study by following your “recipe.” This means that it must describe all the important elements of the study—basic demographic characteristics of the participants, how they were recruited, whether they were randomly assigned to conditions, how the variables were manipulated or measured, how counterbalancing was accomplished, and so on. At the same time, it should avoid irrelevant details such as the fact that the study was conducted in Classroom 37B of the Industrial Technology Building or that the questionnaire was double-sided and completed using pencils.

The method section begins immediately after the introduction ends with the heading “Method” (not “Methods”) centered on the page. Immediately after this is the subheading “Participants,” left justified and in italics. The participants subsection indicates how many participants there were, the number of women and men, some indication of their age, other demographics that may be relevant to the study, and how they were recruited, including any incentives given for participation. The participants section is a necessary subsection of the Methods section and should always go first.

After the participants section, additional subsections may be titled “Materials,” “Design” and/or “Procedure.” The Table below summarizes some of the alternatives for how to organize this information. The Materials section gives the characteristics of any stimuli used in the study, e.g., the words studied, pictures shown, questionnaires or surveys employed. If any special equipment was used for data collection, it would go here. This is followed by sections that explain how the experimental protocol was carried out.

|  |  |  |
| --- | --- | --- |
| Simple Method | Typical Method | Complex Method |
| Participants  The participants were… | **Participants**  The participants were… | **Participants**  The participants were… |
| Design and Procedure  There were three conditions… | **Materials**  The stimuli were… | **Materials**  The stimuli were… |
|  | **Procedure**  There were three conditions… Participants viewed each stimulus on a computer screen… | **Design**  There were three conditions.. |
|  |  | **Procedure**  Participants viewed each stimulus on a computer screen… |

After the participants section, the structure can vary a bit. The table above shows three common approaches. In the first, the participants section is followed by a design and procedure subsection, which describes the rest of the method. This works well for methods that are relatively simple and can be described adequately in a few paragraphs. In the second approach, the participants section is followed by separate design and procedure subsections. This works well when both the design and the procedure are relatively complicated, and each requires multiple paragraphs.

What is the difference between design and procedure? The design of a study is its overall structure. What were the independent and dependent variables? Was the independent variable manipulated, and if so, was it manipulated between or within subjects? How were the variables operationally defined? The procedure is how the study was carried out. It often works well to describe the procedure in terms of what the participants did rather than what the researchers did. For example, the participants gave their informed consent, read a set of instructions, completed a block of four practice trials, completed a block of 20 test trials, completed two questionnaires, and were debriefed and excused.

In the third basic way to organize a method section, the participants subsection is followed by a materials subsection before the design and procedure subsections. This works well when there are complicated materials to describe. This might mean multiple questionnaires, written vignettes that participants read and respond to, perceptual stimuli, and so on. The heading of this subsection can be modified to reflect its content. Instead of “Materials,” it can be “Questionnaires,” “Stimuli,” and so on. The materials subsection is also a good place to refer to the reliability and/or validity of the measures.

# Results

The results section is where you present the main results of the study, including the results of the statistical analyses. Although it does not include the raw data—individual participants’ responses or scores—researchers should save their raw data and make them available to other researchers who request them. Many journals encourage the open sharing of raw data online, and some now require open data and materials before publication.

Although there are no standard subsections, it is still important for the results section to be logically organized. Typically, it begins with certain preliminary issues. One is whether any participants or responses were excluded from the analyses and why. The rationale for excluding data should be described clearly so that other researchers can decide whether it is appropriate. A second preliminary issue is how multiple responses were combined to produce the primary variables in the analyses. For example, if participants rated the attractiveness of 20 stimulus people, you might have to explain that you began by computing the mean attractiveness rating for each participant. Or if they recalled as many items as they could from study list of 20 words, did you count the number correctly recalled, compute the percentage correctly recalled, or perhaps compute the number correct minus the number incorrect? A final preliminary issue is whether the manipulation was successful. This is where you would report the results of any manipulation checks.

The results section should then tackle the primary research questions, one at a time. Again, there should be a clear organization. For studies with complex designs such as multiple dependent and independent variables, the Results section should be organized carefully and with a clear plan. One approach would be to answer the most general questions and then proceed to answer more specific ones. Another would be to answer the main question first and then to answer secondary ones.

For relatively simple studies, the Results section can be written in a very compact way. Report the descriptive statistics about the participants performance by group/condition. Then report the inferential statistics supporting a claim about the difference between the groups. Remember to include the direction of the difference – do not just say that group performance was reliably different, tell the reader which group performed better.

In simple designs, it is best to avoid discussion of the meaning of the results with respect to the original hypothesis in the Results section. Interpretation and evaluation of the findings will go in the next section, Discussion. For more complex designs, some explanation of how the analysis connects to the hypothesis may be necessary to communicate the results effectively.

It is often very helpful to have a visualization of the results to support the presentation of the quantitative data in the text. A bar or line graph can very clearly communicate the findings to the reader. These are included as Figures in the manuscript. If you include a Figure, make sure you reference the Figure in the appropriate place in the Results section where you have the numbers that relate to the graph. Figures should be planned to illustrate the results and include labels on the axes that show the units of the dependent variable (typically on the y-axis) and the grouping conditions of the independent variable (typically on the x-axis). For complex designs, they may also include a Legend in the figure and/or use color to clarify the grouping.

All Figures must have a Figure Caption included with the figure to help the reader understand the content. The caption explains the axes, characterizes the results and explains visualization details such as the use of SE bars to communicate the observed variance. In the official APA guidelines, Figures and Captions are included as separate pages at the end of the manuscript. It is also acceptable to include the figures “in line” on pages near the Results section. Note that if you include the figures “in line” make sure the formatting is readable, e.g., keep the figure and caption together on a page (sometimes this requires making these a separate page to keep document software from moving things around).

Tables of data can also be helpful ways of communicating performance across a complex set of conditions. Tables should only be used to present average performance (and variance measures) across conditions and should virtually never include all the individual participant data for a study. Tables are generally not needed in simple designs where the scores on the DV can be easily described in the text in a sentence format. In general, you should choose between a table or a figure to help the reader understand the data and it is very rare that redundant presentation of both formats is helpful.

# Discussion

The discussion is the last major section of the research report. Discussions usually consist of some combination of the following elements:

* Summary of the research
* Theoretical implications
* Practical implications
* Limitations
* Suggestions for future research

The discussion typically begins with a summary of the study that provides a clear answer to the research question. In a short report with a single study, this might require no more than a sentence. In a longer report with multiple studies, it might require a paragraph or even two. The summary is often followed by a discussion of the theoretical implications of the research. Do the results provide support for any existing theories? If not, how can they be explained? Although you do not have to provide a definitive explanation or detailed theory for your results, you at least need to outline one or more possible explanations. In applied research—and often in basic research—there is also some discussion of the practical implications of the research. How can the results be used, and by whom, to accomplish some real-world goal?

The theoretical and practical implications are often followed by a discussion of the study’s limitations. Perhaps there are problems with its internal or external validity. Perhaps the manipulation was not very effective or the measures not very reliable. Perhaps there is some evidence that participants did not fully understand their task or that they were suspicious of the intent of the researchers. Now is the time to discuss these issues and how they might have affected the results. But do not overdo it. All studies have limitations, and most readers will understand that a different sample or different measures might have produced different results. Unless there is good reason to think they would have, however, there is no reason to mention these routine issues. Instead, pick two or three limitations that seem like they could have influenced the results, explain how they could have influenced the results, and suggest ways to deal with them.

Most discussions end with some suggestions for future research. If the study did not satisfactorily answer the original research question, what will it take to do so? What new research questions has the study raised? This part of the discussion, however, is not just a list of new questions. It is a discussion of two or three of the most important unresolved issues. This means identifying and clarifying each question, suggesting some alternative answers, and even suggesting ways they could be studied.

Finally, some researchers are quite good at ending their articles with a sweeping or thought-provoking conclusion. Darley and Latané (1968), for example, ended their article on the bystander effect by discussing the idea that whether people help others may depend more on the situation than on their personalities. Their final sentence is, “If people understand the situational forces that can make them hesitate to intervene, they may better overcome them” (p. 383). However, this kind of ending can be difficult to pull off. It can sound overreaching or just banal and end up detracting from the overall impact of the article. It is often better simply to end by returning to the problem or issue introduced in your opening paragraph and clearly stating how your research has addressed that issue or problem.

# References

The references section begins on a new page with the heading “References” centered at the top of the page. All references cited in the text are then listed in the format presented earlier. They are listed alphabetically by the last name of the first author. If two sources have the same first author, they are listed alphabetically by the last name of the second author. If all the authors are the same, then they are listed chronologically by the year of publication. Everything in the reference list is double-spaced both within and between references.

Online sources can help with preparing references in APA format. The following is an example provided by Google Scholar. The reference format should be followed closely including the authors’ names and initials (but not full names), the publication year, the title, journal and page numbers.

Gino, F., & Wiltermuth, S. S. (2014). Evil genius? How dishonesty can lead to greater creativity. *Psychological science*, *25*(4), 973-981.

## Appendices, Tables, and Figures

Appendices, tables, and figures come after the references in standard format (but see above for alternate approaches with figures and tables). An appendix is appropriate for supplemental material that would interrupt the flow of the research report if it were presented within any of the major sections. An appendix could be used to present lists of stimulus words, questionnaire items, detailed descriptions of special equipment or unusual statistical analyses, or references to the studies that are included in a meta-analysis. Each appendix begins on a new page. If there is only one, the heading is “Appendix,” centered at the top of the page. If there is more than one, the headings are “Appendix A,” “Appendix B,” and so on, and they appear in the order they were first mentioned in the text of the report.

After any appendices come tables and then figures. Tables and figures are both used to present results. Figures can also be used to display graphs, illustrate theories (e.g., in the form of a flowchart), display stimuli, outline procedures, and present many other kinds of information. Each table and figure appears on its own page. Tables are numbered in the order that they are first mentioned in the text (“Table 1,” “Table 2,” and so on). Figures are numbered the same way (“Figure 1,” “Figure 2,” and so on). A brief explanatory title, with the important words capitalized, appears above each table. Each figure is given a brief explanatory caption, where (aside from proper nouns or names) only the first word of each sentence is capitalized. More details on preparing APA-style tables and figures are presented later in the book.

# Other Presentation Formats

Writing an empirical research report in American Psychological Association (APA) style is only one way to present new research in psychology. In this section, we look at several other important ways.

## Other Types of Manuscripts

The previous section focused on writing empirical research reports to be submitted for publication in a professional journal. However, there are other kinds of manuscripts that are written in APA style, many of which will not be submitted for publication elsewhere. Here we look at a few of them.

## Review and Theoretical Articles

Recall that review articles summarize research on a particular topic without presenting new empirical results. When these articles present a new theory, they are often called theoretical articles. Review and theoretical articles are structured much like empirical research reports, with a title page, an abstract, references, appendixes, tables, and figures, and they are written in the same high-level and low-level style. Because they do not report the results of new empirical research, however, there is no method or results section. Of course, the body of the manuscript should still have a logical organization and include an opening that identifies the topic and explains its importance, a literature review that organizes previous research (identifying important relationships among concepts or gaps in the literature), and a closing or conclusion that summarizes the main conclusions and suggests directions for further research or discusses theoretical and practical implications. In a theoretical article, of course, much of the body of the manuscript is devoted to presenting the new theory. Theoretical and review articles are usually divided into sections, each with a heading that is appropriate to that section. The sections and headings can vary considerably from article to article (unlike in an empirical research report). But whatever they are, they should help organize the manuscript and make the argument clear.

## Final Manuscripts

Until now, we have focused on the formatting of manuscripts that will be submitted to a professional journal for publication. In contrast, other types of manuscripts are prepared by the author in their final form with no intention of submitting them for publication elsewhere. These are called final manuscripts and include dissertations, theses, and other student papers. These manuscripts may look different from strictly APA style manuscripts in ways that make them easier to read, such as putting tables and figures close to where they are discussed so that the reader does not have to flip to the back of the manuscript to see them. If you read a dissertation or thesis, for example, you might notice it does not adhere strictly to APA style formatting. For student papers, it is important to check with the course instructor about formatting specifics. In a research methods course, papers are usually required to be written as though they were manuscripts being submitted for publication.

## Conference Presentations

One of the ways that researchers in psychology share their research with each other is by presenting it at professional conferences. (Although some professional conferences in psychology are devoted mainly to issues of clinical practice, we are concerned here with those that focus on research.) Professional conferences can range from small-scale events involving a dozen researchers who get together for an afternoon to large-scale events involving thousands of researchers who meet for several days. Although researchers attending a professional conference are likely to discuss their work with each other informally, there are two more formal types of presentation: oral presentations (“talks”) and posters. Presenting a talk or poster at a conference usually requires submitting an abstract of the research to the conference organizers in advance and having it accepted for presentation—although the peer review process is typically not as rigorous as it is for manuscripts submitted to a professional journal.

## Oral Presentations

In an oral presentation, or “talk,” the presenter stands in front of an audience of other researchers and tells them about their research—usually with the help of a slide show. Talks usually last from 10 to 20 minutes, with the last few minutes reserved for questions from the audience. At larger conferences, talks are typically grouped into sessions lasting an hour or two in which all the talks are on the same general topic.

In preparing a talk, presenters should keep several general principles in mind. The first is that the number of slides should be no more than about one per minute of the talk. The second is that talks are generally structured like an APA-style research report. There is a slide with the title and authors, a few slides to help provide the background, a few more to help describe the method, a few for the results, and a few for the conclusions. The third is that the presenter should look at the audience members and speak to them in a conversational tone that is less formal than APA-style writing but more formal than a conversation with a friend. The slides should not be the focus of the presentation; they should act as visual aids. As such, they should present the main points in bulleted lists or simple tables and figures.

## Posters

Another way to present research at a conference is in the form of a poster. A poster is typically presented during a one- to two-hour poster session that takes place in a large room at the conference site. Presenters set up their posters on bulletin boards arranged around the room and stand near them. Other researchers then circulate through the room, read the posters, and talk to the presenters. In essence, poster sessions are a grown-up version of the school science fair. But there is nothing childish about them. Posters are used by professional researchers in all scientific disciplines and they are becoming increasingly common. At a recent American Psychological Association Conference, nearly 2,000 posters were presented across 16 separate poster sessions. Among the reasons posters are so popular is that they encourage meaningful interaction among researchers.

Posters are typically a large size, maybe four feet wide and three feet high. The poster’s information is organized into distinct sections, including a title, author names and affiliations, an introduction, a method section, a results section, a discussion or conclusions section, references, and acknowledgments. Although posters can include an abstract, this may not be necessary because the poster itself is already a brief summary of the research.

Given the conditions under which posters are often presented—for example, in crowded ballrooms where people are also eating, drinking, and socializing—they should be constructed so that they present the main ideas behind the research in as simple and clear a way as possible. The font sizes on a poster should be large—perhaps 72 points for the title and authors’ names and 28 points for the main text. The information should be organized into sections with clear headings, and text should be blocked into sentences or bulleted points rather than paragraphs. It is also better for it to be organized in columns and flow from top to bottom rather than to be organized in rows that flow across the poster. This makes it easier for multiple people to read at the same time without bumping into each other. Posters often include elements that add visual interest. Figures can be more colorful than those in an APA-style manuscript. Posters can also include copies of visual stimuli, photographs of the apparatus, or a simulation of participants being tested. They can also include purely decorative elements, although it is best not to overdo these.

Again, a primary reason that posters are becoming such a popular way to present research is that they facilitate interaction among researchers. Many presenters immediately offer to describe their research to visitors and use the poster as a visual aid. At the very least, it is important for presenters to stand by their posters, greet visitors, offer to answer questions, and be prepared for questions and even the occasional critical comment. It is generally a good idea to have a more detailed write-up of the research available for visitors who want more information, to offer to send them a detailed write-up, or to provide contact information so that they can request more information later.

For more information on preparing and presenting both talks and posters, see the website of the Undergraduate Advising and Research Office at Dartmouth College:

<http://www.dartmouth.edu/~ugar/undergrad/posterinstructions.html>

## Professional Conferences

Following are links to the websites for several large national conferences in North America and also for several conferences that feature the work of undergraduate students. For a comprehensive list of psychology conferences worldwide, see the following website.

<http://www.conferencealerts.com/psychology.htm>

American Psychological Association Convention: <http://www.apa.org/convention>

Association for Psychological Science Conference: <http://www.psychologicalscience.org/index.php/convention>

Society for Personality and Social Psychology Conference: <http://meeting.spsp.org/>

Psychonomic Society Annual Meeting: <http://www.psychonomic.org/annual-meeting>

U.S. Regional conferences where undergraduate researchers frequently present

Eastern Psychological Association (EPA): <http://www.easternpsychological.org>

Midwestern Psychological Association (MPA): <http://www.midwesternpsych.org/>

New England Psychological Association (NEPA): <http://www.newenglandpsychological.org/>

Rocky Mountain Psychological Association (RMPA): <http://www.rockymountainpsych.com/>

Southeastern Psychological Association (SEPA): <http://www.sepaonline.com/>

Southwestern Psychological Association (SWPA): <http://www.swpsych.org/>

Western Psychological Association (WPA): <http://westernpsych.org/>

## Key Takeaways

* APA style is a set of guidelines for writing in psychology. It is the genre of writing that psychologists use to communicate about their research with other researchers and practitioners.
* APA style can be seen as having three levels. There is the organization of a research article, the high-level style that includes writing in a formal and straightforward way, and the low-level style that consists of many specific rules of grammar, spelling, formatting of references, and so on.
* References and reference citations are an important part of APA style. There are specific rules for formatting references and for citing them in the text of an article.
* An APA-style empirical research report consists of several standard sections. The main ones are the abstract, introduction, method, results, discussion, and references.
* The introduction consists of an opening that presents the research question, a literature review that describes previous research on the topic, and a closing that restates the research question and comments on the method. The literature review constitutes an argument for why the current study is worth doing.
* The method section describes the method in enough detail that another researcher could replicate the study. At a minimum, it consists of a participants subsection and a design and procedure subsection.
* The results section describes the results in an organized fashion. Each primary result is presented in terms of statistical results but also explained in words.
* The discussion typically summarizes the study, discusses theoretical and practical implications and limitations of the study, and offers suggestions for further research.
* Research in psychology can be presented in several different formats. In addition to APA-style empirical research reports, there are theoretical and review articles; final manuscripts, including dissertations, theses, and student papers; and talks and posters at professional conferences.
* Talks and posters at professional conferences follow some APA style guidelines but are considerably less detailed than APA-style research reports. Their function is to present new research to interested researchers and facilitate further interaction among researchers.

## Exercises

* Practice: Find a description of a research study in a popular magazine, newspaper, blog, or website. Then identify five specific differences between how that description is written and how it would be written in APA style.
* Practice: Find and correct the errors in the following fictional APA-style references and citations.
* Walters, F. T., and DeLeon, M. (2010). Relationship Between Intrinsic Motivation and Accuracy of Academic Self-Evaluations Among High School Students. Educational Psychology Quarterly, 23, 234–256.
* Moore, Lilia S. (2007). Ethics in survey research. In M. Williams P. L. Lee (eds.), Ethical Issues in Psychology (pp. 120–156), Boston, Psychological Research Press.
* Vang, C., Dumont, L. S., and Prescott, M. P. found that left-handed people have a stronger preference for abstract art than right-handed people (2006).
* This result has been replicated several times (Williamson, 1998; Pentecost Garcia, 2006; Armbruster, 2011)
* Practice: Look through an issue of a general interest professional journal (e.g., Psychological Science). Read the opening of the first five articles and rate the effectiveness of each one from 1 (very ineffective) to 5 (very effective). Write a sentence or two explaining each rating.
* Practice: Find a recent article in a professional journal and identify where the opening, literature review, and closing of the introduction begin and end.
* Practice: Find a recent article in a professional journal and highlight in a different color each of the following elements in the discussion: summary, theoretical implications, practical implications, limitations, and suggestions for future research.
* Discussion: Do an Internet search using search terms such as psychology and poster to find three examples of posters that have been presented at conferences. Based on information in this chapter, what are the main strengths and main weaknesses of each poster?