Once you have completed your first research project, you may be asked to present the study to a group. You may be asked to write a paper in APA (American Psychological Association) style, give an oral presentation, or prepare a poster presentation of your research. This is how psychologists communicate with each other about research that they have conducted. It is an important part of the scientific method to tell others about your study and its results. This is how knowledge accumulates and science progresses.

You should already be somewhat familiar with an APA-style article by reading the published journal articles that other psychologists have written. However, the focus up to this point in the text has been on how to read and understand these articles. In this chapter, we focus more on how to write one of these articles as a researcher who has completed a study and is getting ready to present it to others. We will also discuss the other common forms of presentation: the oral presentation and the poster presentation (see Figure 8.1). Oral and poster presentations are common at conferences as methods of presenting research one has completed. They are sometimes given before an APA-style article is written for publication and, thus, represent the most up-to-date findings in an area. There are many undergraduate conferences that are held regionally each year, and your college may hold its own as well. As a student, you are more likely to be involved in an oral or poster presentation if you present research outside
your class. However, all the presentation styles help you learn how to organize a presentation of research, and learning to write APA-style articles also helps you better understand journal articles that others have written. We’ll begin with the APA-style article as a mode of research presentation (see Figure 8.2).
APA-STYLE ARTICLE WRITING

As you have seen in the journal articles you have read (and from the description of these articles in Chapter 2 of this text), APA-style articles follow a particular organizational style. APA style refers to the writing style proposed by the American Psychological Association (APA, 2010) for research articles in psychology and related fields. There are other formatting styles for research articles, but APA style is the most commonly used style in psychology, and most psychological journals require submissions of articles for publication to be written in APA style. Figure 8.3 illustrates the formatting of an APA-style article that has been typed in by a researcher. We are going to discuss each section of the APA-style article and
Does Delay Affect Prospective Memory Accuracy

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Illinois State University
DELAY AND PROSPECTIVE MEMORY ACCURACY

Abstract

The present experiment was designed to test the effect of delay on prospective memory. Prospective memory is remembering to complete a task in the future (Einstein & McDaniel, 2005). Previous studies that measured forgetting of prospective memory have reported mixed results. Thus, the current study tested the effect of delay in an attempt to clarify the effect. Delay between the presentation of the prospective memory instructions and the prospective memory cue was manipulated. Delays of 5 to 20 min were tested. Results indicated that prospective memory performance did not change as delay increased. Thus, there was no evidence that delay affects prospective memory for this range of delays.

Keywords: prospective memory, forgetting
DELAY AND PROSPECTIVE MEMORY ACCURACY

Does Delay Have an Effect on Prospective Memory Accuracy?

Prospective memory (PM) is the act of remembering to perform a task at some point in the future (Einstein & McDaniel, 2005). More and more research is taking place on this topic. Researchers in this area have been examining the effect of delay on PM. In these studies, the delay between the PM instructions and the presentation of the PM cue was manipulated. Knowing how delay affects PM may indicate how similar PM is to retrospective memory (i.e., remembering something you have experienced in the past).

Previous studies have reported mixed results for the effect of delay on PM. For example, in a study by Nigro and Cicogna (2000), university students answered two standardized questionnaires. After completing the first questionnaire, participants were told to relay a message to the experimenter in charge of giving the second questionnaire. The message was the same for all participants. Random assignment was used to place the participants in one of three delay conditions: 10 min, 2 days, or 2 weeks. On seeing the second experimenter at their designated time, participants were to give the message. Results showed that PM accuracy was not affected by delay of the second session. However, Hicks, Marsh, and Russell (2000) did find an effect of delay on PM performance. They manipulated delay in a laboratory study of PM and found that PM performance increased from a delay of 2.5 min to a delay of 15 min. Thus, the effect of delay on PM is unclear.

Contrary to the results of Hicks et al. (2000), Meier, Zimmerman, and Perrig (2006) found that PM performance decreased with longer delays. In their second experiment, they administered delays of 5, 15, and 45 min using two distractor tasks. Results suggested that as the delays got longer the PM accuracy decreased.
DELAY AND PROSPECTIVE MEMORY ACCURACY

The purpose of the current study was to find out if delays between the PM instructions and the presentation of the PM cue significantly affect PM accuracy. Delays of 5, 10, 15, and 20 min were used. Based on the results of Meier et al. (2006) for delays in this range, I hypothesized that as delay increased, PM accuracy would decrease.

Method

Participants

The participants were 80 undergraduate students from a psychology department subject pool at Illinois State University. They completed the experiment voluntarily and received extra credit in their courses for their participation. Participants were randomly assigned to one of the four conditions—5-, 10-, 15-, or 20-min delay—with 20 participants per condition.

Design

A between-subjects design was used to examine the differences between the four delay conditions and PM accuracy. The independent variable was delay between instruction of the PM task and the PM cue. The levels of the independent variable were 5-, 10-, 15-, and 20-min delays. The dependent variable in the study was PM accuracy.

Materials

The stimuli consisted of categories and items that did or did not belong to a specific category. The stimuli were drawn from Battig and Montague’s (1969) category norms. There were 11 categories presented to the participants with exemplars: fruit, vegetable, human body part, metal, fish, flower, city, color, sport, musical instrument, and places to sleep. There were 280 category and exemplar pairings in the experiment, divided into four blocks of trials. Trials were numbered for participant accuracy in recording judgments on the record sheet. Half the
exemplars belonged to the category presented, whereas the other half did not belong. The participants were given response sheets numbered from 1 to 280. They circled “yes” or “no” on each trial according to whether or not the exemplar belonged in the category. Four PM cues appeared in the category-judgment trials: hotel, dormitory, library, and restaurant. Two of these cues were presented with a correct category, and two were presented with an incorrect category. The trials were presented with PowerPoint. In each trial, categories and exemplars were presented in the center of the computer screen.

Procedure

Participants were run individually. Participants first read and signed an informed consent form. The ongoing task for the four conditions was to identify whether the item exemplar on the right of the screen belonged in the category presented on the left of the screen. In addition, the PM task for all participants was to mark an “X” next to the trial number when a building was displayed in the trial. Both the ongoing and PM task instructions were read to the participant by the researcher. Ten practice trials followed. At that time, if participants had any questions, they were answered before the rest of the experiment continued.

Each of the 280 trials remained on the screen for 5 s. There were three breaks of 30 s between each block of trials. The four PM cues appeared within a minute period at the delay time for each delay group. At the end of the experiment, the participants were debriefed.

Results

The effect of delay on prospective memory accuracy was tested. A one-way analysis of variance (ANOVA) was run on the accuracy data with an alpha level of .05. Means and standard deviations for PM accuracy can be found in Figure 1. PM accuracy in all conditions was
DELAY AND PROSPECTIVE MEMORY ACCURACY

relatively low. We found that the effect of delay on PM accuracy was not significant:
\[ F(3,37) = 0.06, \ p = .98. \]

In addition to PM accuracy, we analyzed the ongoing task accuracy for each delay. With
an alpha level of .05, a one-way ANOVA was used to analyze these data. Means and standard
deviations for the ongoing-task accuracy can be found in Table 1. The ongoing-task accuracy
was high in all conditions. Results indicated that the effect of delay on the ongoing task accuracy
was not significant: \[ F(3,37) = 1.44, \ p = .25. \]

Discussion

The current study was designed to examine how the amount of time between the PM
instructions and the presentation of the PM cue affects PM accuracy. The hypothesis was that as
delay increased, PM accuracy would decrease. The results of the current study indicated that PM
accuracy was not significantly affected by delay. The overall PM accuracy was low for all
conditions. It was also found that delay did not affect the accuracy of the ongoing task. The
overall ongoing-task accuracy was high in all conditions.

The present results are consistent with some previous studies that found no effect of delay
on PM accuracy. An example of such a study is that of Nigro and Cicogna (2000), where they
found no effect of delay for delays from 10 min to 2 weeks. In the current study, results
consistent with Nigro and Cicogna’s were found for delays from 5 to 20 min. However, the
present results are inconsistent with those reported by Meier et al. (2006). They found significant
effects of delay for delays of 5 to 45 min. The inconsistency could be due to the way delay was
manipulated (e.g., no distractor task was used in the present study) or the shorter delays used in
the present study.
DELAY AND PROSPECTIVE MEMORY ACCURACY

This study examined the effects of delay on PM accuracy in the hope of better understanding factors that affect PM and how similar PM is to retrospective memory, which typically shows an effect of delay. The results of this study indicated no effect of delay on PM. Future studies should continue to explore delay as a possible factor that affects PM to allow us to fully understand how PM works.
DELAY AND PROSPECTIVE MEMORY ACCURACY

References


### DELAY AND PROSPECTIVE MEMORY ACCURACY

Table 1

Mean Ongoing Task Performance

<table>
<thead>
<tr>
<th>Delay</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min</td>
<td>.97</td>
<td>.05</td>
</tr>
<tr>
<td>10 min</td>
<td>.95</td>
<td>.04</td>
</tr>
<tr>
<td>15 min</td>
<td>.98</td>
<td>.04</td>
</tr>
<tr>
<td>20 min</td>
<td>.96</td>
<td>.03</td>
</tr>
</tbody>
</table>
DELAY AND PROSPECTIVE MEMORY ACCURACY

Figure 1. Mean proportion accuracy for prospective memory task as a function of delay.
the information that should be included in each section. Some important APA-style rules are also covered to help you format your article as you type it. All information described in the section below is also covered in the *Publication Manual of the American Psychological Association* (APA, 2010). In addition, an article describing what belongs in the sections of an APA-style article that is also formatted in APA style is available at http://about.illinoisstate.edu/dmmcbri/Pages/Research-Methods-in-Psychology.aspx.

**Before You Write**

*Citations.* As you write, it is important to cite the sources where you obtain information for your article. You should cite sources for definitions of concepts, review of previous studies, sources for stimuli or questionnaires, and so on. By citing these sources, you are giving credit to the authors for the information you got from their publication. This could be the definition of a concept, a description of their study, use of their methodology, and so forth. This is different from quoting their words—in psychological writing, very few quotes tend to be used, and these are reserved for times when the authors’ specific wording is important to preserve. In most cases, you will just be summarizing the authors’ ideas in your paper: This is the expected writing style in reports of psychological research. Quoting without quotation marks and a citation is plagiarism (see below) and will likely have serious consequences.

APA-style citation format is to include the last names of the authors in the order they appear in the publication and then the year of publication. For articles with five or fewer authors, list all authors the first time you cite the article. If you cite a source with three or more authors a second time or more than five authors at any time, include just the last name of the first author and *et al.* to indicate there are other authors. For single- or double-author articles, continue to cite all authors’ last names.

Sources can be cited by naming the authors in the text and including the publication year in parentheses. An example of a citation of this type is: Hamilton and Mayes (2006) stated that. . . . Alternatively, the entire citation can be provided in parentheses to indicate the source of a statement. An example of a citation of this type is the following: Prospective memory is defined as remembering to perform a task at a future time (Einstein & McDaniel, 2005). Note that this statement is not a quote from the Einstein and McDaniel article. It is a summarization of the definition in the writer’s own words. Although quotes should be used sparingly, if you do include a direct quote from a source, you should also include the page number on which you found the quote in the article. Also note that the word *and* is used for citations where the authors are directly referred to in the text, whereas an ampersand (*&*) is used for citations enclosed in parentheses. Remember to include a full reference for each citation in the reference section.

An important consideration for creating citations is to preserve the order of authors listed for the source. The order of authors on a paper typically denotes the amount of work each author contributed to the paper, so it should not be rearranged when you create a citation or reference of the source.

*Plagiarism.* Proper citation of sources is an important part of avoiding plagiarism (taking credit for someone else’s work or ideas). Any description of another study or of someone’s theory must include the citation of the source of the study or theory to give proper credit to the author(s) of the source. Note that this is different from quoting. You
may not use another author’s words unless you use quotation marks, and direct quotes should be rare in your writing (and your instructor may forbid them in your papers). Presenting another author’s written work verbatim or in a manner similar to the written form produced by the author without quotations also constitutes plagiarism. You should not simply take one of their sentences and rearrange the words—this is still plagiarism. The advice I give my students is to first take notes in your own words when you read a source, then write your paper from your notes instead of the original paper to help you avoid accidental plagiarism. The further you get away from this source while you are writing (i.e., not looking at the source while you’re writing), the easier it will be to use your own words. You should be extremely careful when writing from sources to ensure that quotation marks or original writing is included.

Sections of an APA-Style Article

Title Page. The first page of your article is the title page. It includes the title of the article, the authors’ names, and the authors’ affiliations centered on the page. Your title should be concise and informative. Someone should be able to determine the general topic of your study from the title you choose. The title page also contains a running head that is a shortened version of the title (50 or fewer characters including spaces). The purpose of the running head is to include a shortened version of your title that runs along the top of every other page of a published article to identify the article within the journal. Take a look at an article published in APA style and you will see the running head in the top margin of every other page. The running head is typed in all capital letters and appears in the header on each page, left margin justified. Finally, the page number appears in the header, right margin justified, of every page in the article (including the title page, which is Page 1). Figure 8.4 provides an example title page with each part explained in a bubble.

Abstract. The second page of your article contains your abstract. The abstract is a short paragraph (not indented) that describes the important aspects of your article. In other words, your abstract contains a sentence or two for each of the four major sections of your article: introduction, method, results, and discussion. For example, a sentence or two that explains the purpose of your article begins your abstract. A sentence or two that describes the method follows. Be sure to describe the primary variables in your study. The primary result(s) are described in a sentence or two, and your abstract ends with the primary conclusion of the study. However, the length of your abstract is limited (in most cases, to 120 to 150 or fewer words), so you must be selective in what you discuss. Do not include too many details of the method, and do not include all results. If you use numbers in your abstract, they are typed in numerical form. Finally, the heading “Abstract” is centered in bold at the top of the page.

Introduction. Your introduction begins on the third page of your article. Your full title (not the heading “Introduction”) is centered at the top of the page. Your introduction should cover several things. It should inform your reader about the general topic of your study (e.g., the bystander effect, visual short-term memory, therapeutic treatments for depression). Be careful not to begin your introduction too generally. Your introduction should not begin with statements about all of psychology or all human behavior. Begin by explaining
what behavior your study addresses and which aspects of that behavior are most relevant to your study. Be sure to indicate what your research question is. You should also review relevant background studies that tell your reader what is already known about your research question and how it has been studied previously. Be careful not to simply summarize the background literature. Instead, you should discuss only the aspects of these studies that are particularly relevant for the development of your study.

Your introduction should become more specific as it progresses, with some details about your study’s design being discussed (e.g., simply indicating the variables that were studied) to inform the reader how your study addresses your stated research question. State your hypotheses toward the end of your introduction. Be sure to explain (briefly) why you are making those hypotheses, tying them to the background literature you discussed earlier in your introduction. One of the main purposes of your introduction is to make the argument that your study contributes important knowledge to the topic area you have chosen and that you are justified in making the hypotheses you are making. In other words, if you have written a good introduction, your readers should have a good idea what your hypotheses are before you state them and be convinced that they are the best hypotheses to make for your study. By the time readers reach the end of your introduction, they should also be convinced that the study you are describing is important and worthy of reading. Be sure to keep your argument in mind as you write your introduction.
**Method.** The method section begins on the next line after your introduction ends. To begin the method, type the heading “Method” in bold, centered on the page. Do not begin a new page for the method section. A general rule of thumb to use in deciding what information to include in your method section is enough information that researchers could replicate your study if they wanted to. For example, your method section should contain a description of your stimuli or survey but should not include the type of writing instrument used by your participants (unless it is relevant to the design of your study). The method section has four subsections: participants, design, materials or apparatus, and procedure. Each subsection should begin with the subsection heading left justified and in bold. You may not need to include each subsection in every method section you write. If you take a look at some different journal articles published in APA style, you will see that some authors choose to combine some of these subsections, and in very short articles (e.g., Short Reports of the journal *Psychological Science*), the subsections are all combined into one method section that contains the relevant details of all the subsections. In addition, in many articles, you may see that the design section has been omitted or combined with the materials section.

**Participants.** In the participants subsection, describe the relevant details of the participants or subjects in your study (humans are typically referred to as “participants” and non-human animals as “subjects”). For example, how many participants took part in the study? How were the participants recruited? How were they compensated? Who were the participants? Were they college students or individuals living in retirement communities? Or did you use Sprague-Dawley rats as subjects? Also include demographic information about the participants that is relevant to your study, such as gender breakdown, socioeconomic status, education level, and age. How participants were assigned to study conditions (e.g., randomly) is also indicated in this section.

**Design.** Although not explicitly listed in the *Publication Manual of the American Psychological Association* (APA, 2010), the design subsection is often included by authors for studies with more complex designs (e.g., experiments) to improve the clarity of the method. The design subsection describes the variables in your study and how they were measured and manipulated. Be sure to indicate any independent and dependent variables included in your study. Describe levels of any independent variables. In other words, provide operational definitions of the variables in the method section. In many cases, the materials used in the study (e.g., stimuli, questionnaires) are too closely tied to the design to separate them, and the author combines these two sections.

**Materials/Apparatus.** The materials or apparatus subsection contains information about what was used to run the study. Any stimuli or questionnaires presented in the study are described in this subsection, including the origin of these materials and number of items. Assignment of stimuli to conditions is also described in this section. If complex equipment is used in a study, this section may be labeled “Apparatus,” or the author may include a separate apparatus section.

**Procedure.** The procedure subsection describes what the participants/subjects experienced in the study in chronological order. Information about the instructions they were given in
the study and the tasks they performed is included. Timing of any stimulus presentations is described in the procedure subsection. In addition, how the participants/subjects were assigned to conditions is included for studies that are experiments, and debriefing is described for studies that involve deception. A statement indicating that participants/subjects were treated according to ethical standards is often included in this section or in the participants section.

**Results.** The results section begins on the next line after the end of the method section. Do not begin a new page for the results section. The section begins with the heading “Results” centered on the page in bold. The results section states the dependent variables that were analyzed and the tests used to analyze them. The alpha level for the statistical tests is given, and the tests that were run are described. You should make statements about the results, indicating what differences or relationships were found, with support for the statements provided by the statistical values. For example, your results section may contain a statement such as “The difference between the two age groups was significant, \( t(65) = 4.56, p = .002 \), with older participants scoring higher (\( M = 85.00, SD = 7.89 \)) than younger participants (\( M = 67.00, SD = 7.32 \)).” Notice that the statistics are not the focus of the sentence. The difference is the focus, with support provided by the statistical values and the mean values for each condition. Also note that statistical values are generally rounded to two decimal places. Be sure to format statistics according to APA style, with italics for statistics, degrees of freedom provided, and spaces surrounding equal signs. Consult the *Publication Manual* (APA, 2010) for APA style for specific statistics.

The results section also includes any tables or figures that help illustrate the important results of the study. Choose one or the other for any set of results. Do not provide both a table and a figure for the same results. Figures may take the form of one of the graph types described in Chapter 7 (e.g., line graph of means, bar graph of means, scatterplot). Be sure to refer to the table or figure in the text of the results section. However, tables and figures are positioned near the end of the typed article. They are not embedded in the text of the results section. All figures have a figure caption that is typed above the figure. See Figure 8.3 for examples of formatted tables and figures in APA style.

**Discussion.** The last section of text in your article is the discussion section. Begin the section with the heading “Discussion” on the next line after your results section ends. The discussion section continues where your introduction left off, beginning with a review of the hypotheses and some statements about whether these hypotheses were supported and which results provide that support. The discussion section also contains a comparison of your results with those from past studies, especially the studies you described in the introduction section. For example, are your results consistent with those from previous studies? If not, why not? Limitations of the study are also discussed in this section of the article. However, be careful not to argue that the study was conducted poorly. You are still making an argument (as you did in the introduction) that the study contributes to scientific knowledge. As part of that argument, you can point out, based on the results you found, issues your study does not address or limitations of the research method chosen for the study, and you may also wish to suggest directions for future studies in your area of research. Your discussion section ends with a summary paragraph, describing what you learned overall from the study.
References. The reference section provides a complete listing of all the sources cited in the article. The references are listed in alphabetical order by the last name of the first author. All subsequent authors are listed in the reference in the order in which they appear in the publication. You also provide the publication year, title of the source, where the source was published, and additional information about the publication source. For example, a reference for the journal article described in the Thinking About Research section at the end of this chapter should appear as follows:


See the references section of Figure 8.3 for some additional examples of reference formatting. Figure 8.5 also provides a breakdown of how to format a reference. Begin a new page for the reference section. Reference organization packages, such as Ref Works and EndNote, can help you format source references into APA style.

**FIGURE 8.5  ■ How to Format a Reference**

- List references alphabetically by first author’s last name
- Provide only initials of first and middle names
- Include title of paper – Only capitalize first letter of major words and words after a colon
- Include year of publication
- Include volume number in italics
- Include page numbers
- Include doi code if paper has one
- Include journal name in italics


**STOP AND THINK**

(8.1) For each piece of information about a study listed below, identify the appropriate section(s) of an APA-style paper it should be placed in:
- Reference to a figure
- Description of the stimuli shown to subjects

(8.2) Explain why the method of a study is described in detail in an APA-style paper.

A statement of the hypothesis
Suggestions for future studies
Mean scores
Multiple-Study Articles

For some APA-style articles, you may be describing multiple related studies in one article. For multiple-study articles, you include one introduction section that provides background for all your studies, a method for each study, a results section for each study, and a general discussion section that describes conclusions for all the studies combined. The method and results sections of each study are preceded by headings that indicate the study number, such as “Study 1” or “Experiment 1,” centered on the page. A new hierarchy of headings follows for the method, results, and subsections of the method. In multiple-study articles, method and results headings are left justified in bold, and the subsections of the method are indented with the paragraph and end with a period. See the Publication Manual (APA, 2010) for additional information about formatting multiple-study articles.

Research Proposals

In some situations, researchers must write a proposal for a research project before they conduct the study. Proposals are typically written to convince someone else that a research project should be conducted. The purpose may be to obtain grant funds to conduct the project or to propose a project for a class. To write a research proposal, the APA-style structure described above is generally followed, but a few modifications are made to account for the fact that the study has not yet been completed. For example, the results section typically contains a plan for the analysis of the data and predicted results for the study. Likewise, the discussion section contains a discussion of what may be learned in the cases where the hypotheses are supported and not supported. In addition, the details of the study (method details, etc.) are described in the future tense (e.g., “The participants will be recruited from a population of university students”) because the study will take place in the future.

General Formatting

When you type your APA-style article, you should format it according to the following APA-style guidelines. The entire article should be double-spaced. Use 1-in. margins all around the pages. Type the running head in the top left header and page number in the top right header of each page. Use past tense when you describe any study (including yours) that has already been completed. For example, state “The participants volunteered . . .” rather than “The participants will volunteer . . .” or “The participants are volunteering . . .” The only exception to this rule is if you are writing a proposal for a research study that has not yet been conducted. In this case, use future tense to describe the study. Always use past tense to describe details of published studies. Minimize use of the passive voice in your writing. Instead, use the active voice. For example, state “Williams and Jones (2006) manipulated the stimulus presentation” instead of “The stimulus presentation was manipulated by Williams and Jones (2006).”

When you present numbers in your article, use words for numbers less than 10, and numbers for values 10 and above, unless the number is a measurement, statistical value, or a value representing the sample, for which you should always use numbers. In addition, all numbers in the abstract should be in numerical form. Any number that begins a sentence should be presented as a word. Numbers that are used in lists (Study 1, Study 2, Group 1, Group 2, etc.) should be given in numerical form. Check the Publication Manual of the American Psychological Association (2010) for more rules regarding use of numbers. If you
use abbreviations in your article, you must define the abbreviation the first time you use it. For example, on the first page of this chapter, I defined American Psychological Association (APA) and then used this abbreviation throughout the chapter. APA style provides for a few exceptions for some abbreviations that do not need to be defined, such as $M$ for mean, min for minute, and so on, when they are presented with a value.

**ORAL PRESENTATIONS**

The most common venue for oral presentations of psychological research is a psychological conference. While you may not experience psychology conferences as an undergraduate student, there are many conferences held each year to showcase research conducted by undergraduate students. Your college or university may hold one of these each year. There are also regional conferences, such as the Mid-America Undergraduate Psychology Research Conference (MAUPR), and undergraduate psychology conferences in many U.S. states (e.g., ILLOWA Undergraduate Psychology Conference for Illinois and Iowa) that may be of interest to you. Compared with poster presentations, oral presentations of research studies are less likely to be given by undergraduate students at conferences, although the class in which you were assigned this text may have such an assignment.

Preparing an oral presentation of a research study is not very different from writing an APA-style article. The primary differences are that you present the information orally to an audience, and there is usually a time limit, so you must work out ahead of time how much information you can reasonably include in the presentation. The type of information you present, however, is very similar—but in an abbreviated form. You begin an oral presentation by introducing the main concepts (e.g., the bystander effect, visual short-term memory, therapeutic treatments for depression) and then present your research question and review what is already known about the research question. You present hypotheses for your study. You then explain the method of the study and review the results, typically using tables or figures to illustrate the main results. Finally, you state conclusions of the study, including whether the hypotheses were supported (or not) by the results and what you learned from the study. Throughout the presentation, you cite sources for your information, just as you would in an APA-style article. However, slides should not contain a lot of text. It is better to use a bulleted outline form to help your audience follow what you are saying rather than do a lot of reading during your presentation (see Figure 8.6 for some example slides from an oral presentation of research).

Organization is very important for an oral presentation, just as it is for a paper presentation of research. You must present a coherent argument for your study and your hypotheses. In fact, it can be more difficult to organize an oral presentation because you must choose carefully what information to present to fit into the time limit you are given. For example, many conference-style oral presentations are limited to 10 or 15 min. Thus, presenters must be very clear in what they present to make themselves understood by their audience in such a short time. A good oral presentation is accompanied by visual aids, typically presented as PowerPoint slides. Because audience members must absorb the information quickly, visual displays of information are more important in oral and poster presentations than in written papers.

**POSTER PRESENTATIONS**

As with oral presentations, you are most likely to encounter a poster presentation of psychology research at a psychology conference. You may also have been assigned a poster
presentation in the course you are taking that assigned this text. Poster presentations are essentially mini-APA-style articles that are condensed to allow a visual presentation rather than a text presentation. They contain the same information as an oral presentation but may be even further condensed according to the space allowed for the poster. See Figure 8.7 for an example of a poster presentation of research. Notice that each of the main APA-style sections is included as well as visual presentations of stimuli and results. Bullet points are used in many places instead of full sentences to make the poster more easily read and to save space.

The organization of a poster presentation should be as visual as possible. Include examples of sample stimuli and organize sections so that they flow. Include a title and authors at the top of the poster. The body of the poster is often organized into segments to make information easier to find and comprehend. Place the introductory information at the left of the poster and then direct the flow of information down each segment, with new segments placed to the right. See the sample poster in Figure 8.7 for the organization style used in a poster.
Experiments 1 & 2 Procedure

Consistency: Reaction Times

3000

Before completion of PM task. After completion of PM task.

Experiment 1: 92 Illinois State University students

Experiment 2: 122 Illinois State University students

PM task (cognitive task):
Generate 3 items aloud at one time during the motor task. Subjects choose when to say items,

• n = 3, 7, and 15 in Experiment 1 for a total of 3 blocks (musical instruments, counties, insects)

• n = 5, 10, and 15 in Experiment 2 (2 blocks of each for body parts, 4-footed animals, sports, kitchen items, clothing items, fruits)

Experiments 1 & 2 Design:
Within-subjects design for category difficulty factor
Counterbalanced category order and assignment between-participants

Experiment 1: Manipulation check: Percentage of items correctly generated significantly affected by number of items to be generated, \( p < .001 \).

Reaction times: not significantly affected by number of items to be generated, \( p = .82 \).

Pre-crastination: Generation time chosen significantly affected by number of items to be generated, \( p < .001 \).

Experiment 1: Pre-crastination tendencies will decrease with an increase in difficulty of PM task

H2: There will be more cognitive cost for the difficult PM task than the easy task

H2: Participants pre-crastinated less when the earlier choice was more difficult.

Our study supports this finding because our participants also pre-crastinated less when the task was more difficult.

Unexpectedly, participants’ reaction times were not affected by task difficulty.

However, participants reaction times were longer before completion of the PM task, especially if they were not consistent in when they generated items, suggesting that the cognitive load of the PM task affected the cost to the motor task.

References:


The first poster I brought to a conference was in the survival processing effect, studied intensely by Dr. James Nairne. I was nervous because I was told that he would be at the conference, and I wanted to impress him with my work. To prepare, I created an “elevator speech” of my work to present to individuals who were less familiar with the topic, making sure to hit the most important parts of the background, the methods, results, and discussion. Dr. Nairne did stop by my poster, and I did not need to say my speech to him since my work was trying to replicate his results. Thus, he had a couple of questions and we ended up having a great discussion about my results and reasons I may have found the results I did.

It was awesome getting to discuss my work with Dr. Nairne and with other cognitive psychologists who cared about my topic of interest. I was afraid to mistakenly explain my data and I was afraid to talk too much, or not enough, about my work. I was also afraid that I would be asked a question that I did not know the answer to. I learned that it’s okay to say, “I’m not sure” to a question I did not know how to answer. I also learned that the people who stop by your poster are doing so to have a simple, and usually exciting, conversation about your work, not to make you feel bad if you don’t have the correct answer to a question.

During a poster presentation, the authors typically stand by their poster, prepared to offer a short summary to interested viewers and answer questions viewers may have as they read the poster. If you are preparing to give a poster presentation, it is a good idea to think through what you will say ahead of time so you give clear and concise descriptions of the research study described in the poster. See Figure 8.8 for a description of what it was like to present at a conference for the first time from one of my students.

STOP AND THINK

(8.3) In what ways do paper presentations of a study differ from poster and oral presentations of a study? In what ways are they similar?

THINKING ABOUT RESEARCH

A summary of a research study in psychology is given below. As you read the summary, think about the following questions:

1. Notice that the sections of the following summary are identical to the four main sections of an APA-style article. Describe the four subsections of the method and describe what the authors of this article likely included in each method subsection of their article beyond what is already described below.

2. Read the results section below and determine what is missing that should be included in an APA-style results section.
3. Use the means provided in the results section below to create an APA-style figure or table to present the means. Be sure to include a figure caption if you create a figure.

4. Use PsycINFO (or another journal article search tool) to find the reference for the Loftus (2005) review article published in Learning and Memory. Be sure to locate the reference that is the most appropriate for the citation. Type the reference in APA style.

5. The study described below involved deceiving the participants. Explain how deception was used in the study and describe how the authors should design the study to adhere to ethical guidelines. Also indicate in which section of the APA-style article they report the ethical aspects of the study.


Purpose of the Study. Numerous previous studies have shown that false memories can be created for life events that were never experienced (see Loftus, 2005, for a review). However, previous research has not addressed the question of how these false memories affect the future behavior of participants. The current study planted a false memory in participants that they had become ill after eating egg salad when they were children (see Photo 8.1). Their behavior with regard to egg salad was then tested after 1 week and then again 4 months later.

Method of the Study. Undergraduate students were randomly assigned to either an egg salad group ($n = 120$) or a control group ($n = 60$). All participants completed three study sessions. At the first session, the participants completed a questionnaire regarding their food preferences and experiences, including whether they had ever been sick as a child from egg salad and how much they liked egg salad. Data for participants who had actually gotten sick from egg salad as children (as verified by their parents, $n = 5$) were omitted from the study. At the second session that occurred 1 week later, participants received feedback about their responses to the questionnaire. The feedback was false, but the participants were told that a computer generated the information they were given based on their responses to the questionnaire. The egg salad group was told that they had gotten sick from egg salad as children. The control group was not given this information. Participants then completed another series of questionnaires, including a memory belief questionnaire to determine whether they believed they had gotten sick from egg salad as children. Finally, participants were placed...
in a room for a false debriefing session with various foods present, including egg salad sandwiches. The type of sandwich participants chose was recorded. Four months after the first session, the participants were contacted to take part in a taste-test study. They were asked to rate various foods on an 8-point scale, including egg salad sandwiches. Finally, participants were given the opportunity to eat the leftover food. The number of egg salad sandwiches eaten was again recorded.

Results of the Study. Participants in the egg salad group were first divided into believers and nonbelievers, based on their responses to the memory belief questionnaire. This division created three groups of participants for comparison: egg salad believers \((n = 41)\), egg salad nonbelievers \((n = 58)\), and control participants \((n = 58)\). Results showed that fewer participants in the two egg salad groups \((M = 7\% \text{ for believers, } M = 4\% \text{ for nonbelievers})\) ate egg salad sandwiches at the second session than the participants in the control group \((M = 33\%)\). The believer and nonbeliever groups did not differ. For the third session, participants who were believers \((M = 11\%)\) ate fewer egg salad sandwiches than participants in the control \((M = 44\%)\) and nonbeliever groups \((M = 37\%)\). None of the groups differed in the mean number of other sandwiches eaten at either session. (Note: The means in this section were estimated from Figure 2 in the article.)

Conclusions of the Study. The results showed that exposing participants to a false belief about a life event (e.g., getting sick from egg salad as children) affected their future behavior with regard to the objects of the event (e.g., they ate fewer egg salad sandwiches). Over time, this effect was evident for the believers but not for the nonbelievers. These results indicate that future behavior is affected by a false belief, but the effect will dissipate over time if the false belief is not well accepted by the participants.

CHAPTER SUMMARY

Reconsider the questions from the beginning of the chapter:

- What are the different ways that psychologists present research? Psychologists present research as written reports, oral presentations, and poster presentations.

- How do we write an APA-style article? What information goes in each section of the article? How do we format the article? An APA-style article is organized into sections that present the background and purpose of the study (introduction), method of the study, results of the study, and conclusions of the study (discussion). Additional format information is described in this chapter and in the APA publication manual (APA, 2010).

- What is an appropriate format for an oral presentation of research? An oral presentation is organized according to the major sections of an APA-style article—but presented orally—and often employs visual aids, such as PowerPoint slides.
How do we prepare a conference-style poster presentation of research? A poster presentation is also organized according to the sections of an APA-style article but provides a more visual representation of the most important information that is presented in those sections.

**COMMON PITFALLS AND HOW TO AVOID THEM**

**Problem:** Misuse of citations and quotes—students tend to overuse quotes in research reports and incorrectly cite sources.

**Solution:** Remember that quotes are rarely used in psychological reports. Instead, you should summarize another author’s ideas in your words, being careful not to plagiarize other authors’ writings. Always cite sources for ideas, definitions, theories, methods, and so on, that are from another author.

**Problem:** Incorrect uses of verb tense—students often use the wrong verb tense to describe their studies.

**Solution:** If you are reporting a study that has already been completed, use the past tense to describe the study (yours or someone else’s). If you are writing a research proposal, use the future tense to describe a study that will be completed in the future.

**Problem:** Providing too many details of background studies—writing a full summary of a past study in the introduction of a research report.

**Solution:** The goal of the introduction is to explain your (i.e., the researcher’s) motivation for conducting the study you did (or will do), not to provide a full review of all the studies done in an area. Thus, you should describe only the most relevant background studies in your introduction (i.e., those that help motivate your study or your hypotheses) and only describe aspects of those studies that help you make the point you want to make.

**Problem:** Describing background literature from secondary sources—students often use secondary sources (see Chapter 2 for more information) for literature reviews, leading to problems with misrepresentation of the primary source.

**Solution:** In your introduction, be sure to describe primary sources you have read in reviewing background literature. This allows citations of the primary source and more accurate presentation of background studies. You should never cite sources that you have not read.

**Problem:** Focus on statistics in the results section—making statements about the statistics instead of the effect or relationship tested.

**Solution:** Remember that statistical values should be used to support statements about effects or relationships, not as the focus of your statements. For example, indicate that the effect of the independent variable on the dependent variable was significant and support this statement with statistics. Do not make statements that the statistic itself was significant or not significant.

**APPLYING YOUR KNOWLEDGE**

Read the abstract below from a study by Gomez, Skiba, and Snow (2018):

The opportunity an object presents for action is known as an **affordance**. A basic assumption in previous research was that images of objects, which do not afford physical action, elicit effects on attention and behavior comparable with those of real-world tangible objects. Using a flanker task, we
compared interference effects between real graspable objects and matched 2-D or 3-D images of the items. Compared with both 2-D and 3-D images, real objects yielded slower response times overall and elicited greater flanker interference effects. When the real objects were positioned out of reach or behind a transparent barrier, the pattern of response times and interference effects was comparable with that for 2-D images. Graspable objects exert a more powerful influence on attention and manual responses than images because of the affordances they offer for manual interaction. These results raise questions about whether images are suitable proxies for real objects in psychological research.

What is the purpose of the first two sentences in this abstract?

What is the research question for this study?

Each sentence corresponds to a specific part of an APA-style paper—try to identify an APA section for each sentence in the abstract.

TEST YOURSELF

1. In which section of an APA-style article would you include the following information about your study?
   (a) Statements of hypotheses
   (b) Graphs of the means for each condition
   (c) A description of the questionnaire the participants completed
   (d) The number of participants or subjects in the study
   (e) A citation for a published source
   (f) Instructions that were given to the participants

2. Which of the following is true about formatting an APA-style article? (Choose all that apply.)
   (a) Two-inch margins should be used.
   (b) The entire article should be double-spaced.
   (c) Tables and figures should be embedded into the results section.
   (d) You need to provide citations only when you quote from a source.
   (e) You should begin a new page for the references section.

3. For the citation examples below, indicate which ones display correct APA style:
   (a) Regia-Corte and Wagman (2008) reported that participants perceived a slope to be more difficult to stand on when wearing a weighted backpack.
   (b) In a review of how scientific thinking skills develop, Corinne Zimmerman reported many studies that support this theory.
   (c) The list-strength effect is exhibited when stronger items (studied for a longer time, studied to a deeper level, etc.) in a list produce better memory than weaker items (Verde, 2009).
   (d) The method used in the current study is based on the method described by Garrison (Feb, 2009).

4. Place the following APA-style sections into the correct order in which they should appear in a manuscript: results, introduction, procedure, discussion, abstract, references, title page, participants.

5. Which of the following illustrates correct APA style for references of journal articles?


6. Explain how an oral presentation differs from a poster presentation.

7. In APA-style, the participants section is a subsection of the ________________ section.

8. Figures and tables will most likely be referred to in the ________________ section of an APA-style paper.

9. A(n) ________________ is a short summary of a study that appears on the second page of a research report.

10. The reference section should include __________________.

Answers can be found at edge.sagepub.com/mcbride4e.

**STOP AND THINK ANSWERS**

(8.1) Results; method (materials subsection); abstract (maybe), introduction, and discussion; discussion; results (also possibly a table/figure)

(8.2) The goal of a method section is to provide enough detail that someone could replicate the study if they wish. This will also ensure that the reader has enough information to understand how the study was conducted in order to evaluate the conclusions made.

(8.3) More detailed information is provided in a paper report than in oral/poster presentations. Oral/poster presentations typically cover main ideas about the study in bullet points for speedy understanding of the study. However, the main ideas of the study (why, how, what was found, and what was learned) are provided in all types of presentations.

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