

# 2

## DEVELOPING A RESEARCH QUESTION AND UNDERSTANDING RESEARCH REPORTS

### Where Research Questions Come From

#### CONSIDER THE FOLLOWING QUESTIONS AS YOU READ CHAPTER 2

- How do researchers develop a research question?
- How do researchers conduct a literature review?
- What are the different types of research articles, and how are they organized?
- How do we use a literature review to make hypotheses?
- What are the different ways that psychologists present research?
- How do we write an American Psychological Association (APA)-style article? What information goes into each section of the article? How do we format the article?

## LEARNING OBJECTIVES FOR CHAPTER 2

- Generate appropriate research questions for a psychological study.
- Demonstrate how to conduct a literature review for a research question.
- Locate relevant information in an empirical journal article.
- Demonstrate scientific writing in APA style.
- Compare different methods of communicating research findings.

A number of years ago, I was playing the game Catch Phrase with some friends. In this game, a handheld device displays a target phrase (e.g., a name or object) while ticking down a timer. The players with the device must provide clues to the target phrase (without saying it) to get their teammates to say the phrase. Meanwhile, the timer ticks faster and faster until it runs out and buzzes. When the time runs out, the player who ends up with the device loses a point for their team. The game moves swiftly; teammates are constantly calling out phrases to guess the target phrase.

After the game ended, we discussed the sequence of guessing of a particularly difficult phrase. Two players, Joel and Renée, claimed to have guessed the phrase, but only one had actually done so. Everyone agreed that Renée had actually guessed the phrase, but Joel claimed to have a clear memory of guessing it. It was determined that although Joel believed that he had guessed the correct phrase, he actually did not accurately recall (had an inaccurate memory of) the events of the game. He had a *false memory* in remembering who had actually guessed correctly. Perplexed by his error, Joel suggested that “someone should study this.” As a memory researcher, I became interested in this phenomenon and conducted experiments to investigate false memories like the one that Joel had during the game (e.g., Coane & McBride, 2006; Coane, McBride, Termonen, & Cutting, 2016; McBride, Coane, & Raulerson, 2006). This story illustrates how everyday events such as these can spark psychological research questions (e.g., Why do false memories occur?).

## DEVELOPING A RESEARCH QUESTION

Choosing a research question is the first step in the research process (see Figure 2.1). Answering a research question is the researcher’s primary motivation for designing and conducting a study. These questions come from many sources. Primarily, they come from what the researcher is interested in learning about. Think about what topics in psychology interest you the most. Can you think of questions about behavior that you would like to

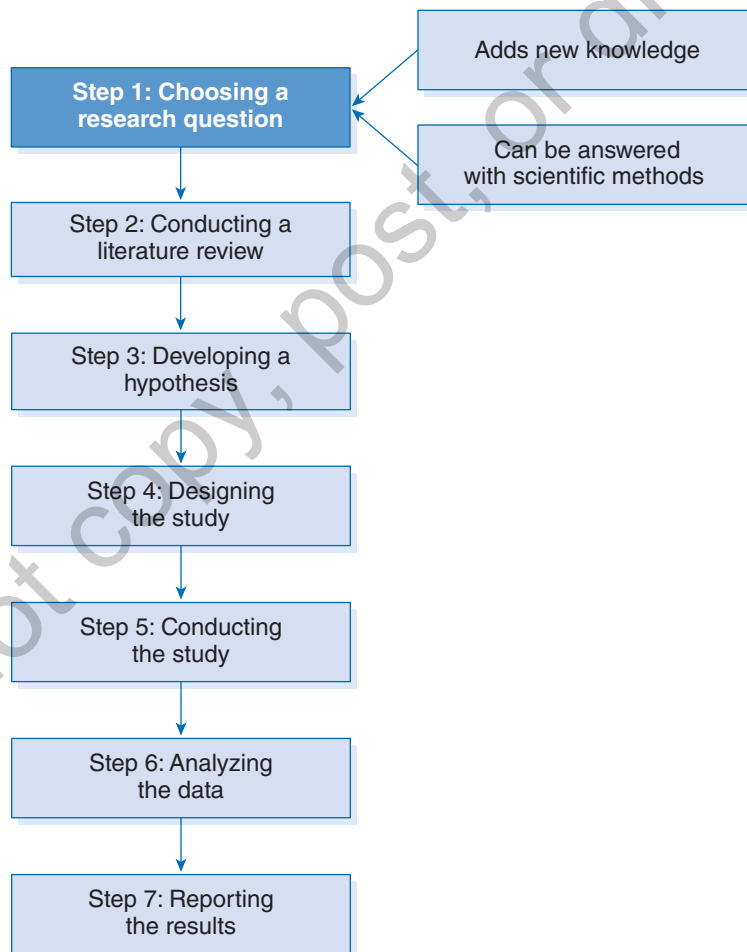
**descriptive research question:**

A research question that asks about the presence of behavior, how frequently it is exhibited, or whether there is a relationship between different behaviors

have answered? Have you ever asked yourself a “what if . . .” question about a behavior? That is often where research questions begin—from the questions a researcher is interested in. In the situation described at the start of the chapter, a research question was sparked by an everyday event (e.g., Why do false memories occur?). In other cases, research questions are developed to solve a real-world problem (e.g., How does the use of a cellular phone affect driving performance?). Finally, explanations of behavior that need to be tested (theories) can guide research questions (e.g., Do negative thoughts cause depression?).

There can be a **descriptive research question**, such as whether a specific behavior occurs (Are college students anxious?), what the nature of the behavior is (How does anxiety manifest itself in college students?), or whether behaviors occur together (Do college students

**FIGURE 2.1** ■ Steps in the Research Process: Choosing a Research Question



who smoke also tend to be anxious?). There can also be a **causal research question**—about causes of behavior (What types of events cause college students to become anxious?). Many causal research questions are also designed to test a **theory** about the cause of a behavior (Is anxiety in college students caused by a lack of confidence in their abilities?) or to compare theories about behavior to see which theory has more support (Is anxiety in college students caused by a lack of confidence in their abilities or a lack of social support?). Research questions can answer fundamental questions about behavior (What are the causes of anxiety among college students?) or questions about how to solve real-world problems (What kinds of student-oriented programs can a college or university initiate that will reduce anxiety in college students?). This is the difference between **basic research** questions and **applied research** questions. The type of question a researcher pursues is based on whether the researcher is interested in basic questions about a behavior or applications of the behavior in daily life. However, even though researcher interest is often a starting place for choosing a question to study, researchers should consider how appropriate their question is for both scientific methods and the specific field of study before moving on to designing a study.

One important issue in choosing a research question is whether the question can be answered with scientific methods. Can observations of behavior provide an answer to the question? Some questions that would be difficult to test with scientific methods are “Does God exist?” and “Was the Iraq War a moral war?” If specific observations of behavior can be made to help answer the question, then it might be an appropriate question for psychological research. Table 2.1 provides some examples of research questions that have been examined in different areas of psychological research to give you some examples of questions that can be answered by observing behavior.

**causal research question:** A research question that asks what causes specific behaviors to occur

**theory:** An explanation of behavior that can be tested through research studies

**basic research:** Research conducted with the goal of understanding fundamental processes of phenomena

**applied research:** Research conducted with the goal of solving everyday problems

**TABLE 2.1 ■ Examples of Research Questions in Different Areas of Psychology**

Area of psychological research	Examples of research questions
Social psychology	How does an authority figure influence behavior (Milgram, 1963)?
	What types of faces are considered attractive (Cornille, Monin, & Pleyers, 2005)?
Cognitive psychology	What types of memory decline as people age (Lipman & Caplan, 1992)?
	How does our knowledge of the world influence our perception (Ban, Lee, & Yang, 2004)?
Industrial-organizational psychology	How does work environment affect job stress (Pal & Saksvik, 2008)?
	How does perception of power in the workplace affect perceptions of sexual harassment (DeSouza & Fansler, 2003)?
Clinical psychology	What types of people benefit most from cognitive behavioral therapy (Green, Hadjistavropoulos, & Sharpe, 2008)?
	What are the causes of schizophrenia (Compton, Goulding, & Walker, 2007)?
Biological psychology	What are the effects of amphetamine on brain activity (Heidenreich, 1993)?
	What are the neurological causes of Parkinson's disease (Olmann, 2007)?

We all develop research questions about behavior every day—“Why did that person just scowl at me? Was it in response to something I did?” “Why did I score well on this exam but score poorly on my other exam when I studied equally hard for both of them?” “How can I get my dogs to tell me they need to go outside?” The human brain is designed to look for explanations of things that happen in the world. But not all research questions are causal, as these examples are. “How many other people are feeling as anxious as I am about the upcoming exam?” “How did the way I studied differ for the two exams on which I got different scores?” These questions simply ask about a description of behavior or how different behaviors are related instead of what causes the behavior. Either type of research question is appropriate for a psychological study. The key is the research question should be as specific as possible. A question like “Does listening to music help me study?” is not specific enough to directly study. We would need to first make the question more specific, such as “Will I get a lower exam score if I study while listening to rock music than studying in silence?” In this question, the concepts of interest are clearer: the background while studying (music and silence) and exam score. This is the type of research question you should try to come up with. Take a minute now to jot down some research questions you have about behavior, and try to make them as specific as possible.

Another important consideration in choosing a research question is how much is already known about the question. In other words, what has been learned from previous studies about the question? To investigate what is known about a research question from previous studies, a thorough **literature review** should be conducted. A literature review involves searching research databases or other sources to find relevant research that has been done in an area of the field. Reading about what other researchers have done will help you to determine what is already known about a research question, determine what methods have been used to investigate the question, and find information that can help you make a prediction about what the answer to the research question will be. (Making predictions will be discussed in a later section of this chapter.) Conducting a literature review ensures that a new study will add to the knowledge in an area without duplicating what is already known. However, it can take many studies with the same research question before the answer to the research question is supported by enough evidence to provide confidence in the answer. Thus, replication of results is an important part of the scientific process. Just because a study had been done before on a specific research question does not mean more studies are not needed to fully answer the question. A research question does not need to be wholly original to contribute to psychological science (see Figure 2.2).

**literature review:**

A process of searching for and reviewing previous studies related to a study being developed to add to the knowledge in an area and make appropriate predictions about the data

## STOP AND THINK

- 2.1. For each of the following research questions, identify whether it is a descriptive or causal question:
  - a. How often does operant conditioning occur in daily life?
  - b. Does jet lag affect one's mood?
  - c. Can cognitive training decrease dementia?
- 2.2. Explain why a researcher should conduct a literature review before conducting a study.

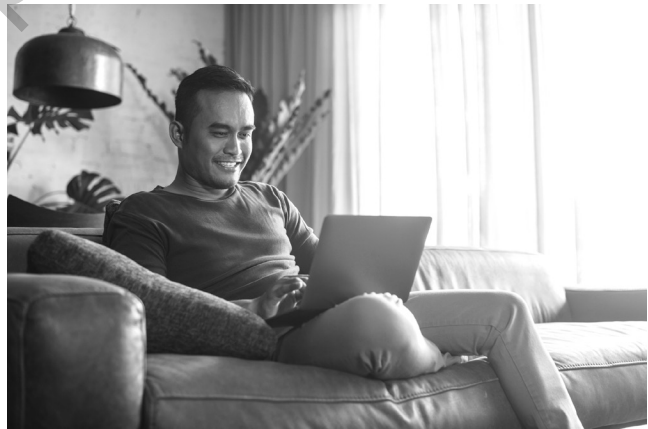
**FIGURE 2.2** ■ A Literature Review Can Help a Researcher Determine What Is Already Known About a Topic



Source: Copyright by S. Harris, <http://www.sciencecartoonsplus.com/scimags.html>.

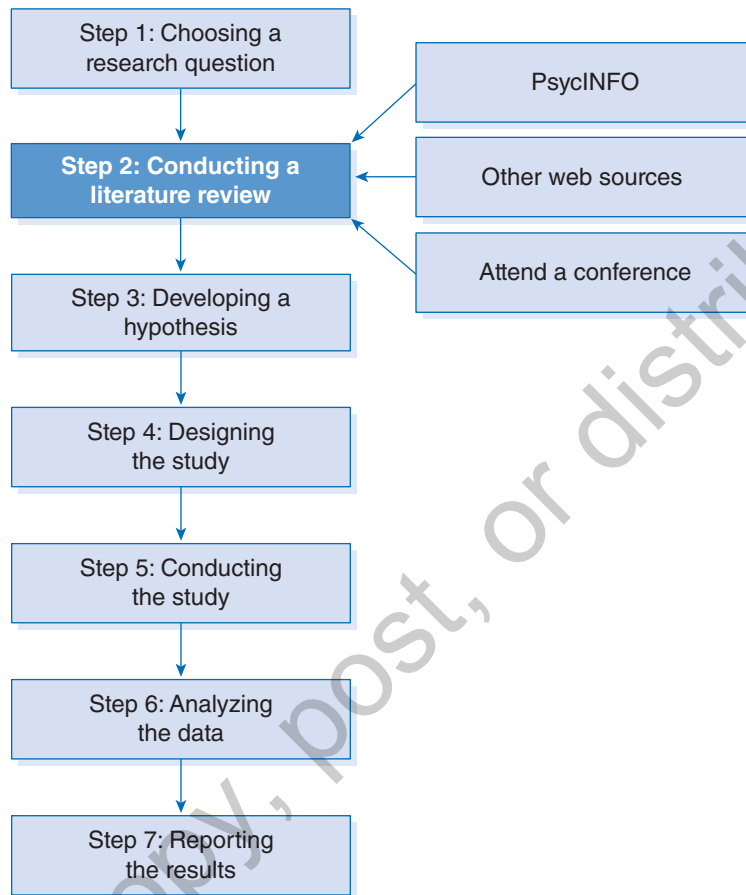
## HOW TO CONDUCT A LITERATURE REVIEW

There are many sources researchers use to conduct a literature review. Searching through databases helps identify studies relevant to a research question (see Photo 2.1). Databases may also hold references to helpful reviews of research in an area. However, if you want to learn about the most recent studies in an area, databases may not be the best source because these databases typically reference published works, and the publication process can take a year or more from the time an article or a book chapter is written to when it is published and cataloged in the database. Therefore, to conduct the most up-to-date literature review, it can be helpful to attend a psychological conference in an area where researchers often present studies that have not yet been published. More information about the sources for conducting a literature review is provided in the rest of this chapter (see Figure 2.3).



**Photo 2.1** Conducting a literature review involves a search for published studies that others have already done on a topic.

FIGURE 2.3 ■ Steps in the Research Process: Conducting a Literature Review



**variable:** An attribute that can vary across individuals

One thing to think about as you begin a literature review is which variables are of most interest to you for the topic you wish to study. A **variable** is something that can change across individuals in a study (see Photo 2.2). It could be something you want to measure, such as anxiety, math skill, or feelings of belonging. Or it could be something you want to compare in a study, such as whether people are given time pressure for a task, whether people get a full night's sleep, or it could also be taking different types of drugs. In the research question example described earlier in the chapter—"Will I get a lower exam score if I study while listening to rock music than studying in silence?"—the variables were the background while studying (either music or silence) and exam score. Performance on the exam is the behavior we want to measure (using exam score as the measure), and the background while studying is the causal variable we want to examine to see if it affects the behavior of performance on the exam. Identifying the variables that are of interest to you (e.g., which type of drug—causal variable—best helps reduce



anxiety—behavior) is an important step to take before you begin your literature review. For the research questions you jotted down in the last section, try to identify the variables in each question.

## PsycINFO

A very useful database for a literature review of psychological research is PsycINFO. PsycINFO is a searchable database that contains records of articles, books, and book chapters written by researchers about research studies in an area of psychology. Although each version may have a different appearance, all versions of PsycINFO can be searched by topic words, words that appear in the citation information for the article (including the title, authors, abstract, and topic words), author names, journal in which the article was published, and so on. In other words, there are many ways to find articles and book chapters about a research question by using PsycINFO. Searching by topic words (called keywords in PsycINFO) is a good way to start a search for a literature review. Note that PsycINFO is not the same as PsycTESTS. PsycTESTS is a database of survey and questionnaire measures that have been developed for use in psychological research and applied settings.

There are two primary ways to search for articles and chapters by keywords. One is to map the term to a subject heading. The APA has designated specific subject headings as general topics of study in psychology. Each article or chapter has been coded by the subject headings that best describe the topic of the article. In PsycINFO, you click a box or a button to turn on the mapping to subject headings, and various subject headings appear that correspond to the keywords you have typed in (you do not have to know the exact subject heading—PsycINFO searches for subject headings similar to what you type in). You can also choose to search just the keywords you entered, which allows PsycINFO to search for articles and chapters that contain those words in the title or abstract. You can also combine searches that focus on different keywords.

An example helps explain how this works (you can follow along by trying this out in PsycINFO if it is available at your college or university—if you have a different database available to you, such as PsycARTICLES, you may be able to follow this process, as most databases allow you to search in similar ways—see also <http://www.apa.org/pubs/databases/training/search-guides.aspx> for information on searching different databases). Suppose that you are interested in conducting a literature search for the relationship between depression and bullying behaviors in children. A good place to start is a keyword search in PsycINFO. You can start by typing *depression* into the keyword window and mapping it onto the subject headings if such an option is shown. Without selecting additional heading phrases, PsycINFO will execute a search of articles that have *depression* anywhere in the full reference of the article (e.g., title, abstract, topic words). You should find that PsycINFO yields a large number of records that fit these keywords (I found 304,994 sources when I last conducted this search using the keyword *depression*—see Figure 2.4). Depending on which subject terms you choose, different sets of articles are



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**Photo 2.2**  
Age can be a variable of interest to allow comparisons for a specific behavior.



found. Obviously, there are far too many for us to search through one by one, so we need to narrow the search further and include the bullying portion of our topic. See Figure 2.4 for what a keyword search on *depression* might look like in PsycINFO.

We can conduct a second keyword search for *bullying* using the same search procedure described previously for *depression*. This search should find a large number of records as well but fewer records than the search for *depression*, as there have been fewer studies conducted on the topic of bullying. Finally, to narrow our search to the specific topic (we started with depression and bullying), we can combine our two searches. Your version of PsycINFO may have a Combine function for this purpose. Or it may have an AND option that automatically combines the search. If you combine your searches, you should find a more reasonable number of records to look at (when I conducted this search in December 2018, I found 194 records, but you may find more if your search terms include more choices or if additional articles have been published on these topics since that time).

Before we look at the results of the search, consider a possible outcome of our *bullying* search. Suppose that *bullying* was not the proper term, and we find no subject headings that are relevant. One thing we can do to be certain that we get the right subject headings is to use a shorter form of our term and search for truncations. We can do this by shortening our term to *bully* and adding a \* or \$ to the end of it in the search window. This

FIGURE 2.4 ■ A Keyword Search in PsycINFO on the Topic of Depression

The screenshot displays the EBSCO PsycINFO search interface. At the top, there are navigation links for 'New Search', 'Thesaurus', 'Cited References', and 'Indexes'. The search bar contains the term 'depression'. Below the search bar, there are options for 'AND' and 'OR' to combine search terms. The search results are displayed in a list format, showing the title, author, journal, and subject headings for each article. The left sidebar contains various filters such as 'Refine Results', 'Current Search', 'Boolean/Phrase', 'Limit To', 'Source Types', and 'Subject'. The search results are sorted by 'Relevance' and show 1-20 of 304,994 results.

Search Results: 1 - 20 of 304,994

1. Screening negative affectivity in young adults: Validation and psychometric evaluation of the French version of the **Depression Anxiety Stress Scales**.  
Clobanu, Teofil; Bédard, Fabrice; Antonelli, Jean-Philippe; Genoux, Philippe A.; Brandner, Catherine; Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement, Vol 50(4), Oct, 2018 pp. 238-247. Publisher: Educational Publishing Foundation; [Journal Article]  
Subjects: Anxiety; **Depression (Emotion)**; Psychometrics; Screening Tests; Negative Emotions; Adulthood (18 yrs & older); Male; Female

2. Perinatal **depression** prevention through home visitation: A cluster randomized trial of mothers and babies 1-on-1.  
Tandon, S; Darlus, Ward, Erin A.; Hamil, Jaime L.; Jimenez, Cindy; Carter, Mya; Journal of Behavioral Medicine, Vol 41(5), Oct, 2018 pp. 641-652. Publisher: Springer; [Journal Article]  
Subjects: Home Visiting Programs; Perinatal Period; Postpartum **Depression**; Prevention; Adulthood (18 yrs & older); Male; Female

3. Rapid effectiveness of intravenous ketamine for ultraresistant **depression** in a clinical setting and evidence for baseline anhedonia and bipolarity as clinical predictors of effectiveness.  
Thomas, Rajesh K.; Baker, Glen; Lind, John; Dursum, Sendar; Journal of Psychopharmacology, Vol 32(10), Oct, 2018 pp. 1110-1117. Publisher: Sage Publications; [Journal Article]  
Subjects: Drug Therapy; Ketamine; Major **Depression**; Treatment Effectiveness Evaluation; Treatment Resistant **Depression**; Adulthood (18 yrs & older); Male; Female

4. Serum and plasma brain-derived neurotrophic factor and response in a randomized controlled trial of riluzole for treatment resistant **depression**.  
Wilkinson, Samuel T.; Kiselycznyk, Carly; Banasz, Mounira; Webster, Ryan D.; Halle, Colin; Mathew, Sarjey J.; Journal of Affective Disorders, Vol 241, Dec 1, 2018 pp. 514-518. Publisher: Elsevier Science; [Journal Article]  
Subjects: Drug Therapy; Treatment Resistant **Depression**; Brain Derived Neurotrophic Factor; Adulthood (18 yrs & older); Young Adulthood (18-29 yrs); Thirties (30-39 yrs); Middle Age (40-64 yrs); Aged (65 yrs & older); Male; Female

addition searches for all words that begin with bully and finds any variations that might get us closer to our search objective. Be sure to use the truncation symbols if you are not certain that you have the right term or if you do not find appropriate subject headings with a given search term.

What will you get from the PsycINFO search? If you view the results of the search I described previously, you will see a list of articles (probably the most recently published articles first) that indicates the names of the authors, the title of the article, the type of article (journal article, book chapter, dissertation, etc.), and where and when the article was published. You should pay attention to the type of article because some of these may not have gone through **peer review**, meaning that they have not been carefully reviewed by experts in the field and revised by the author(s) based on the review. For example, although dissertations have been approved by a committee before being published in PsycINFO, they are not considered peer-reviewed articles in the way a journal article has been reviewed.

For each article, you can choose to view the *abstract* of the article. The abstract is a short paragraph that summarizes the content of the article (abstracts are discussed in detail later in this chapter when the structure of journal articles is presented). You can then read through the abstracts of articles that might be relevant to your topic. You might also see a link to the article available online in PDF format or a link to search your library for the journal or book in which the article was published to assist you in locating any articles you find relevant to your literature review. Finally, the reference sections of the articles you find may also lead you to other relevant articles on your topic. Note that the entire article you find on a topic may not be relevant to your topic. It may be that their theoretical description of behavior is most relevant or that their research method is one you want to model in your study. Be sure to focus on the most relevant parts of the articles from your literature review when you summarize the background studies in developing the rationale for your study. Summarizing the entire article will not be appropriate in many cases.

Suppose that you find an article that is especially relevant to your topic and that you would like to know if the same author has published other articles relevant to your topic. You can find articles by a particular author by conducting an author search in PsycINFO (you could also just click on the reference for the article, and the author name will appear as a link that will give you a list of all articles in the database by that author). Simply type the author's last name and first initial into PsycINFO, and you will see either a list of sources by that author or choices, in alphabetical order, that match what you typed. You can choose any that seem relevant (sometimes the same author will be listed in a few different ways—with or without middle initial). You can also limit keyword and author searches by year if you are just interested in the most recent articles that have been published. Finally, articles in a particular psychology journal can be searched in PsycINFO. For more information on PsycINFO searches, go to <http://www.apa.org/pubs/databases/training/search-guides.aspx> for APA guides on how to use PsycINFO.

Let's consider another example of how to search PsycINFO for articles you might want in your literature review. The first step is to state your research question and to identify the variables in your question. Imagine that you are designing a research study for your class on how use of social media affects one's self-image. What are the variables

**peer review:**

A process that takes place prior to publication of an article in many journals where experts make suggestions for improving an article and make recommendations about whether an article should be published in a journal

in your research question? The causal variable is “use of social media,” and the behavior variable is “one’s self-image.” What terms should we use in PsycINFO to find relevant articles? The first one is “social media,” so we can type this one into the search box as a keyword. The other term is “self-image,” so we can use the AND (or another combine) command to search for articles that include both terms. This search comes up with only a few articles—looking at the abstracts of these articles can help you decide if they are relevant to your study. But if only a couple of articles come up with these terms, you can look at the reference list from one of the relevant articles (look for this link in PsycINFO) to see if any of the sources cited by those authors are also relevant to your study.

## PubMed and ERIC

Although most articles published in psychology journals can be found in PsycINFO or similar psychology databases, some journals publish articles in other topic areas that overlap with psychology, and you will find them only in other databases. For example, journals that publish research in biological and medical areas can be found by searching the PubMed (also called MEDLINE) database. If you are interested in conducting a literature review on topics in biological psychology or about psychological disorders or specific conditions such as autism, you may want to search PubMed in addition to PsycINFO to complete a thorough literature review. Articles in areas related to education can be found in the ERIC (Education Resources Information Center) database. Thus, if you are conducting a literature review on topics such as standardized testing, you may also want to search for articles in ERIC. Like PsycINFO, PubMed and ERIC can be searched by topic, author, and journal with advanced search capabilities that can include year of publication, language of publication, and so on. The search screen will have a different layout, depending on the version of the database that you are viewing, but many versions of both PubMed and ERIC have drop-down menus for choosing a search by these features of an article. A database dealing with more general topics, called Web of Science, is also available for searching for journal articles in different areas of research.

## Other Sources

In addition to PsycINFO and similar databases, there are search engines that can be accessed to obtain articles relevant to your topic. The first is a sub-engine of Google called Google Scholar. You can access Google Scholar at <https://scholar.google.com>. Google Scholar searches the web for academic journals and books to find articles relevant to a defined topic or specific author. As with PsycINFO, you may not always find links to copies of the articles on Google Scholar, but you may find articles that were not found in a search of PsycINFO. Because Google Scholar will search for articles on many different topics, you are not limited to what is categorized in a particular database (e.g., you can find articles that are in both PsycINFO and PubMed in Google Scholar). With search engines, though, you are also more likely to come across articles that have not been peer reviewed (see the next section for more discussion of peer review). Articles that have not been peer reviewed are typically less reliable sources of information because they have not been evaluated by experts in the field who verify the quality of the study.

Other search engines may yield information on a topic, but the veracity of that information may vary. Whereas PsycINFO and Google Scholar yield articles published in

journals and books, most search engines produce other sources of information, such as popular press articles that may or may not report research findings accurately. Thus, a search of a database such as PsycINFO or Google Scholar is a necessary step in any literature review. Simply typing your topic into Google or Wikipedia will not provide an adequate search for a literature review. The sources that are represented in such searches are not reliable enough to use to design a study or to write a research report of a study. Wikipedia provides unverified information on a topic that is too general for use in a literature review, and a normal Google search of the web will not provide a thorough search of the articles on your topic, as many are not freely available on the web. You will also likely find sources that are not reliable with a Google search. In other words, Google web searches and Wikipedia searches are how *not* to do a literature review.

Finally, psychology conferences can provide a way to get the most up-to-date information about research conducted in an area (often so new that it has not been published yet). If you are unable to attend such a conference yourself, you can often search the programs of these conferences online to view titles, authors, and abstracts or research studies that will be or have been presented at the conference. Some of the larger conferences in the United States that cover many areas of psychology are the APA Convention (typically held in August each year) and the Association for Psychological Science Convention (typically held in May each year). International meetings on specific topics in psychology are also periodically held. In addition, there are many area-wide psychological association conferences for all areas of psychology (the Midwestern Psychological Association, the Southeastern Psychological Association, the Western Psychological Association, etc.) that can be found on the APA webpage (<https://www.apa.org>) under News & Events. Many areas of psychology also hold annual conventions (a quick web search will yield some of these meetings and sites).

## WHAT YOU FIND IN A LITERATURE REVIEW

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As described in the previous section, a PsycINFO search (or a search with one of the other sources) provides you with a list of journal articles and/or book chapters that are relevant to your topic. How can these sources help you as you attempt to make a prediction about your research question? As you read the articles, you may find important information for your literature review in different sections of the articles. Before you conduct your literature review, it is a good idea to become familiar with the structure of different types of articles and what type of information you can expect to get from the different sections of an article. The next section will discuss the structure of some of the different article types. We will begin with journal articles.

### What Is a Journal Article?

An empirical journal article is written by a researcher, or multiple researchers in many cases, to describe a research study to others who might be interested in knowing what the researcher did (someone like you if you are conducting a literature review on the researcher's topic). The researcher's article may describe a single study (e.g., one experiment), or it

may describe multiple studies, all of which relate to the same research question. After the researcher has written the article, the researcher submits it to a psychological journal to attempt to get it published. If the article is published, it will be cataloged in PsycINFO, PsycARTICLES, and other databases. The article is typically sent out to several reviewers who are experts on the general topic of the article (they are typically researchers who have done studies on the topic in the past). This is the process known as peer review. These reviewers make recommendations about revisions to the article to improve it and indicate whether or not they think the journal should publish the article. The editor of the journal uses these reviews to decide if the article can be published in the journal and which revisions are most important. The author of the article then revises the article or may attempt to submit it to a different journal if the editor has decided not to publish the article in that particular journal. If the revised article is submitted to the same journal, it may then be reviewed again, or it may be accepted by the editor for publication. The review process can be lengthy (sometimes taking many months or even a year), but it is important in verifying the quality of the study before it is published. Thus, articles that are not peer reviewed may describe studies of lower quality. If you conduct only a simple Google search of the web for your literature review, you may find some of these unpublished articles. After the article is accepted for publication, it can then take a few more months before the article appears in the journal, but many journals now publish an online version as soon as it is ready, which gives readers earlier access to the article. Despite this, articles are rarely published very soon after they are written, which means that research is typically a year or more old before it is published.

Empirical journal articles are considered primary sources for research information because they are written by the researchers who conducted the research, and details of the study are provided. Journal articles differ from popular magazine articles. Popular magazine articles often contain short summaries of the study written by an author other than the primary source (i.e., they are secondary sources) and may not provide an accurate account of the study in all cases. Thus, popular magazine articles are considered secondary sources. An accurate and thorough literature review requires review of primary sources (i.e., journal articles).

Many areas of psychology have journals devoted to research on a particular topic, but there are also journals that publish research in all areas of psychology. Table 2.2 provides a list of some general psychology journals as well as journals that specialize in a particular area. In most cases, you can figure out what types of studies are published in the journal from the title of the journal.

## Structure of an Empirical Journal Article

Journal articles are organized into sections. Each section provides specific information about a study. Each major section of a journal article is described here.

### Abstract

As described earlier, an **abstract** is a short summary of the study that allows readers to decide if the article is relevant to their literature review without their reading the entire article. Abstracts of articles are catalogued in PsycINFO. They are typically 150 to 250 words long and include a sentence or two summarizing each of the major sections of the article. Thus, the abstract usually includes (a) the general topic of the study, (b) a

**abstract:** A summary of an article that appears at the beginning of the article and in searchable databases of journal articles

**TABLE 2.2 ■ A List of Psychological Journals by Type of Article Published**

**General Psychology Journals:** These journals publish studies from various areas of psychology.

*Psychological Science*

*Journal of Experimental Psychology: General*

*Journal of Experimental Psychology: Applied*

*American Psychologist*

*Canadian Journal of Experimental Psychology*

*Experimental Psychology*

*Acta Psychologica*

**Personality and Social Psychology Journals**

*Journal of Personality and Social Psychology*

*Journal of Experimental Social Psychology*

*Personality and Social Psychology Bulletin*

*Personality and Individual Differences*

*Journal of Research in Personality*

**Cognitive Psychology Journals**

*Journal of Experimental Psychology: Learning, Memory, and Cognition*

*Journal of Experimental Psychology: Human Perception and Performance*

*Cognition*

*Journal of Memory and Language*

*Memory & Cognition*

*Applied Cognitive Psychology*

*Attention, Perception, & Psychophysics*

**Developmental Psychology Journals**

*Journal of Experimental Child Psychology*

*Child Development*

*Psychology and Aging*

*Developmental Psychology*

*British Journal of Developmental Psychology*

**Biological Psychology Journals**

*Neuropsychology*

*Neuropsychologia*

*Applied Neuropsychology*

**Review and Theoretical Journals:** These journals publish review articles and/or articles describing new or revised theories about behavior (some of these journals publish empirical studies as well).

*Psychological Review*

*Psychological Bulletin*

*Psychonomic Bulletin & Review*

*Developmental Review*

*Best Practices in School Psychology*

*Behavioral and Brain Sciences*



brief description of the methodology, (c) the major results of the study, and (d) what was learned from the study.

## Introduction

**introduction:** A section of an APA-style article that introduces the topic of the study, reviews relevant background studies, and presents predictions for the data

As the title implies, the **introduction** section of the article introduces the topic, research question, and other relevant information for the study. If an introduction is written well, it should contain the following information:

- Introduction to the general topic of the study (e.g., the bystander effect)
- General problem that the study addressed (e.g., factors that affect the bystander effect)
- Discussion of relevant background studies that inform the reader about what is known about the problem and how these studies are related to the present study the researchers described in their article (e.g., studies that were found in a literature review of factors that affect the bystander effect)
- Justification of the present study (i.e., what aspect of the research question the present study answered that has not been determined from past studies)
- Brief description of how the current study addressed the relevant aspect of the research question (may include variables that were studied and a short outline of the method of the study)
- Predictions (i.e., hypotheses) that the researchers made about the outcome of the present study

The introduction should essentially make an argument about what the present study contributes to knowledge in the selected area of psychology and why the researchers made their hypotheses. If you can identify the points of support for the authors' argument, then you probably have a reasonable understanding of the important information in the introduction.

## Method

**method:** Section of an APA-style article that describes the participants, design, stimuli, apparatus, and procedure used in the study

The purpose of the **method** section is to provide enough information about how a study was conducted so that others can evaluate and (if they wish) reproduce the study to see if the results replicate. There are four subsections of the method that may be seen in empirical articles: (1) participants (also called subjects in non-APA-style journals or if animal subjects are used), (2) design, (3) materials (or apparatus), and (4) procedure. The participants subsection describes who the participants in the study were (How many were there? Were they college students? How many males and females participated? If they were animal subjects, what species were they?). How the participants for the study were obtained is also described (Did they volunteer from a participant pool? Were they recruited on a website? If they were animal subjects, were they bred by the researcher?). The design subsection describes the design of the study (What were the variables studied? How were they studied?). The materials (or apparatus) subsection describes the various materials and



apparatus that were used in the study (If there were stimuli shown to the participants, what were the stimuli? If a survey was used, what kinds of items did it include?). The procedure subsection provides a chronological description of what the participants did in the study (What did they do from start to finish? What were their tasks? What instructions were they given? How many trials did the participants complete?). Sometimes authors will combine some of these subsections (e.g., design and materials) as the information in these sections can overlap. In very short empirical articles (e.g., *Psychological Science* short reports), the subsections will all be combined into one large method section.

## Results

The **results** section provides a summary of the data (often in tables or figures) and information about the statistical tests that were performed to analyze the data. The findings are described in the text; statistical values are given as support for the findings. The specific types of values given depend on the type of tests the researchers conducted. Thus, if the tests themselves are not familiar to you, focus on the description the authors provide of the findings. Were there group differences? Was there a relationship between the behaviors measured? Look back at what the authors expected to find to see if you can match their findings to their predictions. Tables and figures are typically organized by the most important variables of interest, so consider the organization of tables and figures as you work on understanding the design of a study. The graph in Figure 2.5 shows an example of this organization from a study by Russell, Ickes, and Ta (2018) that investigated women's comfort level interacting with gay and straight men. The behavior variable the researchers measured (participants' rating of how comfortable they would be talking to a male described in a scenario) is shown on the y-axis, and one of the causal variables (whether the participant knew the sexual orientation of the male described in the scenario when they made their ratings) is shown on the x-axis. The bars are grouped according to the other causal variable (sexual orientation—gay or straight—of the male described in the scenario).

**results:** Section of an APA-style article that presents a summary of the results and the statistical tests of the predictions

## Discussion

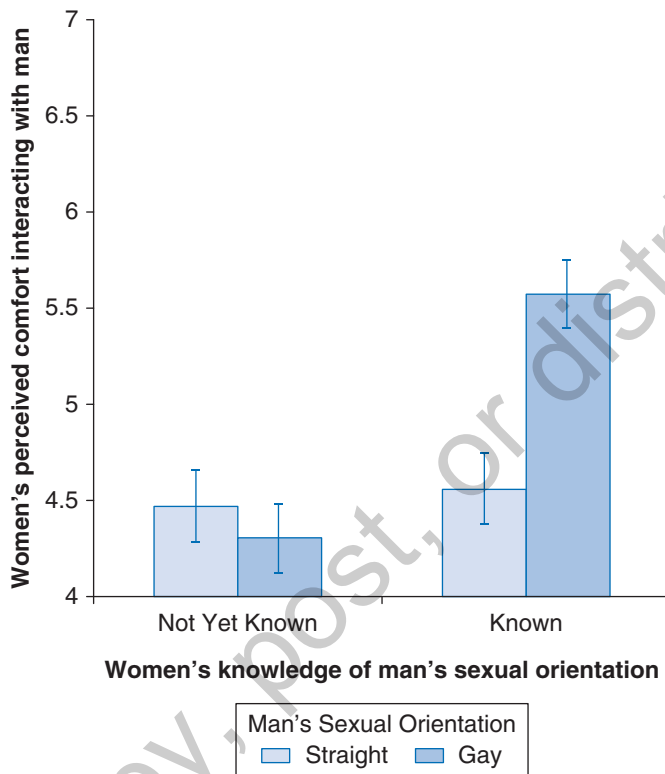
The last section of the article is the **discussion** section. The authors go back to their predictions and discuss their findings in reference to their predictions. If the findings support their predictions, the authors indicate what they learned about the research question and perhaps where researchers should go next in this area. If the findings do not support their predictions, they should describe some possible explanations for why they did not support the predictions. A discussion of the results in the context of previous findings is also included. Finally, a summary of what was learned from the study should be included in the discussion section, including possible limitations of these conclusions based on strengths and weaknesses of the study conducted. Researchers may also suggest a direction for future research in that area.

**discussion:** Section of an APA-style article that compares the results of a study with the predictions and the results of previous studies

## Review Articles and Book Chapters

Most of the articles you come across in a literature review are empirical journal articles, as described in the previous section. However, you may find a smaller number of articles that fit into the categories of review article or book chapter. The purpose of these

**FIGURE 2.5** ■ Results From Russell et al.'s (2018) Study Showed That Women Were More Comfortable Interacting With Gay Men Than Straight Men When They Knew the Man's Sexual Orientation



Source: Russell et al. (2018).

articles is to organize and summarize research in a particular area of psychology to give researchers a review of the research to date. Accordingly, these sorts of articles can be very useful in a literature review because they allow a researcher to find a lot of information about a topic in a single article. These reviews also provide a list of references that can be helpful in searching for empirical articles about specific studies that may be important for developing a prediction for the researcher's study. The main difference between review articles and book chapters is where they are published. Some psychological journals are devoted entirely to review articles (see Table 2.2 for some examples). There are also journals that reserve a small portion of space for review articles (e.g., *Psychonomic Bulletin & Review*). Review articles go through the same rigorous review process as that for empirical journal articles, which were described earlier. Book chapters are typically published in a book that is entirely written by a set of authors (i.e., every chapter is written by the authors) or is in an edited book where editors compile chapters on a similar topic from

## STOP AND THINK

- |  |   |
|--|---|
| <p>2.3. What is the purpose of a journal article?</p> <p>2.4. How can reading journal articles aid in a literature review?</p> | <p>2.5. In what way(s) can peer review affect the quality of a journal article?</p> <p>2.6. Briefly describe the major sections of a journal article.</p> |
|--|---|

multiple authors. The review process for book chapters is variable and may not be as rigorous as that for journal articles but does typically involve some peer review.

## USING THE LITERATURE REVIEW TO MAKE HYPOTHESES

The primary goals of a literature review are to (a) determine what research has been done on a research question to avoid duplicating previous research and (b) review previous findings and theories to make a **hypothesis** about the outcome of a study. A hypothesis is the prediction for the findings of the study. For example, a researcher might hypothesize that a relationship exists between two measures of behavior. For a different type of study, a researcher might predict that one group of participants will have average scores that are higher than the average scores of another group. There are two primary types of information that researchers use to make hypotheses from a literature review: theories and previous results. From these types of information, researchers can make a **theory-driven hypothesis** or a **data-driven hypothesis**, respectively. However, regardless of the types of hypotheses that are developed, hypotheses should be stated as specifically as possible in terms of how behaviors and conditions are related (see Figure 2.6).

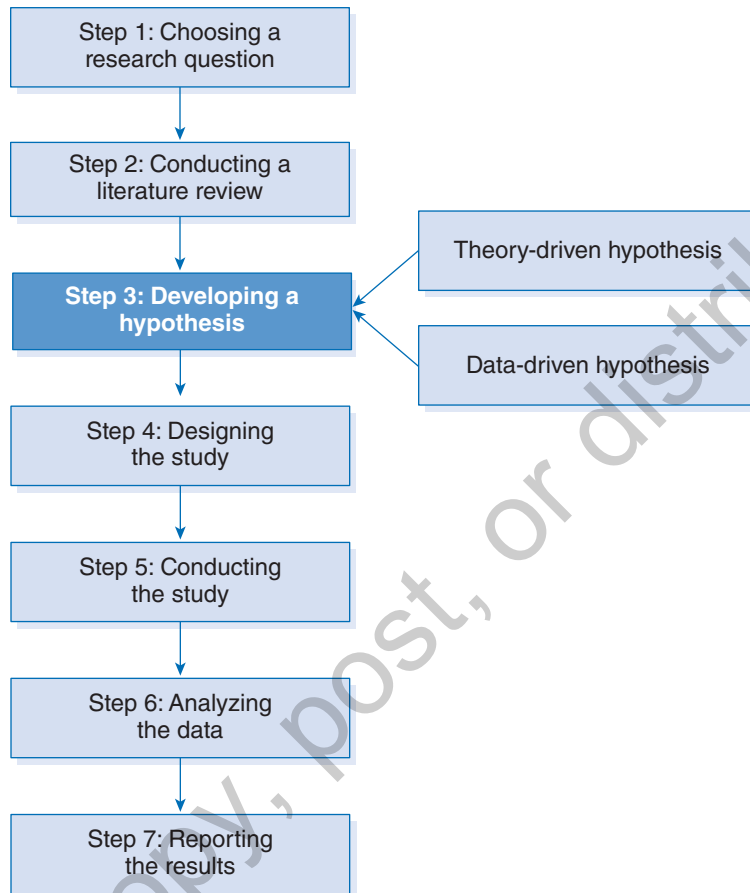
### Theory-Driven Hypotheses

Theory-driven hypotheses are made from the predictions of a theory. These are typically made in studies designed to test a theory (i.e., look for data that support or falsify a theory). For example, suppose a theory has been proposed that anxiety causes insomnia. A researcher conducting a study to test this theory might then predict that if two groups of participants are compared—one that is put in an anxiety-provoking situation and one that is put in a relaxing situation—the anxious group will report more problems sleeping than the relaxed group. In other words, the researcher might predict that the anxious group, on average, will report fewer hours of sleep per night than the relaxed group. This hypothesis would be consistent with the theory that anxiety causes insomnia and is therefore a theory-driven hypothesis. A theory-driven hypothesis involves a researcher taking a general statement about behavior (the theory) and making a specific prediction (the hypothesis) about the study from this general statement.

**hypothesis:**  
Prediction regarding the results of a research study

**theory-driven hypothesis:**  
Hypothesis for a study that is based on a theory about the behavior of interest

**data-driven hypothesis:**  
Hypothesis for a study that is based on the results of previous, related studies

**FIGURE 2.6** ■ Steps in the Research Process: Developing a Hypothesis

Another example of a theory-driven hypothesis can be seen in a recent study on face perception (see Photo 2.3). Sofer, Dotsch, Wigboldus, and Todorov (2015, Experiment 1) tested a theory that the typicality of a face is important in social evaluations of a person. From this theory, the researchers hypothesized that more typical faces would be judged as more trustworthy because trustworthiness is an important part of social interaction. To test their hypothesis, they conducted a study where female students were presented with female faces created from composites of two faces: an attractive female face and a typical female face (see Figure 2.7 for the two types of faces used in composites). Thus, the faces ranged from highly typical to highly attractive depending on the amount of each of the two original faces present in the composite. Subjects in the study were asked to judge both the attractiveness and the trustworthiness of each face. The results were

consistent with their hypothesis: The more typical the face was, the higher the ratings of trustworthiness from the participants. The attractiveness ratings supported their prediction as well, as the less typical faces were judged as more attractive and less trustworthy than the more typical faces. Thus, their study supported the hypothesis that typical faces are judged as more trustworthy, which provided support for the theory that the typicality of a face is important in social evaluations.

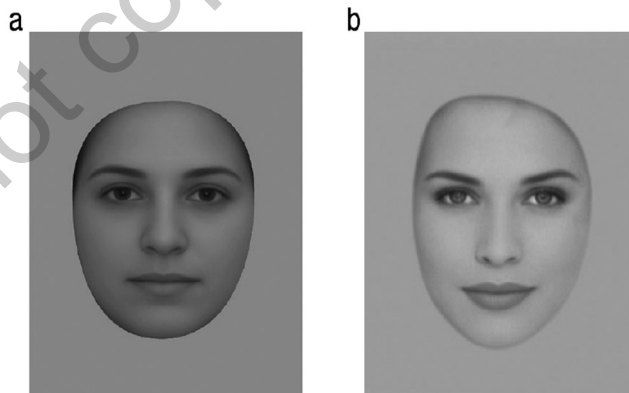
Now, consider how the process of a literature review can aid you in developing research questions and hypotheses for your studies. Suppose you are interested in the origin of math abilities and you are conducting a literature review on the development of mathematical concepts. You find that a researcher has suggested the theory that understanding of mathematical operations (e.g., addition, subtraction) is innate (something children are born with). Can you think of a way to make a theory-driven hypothesis for a study that tests this theory? Think about how a study would be conducted to test this theory, and then use the theory to make a hypothesis about the outcome of the study (see the following box for an example of how you could do this).



CanStockPhoto/photography33

**Photo 2.3**  
Sofer et al. (2015) found that attractive faces are judged as less trustworthy because they are less typical.

**FIGURE 2.7** ■ Faces Used to Create Stimuli in the Sofer et al. (2015) Study. Photo a Shows a Typical Face, and Photo b Shows an Attractive Face



© Sofer et al., 2015, *Psychological Science*

Source: Sofer et al. (2015, Figure 1).

## Example of Theory-Driven Hypothesis for Innateness of Mathematical Operations

To determine that something is innate, you would need to test infants who are very young and have not had enough experience with objects to develop an understanding of mathematical operations such as addition and subtraction. You could then test these infants in a study where you show them objects of a set number that they are habituated to (no longer show interest in), occlude the objects with a screen, and then either add an object or remove an object behind the screen so that the infant can see the object being added or subtracted. You then remove the screen and show them the objects but show them an incorrect number of objects based on the operation. If the infants show interest (indicating something that was not expected by the infants) in what they are shown, this can be seen as evidence that the infants understand what they should have seen after the operation was performed. Thus, the theory-driven hypothesis for this study is that infants will look longer when the number of objects does not match the operation than when the number of objects does match the operation.

A study like this was performed by Wynn (1992), where her findings indicated that infants as young as 5 months looked longer when the number of objects did not match the operation than when the number of objects shown was correct based on the operation. Wynn argued that these results support the theory that understanding of addition and subtraction operations is innate.



CanStockPhoto/zf

**Photo 2.4**

Schnall, Benton, and Harvey (2008) found that priming the concept of cleanliness led to less harsh judgments of moral situations, such as keeping money in a found wallet.

## Data-Driven Hypotheses

Another way in which researchers can make hypotheses about a study is by examining the specific findings of previous studies that are similar and generalizing the findings to their study. Hypotheses made in this way are considered data-driven hypotheses because they are made based on data from previous studies. For this type of hypothesis, a researcher takes a specific result from another study and uses it to make a more general prediction for the research question of interest. For example, suppose researchers are interested in causes of insomnia. In their

literature review, they come across a study that found that people who report high levels of anxiety also report getting less sleep per night. From this study's results, they may conclude that anxiety is related to insomnia and make the hypothesis for their study that a relationship between level of anxiety and number of hours of sleep will be found.

A study by Schnall, Benton, and Harvey (2008) provides an example of a hypothesis based on data from previous studies. These researchers were interested in the connection between emotions and moral judgments. Previous studies (Schnall, Haidt, Clore, & Jordan, 2008) had shown that when participants were induced to feel disgust (e.g., exposed to a bad smell), they judged an action as more immoral than control participants who did not experience the disgusting situation. Schnall, Benton, and Harvey (2008) hypothesized from these results that if feelings of cleanliness were induced, the opposite effect should occur: Participants should judge actions less harshly (see Photo 2.4). They conducted two experiments to test this data-driven hypothesis.



In both experiments, one group of participants was primed with the concept of cleanliness, whereas another group was not primed with this concept. Participants then judged the actions of others in a set of moral dilemmas (e.g., keeping money in a found wallet). Results indicated that participants who experienced the concept of cleanliness in the study rated the actions in the dilemmas less harshly than participants who were not primed with the concept. Schnall, Benton, and Harvey (2008) supported their data-driven hypothesis with the results of their study.

## Descriptive and Causal Hypotheses

Regardless of where the information comes from, hypotheses will either attempt to describe behavior or make a causal prediction about behavior. This distinction maps onto the different types of research questions described above: descriptive and causal. Which type of research question is being asked will also dictate which type of hypothesis is made: a **descriptive hypothesis** or a **causal hypothesis**. If researchers are interested in the causes of behavior, they state a prediction about a particular cause of that behavior—typically as a difference in groups or conditions based on the causal factor they studied. For example, if researchers have the research question “Does drinking caffeine on the day of an exam cause an improvement in test performance in college students?,” then their hypothesis may be that students who drink caffeine the day of an exam will have higher test performance than students who do not drink caffeine. If, however, the researchers are interested only in whether certain behaviors occur together or wish to document the occurrence of a particular behavior, they are likely to have a descriptive research question and a descriptive hypothesis. For example, if researchers have the research question “Do students who score low on an exam also have high levels of anxiety?,” then their hypothesis may be descriptive, such that a relationship between these behaviors is predicted (i.e., when these behaviors are measured together, students with lower test performance will have higher anxiety scores; see Photo 2.5). Descriptive and causal hypotheses are typically tested with different types of research designs, which are discussed in later chapters of this text.

Here is one important thing to note about testing hypotheses and theories: We can never *prove* a hypothesis or theory is correct in our research studies. The best we can do is to support or not support the hypothesis or theory from the data we observe in our study. This is due to the limitations of the research process (e.g., we are testing a small sample, our statistical tests are based on the probabilities of outcomes). We will discuss these limitations throughout the text but know that they are part of any scientific process. The goal is not to prove facts but to support predictions and explanations of the phenomena through the observations we make in our studies.

**descriptive hypothesis:** A prediction about the results of a study that describes the behavior or the relationship between behaviors

**causal hypothesis:** A prediction about the results of a study that includes the causes of a behavior



©istockphoto.com/PeopleImages

**Photo 2.5**

The research question “Do students who score low on an exam also have high levels of anxiety?” leads to a descriptive hypothesis about the relationship between these variables.



## STOP AND THINK

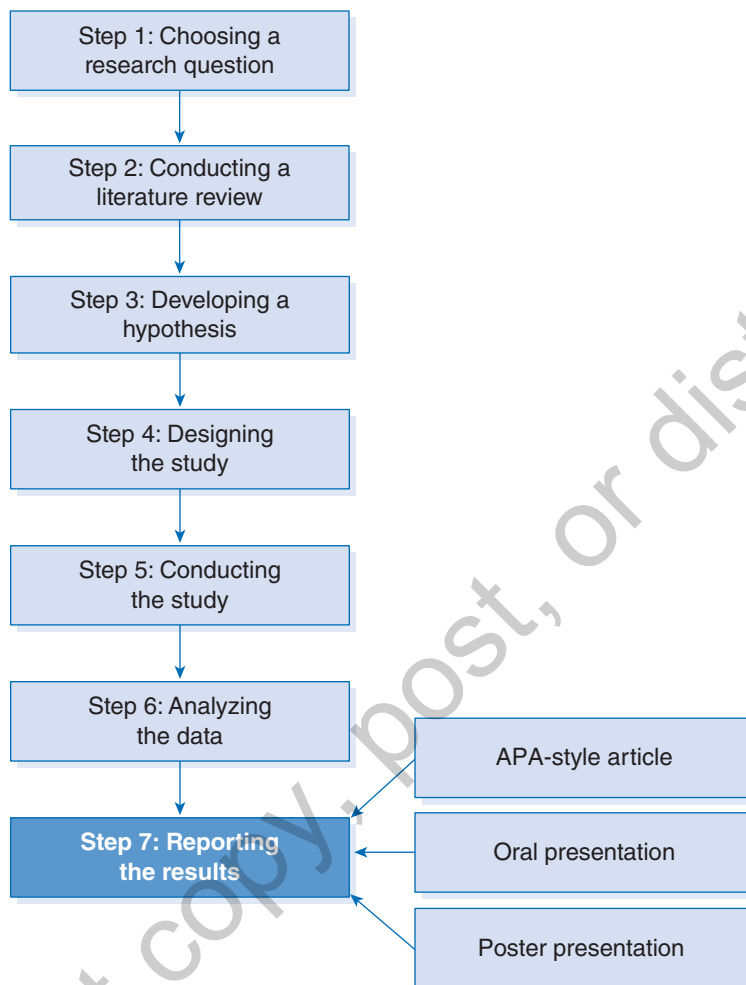
- 2.7. Explain the difference between a theory-driven and a data-driven hypothesis.
- 2.8. How does a literature review help researchers make hypotheses about their study?
- 2.9. Describe the difference between a theory and a hypothesis.

## APA-STYLE ARTICLE WRITING

Because this chapter covers the structure of empirical articles and how research is reported, we'll take a look at the last step in the research process here so that you can keep this step in mind as you continue through the process of conducting research (see Figure 2.8). As you have seen in the journal articles you have read and from the description of these articles earlier in this chapter, APA-style articles follow a particular organizational style. APA style refers to the writing style proposed by the 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. Appendix A illustrates an APA-style article that has been typed in by a researcher to give you an example of the format you should use in typing up your own APA-style research report. This section discusses each section of the APA-style article and the information that should be included in each section. Some important APA-style rules are also covered to help you format your own research articles. All information described in the following section is also covered in the *Publication Manual of the American Psychological Association* (APA, 2010).

### Before You Write

**Citations.** There are a couple of issues to consider before you begin writing a research report—how to cite sources and how to avoid plagiarism. In your research reports, it is important to cite the sources where you obtain information. 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 publications. 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 own words in your paper: This is the expected writing style in reports of psychological research. Quoting without quotation marks and a citation is plagiarism (see the next section) and will likely have serious negative consequences.

**FIGURE 2.8 ■ Steps in the Research Process: Reporting Results**

APA-style citation format includes 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 the 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 this: 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 this: Prospective

memory (PM) 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 my 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:**  
Claiming another's  
work or ideas as  
one's own

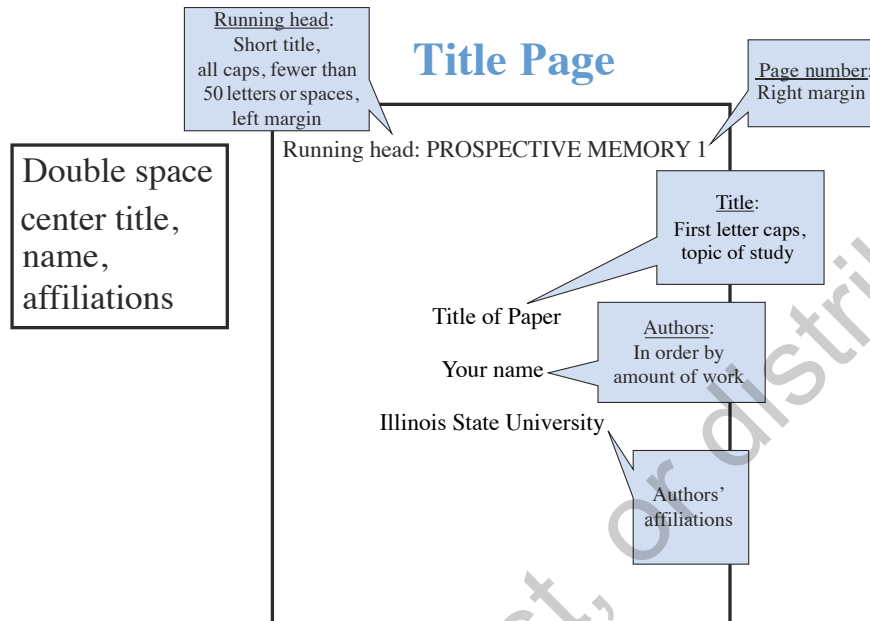
**Plagiarism.** Proper citation of sources is an important part of avoiding **plagiarism**—taking credit for someone else's work or ideas. Any description of another study or of someone's theory must include the citation of the source of the study or theory to give proper credit to the author(s) of the 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 your own 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 (see Appendix A). 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 2.9 provides an example title page with each part explained in a bubble.

FIGURE 2.9 ■ Sample APA-Style Title Page



## Abstract

The second page of your article contains your abstract. The abstract is a short paragraph (first line 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 150 to 250 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 the parts of 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 each background article. 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; some details about your study's design should be discussed (e.g., briefly describing 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 to study 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 of 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: (1) participants, (2) design, (3) materials or apparatus, and (4) 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 chose 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 nonhuman 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 the researcher 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 many participants were assigned to study conditions is also typically 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 or 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 or subjects experience 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 or 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 or 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. This 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:  $t(65) = 4.56, p = .002$ ; older participants scored 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  $t$  and  $p$  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—italics for statistics, degrees of freedom provided, and spaces surrounding equal signs. Consult the *Publication Manual of the American Psychological Association* (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 a graph (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 Appendix A 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, 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 similar 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.

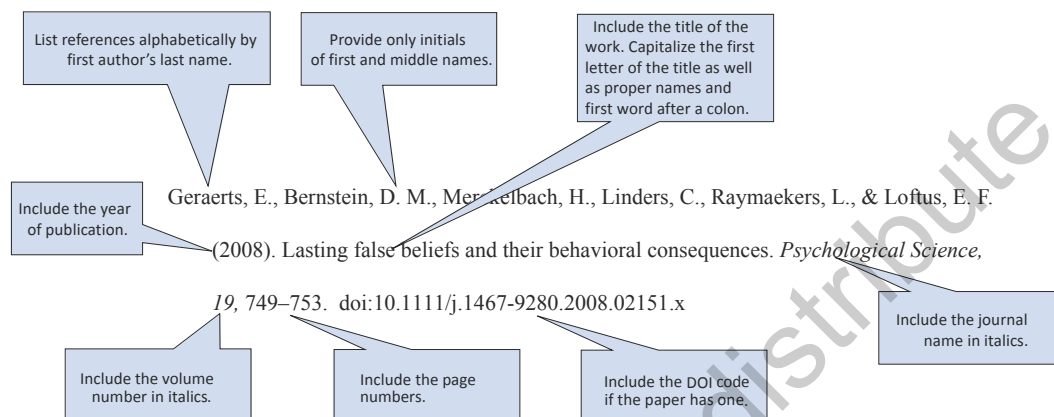
### References

The references 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 should 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 a journal article should appear as follows:

Geraerts, E., Bernstein, D. M., Merckelbach, H., Linders, C., Raymaekers, L., & Loftus, E. F. (2008). Lasting false beliefs and their behavioral consequences. *Psychological Science, 19*, 749–753. doi:10.1111/j.1467-9280.2008.02151.x

See the references section of Appendix A for some additional examples of reference formatting. Figure 2.10 also provides a breakdown of how to format a reference. Begin a new page for the references section. Reference organization packages, such as RefWorks and EndNote, can help you format source references into APA style.



**FIGURE 2.10** ■ How to Format a Reference

## STOP AND THINK

- 2.10. For each of the following pieces of information that follow, 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
  - A statement of the hypothesis
  - Suggestions for future studies
  - Mean scores
- 2.11. Explain why the method of a study is described in detail in an APA-style paper.

## Multiple-Study Articles

For some APA-style articles, you may be describing multiple related studies in one article. For multiple-study articles, you should 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 of the American Psychological Association* (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 previously 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 the 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 one through nine, and numerals for values 10 and above, unless the number is a measurement, a 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* (APA, 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, earlier in this chapter, I defined the 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 conferences. There are also regional conferences, such as the Mid-America Undergraduate Psychology Research Conference (MAUPRC), and undergraduate psychology conferences in many U.S. states (e.g., Illinois–Iowa Undergraduate Psychology Empirical Research Conference [ILLOWA]) 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 2.11 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

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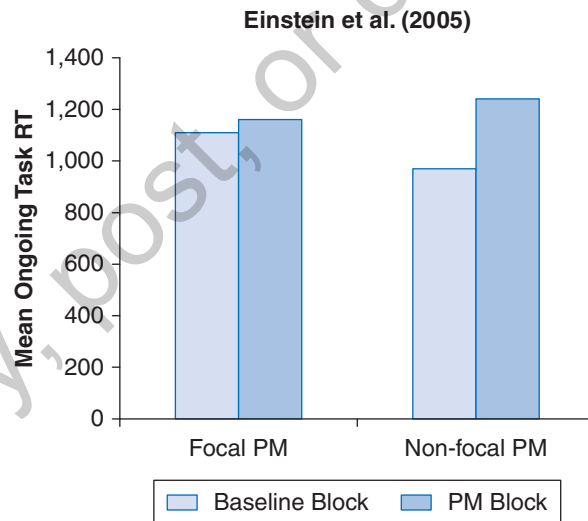
As with oral presentations, you are most likely to encounter a poster presentation of psychology research at a psychology conference. You may have been assigned a poster presentation in the course you are taking that assigned this text. Poster presentations are essentially mini-APA-style articles that 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 2.12 for an example of a poster presentation of research. Notice that each of the

**FIGURE 2.11 ■ Example Slides From an Oral Presentation of Research****TYPES OF PROSPECTIVE MEMORY**

- Prospective Memory (PM): remembering to perform a future task
  - Respond to an email from a colleague during the day
  - Take medication after dinner or at 6 p.m.
- Event-based PM: Perform task after an event occurs (eat dinner)
- Time-based PM: Perform task at a set time (6 p.m.) or after a period of time (in 20 min)

**EVENT-BASED COGNITIVE COST**

- No cost shown for focal PM task, but significant cost found for non-focal PM task



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 2.12 for the organization style used in a poster.



# Pre-crastination Effects in a Prospective Memory Task

Rachel L. VonderHaar<sup>1</sup>, Dawn M. McBride<sup>1</sup>, and David A. Rosenbaum<sup>2</sup>  
 University of California, Riverside<sup>2</sup>



Illinois State University<sup>1</sup>

## Introduction

Prospective memory (PM) is remembering to perform a future task (Einstein & McDaniel, 2005). In the "real world" there are often delays between receiving the PM cue and completing the PM response, which causes a decrease in PM accuracy (Einstein et al., 2000). In lab settings, some participants respond before the delay is over to avoid forgetting the task (McDaniel et al., 2005), thus, they *pre-crastinate*. Pre-crastination is the phenomenon of completing tasks earlier rather than later to "get it out of the way" (Rosenbaum et al., 2014). Rosenbaum et al. found that participants pre-crastinated in a motor task. In the current study, we applied this phenomenon to a PM task in which participants were given a choice of when to complete the PM task. We also manipulated the difficulty of the PM task to determine its effect on pre-crastination. Thus, the purpose of the current study was to investigate pre-crastination using PM tasks of easy, medium, and hard difficulties, within an ongoing motor task. The primary question was whether participants complete a more difficult cognitive PM task later than an easy PM task in ongoing motor task trials.

## Hypotheses

- H1: 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

## Method

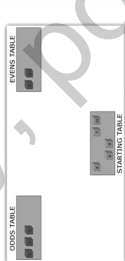
### Participants

- Experiment 1: 92 Illinois State University students
- Experiment 2: 122 Illinois State University students

## Method

### Experiments 1 & 2 Procedure

Ongoing task (continuous computerized motor task): Move the 10 boxes one at a time in numerical order to the corresponding ending table. Blue boxes still need to be moved. Purple boxes have already been moved.



PM task (cognitive task):  
 Generate *n* 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, countries, 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)

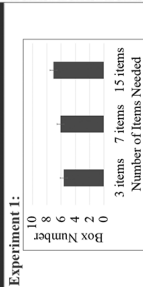
### Experiments 1 & 2 Design

- Within-subjects design for category difficulty factor
- Counterbalanced category order and assignment between-participants

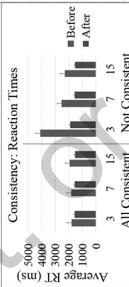
## Results

- 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,  $p = .62$
- Pre-crastination: Generation time chosen significantly affected by number of items to be generated,  $p < .001$ .

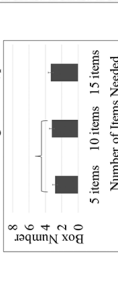
## Results



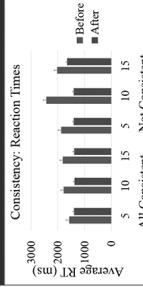
- Consistency and reaction times: Difference in reaction times (RTs) Before completion of PM task and After completion of PM task. Consistent = same box # (completion time) for each block. Not consistent = different box # (completion time) for each block. Overall, RTs were longer in the ongoing task before completing the PM task and shorter after completing the PM task.



- Experiment 2:
  - 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,  $p = .17$ .
  - Pre-crastination: Box number when generation occurred significantly affected by number of items to be generated,  $p = .01$



## Results



- Consistency: Reaction Times
- All Consistent Not Consistent
- Consistency and reaction times: Experiment 2 data found the same general trend as Experiment 1 data

## Conclusions

- Rosenbaum et al. (2014) found that 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

Einstein, G. O. & McDaniel, M. A. (2005). Prospective memory: Multiple retrieval processes. *Current Directions in Psychological Science*, 14, 286-290.

Einstein, G. O., McDaniel, M. A., Goshies, B., & Brinkley, M. (2000). Prospective memory and forgetting: Interactions over short delays. *Psychology and Aging*, 15, 671-683.

McDaniel, M. A., Einstein, G. O., Steel, A. A., & Morgan, Z. (2003). Aging and maintaining intentions over delays: Do it or lose it. *Psychology and Aging*, 18, 823-835.

Rosenbaum, D. A., Gong, J., & Potts, C. A. (2014). Pre-crastination: The effects of pre-crastination on the experience of extra physical effort. *Psychological Science*, 25, 1487-1496.

Zhang, L., Wininger, M., & Rosenbaum, D. A. (2014). Word generation affects creative and linguistic innovations. *Journal of Motor Behavior*, 46, 115-122.

**FIGURE 2.13 ■ Presenting at a Conference for the First Time—Rachel VonderHaar**

Rachel VonderHaar

The first poster I brought to a conference was on 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 2.13 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

2.12. 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 here. As you read the summary, think about the following questions:

1. What type of hypothesis (theory-driven or data-driven) did the authors make?
2. Do you think this is a causal or a descriptive hypothesis? How do you know?
3. Can you state the authors’ research question? From the description of the study, how do you think they developed this research question?



4. If you were to conduct a literature review for their research question on PsycINFO, how would you proceed? Describe the steps you would take.
5. Write an abstract for the study in your own words that adheres to APA guidelines.
6. If you were to read an APA-style article describing this study (which you can do by finding the reference that follows), in which section would you find information about the paragraphs the participants read during the study? In which section would the authors report what statistical test they conducted? In which section would they indicate if their hypothesis was supported?

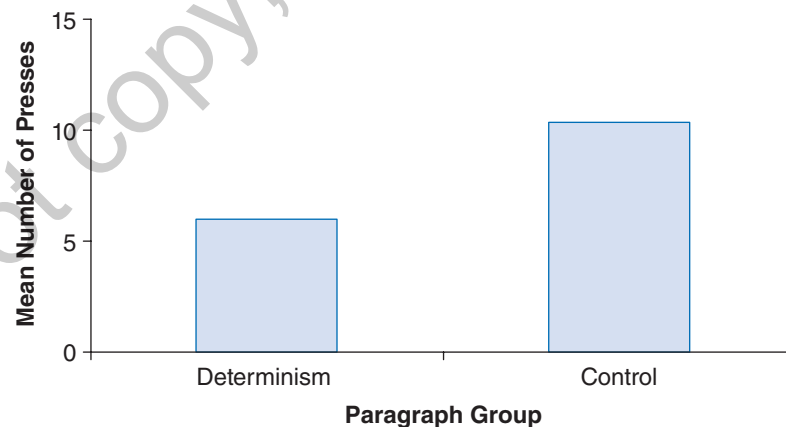
**Research Study.** Vohs, K. D., & Schooler, J. W. (2008). The value of believing in free will: Encouraging a belief in determinism increases cheating. *Psychological Science, 19*, 49–54.

**Purpose of the Study.** Vohs and Schooler (2008) were interested in the effects of a belief in

determinism (i.e., believing that events in a person's life are not under their control) on moral behaviors. Their interest stemmed from recent findings from neuroscientists that our behaviors may be caused by factors out of our control (e.g., our genes, the functioning of our brain, our environments). They reported that a previous study (Mueller & Dweck, 1998) had found that children exert less effort in a task if they are told that their failure, in a difficult task they had previously completed, was due to their intelligence level rather than their level of effort. From this finding, Vohs and Schooler reasoned that a belief in determinism may negatively affect behavior. Thus, in their study, they predicted that exposure to a deterministic argument would result in more cheating behaviors than if this belief was not promoted.

**Method of the Study.** Thirty college students participated in the study. Participants were randomly assigned to read one of two paragraphs taken from the same book. One of the paragraphs suggested that scientists believe that free will is an illusion. The other paragraph discussed consciousness and did not mention the topic of free

**FIGURE 2.14** ■ Mean Number of Space Bar Presses for Each Group



*Source:* Results from Vohs and Schooler's (2008) study.

(Continued)



(Continued)

will. All participants were then asked to complete a set of math problems, presented one at a time on a computer screen. Participants were asked to complete each problem. They were also told that the computer program had an error such that the answers to some of the problems may appear with the problem and that they should try to solve the problems on their own (they could make the answer disappear by pressing the space bar when the problem appeared). The researchers measured the number of times the participants pressed the space bar as a measure of cheating behavior (more presses means less cheating).

**Results of the Study.** The results indicated that the group that read the determinism paragraph pressed the space bar less often (about 5 times during the study) than the control group (about 10 times during the study) that read the consciousness paragraph. Figure 2.14 displays the mean space bar presses for each group.

**Conclusions of the Study.** From their results, Vohs and Schooler (2008) concluded that a belief in determinism (i.e., free will is an illusion) causes more immoral behavior (e.g., cheating) to be exhibited by individuals.

## Chapter Summary

Reconsider the questions from the beginning of the chapter:

- **How do researchers develop a research question?**

Research questions come from many sources, including researchers' curiosity. However, research questions should be relevant to current knowledge in the field of study and answerable using scientific methods. A literature review helps researchers know if their research question fulfills these criteria.

- **How do researchers conduct a literature review?**

A literature review is a thorough review of research done in an area of study. Searchable databases, such as PsycINFO and PsycARTICLES, are useful for conducting a literature review. Conducting a Google web search or using Wikipedia is *not* a good way to conduct a literature review.

- **What are the different types of research articles, and how are they organized?**

Research articles are empirical, review, or theoretical. Empirical articles describe a study conducted by the authors of the article. Review articles summarize results and methods from a particular area of study. Theoretical articles discuss new or revised theories of behavior in an area of study.

- **How do we use a literature review to make hypotheses?**

Researchers can use theories described in journal articles to develop hypotheses, or researchers can use past studies' results to develop a hypothesis about the outcome of their study.

- **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 *Publication Manual of the American Psychological Association* (APA, 2010).

## Applying Your Knowledge

Shark attacks are often reported in the news, making it seem as though the chance of an attack is higher than it actually is.

- Suppose you wanted to determine how likely a shark attack is. What are some good research questions to study this?
- What kinds of sources would be appropriate to answer your research questions? Explain how you would go about finding these sources.

## Test Yourself

- For the information in the list that follows, indicate in which section(s) of a journal article it should be found:
  - Average scores for different groups in a study
  - Number of participants in the study
  - Researchers' hypotheses
  - Comparison of results of present study with results of previous studies
  - Summary of the instructions given to the participants
- Describe how theory-driven and data-driven hypotheses are made.
- Explain why the following research question is not an appropriate research question for psychological research: Does every human being have a soul?
- What is a peer-reviewed journal article, and how does it differ from an article you might find in a popular magazine?
- What is a literature review, and why is it an important part of the research process?
- For each research question that follows, identify the behavior variable and the causal variable:
  - Do men and women differ in conscientiousness?
  - Does waking up at the same time (i.e., setting an alarm) every day improve sleep quality?

(Continued)

(Continued)

- c. Does ostracism increase violent behavior?
  - d. Is eyewitness memory in children worse than in adults?
  - e. Does using crutches change the way you perceive the size of an opening?
7. Explain the differences between a database such as PsycINFO and a search engine such as Google.
  8. A short summary of a journal article that appears at the beginning of the article and in databases such as PsycINFO is called a(n) \_\_\_\_\_.
  9. A hypothesis that proposes a link between exercise and memory would be classified as a \_\_\_\_\_ hypothesis.
  10. What is the difference between an empirical journal article and a book chapter or review article?
  11. 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
  12. 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.
  13. For the citation examples that follow, 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).
  14. 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.
  15. Which of the following illustrates correct APA style for references of journal articles?
    - a. Reese-Weber, Marla (2008). A new experimental method assessing attitudes toward adolescent dating and sibling violence using observations of violent interactions. *Journal of Adolescence, 31*, 857–876.
    - b. Reese-Weber, M. (2008). A new experimental method assessing attitudes

toward adolescent dating and sibling violence using observations of violent interactions. *Journal of Adolescence*, 31, 857–876.

- c. Marla Reese-Weber (2008). A New Experimental Method Assessing Attitudes Toward Adolescent Dating and Sibling Violence Using Observations of Violent Interactions. *Journal of Adolescence*, 31, 857–876.
- d. Reese-Weber, M. (March, 2008). A new experimental method assessing attitudes toward adolescent dating and sibling

violence using observations of violent interactions. *Journal of Adolescence*, Vol. 31, pp. 857–876.

16. Explain how an oral presentation differs from a poster presentation.
17. In APA style, the participants section is a subsection of the \_\_\_\_\_ section.
18. Figures and tables will most likely be referred to in the \_\_\_\_\_ section of an APA-style paper.



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