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2 DEVELOPING RESEARCH IDEAS AND HYPOTHESES

LEARNING OBJECTIVES

Upon completion of this chapter, the reader should be able to do the following:

2.1 Identify four sources of research ideas.

2.2 Describe ways to find literature relevant to your research topic.

2.3 Identify the basic components of a journal article.

2.4 Identify how to properly take notes while conducting a literature review.

2.5 Explain what it means to generate a hypothesis.

When I was a first-year graduate student, I had to write a research proposal for one of my psychology classes. I was supposed to propose something original, something no one had ever done before (since, at that time, most of the research that got published was original, my professor thought I should get used to thinking of these kinds of ideas). I had a very difficult time choosing a topic to study. It seemed that all the original ideas were taken!

I've since realized that if you want to conduct original research, you don't need to find a *big* new idea; you just need to do something that's at least a *little* bit different from what's been done before (although big new ideas are good too!). In this chapter, I'll tell you how to generate research ideas, both original and not original (replications) as well as how to conduct a literature review and understand how to look at journal articles. The chapter will conclude with information about generating a hypothesis.

SOURCES OF RESEARCH IDEAS

We'll begin by exploring the following potential sources of research ideas as shown in Figure 2.1: (1) real life, (2) practical problems, (3) previous research and (4) theory.

Real Life

Have you ever come across an item in the news or in your own life that made you wonder about why things happen? Perhaps you won't be surprised that real life is a primary source of ideas for research.

Let's look at an example. I recently read that people have been live streaming their stay at a psychiatric ward through the online social media platform TikTok (use the search term "#grippysock" or "#grippysock holiday" on TikTok for example—Parsons, 2024). I'll admit that I was surprised by this as I wasn't used to seeing this type of an experience to be so openly shared. There's no shame in getting psychiatric help when it is needed of course, but live streaming from a psychiatric ward seemed to fall in the oversharing category for me (people even have streamed the experiences of others in the ward—consent seems a likely issue here). What do you think? Have you viewed or shared information on TikTok? Should there be an expectation of privacy when you are on a psych ward?

FIGURE 2.1 ■ Sources of Research Ideas

Real life

Practical problems

Previous research

Theory

I began to wonder what else were people willing to reveal about themselves on TikTok? So I started looking. I could have just started watching TikTok, but I wanted to learn from those who had completed a systematic review of TikTok content so I searched the psychology literature.

TikTok, I learned, is currently one of the most popular social media sites for teens and young adults. A recent poll found that 67% of teens say they have used TikTok, and 16% said they "use it almost constantly" (Vogels et al., 2022, para 1). It turns out that TikTok has played a large role in the discussion of mental health among young people. Researchers found videos of people sharing all kinds of health experiences such as their recovery from eating disorders (Herrick et al., 2021) and substance abuse disorders (Russell et al., 2021). Some of the videos from those recovering from drug abuse had millions of views (Russell et al., 2021)!

TikTok's "sick role subculture" (Harness & Getzen, 2022, p. 351) went far beyond just posting a photo of your dinner or your recent get-together with friends (I'm looking at you, Facebook!). Was there anything off-limits on TikTok? Was there any expectation for privacy on TikTok at all?

At this point, I have the beginning of a research idea: Use a survey to ask people about sharing on social media and their expectations for privacy (see Chapter 7 for more information on surveys). But before you go and conduct this study, or any study actually, you need to find out what researchers already know about the topic. So I conducted a search on the topic of TikTok and privacy. I found, for example, an article in which interviews were conducted with everyday people (i.e., non-celebrities) who have at least 10,000 followers on TikTok. More specifically,

Trifiro (2022) asked 25 TikTok content creators about their views on privacy in light of their TikTok public image. She found that there were indeed limitations to the information participants were willing to provide. While authenticity was the goal for all sampled, nearly all were unwilling to provide information regarding their location, a response motivated by safety concerns. In addition, most respondents were careful to keep their personal relationships private (romantic, platonic, and familial). The key here appears to be that divulging information about one's personal relationships means revealing things about another person, not just oneself. Respondents were also careful to keep their online persona separate from their offline identity, thus many of the respondents did not have their real name linked to their TikTok content.

So now I know a little about TikTok and the privacy expectations of some of their content creators, but there is still so much more I could learn. For example, are there different expectations for privacy for those who create content regarding their personal health as opposed to other types of content? Why do people share health-related information and how does this information affect both the viewers and the content creators? Do people of different ages differ in how much they use TikTok for their health issues? Do different genders share health information differently? These last two questions are relevant to the issue of external validity. External validity refers to our ability to generalize our findings to other people, settings, and times. Here I am asking the question: Are the results you get with one population similar to the results you're likely to see with other types of people? You might want to investigate why people use TikTok, and whether people of different ages, genders, or ethnic groups tend to use it for different reasons. These are just a few examples; the possibilities are virtually limitless.

As I hope you can see from this brief example, the real world is full of possibilities for research ideas. In the next section I will describe practical problems as a potential source of research ideas.

Practical Problems

Sometimes researchers are motivated to conduct research on a particular topic because of the desire to solve a problem in the world. Let's take one such problem and see how a researcher sought to provide information that could help solve it. The targeted problem in this case is that college students have a relatively high rate of binge drinking (Centers for Disease Control and Prevention [CDC], 2024; *Facts on College Student Drinking,* 2021). Binge drinking is defined as 4+ drinks for females or 5+ drinks for males on one occasion, and this abuse of alcohol is a major contributor to accidents, risky sexual behaviors, serious health conditions, and even death (CDC, 2024).

Many researchers have been working to find an intervention to decrease binge drinking in undergraduates. Let's take a closer look at one of these research studies. Tahaney and Palfai (2017) used an internet-based intervention approach to see if it could reduce alcohol use in undergraduates. In order to be included in this research, participants had to be "risky drinkers" (p. 63). In other words, students from the researchers' home institution were recruited online and asked how much they drink. If students had at least one "heavy drinking episode" in the last month or at least one "alcohol-related consequence" in the past three months (e.g., passed out from drinking), then they were determined to be eligible to participate. They used the Brief Young Adult Alcohol Consequences Questionnaire to assess students' alcohol-related consequences (Table 2.1).

TABLE 2.1 ■ The Brief Young Adult Alcohol Consequences Questionnaire

		NO	YES
1.	While drinking, I have said or done embarrassing things.		
2.	I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
3.	I have felt very sick to my stomach or thrown up after drinking.		
4.	I often have ended up drinking on nights when I had planned not to drink.		
5.	I have taken foolish risks when I have been drinking.		
6.	I have passed out from drinking.		
7.	I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.		
8.	When drinking, I have done impulsive things that I regretted later.		
9.	I've not been able to remember large stretches of time while drinking heavily.		
10.	I have driven a car when I knew I had too much to drink to drive safely.		
11.	I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
12.	My drinking has gotten me into sexual situations I later regretted.		
13.	I have often found it difficult to limit how much I drink.		
14.	I have become very rude, obnoxious or insulting after drinking.		
15.	I have woken up in an unexpected place after heavy drinking.		
16.	I have felt badly about myself because of my drinking.		
17.	I have had less energy or felt tired because of my drinking.		
18.	The quality of my work or schoolwork has suffered because of my drinking.		
19.	I have spent too much time drinking.		
20.	I have neglected my obligations to family, work, or school because of drinking.		
21.	My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.		
22.	I have been overweight because of drinking.		
23.	My physical appearance has been harmed by my drinking.		
24.	I have felt like I needed a drink after I'd gotten up (that is, before breakfast).		

Source: Kahler, Strong, & Read (2005)

Once their participants had been recruited, Tahaney and Palfai (2017) randomly assigned participants to one of three groups: (1) assessment-only, (2) web intervention, or (3) web intervention plus text messaging. Those in the assessment-only group just answered questions about their drinking. Those in the other two groups participated in a web-based intervention called eCHECKUP TO GO-alcohol which provides interactive and personalized online feedback regarding one's drinking behavior (eCHECKUP TO GO, 2021). The third group received an additional intervention; they received text messages about general health behaviors (e.g., sleep). Tahaney and Palfai expected that those receiving the web-based intervention as well as the text messages would later show less drinking and fewer alcohol-related consequences than those who had received just the web-based intervention or those who just filled out surveys. This hypothesis was only partially supported as after one month, those who had received the web-based intervention plus the text messages had less heavy drinking episodes than those who just answered questions.

Thus, Tahaney and Palfai (2017) saw a problem (binge drinking in college students) and used research to try and find a solution. They concluded that the combination of a web intervention plus the delivery of text messages showed promise for affecting the alcohol intake of college students. They did, however, note that this research has limitations. For example, the drinking assessments only took place at the start of the experiment and one month later, a relatively short follow-up period. They recommended that future researchers consider testing this intervention strategy over a longer period of time. They also noted that these results were obtained on a sample of college students who were primarily female and White; thus, these results may not generalize to other more diverse samples. Only additional research can provide answers to these questions.

Previous Research

Many researchers come up with an idea for research by reading what others have done in an area they find interesting. If you don't have any idea at all about what you want to study, open a textbook and find a topic that's appealing. Once you do have a general topic you are interested in, go to a library database that provides coverage of the relevant literature, type in a few selected key terms, and start searching through titles of literature sources (I'll say more on how to search the literature later in this chapter). When you find a title that sounds like something you want to investigate further, read the abstract. The **abstract** is a short summary of the research report. Does it still sound appealing? If so, locate the entire document so you can learn more.

Once you find a journal article that appeals to you, consider reading more articles on the same general topic so you can get a better sense of what researchers have done relevant to your topic of interest. Newer articles will tend to give you a more up-to-date view of what researchers know about your topic.

Once you have some familiarity with your topic, you can start thinking about what you want to do. Consider choosing one article you like and thinking about the next step that would be reasonable to take; in fact, most articles include ideas for future research in their discussion. Feel free to consider those ideas as you plan your own research. Recognize, of course, that it's possible other researchers were similarly inspired—you can check on this by using a library database to see who else has cited your article of interest.

Another possibility you might want to pursue is to take an article or a set of articles you like and tackle the same idea. In fact, you can conduct an **exact replication** (rerun a previously conducted study). That's what we'll consider next.

Exact Replication

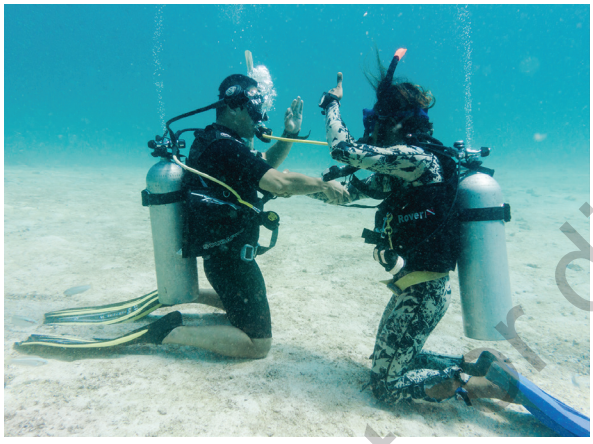
As I mentioned earlier, when I was in graduate school, I was taught that researchers should strive to come up with new ideas for research, something that no one else had done. In other words, conducting a study that had already been conducted (i.e., conducting a "replication") was not worth our time, and it was unlikely to be publishable. I wasn't likely the only one who was taught in this way at that time. In 1990, Neuliep and Crandall found that almost 94% of journal editors indicated that replications were not "encouraged for submission" while in 1993, Neuliep and Crandall cited manuscript reviewers who said that "replications are a waste of time and journal space" (p. 21). Given this information, it is not surprising that students were taught that the goal of research was to find something new and noteworthy to say.

In recent years that has changed. Researchers are still interested in new and noteworthy, but there is now also an interest in replicating research. As you'll read about in Chapter 3, this new interest in replication began around 2011 and was precipitated by what occurred in the labs of two well-known researchers, one of which was discovered to be making up his data (see Bhattacharjee, 2013) and another who engaged in research practices that while, methodologically sound using traditional methods of analysis, could have inappropriately affected his results (see Engber, 2017). Suddenly researchers were interested in determining whether other previously obtained results would hold up. Thus, researchers conducted replications of 100 experiments and found that many of the original results were not replicated (Open Science Collaboration, 2015). As a result of this and other replication efforts, researchers now acknowledge that attempting replication is an important part of the scientific process; it allows us to ultimately get at the truth (Open Science Collaboration, 2015).

So, let's look at what it means to conduct a replication. One way of doing this is to conduct an exact replication. Let's take a look at an example of an experiment that a researcher recently tried to replicate. The work in question is Godden and Baddeley's (1975) investigation of context-dependent memory. Those testing context-dependent memory put forth the hypothesis that one will show better recall in the environment in which they learned the material. For example, if you were planning on taking the Scholastic Aptitude Test (SAT) on a computer, then you should study for it on a computer as opposed to studying out of a book. Correspondingly, if you were planning on taking the SAT using paper and pencil, then that's the way you should study.

Godden and Baddeley's (1975) investigation of context-dependent memory is quite well known as they used an unusual way of testing (at the time of this writing, Godden & Baddeley's work has been cited 524 times by other sources). Godden and Baddeley presented a list of spoken words to study participants either while they were on land or underwater, and then, after four minutes, while on land or underwater, they had participants write down all the words they could remember. After a practice session, all participants completed all four conditions (on separate days with different lists): (1) learn underwater/recall underwater, (2) learn on land/

recall underwater, (3) learn underwater/recall on land, and (4) learn on land/recall on land. If participants showed context-dependent memory, they would have better recall when the learning conditions and recall conditions matched. And that's exactly what they found! The words participants learned while underwater were best recalled underwater and the words learned while on land were best recalled on land.



Do people who learn while underwater recall more while underwater than while on land?

Murre (2021) decided to try and replicate Godden and Baddeley's (1975) classic experiment because, as he put it, "these studies are the foundation of what we are teaching our students and if they are unreliable or wrong, it is of paramount importance to know so" (p. 2). He followed Godden and Baddeley's original methodology as much as possible (this provides an example of one reason why it is important to provide all essential details of your study in your method section), but he did not replicate their results. Murre's participants recalled more on land than underwater; he did not find evidence of context-dependent memory.

Murre (2021) did not replicate Godden and Baddeley's (1975) results, but the work does not stop there. It's important to try and figure out why the results were different. Nosek and Errington (2017) made the point that there is no such thing as an "exact replication" because there is always something different between the original and the newer study (p. 1). Murre proposes a few possibilities relevant to his replication. For example, Murre indicated that his participants were probably older and less well educated than Godden and Baddeley's participants. Is that the reason for the different results? Additional research can address that issue. Another possible reason for the discrepancy in the results was that Godden and Baddeley's participants did the required tasks over four days, whereas Murre's participants completed the entire set of tasks over 1.5 hours due to practical constraints. Thus, Murre's participants may have been more apt than Godden and Baddeley's participants to get words from different lists mixed up. Again, this possibility could be tested. So while Godden and Baddeley's work was not replicated in this instance, it is only with further attempts at replication that we will come closer to knowing whether memory in this context is truly context dependent.

Conceptual Replication

Of course, you might decide that instead of conducting an exact replication, you would prefer to complete a more original study or conduct a study that is similar but perhaps just a little bit different from what was previously done. If you are investigating the same research questions or testing the same hypotheses as previous researchers, but are investigating the research question differently (e.g., using a different way of manipulating the independent variable, or use a different way of measuring the dependent variable), this is known as a **conceptual replication**. If we get similar findings when conducting a conceptual replication, it gives us confidence in the generalizability of the findings. Let's look at different ways of doing this.

Vary an Independent Variable Differently. Recall that in an experiment you present different groups with different stimuli or different experiences (the independent variables), and then you examine whether those variations had an impact on whatever it is you are measuring (the dependent variables). Sometimes when designing original research, researchers choose to vary their independent variables in a way that others in the field have not done before. Here's an example: Have you ever been attracted to someone else's partner? If you acted on those feelings, you would be doing what is known as "mate poaching." The idea behind mate poaching is that someone in a committed relationship is appealing because someone else has prescreened this person and found desirable qualities in them. Some researchers have considered this phenomenon, although not all have found the expected relationship (stronger feelings of attraction for one in a committed relationship).

In recent years, researchers have tried to isolate the conditions in which mate poaching would be more versus less likely. For example, let's look at two research teams who considered how physical attractiveness might play a role in mate-poaching desires.

Moran and Wade (2022) wanted to know the role of physical attractiveness on mate poaching and mate copying. I will concentrate this discussion on their mate-poaching findings (*mate copying* refers to when an appealing potential mate is in a relationship, individuals try to find a mate who is similar). To investigate mate poaching and mate copying, Moran and Wade presented male heterosexual participants with a randomly ordered set of three photographs of three different males sitting on a bench with their arm around the same woman.

The males had previously been rated in terms of their attractiveness. Thus, the independent variable (the male's attractiveness level) was manipulated through photographs; the male was less attractive, more attractive, or similarly attractive as compared to the pictured female (it was always the same woman).

As for Moran and Wade's (2022) dependent variables, the participants were asked eight questions about the couple including, "Please rank the photos . . . in terms of which couple would be the easiest target to steal the girl away from her boyfriend for a short-term sexual hookup" (p. 97). As hypothesized, the couple with the least attractive male was seen as significantly easier to be the target of mate poaching. This suggests that the match or mismatch in attractiveness between the members of a couple can influence the likelihood of mate poaching.

Now let's look at how another research team considered the same general topic. In one of the experiments completed by Hoplock et al. (2019), an attractive and friendly female undergraduate confederate ("Alice") approached males on campus, one at a time, and asked them

to help her with a class project in which she had to give a short speech and get feedback from students regarding her performance. Once the males consented, the female called over a male confederate. There were actually two male confederates playing this role and they varied in attractiveness (high attractiveness, low attractiveness). The male confederate handed her a questionnaire packet. Alice "smiled at him sweetly and said, 'Thanks hun!'" Then once the male confederate left, Alice explained to the male participant, "That's my boyfriend, he's helping me out" (p. 186). (There was also a condition in which Alice was alone; she did not have a male confederate hand her a questionnaire packet in that case.)

Thus, Hoplock et al. (2019) manipulated the male's attractiveness level, but instead of using photos of males as Moran and Wade (2022) did, they used two real live human beings. And what did Hoplock et al. measure? Among other things, they measured what they referred to as "proximity seeking" which they used as a measure of mate poaching (p. 187). They had participants answer three questions regarding Alice's class project (each one of these questions is considered a dependent variable); these three questions were really designed to determine how much the male participants were interested in seeing Alice again. The participants were told that Alice had to form and lead a focus group over the next few weeks. The participants were then asked questions such as, "How willing are you to attend meetings held late in the evenings, and on Saturday and Sunday mornings at 8:00 a.m.?" (If they were willing to show up at those times, they likely were really motivated to see Alice again.)

Hoplock et al. (2019) did another thing differently from Moran and Wade (2022). They secretly obtained ratings of the male participants' attractiveness (confederates rated the participant's level of attractiveness while he listened to Alice's speech). So what did Hoplock et al. find? Did the male participants desire more time with Alice when her boyfriend was less attractive than she was? Yes, but with an important qualifier. The more attractive males wanted more time with Alice (proximity seeking) when she had a less-attractive boyfriend, but not when she had a boyfriend who was similar in attractiveness or when she had been alone. So this is evidence that the likelihood of mate poaching can be increased if a woman is more attractive than her boyfriend and the male poacher has a higher level of attractiveness.

As noted above, Hoplock et al. (2019) used a live interaction between the target female and her boyfriend, an interaction in the real world. There is typically less control when one is in the real world. This research took place in various common areas of a mid-size Canadian university campus. So there were likely times when more people were around and times when there were less people around. Maybe sometimes there were distractions in the environment (e.g., on my campus, sometimes the students play football in the common areas) or maybe not. The bottom line is when we bring our research into the real world, we generally have less control over what's going on. In addition, while a live interaction is probably more realistic, perhaps the scripted nature of this interaction made for a less than natural interaction.

Of course, it's important to remember why I brought up these examples in the first place. Both Moran and Wade (2022) and Hoplock et al. (2019) varied the level of a male's attractiveness to see if it would impact the desire to mate poach. They used different ways of varying that independent variable (Moran & Wade used photos and Hoplock et al. used live interactions), but in both cases, they found evidence of a male's increased desire for mate poaching when the female's mate was less attractive than she was.

Change the Way You Measure Something. Another change you can make when designing your research is to measure the variable of interest differently than others have done (recall that we measure variables within both experimental and nonexperimental studies; within the context of an experiment, the measured variable is called the dependent variable). Take the following nonexperimental examples: Day et al. (2018) were interested in examining drug use patterns among those attending a music festival in Australia. In their effort to do this, they asked a sample of festival attendees to answer a survey. Participants completed the survey anonymously and once completed, placed the survey in a sealed container to ensure that their responses could not be linked to their identity. Day et al. found out, for example, that almost 75% had used illicit drugs in the past year, most often marijuana and ecstasy.

Researchers have examined drug use patterns among patrons at music festivals.

Now in terms of methodology, Day et al.'s (2018) technique had its advantages. First of all, a music festival is potentially a good way to find large numbers of illicit drug users (Lim et al., 2008). Secondly, the anonymous nature of this survey likely increased the response rate (respondents could be at risk for legal trouble if police became aware of their drug purchasing and use). This technique also had disadvantages. People were able to choose whether to answer the questionnaire. Perhaps those who answered were somehow different from those who did not. Thus, as Day et al. acknowledge, their results do not necessarily reflect the typical experience of people in general.

There are other limitations to the self-report technique Day et al. (2018) used. Whenever you use self-report, you have to rely on what people remember or what they say they remember. Both can be wrong; people may misremember or may purposely lie. Day et al. did use some precautions in that they did not approach people who looked intoxicated; intoxicated individuals may be even less likely to self-report accurately.

Now let's look at another way to measure drug use. Lai et al. (2013) recognized the limitations of the self-report of drug use, so they decided to use a different way of investigating drug

use among music festival attendees. They analyzed wastewater. Wastewater analysis measures drug consumption by analyzing the water in toilets (drugs are excreted out through urine and feces). So unless music festival goers chose to use the bushes instead of a toilet, their data were, shall we say, captured. With this analysis they found, for example, that those at the music festival ingested more ecstasy than those in a nearby community. Thus, these researchers did not rely on self-report. They were able to get information regarding drug use in music festivals in Australia by measuring the variable of interest (the type of drugs present) differently; they analyzed the wastewater. This type of analysis has its advantages over self-report. For example, you are not limited to only what participants can remember ingesting, and the collection of data is not at all intrusive.

Wastewater analysis has its limitations too. For example, while Lai et al.'s (2013) technique gives us information about the types of drugs taken, it does not tell us about the pattern of usage (e.g., typical dosage). For our purposes, note that in both cases—Day et al. (2018) and Lai et al.—the researchers sought to find out about the drug use of those associated with music festivals; both teams obtained important information, but they did it in different ways.

Extend the External Validity. As mentioned above, external validity refers to our ability to generalize our findings to other people, settings, and times. In other words, we are asking the following questions: Will we get similar results with other people, in other kinds of places, and are these results likely to be similar over time? While we will delve into this area more in Chapter 12, I will talk about external validity briefly here because the desire to extend the external validity of a given piece of research can be a reason to conduct a new study.

My first example describes an attempt to extend the external validity of findings to another time. Before I describe this research, let me tell you about the conversation that started it all. Russ Clark was teaching a course in experimental social psychology, and he and his students were discussing Pennebaker et al.'s (1975) study "Don't the Girls Get Prettier at Closing Time" (see more on this study at the end of the chapter). In this study, Pennebaker et al. investigate whether members of the "opposite sex" are seen as more attractive as the time to interact with them diminishes (p. 309). This led to a discussion in Clark's class of men's and women's receptivity to sexual offers. Clark ventured an opinion that "a woman . . . good looking or not, doesn't have to worry about timing in searching for a man. Arrive at *any* time. All she has to do is point an inviting finger at any man, whisper 'Come on 'a my place,' and she's made a conquest" (Clark & Hatfield, 2003, p. 228). When the women in Clark's class disagreed with his assessment, he replied, "It's an empirical question. Let's design a field experiment to see who's right" (Clark & Hatfield, p. 228). (This is a perfect response for a researcher! I invite you to incorporate this set of phrases into your collection of conversational choices!)

Clark and his class then designed a simple experiment. He had research assistants approach students of the opposite sex on campus (whom they did not know) and randomly ask one of three questions: "Would you go out tonight?" "Will you come over to my apartment?" or "Would you go to bed with me?" The reason I'm mentioning this study here is that this study was actually

conducted three times. The first study was conducted in 1978, but was not published until Clark and Hatfield published it in 1959. (Clark & Hatfield noted that the earlier journal reviewers did not recognize the merit of this work), revealed that while men and women were equally receptive to the offer of a date, there were striking gender differences in receptivity to the other offers. Sixty-nine percent of men and only 6% of women were willing to go to the apartment of someone they just met. How about the offer of sex? No woman was willing to take the man up on that offer, but 75% of men said yes. Beyond saying "yes" or "no," the males provided responses such as, "Why do we have to wait until tonight?" or "I cannot tonight, but tomorrow would be fine," while the females' responses included statements such as, "What is wrong with you? Leave me alone" (p. 52). Clearly there were differences in receptivity to offers of a liaison.

Would you be willing to accept a date with, go to the apartment of, or sleep with someone you just met?

Just four years later, Clark conducted an exact replication (also published by Clark and Hatfield in 1989) to test whether similar results would be obtained (see Clark & Hatfield, 2003). Then another exact replication was run (Clark, 1990, Experiment I). Why the subsequent testing? Certainly, an advantage of conducting exact replications is that we gain confidence that the original finding is a true effect. But there was another reason for Clark's interest in rerunning this experiment. AIDS was now a part of the social climate, first recognized by the Centers for Disease Control and Prevention in 1981 (CDC, 2023). Would the presence of a potentially deadly sexually transmitted disease change the way people respond to the offer of a night with a stranger?

It didn't. The results were basically the same. (In the third study, Clark (1990) reported that only one person, a female, said anything about sexually transmitted diseases when explaining a refusal.) The subsequent testing extended this study's external validity; the results generalized to other times. If the results are similar each time the study is conducted, you can have more confidence in the generality of the findings.

Others have attempted to extend the external validity of Clark and Hatfield's (e.g., 1989) work in other ways. For example, Baranowski and Hecht (2015) ran a version of Clark's basic

study in two different settings. More specifically, they had confederates approach those of the "opposite sex" on a German university campus or in a nightclub in Germany and ask them either to go on a date or have sex (p. 2260). (The nightclub was seen as a location in which it was more reasonable to hear a date request or a request for sex.) The results were essentially the same as in the previous research. Men in either location were much more willing to have sex with someone they didn't know than women were. The similarity in results obtained in these two different settings and in two different cultures (the original Clark and Hatfield research, e.g., 2003, was conducted in the U.S.) gives us further confidence in the generalizability of the results. In other words, we can state that the external validity of this work appears to be high.

Theory

Sometimes research is conducted to test a particular theory. First, I'll remind you what a theory is and does, and then I'll provide an example. A theory is a set of ideas that explains a particular phenomenon. More specifically, a theory will summarize an existing body of knowledge about a particular phenomenon, provide a coherent explanation for that body of knowledge, and help to generate predictions about the phenomenon of interest. A good theory must be **parsimonious**. This means it should explain the phenomenon of interest in the simplest way possible. What this means in practical terms is this: If more than one theory is proposed to explain a phenomenon, scientists will prefer the theory that makes the fewest assumptions and explains the data in the simplest terms.

A good theory must also be testable. If the research conducted to test the theory provides data that we expect, given the theory, our confidence in that theory grows. If the research does not provide data that we expect given the theory, the theory will need to be modified so it can better account for the data.

For example, take the research reported by Clark and Hatfield (1989) presented earlier. Clark and Hatfield (1989) used sociobiological theory to make a prediction. They cited the work of Symons (1979), who argued that individuals are motivated to produce as many surviving children as possible so their genetic material is passed on to as much of the next generation as possible. Females have a 9-month commitment to a single pregnancy, so they have to be very selective in the choice of mates. Males don't have the same time investment. They generally father a large number of children, so for them the optimal strategy for spreading their genetic material is to impregnate as many females as possible.

Clark and Hatfield (1989) used this sociobiological theory to generate a prediction for males' and females' receptivity to sexual offers from strangers. Because men have the evolutionary-based goal of wanting sex with a lot of women, and women have the evolutionary-based goal of holding back in an effort to discover whether a man is a good genetic choice, Clark and Hatfield predicted that men will be more likely to accept an offer of a sexual encounter with a stranger than women will. This prediction is Clark and Hatfield's hypothesis. Hypotheses are predictions about the relationship that exists among the variables of interest, and they are often developed from theories as you saw here (you'll read more about hypotheses later in this chapter). As you recall, Clark and Hatfield's hypothesis was indeed supported.

GENERATING RESEARCH IDEAS

Keep a journal of possible research topics that interest you.

- **Real Life (on campus and beyond)**
  - Look around campus.
    - Do you see some interesting patterns of behavior?
    - Are students walking while looking at their phones?
    - Are students cleaning the exercise machines before and/or after using them?
    - Are students more likely to study in groups or alone? What are the advantages/disadvantages of these choices?
  - Look beyond campus.
    - How popular are the political ideas currently in the news?
    - What percentage of community members have a pet within their household? Do people take their pets to work?
    - What percentage of people are working from home at least part of the week?
- **Practical Problems (on campus and beyond)**
  - Look around campus.
    - Are students smoking? Vaping? Binge drinking? Taking hard drugs? Taking prescription drugs that have not been prescribed to them?
    - Are students cheating?
    - Are students engaging in risky sexual behaviors?
    - Are students staying up all night?
  - Look beyond campus.
    - How are communities working to help those in need? What percentage of community members volunteer their time and how do they help?
    - Are community members tending to concentrate on practical problems in their own communities or is there a more global focus?
- **Previous Research**
  - Exact replication
  - Conceptual replication
    - Manipulate the independent variable in another way.
    - Measure the dependent variable in another way.
    - Extend the external validity.
      - Test other types of people.
      - Test other settings.
      - Test at other times.
- **Theory**
- Journal articles often include theories as an explanation for their expectation for their results. Can you think of another way to test their theory? Or if their theory was not fully supported, can you think of a modification of the theory that you can then test?

One More Point About Generating Research Ideas

As researchers, we aim to do meaningful research, research that ultimately provides explanations for phenomena we experience in the world around us. As you saw above, the ideas for research come from a variety of sources. However, no matter what the source of your research

idea is, feel free to think about creative ways to test your hypotheses. I'll use one of my favorite examples from Wegner's lab to illustrate.

Did you ever have a relationship or even a crush that you had to keep secret? Maybe you wanted to keep knowledge of it from your parents, or your friends, or your employer, or the object of the crush itself. Wegner et al. (1994) decided to study the "allure of secret relationships" (p. 287); they wondered whether a secret relationship is more exciting *because of* its secrecy. Now I think this topic is inherently interesting, but the creative way Wegner et al. studied it using an experiment makes it especially compelling. Simply put, Wegner et al. used a game of "footsie" to create secret "relationships" between study participants (p. 287).

Groups of four unacquainted participants (two "opposite-sex" pairs) would come to the lab to play a "Communication" card game (p. 294). Each pair received a randomly determined set of instructions. Specifically, in each group of four, one of the pairs were told that while they were playing cards, they should touch their partner's feet with their feet and try to find some pattern of nonverbal communication to help them win the game. In some cases, these "footsie" pairs were to keep this touching secret, while in other cases, the nonverbal communication taking place under the table was known to all four players.

After 10 minutes of playing cards, the study participants separated, and then each filled out a questionnaire to determine how attracted each participant was to each opposite-sex team member. As Wegner et al. (1994) predicted, those who had touched their partner's feet secretly reported more attraction to that partner than those who either touched without secrecy or did not touch at all (attraction measures taken after the teams were formed but before the game was played revealed no differences—there were differences only after the game was played). So Wegner et al. were able to demonstrate that playing a secret game of footsie can lead to increased attraction for the footsie partner, and it is the secretive nature of the game that is crucial; there was significantly less attraction for the partner who played footsie, but didn't keep it a secret. What an creative way to demonstrate a fascinating part of the human experience!

TEST YOURSELF! 2.1

1. Tahaney and Palfai (2017) wanted to investigate an internet-based intervention approach to see if it could reduce alcohol use in undergraduates. According to the information provided, this research could reasonably be classified as a research idea meant to address the following:
   - **a.** a practical problem
   - **b.** an issue experienced by only undergraduates
   - **c.** long-term alcohol abuse
   - **d.** the inadequacy of the internet to fix social problems
2. What is the term for a short summary of a journal article?
   - **a.** abstract
   - **b.** digest
   - **c.** gist
   - **d.** synopsis

3. Murre (2021) conducted an exact replication of Godden and Baddeley's (1975) experiment on context-dependent memory. They presented divers with to-be-remembered words while they were either on land or underwater, and then had them try and recall the words while they were either on land or underwater. Which of the following is the most accurate representation of Murre's results?
   a. He did not replicate Godden and Baddeley's results, although he did find that participants recalled more on land than underwater.
   b. He did replicate Godden and Baddeley's results in that he found evidence for context-dependent memory.
   c. He did not replicate Godden and Baddeley's results, although he did find that participants recalled more underwater than on land.
   d. He only partially replicated Godden and Baddeley's results in that words presented underwater were recalled best on land.
4. Which of the following would be considered a conceptual replication?
   a. vary an independent variable in the same way that previous researchers did
   b. measure a dependent variable in the same manner that previous researchers did
   c. test a sample of undergraduates again
   d. instead of testing undergraduates, test community members

FINDING RELEVANT LITERATURE

No matter what kind of research you do and no matter where you get your research idea, you should investigate what others have written about the topic. Why do a literature review? There are many reasons. This information helps you develop your hypotheses (more on this point later), and it also gives you information about what has already been done so you can make an educated decision as to what would be a good addition to the literature.

You don't have to read everything written on your topic since the invention of the printing press, but you do need to become familiar with the *current* state of knowledge on your topic; recent articles will be more helpful for this than older ones. Review articles and meta-analyses are good sources too. And the introduction sections of research articles on your topic will also tell you what others have done that's relevant. Another reason to do a literature review is to learn from others' experiences; perhaps other authors experienced a methodological problem you can avoid. That sort of information will likely be discussed in the relevant journal articles.

Oftentimes no one has done *exactly* what you're planning on doing; in that case you need to review the research most relevant to what you're doing. Here's an example. Lee et al. (2018) wanted to know whether the presence of a particular color, specifically the color gold, might affect tipping behavior at a restaurant. No one had considered this exact question before, but others had studied the sorts of things that can affect restaurant tipping behavior (e.g., Frank & Lynn, 2020), and some had found that color could affect consumer behavior (Labrecque et al., 2013). They decided to study the effects of the color gold because some had found that the color gold was associated with status (Drèze & Nunes, 2009), and there was evidence that tipping can be seen as a display of status (Conlin et al., 2003). Lee et al. reviewed the relevant literature from each of these areas. Then they put it all together and hypothesized that consumers presented

with a gold versus a black or white check holder would leave a larger tip, and that's exactly what happened! Their hypothesis was supported. So if you happen to be working in food service, you might want to keep this in mind. A gold-colored check holder could mean a larger tip for you.

How to Search the Literature

To locate sources relevant to your topic, you'll likely use a computerized database that provides citations, abstracts and in some cases, the full-text of journal articles, as well as information about books on all topics relevant to behavioral and social science research. Some common databases to use for a literature review in psychology include the following:

- *PsycINFO*. PsycINFO is a popular database choice for those in psychology and related fields. Put forth by *The American Psychological Association* (APA), PsycINFO contains information from different types of sources, but most of the citations refer to journal articles, books, and book chapters. In some cases, the full-text of the cited information is available; in other cases, you will only see the reference citation and the abstract (you'll have to find the full text in another way—discussed later in this chapter). You might have access to PsycINFO through your university or college library (other access options are available: for example, it is possible to buy access to PsycINFO as an individual on a 24-hour or yearly basis). Go to apa.org and search for "FAQs about APA PsycINFO" for more information.
- *PsycARTICLES*. PsycARTICLES is a database that contains the full-text of the journal articles published by APA and several allied organizations. As with PsycINFO, if your college or university's library does not subscribe to PsycARTICLES, you can access it as an individual by subscribing through APA. Go to apa.org and search for "PsycARTICLES" for more information.
- *Web of Science*. This database allows you to search for journal articles and conference proceedings in science, social science, arts and the humanities. Go to webofscience.com for more information.
- *Scopus*. Scopus is a database that has abstract and citation information for journals, books and conference proceedings in the sciences, social sciences, arts, humanities, technology and medicine. Go to Scopus.com for more information.
- *PubMed*. PubMed focuses on biomedical literature. Includes information about journal articles and books (some of it is available as full-text). This database is freely available to anyone with access to the internet.
- *Google Scholar*. Google Scholar has journal article citations and book information and is free to access on the internet. Sometimes you can even obtain the full text of articles through Google Scholar. Go to https://scholar.google.com to try it out.

While the look of various databases may be slightly different, the basic information provided will generally be similar. Each entry typically includes bibliographic information for

a particular source (see Figure 2.2). For example, in the case of a journal article, you will see the title of the article, the name or names of the author or authors, the title of the journal, the volume number, and the year of publication. Each entry will also generally include an abstract. You can often decide whether you want to read the article by reading the title and abstract.

FIGURE 2.2 ■ Here Is a Sample Listing from PsycINFO

Hey big spender! A golden (color) atmospheric effect on tipping behavior.

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Source:	Journal of the Academy of Marketing Science, Vol 46(2), Mar, 2018. pp. 317-337.
NLM Title Abbreviation:	J Acad Mark Sci
Page Count:	21
Publisher:	Germany : Springer
Other Publishers:	US : Sage Publications
ISSN:	0092-0703 (Print) 1552-7824 (Electronic)
Language:	English
Keywords:	Color, Gold, Payment behavior and tipping, Servicescape, Service props, Sensory cues, Atmospherics, Retail ambience, Frontline employee, Retail strategy
Abstract:	This research examines how gold-related color in atmospherics might influence customer tipping behavior at restaurants. A series of five studies shows that the color gold (as opposed to other colors) in a service atmosphere positively influences consumer tipping. First, a field experiment (Study 1) demonstrates that customers presented with a gold-colored (vs. black-colored) service prop (i.e., bill folder) leave larger tips. Study 2 further confirms this effect of the color gold by validating the findings of Study 1 with a different service prop (i.e., tablecloth). Process evidence demonstrates the underlying mechanism of this effect, whereby a gold-colored service prop increases tipping by influencing status perceptions about the restaurant and the self (Study 3). Additional studies further confirm this by ruling out novelty of the color in this mechanism (Study 4) and by highlighting the effect of status on tipping through status priming (Study 5). The findings of this research have implications for strategic use of color in servicescape design and atmospherics in general. (PsycInfo Database Record (c) 2022 APA, all rights reserved)
Document Type:	Journal Article
Subjects:	*Color; *Consumer Attitudes; *Consumer Behavior; Salaries
PsycInfo Classification:	Consumer Attitudes & Behavior (3920)
Population:	Human
Age Group:	Adulthood (18 yrs & older)
Methodology:	Empirical Study; Field Study; Quantitative Study
Format Covered:	Electronic
Publication Type:	Journal; Peer Reviewed Journal
Publication History:	First Posted: Nov 15, 2016; Accepted: Nov 3, 2016; First Submitted: Nov 2, 2015
Release Date:	20190114
Correction Date:	20220509
Copyright:	Academy of Marketing Science. 2016
Digital Object Identifier:	http://dx.doi.org/10.1007/s11747-016-0508-3

Primary Versus Secondary Sources

Most journal articles are primary sources of information. Most books are secondary sources. A **primary source** is a complete research report about a particular study or studies the author or authors conducted (it will include sections on participants, method, and results). A **secondary source** does not provide the complete research report of a study or studies; it provides only summaries of the cited works. The textbook you're reading is an example of a secondary source; it is a secondary source for all the different research studies I summarize in these pages. To prepare this text, I read the primary sources of those research studies (journal articles) so that I could be sure to get all the details I needed.

It is important to read primary sources when you are preparing a literature review and not just trust what secondary sources tell you. Secondary sources do not always depict a study accurately. For example, consider the work of Landy and Aronson (1969). They provided an early example of how characteristics of both defendants and victims could affect the sentencing of a defendant. More specifically, they varied the character of the defendant and victim; the character was either presented as "attractive" (e.g., gave to charity), "unattractive" (e.g., was a criminal) or "neutral" (p. 141). They found, for example, that when a defendant was portrayed as an unattractive rather than a neutral or an attractive character, he was sentenced to a longer period of time in prison. However, some researchers have mistakenly indicated that Landy and Aronson varied the physical characteristics (presumably misled by the "unattractive" and "attractive" labels), and not the character, of the defendant and the victim. If we had consulted only one of these secondary sources, we would have been led to believe something that was not true.

Does this mean you should never consult secondary sources? No. Books, as secondary sources, can give you ideas about what primary sources you'll want to investigate further. Books are also generally good sources if you want an overview of an area. **Review articles** are also good for getting an overall view of the previous research on the topic. When preparing a review article, a researcher reads through the existing literature, evaluates it, and summarizes it. Thus, a review article provides a comprehensive summary regarding what's been done on a topic, but without including a full research report for any of the research projects it covers.

Let's take a look at an example of a review article. First, let me ask you this: Do you have a dog? If so, does that dog communicate with you? How would that dog tell you that the toy they want is not where they want it to be? Perhaps the dog would bark and look at the item and then back at you (see Miklósi et al., 2000)? Those are just a few of the many questions one can ask regarding the cognitive capabilities of dogs. Bensky et al. (2013) were interested in dog cognition, and thus, they produced a comprehensive review of this research. To complete this literature review, they first searched databases such as PsycINFO and the Web of Science for all articles that concerned any form of dog cognition by using the words *dog, canine*, and *puppy* in combination with the words *cognition*, or *learning*. They ended up with 285 publications. After reading all of these articles, Bensky et al. summarized their findings. They found, for example, that there has been a surge in research on dog cognition in more recent years. Overall, the majority of this research has been focused on topics in social cognition using visually oriented tasks (e.g., responses to cues provided by humans). The remaining research that has been conducted has concerned nonsocial cognition (e.g., memory tasks). So, for example, Bensky et al.

noted that generally, researchers have demonstrated that dogs can remember with better than chance performance even after delays up to four minutes (e.g., Fiset et al., 2003).

Not only did Bensky et al. (2013) identify the major areas in which researchers have focused their attention, and summarize what they found, they made suggestions for future research. For example, they noted that almost 72% of the research studies that they found involved dogs that are pets as opposed to shelter dogs or working dogs. Would shelter dogs, for example, be less effective communicating with a human because they presumably have less experience? In addition, they noted that few researchers have examined differences in cognition between different breeds. These are just a few of Bensky et al.'s recommendations for future research. Overall, they have provided us with a comprehensive view of the state of the research on dog cognition. If you are interested in this topic, this would be considered a must-read resource.

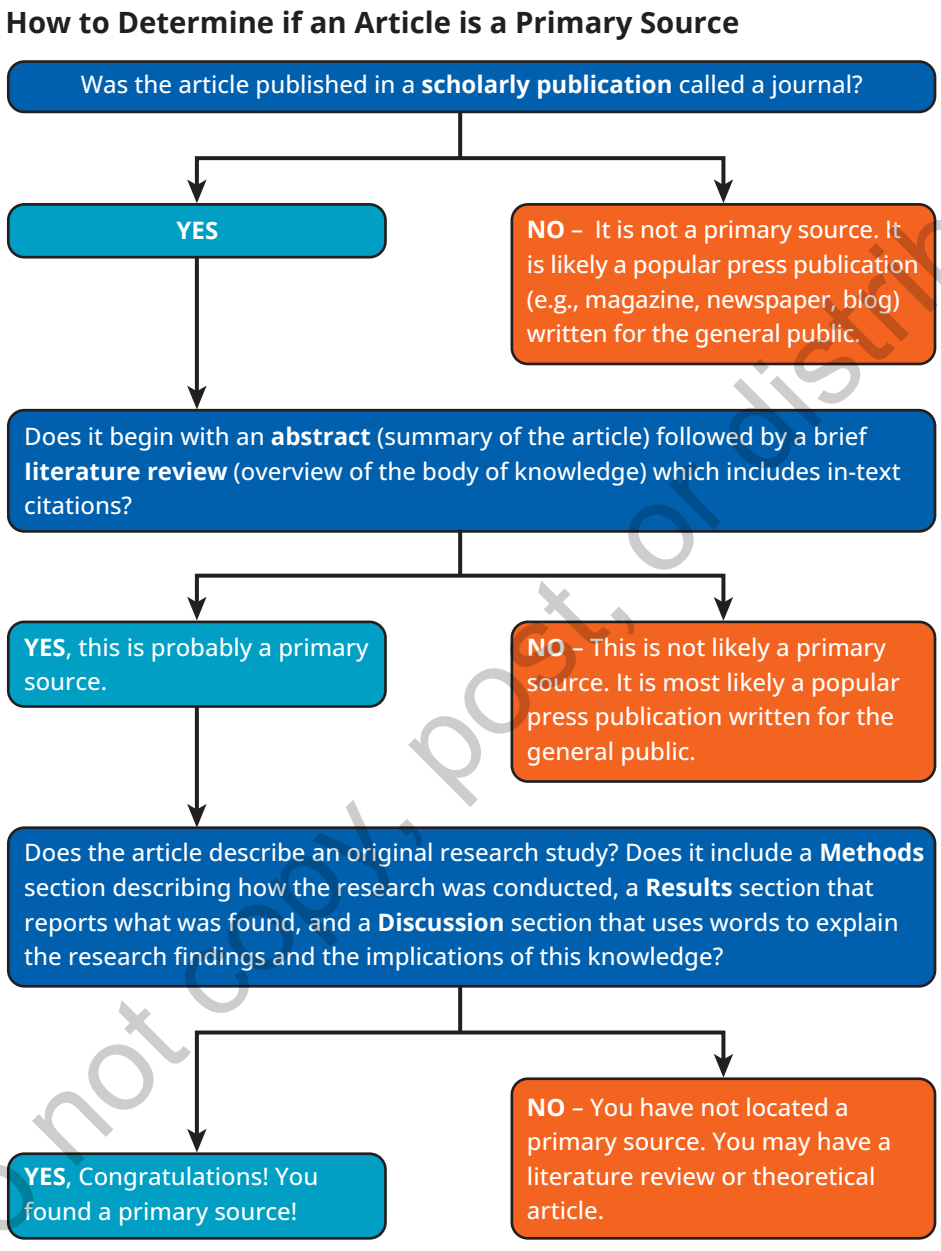
Another potential secondary source of information about a topic is a meta-analysis. When conducting a **meta-analysis**, the researcher uses statistical procedures to combine the results of multiple studies on the same topic. Instead of just relying on the researcher's evaluation of the literature, a meta-analysis allows the researcher to determine, statistically, what conclusions can be made overall.

Let's look at an example. Steinka-Fry et al. (2015) conducted a meta-analysis to determine whether an intervention targeting college students turning 21 reduced the amount of 21st birthday drinking. After a search for relevant literature, Steinka-Fry et al. found nine research studies to include in their meta-analysis. Intervention was operationalized in different ways in these nine studies. For example, some emailed while others mailed a card; some messages were educational information about alcohol, while others told a story about a student who died from drinking too much alcohol. But for each research study, the goal was to determine whether those with upcoming birthdays who had received information regarding alcohol would drink less to celebrate than those who did not receive such information.

The overall result was that although those who received the intervention had a slightly lower blood alcohol content (BAC) than those who did not, there was no difference in the amount of alcohol consumed. Why was the BAC affected while the amount of alcohol consumed was not? Steinka-Fry et al. (2015) thought that perhaps study participants ate more food while drinking or spaced their drinking over a longer period of time. Thus, with the aid of this meta-analysis, Steinka-Fry et al. concluded that these types of interventions have, at best, only minimal effects on the alcohol consumption of those celebrating their 21st birthdays. Even though a variety of methods were used to ask the same basic question, a meta-analysis was able to reveal an overall conclusion regarding the magnitude and the generality of the intervention. Steinka-Fry et al. urged researchers to continue to work on developing interventions to target risky 21st birthday celebration behavior.

Although secondary sources are good for getting an overall view of the literature, most of the sources you should use in your research are journal articles that are primary sources. You'll want to see the entire research report, to know how the authors developed their hypotheses and to learn the details of their methodology. Obtain the primary sources of research that interest you, so you'll have access to details about what those researchers actually did. Figure 2.3 shows you how to identify a primary source.

FIGURE 2.3 ■ How to Determine If an Article Is a Primary Source



Search Terms

Once you have decided what your topic of interest is, it's time to do a search for relevant literature. You'll first need to choose appropriate search terms. This can entail some trial and error. You'll want your search to be specific enough to generate some relevant hits, but not so general that you end up

with a list of sources that have little to do with your topic. For example, let's say you're interested in conducting research on friendship, but you aren't quite sure exactly what search terms to use. Some of the databases are designed to help you with this task. For example, one possibility is to go to the PsycINFO thesaurus, type in "friendship," and check off "relevancy rating," click "Browse," and the thesaurus will give you a variety of search terms for finding information about friendship (such as "interpersonal relationships," "close relationships," and "significant others"). Any search terms that you find through the PsycINFO thesaurus can also be used in other databases as well.

PubMed can also provide help finding search terms; PubMed uses *medical subject headings* (MeSH) to help you search. Let's go over an example in PubMed. Go to https://www.ncbi.nlm.nih.gov/mesh and put in a search term: "taste perception." You will see that MeSH will offer other search terms such as *gustatory perception* and *gustatory responses*. These can be used to help broaden your search for sources.

Scopus, Web of Science and Google Scholar do not have thesauruses, however, conducting a search will often provide you with ideas for other search terms. If you start reading articles on your topic of interest, you'll likely think about other words that can be used to represent that topic.

Interested in finding out the potential health benefits of community yoga? Try using the phrase *yoga AND health* in your search of the literature and then narrow your search from there.

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How to Narrow Your Search

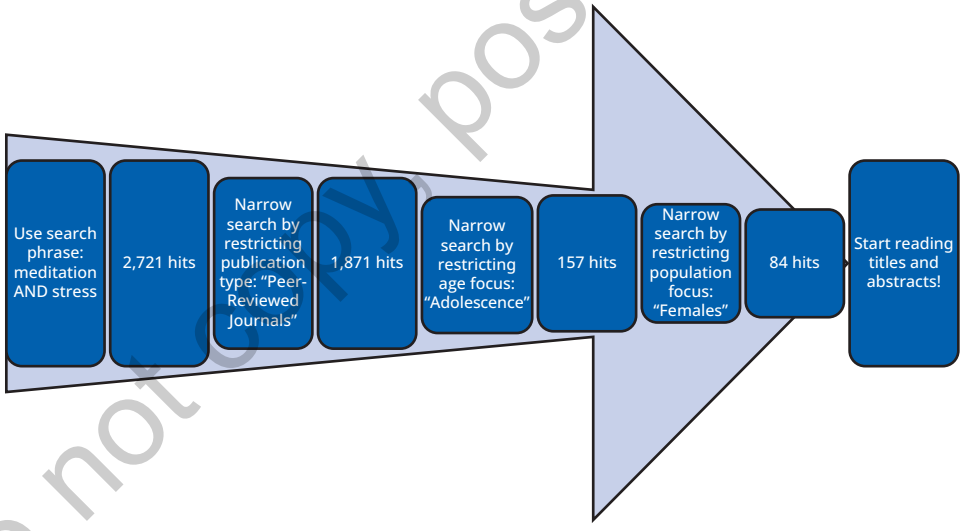
Let me give you an example of how to narrow your search.

Let's say you are interested in reading about the relationship between meditation and stress. The key terms here are *meditation* and *stress*. Use of Boolean operators can expand or narrow a search, and all of the databases I mentioned above use Boolean operators. For example, the Boolean operator "AND" can narrow a search (note the use of capital letters). In this case, I would search for "meditation AND stress." The word *AND* narrows the search because adding it means each retrieved source must include *both meditation* and *stress* in the title, abstract, subject or keyword fields.

However, when I do a search for "meditation AND stress," I end up with a lot of irrelevant references. So I want to narrow the search further. Some of the databases have search limiters that you can use to narrow your search. For example, in PsycINFO and PsycARTICLES, you can do an "advanced search" that allows you to use search limiters. Let's start with a limiter that works within PsycINFO. Since you'll want to use mostly primary sources, one search option to use in PsycINFO is to limit your search to just peer-reviewed journal articles (peer-reviewed articles have been evaluated prior to publication by those with expertise on the topic of the article). (Note that there is no need to limit your search to peer-reviewed articles in PsycARTICLES as every article is peer-reviewed in that database.) Let's also say you're interested in meditation and stress in adolescents. With advanced search capabilities in both PsycINFO and PsycARTICLES, you can limit a search to citations that consider only the age range of interest.

Another way to narrow your search within PsycINFO and PsycARTICLES is to use a "population" limiter. Say I want to focus on the relationship between meditation and stress in females. I can narrow my search by population and chose "females." This means that the search will only produce hits that include females. When I did this search using all the search limiters noted above, the retrieved result was 84 relevant journal articles. That is a manageable number to peruse. You can see how I narrowed my search, step by step in Figure 2.4.

FIGURE 2.4 ■ Example of How to Narrow a Search



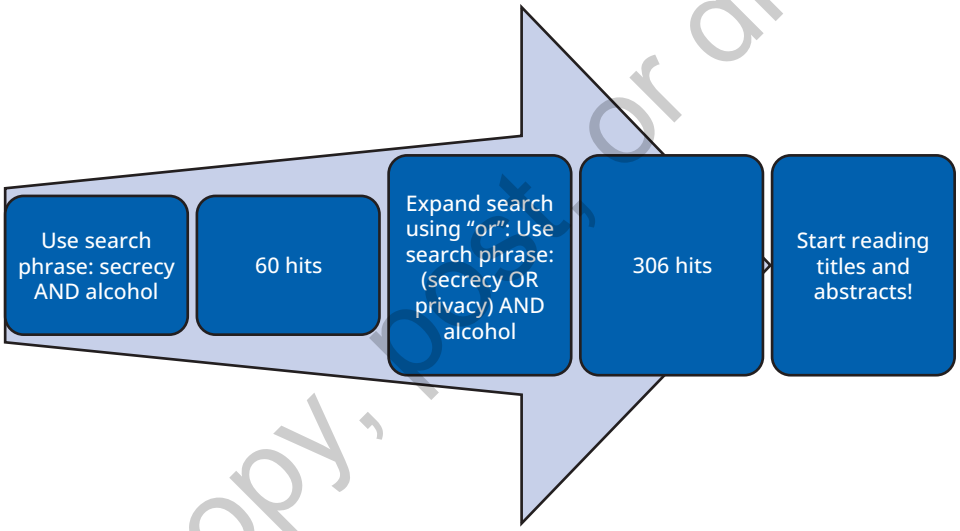
There are still additional options for narrowing a search within PsycINFO and PsycARTICLES. Consider visiting apa.org and doing a search for "search guides for APA databases" for more information regarding designing an efficient search for relevant literature.

Other databases have limiters as well. For example, when you search for information within Google Scholar, it will return a list of sources which you can then sort by relevance or by date.

How to Broaden Your Search

Now let's say you want to broaden your search. Suppose you're interested in finding out about people who have a tendency to drink alcohol in secrecy. So you start out with the search terms *secrecy AND alcohol*. Unfortunately, that doesn't generate many hits. You want to broaden your search. One thing you can do is to use the Boolean operator "OR." I've looked up *secrecy* in PsycINFO's thesaurus and found the similar term *privacy* so I will include that in my search phrase (I'll use parentheses so that PsycINFO understands what words I'm grouping together). So now the search phrase is "(privacy OR secrecy) AND alcohol." Now that generates far more hits. (Note that if you've made the search too broad, you can still use the limiters (e.g., population limiter) discussed earlier.) See Figure 2.5 for more on this particular search and the citations retrieved.

FIGURE 2.5 ■ Example of How to Broaden a Search



Note that I didn't suggest "privacy and secrecy and alcohol," because that would provide only a very short list of the sources that use **all** those terms in their title, abstract, subject line or as keywords. After your search, take a look at how relevant the citations are, and decide whether to broaden or narrow the search from there.

Another technique to broaden a search is to use truncation. Let's say you are still looking for articles on friendship. You can search using a truncated term, meaning you use an asterisk to stand in for the different ways a particular word can end. In this case, if you search using the term *friend** you'll get any word that begins with *friend*, regardless of how it ends—*friendly, friends* and *friendship*.

You do need to be careful how you use truncation; think about all different ways the word of interest could end. For example, when trying to broaden a search on dating behavior I used *dat** because I thought that would give me *date, dates*, and *dating*. However, this search was not a

good choice, because I also ended up with a lot of sources on my generated list that had the word *data* in the title or abstract, and they had nothing to do with the topic of interest.

There are other options for broadening a search. Again, you may choose to visit apa.org for more information. Once on the home page, use the site search feature and the terms *search guides* or *search guides for APA databases*.

Once you find some sources that will work for you, some of the databases have another good technique to use. For each citation listing, PsycINFO and PsycARTICLES will provide both a list of the references cited within that source (click on "cited references"), and a list of the other sources that have cited your source of interest (click on "times cited in this database"). Google Scholar will also provide information regarding who has cited an article of interest. You may choose to find out more about these additional sources, because they may also be helpful in your search for information about your topic of interest.

Full-Text Articles

In some but not all cases, a database will include the full text of the article (this can be available as a PDF file in which the content maintains proper formatting and appearance, or as an HTML file that does not have formatting). In these cases, you can download, email, or print the article directly. In other cases, the database will not have the full text of the article available (e.g., Scopus and Web of Science do not have access to full-text articles unless your library subscribes to the journal of interest). In these cases, if you want to read beyond the title and the abstract, you'll have to get the article in another way. It might be shelved at your university or college library, or you may have to go through a process called interlibrary loan. **Interlibrary loan** is a system in which libraries lend and borrow from each other. A librarian should be able to help you with this request.

Although it is possible to limit your search to articles that have the full text attached, I do not recommend this. It may be that great articles for your topic exist, but the database you are using does not have the full text available for them. If you limit your search to only full-text articles, you'll never know about their existence.

TEST YOURSELF! 2.2

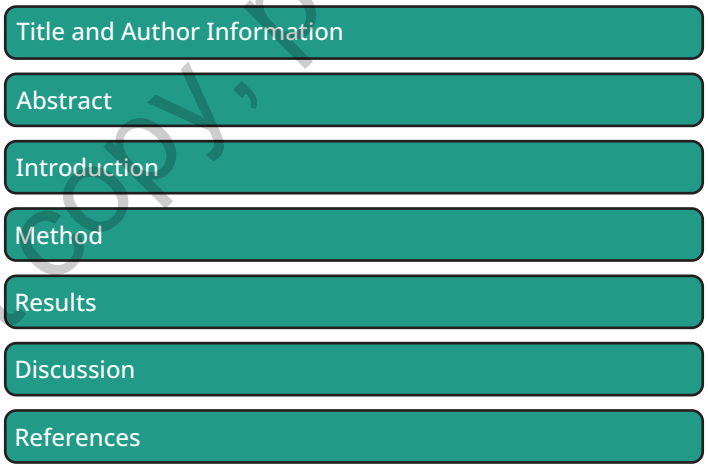
1. When searching through databases for relevant literature, which information is going to be most helpful when deciding whether to read the article?
   - **a.** the title and the abstract
   - **b.** the name or names of the author or authors
   - **c.** the name of the publisher
   - **d.** the year of publication
2. This research methodology textbook by Heath is appropriately classified as a(n)
   - **a.** meta-source
   - **b.** primary source
   - **c.** secondary source
   - **d.** tertiary source

3. Which of the following techniques serves to broaden a search for psychological literature?
   a. restrict your search to "Academic Journals"
   b. truncation
   c. use an age limiter
   d. use a population limiter
4. A journal article that provides the complete research report of a series of research studies would be considered a
   a. meta-source.
   b. primary source.
   c. secondary source.
   d. tertiary source.

THE BASIC COMPONENTS OF A JOURNAL ARTICLE

Now that you have found sources relevant to your topic, it's time to start reading. Since much of what you'll likely read is primary source journal articles, this section presents the basic components of a journal article (see Figure 2.6) so you will generally know what to expect. We'll discuss journal articles in more detail in Chapter 13 when we talk about how to write up your own research.

FIGURE 2.6 ■ The Basic Components of a Journal Article



Title and Author Information

A well-written title will give you a good idea of what the article is about. This initial part of the article will also typically list the authors, their affiliations, and contact information for the lead author.

Abstract

The abstract is generally a one-paragraph summary of the article. The abstract will typically provide information regarding the purpose of the research, the number and type of participants, the methodology, a summary of the results and the implications of the findings. Because it provides an overview of the entire article, reading the abstract is a good way to determine whether the article is a good fit for your needs.

Introduction

The purpose of the introduction is to provide information regarding past research and theories relevant to the topic of interest, develop a rationale for doing the present research and provide information regarding the purpose of the present research. The researchers' expectations (hypotheses) for the results of the current study are presented in the introduction too.

Method

The Method section is typically divided into subsections. For example, there is a Participant Characteristics subsection in which the details regarding the sample are provided (such as the number of participants as well as their gender, age and how they were selected). Older articles and articles that concern animals usually refer to this section as a Subjects section.

While the other subsections that are presented in the Method section will vary based on the needs of you and your co-authors (more information about this will be provided in Chapter 13), in general, you will provide the details one will need if they choose to replicate the study.

Results

The Results section describes the statistical tests the researchers used to analyze the data, and the outcomes of those tests are provided. Tables and figures (e.g., graphs) are sometimes included to further illustrate the results.

Discussion

The discussion usually begins with a statement of how well the data supported the hypotheses. Any other notable results are mentioned here as well. Then the researchers discuss the results in light of previous research. Were the results consistent with what others have found? If not, the researchers will speculate about why not. The discussion section will also typically include information about the limitations of the present research as well as ideas for future research.

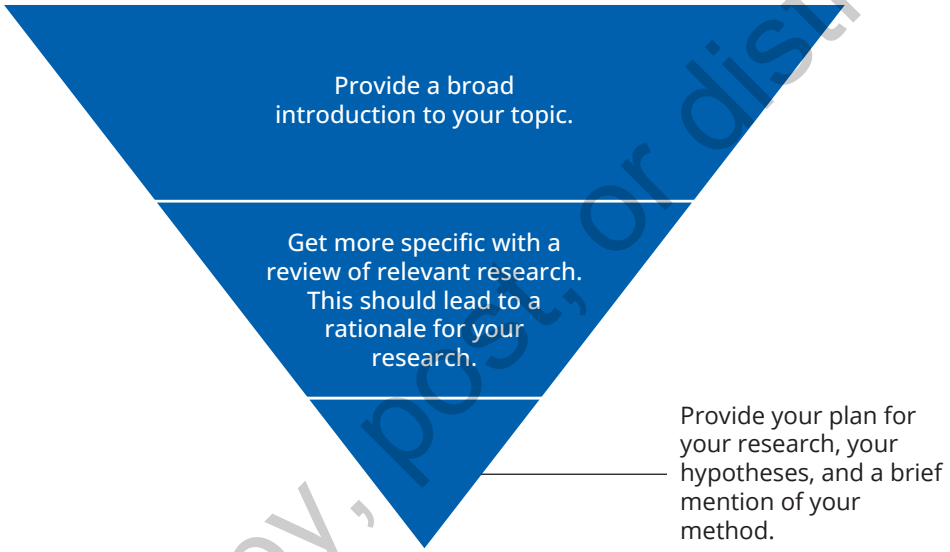
References

The reference section provides a list of all the sources referred to in the article. This section can be a wonderful resource because the sources cited in an article of interest may also be of interest to you.

OUTLINING YOUR LITERATURE REVIEW

Now that I have my literature in hand, what do I do with it? A good next step is to write an outline of your literature review. Think about your introduction section of a paper as an inverted triangle (see Figure 2.7). You should start out with a very broad introduction to your topic. After this, you should provide information about the relevant previous research on your topic. Think about the major points that you want to cover; some authors choose to divide these up using headers.

FIGURE 2.7 ■ Your Introduction Can Be Thought of as an Inverted Triangle, Starting Out Broadly, and Getting More Specific as It Progresses



While we will talk more about writing a research paper in Chapter 13, I do want to point out how you should think about your literature review. Let's take a look at a literature review from Yalch et al. (2019) on the topic of students reviewing the writing of their peers (note that Yalch et al. decided not to use headings).

> Engaged learning has been recognized as a touchstone of successful acquisition of knowledge and skills related to psychology (McGovern, 2002; McKeachie, 1999, 2002; Miserandino, 1999).
>
> *Note: Yalch et al. (2019) start their literature review with a very broad introduction to the topic of learning and how being actively engaged in learning can help one acquire skills.*
>
> One commonly used method of engaged learning is writing, which is not only a means of learning, but also a useful skill in and of itself (Noodine, 1999; for historical review see Haswell, 2008). Discerning ways to improve teaching students how to write has thus remained an active area of pedagogical research.

Note: Yalch et al. get more specific by talking about learning how to write.

Master teachers of psychology have noted that writing is an effective way of learning about psychology (e.g., Noodine, 1999, 2002; Pinker, 2014). Indeed, a number of studies have suggested that prompting students to write both inside and outside the classroom leads to increased learning (e.g., Butler et al., 2001; Radmacher & Latosi-Sawin, 1995). While this research suggests that writing may improve student learning about psychological content, writing activities did not necessarily improve the quality of writing in and of itself. To the contrary, teaching students to improve their writing is a difficult thing to do.

Note: Yalch et al. (2019) begin to review the literature on teaching students to write; they note that it has not been uniformly successful.

Some popular writers of fiction have suggested that reading the work of others is an effective means of improving one's own writing (e.g., King, 2000; Prose, 2006). Such writers note that their reading is not passive, but close and critical such that they read not only to identify aspects of writing that they like and want to emulate (e.g., vocabulary, turns of phrase), but also things they want to avoid (e.g., excessive elaboration, poor sentence structure). These themes are consistent with the idea that successful writing entails a dialectic between writing and reading in which each reinforces the other (Elbow, 2000). Critical reading of others' writing is also a method endorsed by psychologists interested in writing (e.g., Goddard, 2002; Pinker, 2014). For example, in her guidance on how to teach writing to psychology students, Noodine (2002) suggests that in addition to the instructor offering one or more model papers for students to emulate, students should be offered structured guidance for how to review papers and spend time reading and critiquing the writing of their peers.

Note: Yalch et al. (2019) review the related topic of teaching students to write by having them critically read others' writing.

There is some evidence suggesting that structured peer review of papers can be effective in improving students' writing. Fallahi et al. (2006) found that the effect of peer review combined with didactic instruction on writing, formal feedback, and in-class practice was effective at improving writing skills for psychology students. Earlier research suggests that one possible mechanism by which student peer review might improve writing skill is that students tend to provide more critical feedback on their peers' papers than course teaching assistants (Kottke, 1988). Given that course instructors (or other course staff like teaching assistants who assign grades to students' written work) are those who ultimately decide what "good" writing looks like (i.e., they, not students, control the standard of what a good paper is), these latter findings may suggest that critical peer reviews are more beneficial for the reviewer than for the reviewed, a finding that has also been demonstrated in subsequent studies (e.g., Cho & MacArthur, 2011; Li et al., 2010; Lundstrom & Baker, 2009). In other words, as writers who have written about their writing process (e.g., King, 2000) have suggested, it may be that the more critical students are in their reviews of peers' papers, the more attentive they are to their own writing. However, there is insufficient evidence demonstrating this empirically.

Note: Yalch et al. have established a rationale for their work.

Current Study

In this study we examined the influence of peer review on students' writing. We hypothesized that the more critical students were in their review of other students' paper drafts, the better the grades on their (the reviewers') papers would be *(pp. 317–318).*

Note: Yalch et al. (2019) provide the purpose of their research and they indicate what they expect to find (i.e., their hypothesis)".

What information should you take away from Yalch et al.'s (2019) literature review? You now have a better understanding of what research has been conducted on these topics previously, and you might decide to cover some of the same topics in your paper's introduction. It is important to note that you *cannot* cite any of the research cited in Yalch et al.'s literature review in your own paper unless you go and get the cited primary source. For example, let's say that you are interested in one of the statements that Yalch et al. made: "one possible mechanism by which student peer review might improve writing skill is that students tend to provide more critical feedback on their peers' papers than course teaching assistants (Kottke, 1988)." Let's say, you would like to make a similar point in your own paper. You must go get Kottke (1988) and read that; only then can you bring Kottke into your work (ideally, you should paraphrase Kottke and cite Kottke as the source of this information; only quote a source when the words are so special, you can't think of another way to say the same thing). So a literature review is a great source for figuring out what articles you want to pursue.

So what can you cite from Yalch et al. (2019)? You can cite details about the study that Yalch et al. did and what they found. That information is mainly in Yalch's Method, Results and Discussion sections. Yalch et al.'s article is the primary source for what Yalch et al. did. So when you are reading through an article and taking notes, do the following:

1. You should create a list of the primary sources you want to find (I usually put asterisks by the source citations in the article's reference section, and then when I'm done reading that article, I go to my library website and either download or request those articles from interlibrary loan, the articles I now know I want to read).
2. You should make notes regarding what article you are reading, and what those researchers did, and what they found (again, use your own words and cite your source). This usually can be summarized in one to two sentences. Some suggest that you can put this information on notecards (e.g., Landrum, 2021 see Figure 2.8).

Instead of using notecards, I put this information directly into my word processing program (I can change and/or move the information around later if necessary). I usually choose to immediately put the information into my own words so that plagiarism is not a risk as long as I also cite the person responsible for this information. However, if I do not have time to put something in my own words at that moment, I put the information in italics in the paper I'm writing, so that I know to go back and paraphrase the information. So for example, for Yalch et al.'s (2019)

FIGURE 2.8 ■ Example of Notes Taken from a Primary Source. The Notes Include a Citation as well as Information Regarding What the Researchers Did and What Results They Found

Citation of the Primary Source: Yalch, M. M., Vitale, E. M., & Ford, J. K. (2019). Benefits of peer review on students' writing. *Psychology Learning & Teaching, 18*(3), 317-325. https://doi.org/10.1177/1475725719835070

- **What the researchers did and what they found:** Yalch et al. (2019) had students in an undergraduate senior-level class review the papers that their classmates wrote. They found that those who were more critical of the student papers that they read were also the students who achieved higher grades on their own papers.

article, I would put the reference citation into my References page (we'll talk about formatting this in Chapter 13), and indicate in an introductory section that Yalch et al. (2019) had students in an undergraduate senior-level class review the papers that their classmates wrote. They found that those who were more critical of the student papers that they read were also the students who achieved higher grades on their own papers.

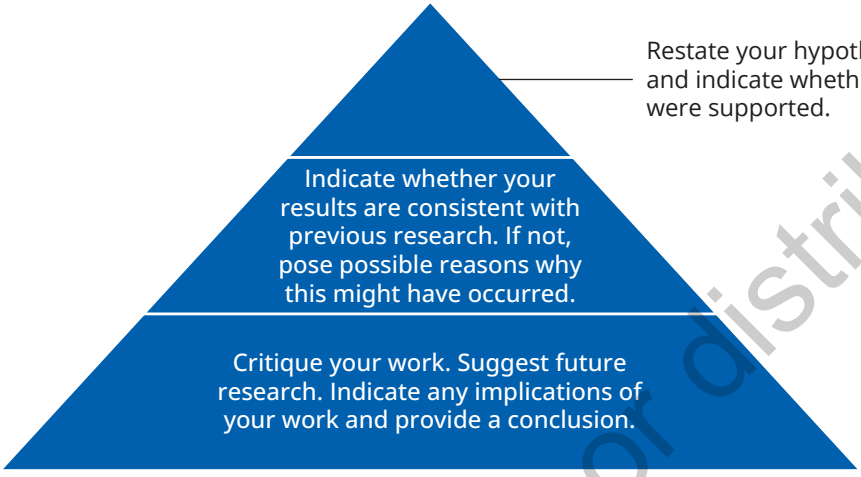
Make sure you make notes about your articles as you read them. If you wait to start writing until after you've read all your collected articles, you're likely to forget what you want to say about each piece of literature. You can always go back to an article if you need to clarify something.

After taking notes for all of the articles you wish to include in your literature review, you are ready to organize this information. Research articles on a similar topic or with similar results should be grouped together in your review. Multiple articles can be discussed in the same paragraph as long as they are connected by topic. Ultimately, your presentation of this literature will lead to the rationale for the current study. As the APA *Publication Manual* (2020) indicates, you will "show how your work builds usefully on what has already been accomplished in the field" (p. 76). As I mentioned before, we'll talk more about the specifics of writing of the literature review in Chapter 13.

There will also be opportunities to revisit information from your literature review when you are writing the Discussion section of your paper. Do you remember how your introduction took the form of an inverted triangle, starting out with a broad statement of the topic of interest and getting more specific as you progressed? Well the Discussion section takes the opposite form. Think of it as a right-side-up triangle (see Figure 2.9) that begins with specific information about your study.

Researchers often begin with a restatement of their hypotheses and an indication of whether or not those hypotheses were supported. You can also discuss any other major results that you obtained here, and you should indicate whether these results are in line with what others have found or not. So here, again, you will be discussing what others have done, and again, you need to make sure that you are working from the primary source material for anything you discuss. In addition, if your work adds to previous research in some way, you should indicate how. Thus, with this statement, you are focusing on the strengths of your work.

FIGURE 2.9 ■ The Discussion Section Can Be Thought of as a Right-Side-Up Triangle; It Starts with the Specific Details of Your Study and Gets Broader (e.g., Implications of the Work) as It Progresses



You should follow this information with a critique of your work (all studies have limitations). This critique potentially will lead to presented ideas for future research. It's important that the future research ideas are a reasonable next step given what you've done in your current research. Let's take a look at Yalch et al.'s (2019) discussion.

> In this study we examined the influence of peer review on students' writing. We found that the more critical students were of their peers' writing during an in-class peer review workshop, the higher their paper grades were even when controlling for their previous grades on written assignments and informal grades they received from peers during the peer review workshop.

Note: Yalch et al. begin with a statement of their results. (Note that Yalch et al. do not explicitly restate their hypothesis although the presented result is what they hypothesized.

> These results extend previous research on student peer reviewing and have implications for teaching writing to students of psychology.

> Study findings suggest that peer reviewing can be an effective means of improving students' grades on written assignments. These findings are consistent with previous research on student peer reviewing suggesting that (a) peer review is useful for improving student writing (Fallahi et al., 2006) and that (b) the degree to which students are critical during peer review is a possible mechanism for this improvement (Cho & MacArthur, 2011; Li et al., 2010; Lundstrom & Baker, 2009).

Note: Yalch et al. (2019) indicate that their results are consistent with previous research.

Current findings extend those of previous studies showing that it is the degree to which students are critical of their peers' writing rather than peers' critiques of their writing that drives the effectiveness of peer review.

Note: Yalch et al. indicate how their results extend previous findings.

This finding is also supportive of findings that unfavorable feedback provided for developmental purposes is often not perceived by the receiver as useful and does not lead to the willingness to change behavior based on that feedback (Steelman & Rutkowski, 2004). In addition, that the effect of peer review persists despite controlling for students' grades on previous writing assignments suggests that being more critical in peer reviews may help students become better writers (e.g., rather than more critical readers simply being better writers to begin with). This idea of self-improvement is further underscored by the finding that informal grades given during peer review are uncorrelated with official grades on previous written assignments.

These results have implications for pedagogical practice. The most obvious implication is that one way to facilitate self-improvement in writing is to get students engaged in critically reviewing the writing of their peers.

Note: Yalch et al. indicate what the implications are of their research.

A more subtle implication arises from a result that was not statistically significant: current findings suggest that although students benefitted from giving feedback on peers' writing, they did not benefit from receiving feedback from their peers. This suggests that learning from peer review is only one way and that there is thus work for instructors to do to get students to benefit from the feedback they receive from their peers rather than just using their peers' work to help sharpen their own editorial skills. Therefore, providing the scoring rubric may not be enough for a student to provide a critical review. Rather, one study showed that even with a rubric, several (e.g., three or more, and optimally at least six) peer ratings are necessary to establish reliable peer reviews (Cho et al., 2006). Research further suggests that certain techniques used by peer reviewers (e.g., localizing comments, focusing on higher vs. lower level writing issues) are more likely to improve future draft quality for those reviewed (Patchan et al., 2016) and that explicit instruction to peer reviewers is often necessary to facilitate their utilization of these techniques (e.g., Baker, 2016; for meta-analytic review of instructional approaches to scaffolding peer review, see Hoogeveen & van Gelderen, 2013). There is also evidence that the best reviewers provide critical, problem-focused feedback (Patchan & Schunn, 2015), although students may need some training both on the usefulness of this kind of feedback and how to resist the pull to be too lenient and reliant on praise in their reviews in order for reviewers to implement this feedback (Vinton & Wilke, 2011). In addition, instructors may want to allocate additional time to students after the critique of others to reflect on their own paper and how to improve it based on feedback given to others (Baker, 2016). Future research may also focus on the effect of feedback specificity (Goodman et al., 2004) as well as having

students take a strengths-based approach to delivering feedback on paper as well as the weakness-based approach that is typically employed (Aguinis et al., 2012).

Note: Yalch et al. note ideas for future research.

This study benefitted from a longitudinal design and from using relevant, real-world metrics of classroom behavior as variables in the study.

Note: Yalch et al. indicate what the strengths of their work were.

However, this study also had limitations that point to directions for future research. Some of these limitations have to do with the study's correlational design, which precludes causal interpretations of findings. For example, although our data suggest that reviewing peers' written work leads to better writing on the part of peers, this interpretation cannot be conclusive without comparison with a control group (e.g., a group in which students only read peers' work, not evaluate it). Another limitation to this study was that we examined only the quantitative feedback reviewers provided (e.g., final tabulated score on a rubric) and did not examine qualitative comments, either written (on the paper draft or rubric) or spoken (during feedback session). Analysis of this latter form of feedback could not only yield rich contextual information, but also provide information about possible mediators of the effects observed. For example, one reason for the lack of benefit of receiving peer reviews may be that qualitative comments on the lowest quality drafts were out of the zone of proximal development of the students reviewed whereas comments on higher quality drafts were more easily integrated. Finally, and on a related note, in this study we did not measure other potential mediators of the effects of this study (e.g., overall GPA, level of motivation in general and for peer review in particular). Future research can thus improve upon and extend this study by examining possible alternative hypotheses and possible mediating/moderating influences on the effects found in this study using an experimental design including both quantitative and qualitative data.

Note: Yalch et al. note what the limitations of their work were, and provide future research ideas that were inspired by these limitations.

Conclusion

In this study we examined the effect of peer review on students' grades in a writing-focused, senior-level psychology course. Results suggest that the more critical students were when reviewing their peers' writing, the better grades they received. These findings highlight the utility of peer review as a pedagogical tool in the psychology classroom (Yalch et al., 2019, pp. 321–323).

Note: Yalch et al. end their paper with a concluding statement; it's the "take-away" from this work.

Note: The passages quoted from Yalch et al. (2019) have been altered so that cited references are in line with the 7th edition of the APA Publication Manual (e.g., when a reference citation has more than two authors, the citations note the first author's last name and "et al." each time).

TEST YOURSELF! 2.3

1. When you are writing a manuscript, where do you develop your rationale for doing your particular research project?
   - **a.** discussion
   - **b.** introduction
   - **c.** method
   - **d.** results
2. How do we generally start a literature review in psychology?
   - **a.** We indicate the purpose of the study.
   - **b.** We start with a broad introduction to the topic.
   - **c.** We start with a thesis statement.
   - **d.** We start with a statement of the hypothesis.
3. When reading through an article by Bensky et al. (2013), you read about research by Fiset et al. (2003) that is really appealing to you. What do you need to do in order to cite Fiset et al.'s work in your paper?
   - **a.** Provide details regarding what Fiset et al. did and give credit to Bensky et al. (2013) in your paper.
   - **b.** Provide details about what Fiset et al. did and give credit to Fiset et al. (2003) in your paper.
   - **c.** Go get Fiset et al.'s (2003) paper so you can read it, and then provide details about what Fiset et al. did and credit Bensky et al. (2013) in your paper.
   - **d.** Go get Fiset et al.'s (2003) paper so you can read it, and then provide details about what Fiset et al. did and credit Fiset et al. (2013) in your paper.

GENERATING HYPOTHESES

In most forms of research you will need to generate one or more hypotheses *before* you conduct the research. As mentioned above, hypotheses are your expectations or predictions about the relationship that exists among the variables of interest. Earlier I gave an example of generating a hypothesis from theory. Hypotheses are also often derived from previous research. For example, let's look at the research of Dieze et al. (2017). They were interested in investigating whether viewing a movie while wearing headphones versus hearing the audio over loud speakers would differentially impact the amount of snacking that people did. Previous researchers have found that if people are distracted while eating, for example, while playing video games, they will tend to eat more (Chaput et al., 2011). Some (e.g., Witmer & Singer, 1998) have claimed that distraction reflects immersion, the act of being deeply involved in an activity, thus, the more someone is immersed in an activity, the more distracted they are and the more they are predicted to eat. Thus, Dieze et al. hypothesized that using headphones would increase the level of immersion and lead to an increased snack intake more than loud speakers would.

Dieze et al. (2017) then had college students in Germany watch a 40-minute movie; one half of the participants listened to the movie on headphones while the other half listened to the movie on speakers. Participants were allowed to choose preferred snacks before the viewing; these snacks were available in bowls during the movie, and participants were free to eat as much

as they pleased. After the movie, the participants answered questions in which they rated, for example, their level of immersion during the movie. The researchers determined how much participants ate by weighing the bowls before and after the movie. And the results? Those listening to the audio through speakers ate more than those listening through headphones! Dieze et al.'s hypothesis was not supported. There were also gender differences that were unexpected. Females ate less while wearing headphones, but males ate about the same amount regardless of whether they were wearing headphones or listening to speakers.

When results do not come out as expected, it is appropriate to try to figure out why the data did not support the hypothesis(es). Dieze et al. (2017) did this, and they found that those wearing headphones were equally immersed in the movie as those listening through speakers. Thus, this manipulation did not work to increase immersion as expected. Dieze et al. were good to include an assessment of the level of immersion in their research. This is called a **manipulation check**; it is a dependent variable that is used to check and see if a manipulation worked.

Dieze et al. (2017) set out to investigate the issue of whether the type of audio presented affects the amount of snack intake; the results suggest that audio transmission may affect eating behavior, although not in the way that Dieze et al. expected. Note that just because Dieze et al.'s hypothesis was not supported, this does not mean that we should give up on the idea that distraction causes people to eat more or even that headphones do not work to encourage immersion. As Dieze et al. point out, researchers need to conduct additional research, perhaps using other methods of encouraging immersion and different types of movies (maybe headphones will be more immersive with action movies?). It is only with additional research that we will ultimately be able to understand the conditions under which snack intake is likely to be increased.

Thus, once you have a research idea and literature relevant to your topic, researchers typically create a research hypothesis or hypotheses. There are a few guidelines to follow. First your hypothesis must be testable; you must state your hypothesis so that it is possible to design a study to test it. You must also state your hypothesis as something you *expect* to happen, not something that *will* happen. Since hypotheses are stated before a study has been conducted, if you state what will happen, you'll inappropriately sound like some all-knowing being.

Let's look at another example of a hypothesis. Consider the study conducted by Byington and Schwebel (2013). They were interested in whether mobile devices play a role in college students' pedestrian accidents. To investigate, they had college students participate in a virtual pedestrian task while either undistracted or distracted by their cell phones. Before conducting the study, Byington and Schwebel stated the following, "We hypothesized that participants would take greater risks and be less attentive to traffic while distracted by mobile internet in the virtual pedestrian environment" (p. 79). Another way to write this hypothesis is to use an if/then format: If pedestrians are distracted, as opposed to not distracted, by mobile internet in a virtual pedestrian environment, then they are hypothesized to take greater risks and be less attentive to traffic. (This hypothesis was supported.)

Regardless of the format used to convey Byington and Schwebel's (2013) hypothesis, note that the hypothesis not only says differences are expected between those distracted and those not distracted; it also predicts the direction of the outcome—that those on the phone will take *greater* risks and be *less* attentive. Researchers typically do expect to obtain differences between groups (although note that researchers can state that they expect differences between all groups

or specify explicitly that they expect differences between just some of the tested groups), and they often are able to indicate an expected direction for the outcome because the previous literature has led them to that expectation. If there is a lack of previous research on your topic, however, you can state a nondirectional hypothesis, such as that those who are distracted are expected to display a different amount of risk and attention to traffic than those who are undistracted, or no hypothesis at all. In the latter case, you should state that because of the lack of previous research, no hypotheses will be provided. Table 2.2 provides guidelines to follow when creating your hypothesis.

TABLE 2.2 ■ Use These Guidelines When Creating a Hypothesis for an Experiment

Sample Hypothesis: If (1) a defendant has a face tattoo as opposed to no face tattoo (3), then (1) participants (6) are expected (2) to be more likely (5) to find him guilty (4).
(1) Use an "if, then" statement (other forms are allowed but this is common).
(2) State the hypothesis as an expectation.
(3) Write your hypothesis as a parallel statement (i.e., if you are comparing groups, identify both groups in the hypothesis).
(4) A hypothesis statement should include your dependent variable.
(5) A hypothesis should state the expected direction of the finding (e.g., more than, less than).
(6) A hypothesis for an experiment typically will refer to groups of individuals.

TEST YOURSELF! 2.4

1. Which of the following is a necessary feature of a hypothesis?
   - **a.** The hypothesis should be stated after a study is conducted.
   - **b.** The hypothesis should be stated before a study is conducted.
   - **c.** The hypothesis should be stated as something you know will occur.
   - **d.** The hypothesis must be agreed upon by three scholars before being put forth.
2. Hypotheses are often generated from
   - **a.** our expectations.
   - **b.** our results.
   - **c.** practical problems.
   - **d.** theory.
3. Which of the following is a necessary feature of a hypothesis?
   - **a.** A hypothesis states the direction of the outcome.
   - **b.** A hypothesis is what common sense dictates.
   - **c.** A hypothesis states what is expected to happen.
   - **d.** A hypothesis must use an "if, then" format.

SUMMARY

Researchers can get their research ideas from real life experiences, from a need to solve practical problems, from reading previous research, and from a knowledge of theory. They often conduct original research, building on work that has been done previously; thus it is important that before starting your own investigation you become familiar with your topic by conducting a literature search. There are various databases that can be used to search for literature in psychology, and depending on your needs, you can narrow or broaden a search in an effort to find the literature most relevant to your topic.

Your search may yield both primary and secondary sources. Although reading secondary sources such as books is good for getting an overall view of the literature, most of the sources you should use in your research are journal articles that are primary sources. You'll want to see the entire research report, to know how the authors developed their hypotheses and to learn the details of their methodology. Having access to these details will help you to provide your readers with a true representation of what the other researchers did. Primary sources are also helpful in that the literature review within a primary source will provide information regarding past research and theories relevant to the topic of interest. Thus, you may get ideas about what other primary sources you wish to read from reading the literature review of other researchers.

When writing your own literature review, you should start out with a very broad introduction to your topic. After this, you should provide information about the relevant previous research on your topic. This will lead up to a rationale for your research, the purpose of your research and your expectations for your results (i.e., your hypotheses). Hypotheses are typically generated from results obtained in previous research or from theory; thus, the literature search is important to this process as well.

KEY TERMS

abstract
conceptual replication
exact replication
interlibrary loan
manipulation check
meta-analysis
parsimonious
primary source
review articles
secondary source

REVIEW QUESTIONS

1. Identify four sources of research ideas.
2. State three general ways you can modify previous research.
3. Differentiate between a primary source and a secondary source. What kind of information can you obtain from each kind of source?

4. Differentiate between a review article and a meta-analysis.
5. Describe how to locate sources relevant to your research topic.
6. Identify the basic components of a journal article.
7. List the guidelines for creating a hypothesis.

ARTICLES AS ILLUSTRATION

The three articles mentioned immediately below provide an extended example of how some researchers got the ideas for their work. In the first example, a favorite of mine, James Pennebaker and his colleagues (1979) got an idea for a study by listening to a country and western song presumably based on someone's real life experiences: *Don't the Girls Get Prettier at Closing Time*? An interesting idea for research certainly, but how to test it? They decided to do an experiment to investigate, for both sexes, whether members of the opposite sex are seen as more attractive as the time to interact with them diminishes. Pennebaker et al. had study participants rate the attractiveness of those of the opposite sex at three different times during the night (9:00 p.m., 10:30 p.m., and midnight). Then they examined whether those ratings changed significantly over the course of the evening. I'll let you read the article to find out what happened!

The other two articles mentioned immediately below show how researchers can use previous research to get their ideas. Specifically, at the end of Pennebaker et al.'s (1979) article, the authors wrote about possible reasons for their results, reasons that future researchers might be inclined to investigate (Pennebaker's research was not designed to isolate the reasons for their findings). Gladue and Delaney (1990) read Pennebaker's work and decided to investigate a possible reason for their findings (Here's a hint: beer goggles!). Again, I'll let you read the article to discover what they found.

In the third article mentioned below, Madey and his colleagues (1996) also read Pennebaker et al.'s (1979) article and investigated whether there is a limitation to its results—a situation in which Pennebaker et al.'s results do not hold. In this case, the title reveals the answer to the question they ask with their research: *They Do Get More Attractive at Closing Time, But Only When You Are Not in a Relationship*.

The questions for each of these three articles will help you focus on the important points of the articles. In addition, see how one article leads to the next and how together they tell a story.

> Pennebaker, J. W., Dyer, M. A., Caulkins, R. S., Litowitz, D. L., Ackerman, P. L., Anderson, D. B., & McGraw, K. M. (1979). Don't the girls get prettier at closing time: A country and western application to psychology. *Personality and Social Psychology Bulletin, 5*, 122–125. https://doi.org/10.1177/014616727900500127

1. What was Pennebaker et al.'s hyp othesis? How did Pennebaker et al. come to develop this hypothesis?
2. What does it mean to say that individuals exhibit greater liking for threatened behaviors, and how does this greater liking apply to Pennebaker et al.'s work?
3. Describe Pennebaker's methodology, including dependent and independent variable(s).
4. How did Pennebaker et al. choose their study participants?
5. Pennebaker et al. tested their hypothesis at three different bars. Why do you think they went to three bars as opposed to only one?
6. What were Pennebaker et al.'s results?
7. What do Pennebaker et al. propose as possible reasons for their results?

Gladue, B. A., & Delaney, H. J. (1990). Gender differences in perception of attractiveness of men and women in bars. *Personality and Social Psychology Bulletin, 16*, 378–391. https://doi.org/10.1177/0146167290162017

1. Where did Gladue and Delaney get their idea to do this research?
2. Describe Gladue and Delaney's methodology, including dependent and independent variable(s).
3. Why did Gladue and Delaney ask their study participants to rate both patrons at a bar and those in photos?
4. What were Gladue and Delaney's results?

Madey, S. F., Simo, M., Dillworth, D., Kemper, D., Toczynski, A., & Perella, A. (1996). They do get more attractive at closing time, but only when you are not in a relationship. *Basic and Applied Social Psychology, 18*, 387–393. https://doi.org/10.1207/s15324834basp1804_2

1. Where did Madey et al. get their idea to do this research?
2. Describe Madey et al.'s methodology, including dependent and dependent variable(s).
3. What were Madey et al.'s results?

SUGGESTED ACTIVITIES

1. Do a search for literature on a topic you find interesting. Try narrowing and broadening your search.
2. Propose a research study to study a real-life issue relevant for your campus. One possibility is to propose a survey to assess what people would think about a particular

change on campus (I recently wondered what people think about students living with pets in their dorm rooms—what campus change can you think of?). Do a literature search on the topic and use this literature to help you generate a hypothesis.

LET'S WRITE ABOUT RESEARCH!

1. Do a search for a primary source journal article, locate the entire article, and prepare an outline of the article. Need a suggestion for an article? How about this one?

   Mattar, L., Farran, N., Abi Kharma, J., & Zeeni, N. (2019). Movie violence acutely affects food choices in young adults. *Eating Behaviors, 33*, 7–12. https://doi.org/10.1016/j.eatbeh.2019.02.002

2. Do a search for a primary source journal article, locate the entire article, and summarize briefly each of the major sections using your own words. Here's a suggestion for an article you can use.
   Boysen, G. A., Prieto, L. R., Holmes, J. D., Landrum, R. E., Miller, R. L., Taylor, A. K., White, J. N., & Kaiser, D. J. (2018). Trigger warnings in psychology classes: What do students think? *Scholarship of Teaching and Learning in Psychology, 4*(2), 69–80. https://doi.org/10.1037/stl0000106

3. Do a search for a primary source journal article designed to solve a practical problem. Summarize the article in your own words. Need a suggestion for an article? How about this one?

   Zhao, Li., Zheng, J., Mao, H., Yu, X., Ye, J., Chen, H., Compton, B. J., Heyman, G. D., & Lee, K. (2021). Effects of trust and threat messaging on academic cheating: A field study. *Psychological Science, 32*(5), 735–742. https://doi.org/10.1177/0956797620977513

4. Propose a research study as a follow-up to previous research. Need a suggestion for an article? How about this one?

   Knepp, M. M. (2022). Closeness of relationship to LGBTQ individuals is associated with increases in ally identity and behavior. *Journal of LGBT Youth, 19*(2), 135–151. https://doi.org/10.1080/19361653.2020.1761924