

Psychological Research and the Research Methods Course

CHAPTER

1

How Psychologists Acquire Knowledge

The Research Process

- Finding a Problem • Reviewing the Literature
- Theoretical Considerations • Hypothesis
- Research Plan • Conducting the Research Project
- Analysis of Research Findings

- Decisions in Terms of Past Research and Theory
- Preparing the Research Report
- Sharing Your Results: Presentation and Publication
- Finding a New Problem

Why Is the Research Methods Course Important?

Welcome to the world of psychological research! Because the two of us have taught this course for over 60 years (combined!), we have seen the excitement that research can generate in student after student. Throughout this text we have tried to make it perfectly clear that research is something that you can (and should) become involved in. We hope you will enjoy reading about the student projects we use as research examples throughout this text. Student research projects are making valuable contributions to our field, and we hope to see your name among those making such contributions!

To make full use of this text, you need to become actively involved. Active involvement means that you need to

1. Stop and think about **The Psychological Detective** sections as soon as you encounter them. Each of these sections asks you to think about a question concerning psychological research. Take full advantage of these sections; we designed them to help you think critically about psychological research. Critical thinking is vital to good detective work; we want you to become the best psychological detective possible.
2. Refer to figures and tables when directed to do so.
3. Complete the **Check Your Progress** features when they appear.

Becoming actively involved in this course helps the material come alive; your grade and your future involvement in psychology will reflect your efforts.

We purposely titled our text *The Psychologist as Detective* to convey the excitement and thrill experienced by researchers when they investigate questions that are at the core of what it means to be a psychologist. To make the fifth edition of *The Psychologist as Detective* as lively as possible, we've included several quotations from the world's most famous detective, Sherlock Holmes. For example, Holmes reflected his passion for his work when he said, "I swear that another day shall not have passed before I have done all that man can do to reach the heart of the mystery" (Doyle, 1927, p. 732). Psychological researchers are just as passionate in their pursuit of the truth.

The parallels between conducting psychological research and working on a detective case are striking. The detective has to know the boundaries of the case (the experimenter develops a research question). The detective eliminates suspects (the researcher exercises control over unwanted factors), gathers evidence (the researcher conducts the experiment and makes observations), proposes a solution (the researcher analyzes research results and offers an interpretation), and offers a solution to the jury (researchers share their results and interpretations with their peers).

Our examination of psychological research begins by considering a research project that would intrigue even the best psychological detective:

You have been receiving junk e-mails inviting you to try out the many online dating services for several months. Your typical response is to click the “delete” key; however, you finally start to wonder about online dating services. What characteristics do people look for in a potential date? Are there differences in the characteristics looked for by men and women?

Such questions prompted Kim Driggers and Tasha Helms, students at Oklahoma State University, to conduct a research project that involved an evaluation of salary as a factor in dating. Driggers and Helms (2000) reported, “Male and female college students viewed pictures of the opposite sex and rated the target’s attractiveness and their own willingness to date the target” (p. 76). As you can see from Figure 1-1, they found that willingness to date increased as salary increased. Moreover, the female participants seemed to be more influenced than the male participants by the highest salary level.

For the time being we will not concern ourselves with exactly how Driggers and Helms gathered their information concerning willingness to date. Our concern at present is why they gathered this information. The answer really is quite straightforward—they had an interesting

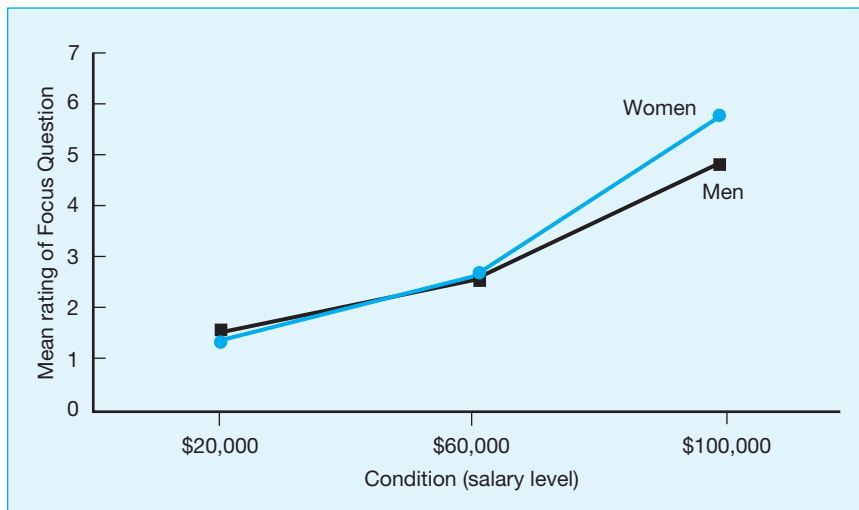


FIGURE 1-1 The Mean Rating of Male and Female Participants for Each Condition (\$20,000, \$60,000, \$100,000) on the Focus Question (“How willing would you be to go on a date with this person?”).

Source: Fig. 1 from Driggers, K. J. and Helms, T. (2000). “The effects of salary on willingness to date.” *Psi Chi Journal of Undergraduate Research*, 5, 76–80. G144. Copyright © 2000 Psi Chi, The National Honor Society in Psychology (www.psiichi.org). Reprinted by permission. All rights reserved.

question that needed an answer. Asking and then attempting to answer questions are at the heart of what psychologists do. In short, psychologists are in the business of acquiring new knowledge.

How Psychologists Acquire Knowledge

Part of the reason that psychology always is exciting and interesting is because it deals with the full range of the behavior of humans and animals. Without question, we are talking about an immense number of behaviors. Now, add the vast number of situations and circumstances under which these behaviors can occur and the total number of questions about behavior that psychologists can be interested in is truly staggering.

Because of this great diversity of questions, psychologists have developed different types of research methods. Each method is designed to provide an answer to a research question about a specific behavior in a specific setting. For example, the method researchers use to investigate the effects of a person's salary on desirability as a date likely will be different from the method used to study road rage or the behavior of a white rat in a maze.

In the following chapters we will explore several of the most popular research methods that psychologists have developed. More specifically, the procedures that we will examine include qualitative research; descriptive methods; correlational studies; surveys, questionnaires, tests, and inventories; ex post facto studies; and experiments. Table 1-1 provides a brief description of each of these methods and where you will find them in this book.

TABLE 1-1 Research Methods Used by Psychologists

Method	Description	Location
Qualitative Research	A holistic approach that is conducted in a natural setting. It focuses on an entire phenomenon, subculture, or culture. The goal of this approach is to develop a complete description of the behavior of interest.	Chapter 4
Descriptive Methods	Research methods that do not involve the manipulation of factors or variables by the researcher. The researcher may collect data from archives and other previously recorded sources, case studies, and clinical observation.	Chapter 5
Correlational Studies	A mathematical approach that studies the strength of the relation between two factors or variables of interest.	Chapter 5
Surveys, Questionnaires, Tests, and Inventories	An approach that researchers use to assess attitudes, thoughts, emotions, and feelings.	Chapter 6
Ex Post Facto Studies	As the name indicates, the factors or variables of research interest are studied "after the fact" (<i>ex post facto</i>)	Chapter 6
Experiments	An attempt to determine the cause-and-effect relations that exist in nature. This approach involves the manipulation of an independent variable (IV), recording of changes in a dependent variable (DV), and control of extraneous variables.	Chapter 7

As you will see in the following chapters, each of these general methods can have several types or variations. However, regardless of the method that the researcher selects, the general research process will be the same.

The Research Process

A number of interrelated activities make up the research process. These activities appear in Table 1-2. As you can see, one activity leads to the next one until we share our research information with others and the process starts all over again. We will now briefly describe each of these steps but will cover them in greater detail in the following chapters.

TABLE 1-2 Components of the Research Process

Each component builds on the previous components until a new problem is developed and the process starts over again.

Problem	You detect a gap in the knowledge base or wonder about a relation.
Literature Review	Consulting previous reports determines what has been found in the research area of interest.
Theoretical Considerations	The literature review highlights theories that point to relevant research projects.
Hypothesis	The literature review also highlights hypotheses (statements of the relation between variables in more restricted domains of the research area). Such hypotheses will assist in the development of the experimental hypothesis—the predicted outcome of your research project.
Research Plan	You develop the general plan or research design for conducting the research project.
Conducting the Project	You conduct the research project according to the research plan or experimental design.
Analysis of Research Findings	You analyze your research findings. Many projects will involve statistical analyses and statistical decisions.
Decisions in Terms of Past Research and Theory	Your findings guide decisions concerning the relation of the present research project to past research and theoretical considerations.
Preparation of the Research Report	You write a research report describing the rationale, conduct, and results of the project according to accepted American Psychological Association (APA) format.
Sharing Your Results: Presentation and Publication	You share your research report with colleagues at a professional society meeting and/or by publication in a professional journal.
Finding a New Problem	Your research results highlight another gap in our knowledge base, and the research process begins again.

Finding a Problem

Each research project begins as a problem or a question for which we are seeking an answer. For example, Driggers and Helms (2000) wanted to know whether a person's salary affected the willingness of others to date that person.

Reviewing the Literature

Once you have chosen the problem you plan to research, you must discover what psychologists already know about the problem. Thus, the next step is to find out what research studies already exist in this area.



Why is it important to conduct a thorough review of the literature before conducting your research project? Give this question some thought and write down your reasons before reading further.

You may find that the exact project you have in mind has been conducted many times before. Hence, a modification of your idea, not a replication, may be more informative.

Theoretical Considerations

In the course of your literature review you will undoubtedly come across theories that researchers have developed in the area you have chosen to research. A **theory** is a formal statement of the relation among the variables or factors of interest in a particular research area. A theory is not based on the researcher's guess about the relations among variables. The results of numerous research studies typically form the basis for a psychological theory.

Theory A formal statement of the relations among the variables in a given area of research.

Leon Festinger's (1957) cognitive dissonance theory is a good example of a psychological theory that has generated considerable research. Festinger proposed that tension is aroused when two beliefs, thoughts, or behaviors are psychologically inconsistent (dissonant). In turn, we are motivated to reduce this cognitive dissonance by altering our thoughts or behaviors to make them more compatible. For example, (1) believing that high cholesterol is bad for your health and (2) eating pizza (which raises cholesterol) almost every day are inconsistent. The dissonance created by having this incompatible belief and behavior might be reduced by deciding that the reports on the harmful effects of cholesterol really are not correct or by eating pizza less often. Many researchers have tested predictions from Festinger's theory over the years.

All good theories share two common properties. First, they represent an attempt to organize a given body of scientific data. If a theory has not been developed in a particular area of research, we are faced with the task of having to consider the results of many separate experiments and decide how these results are related to each other.

The second property shared by theories is their ability to point the way to new research. By illuminating the relations among relevant variables, a good (i.e., testable) theory also suggests what might logically happen if researchers manipulate these variables in certain

ways. You can think of a theory as being like a road map of your home state. The roads organize and show the relations among the towns and cities. By using this map and a bit of logic, you should be able to get from point A to point B. Thus, the theories that you encounter while conducting a literature review will help point you to a relevant research project.

Hypothesis

If you think a theory is like a road map of your home state, then you can think of a hypothesis as being like the map of a specific town in your state. The **hypothesis** attempts to state specific relations among variables within a selected portion of a larger, more comprehensive research area or theory. Within the general domain of cognitive dissonance theory, a number of studies have been concerned with just the finding that cognitive dissonance results in arousal. The hypothesized arousal occurs through increases in such physiological reactions as perspiration and heart rate (Losch & Cacioppo, 1990). Just as the map of your hometown may show you several ways to arrive at your destination, researchers may find that there is more than one route to their research objective. Hence, researchers may develop several hypotheses to answer the research question. For example, you might predict that a reduction in arousal would result in a decrease in cognitive dissonance. This prediction has been tested; one experiment showed that participants who consumed alcohol (arousal reduction) had reduced levels of cognitive dissonance (Steele, Southwick, & Critchlow, 1981).

Hypothesis An attempt to organize certain data and specific relations among variables within a specific portion of a larger, more comprehensive theory.

As your research project takes shape, you will develop a specific hypothesis. This hypothesis, frequently called the **research** or **experimental hypothesis**, will be the predicted outcome of your research project. In stating this hypothesis you are stating a testable prediction about the relations between the variables in your project. Based on the scientific literature you have reviewed, your experimental hypothesis will be influenced by other hypotheses and theories that researchers have proposed in your area of interest. For example, your hypothesis might be “If potential customers dress in old, worn-out clothes, then they will not be waited on as quickly as customers dressed in better clothing.”

Research or experimental hypothesis The experimenter’s predicted outcome of a research project.

Research Plan

Once you have formulated your hypothesis, you need a general plan or experimental design for conducting your research and gathering data. This plan is called a **research design**.

Research design The general plan for conducting research and gathering data.

Conducting the Research Project

The next step is to conduct the research project. It is not a foregone conclusion that you will conduct your research in a laboratory. You may find yourself gathering research data in a shopping mall, an animal observation station, an archive, or hundreds of other possible locations. You will put all your preparations and controls to the test as you gather your research data.

Analysis of Research Findings

Your research project is not complete when you have gathered the data; the next step is to analyze the data that you gathered. As you will see in our discussion of qualitative research

(see Chapter 4), this analysis may result in a lengthy narrative description of the behavior of interest. However, in many projects numerical data are involved. This is where statistics come into play; statistics is the branch of mathematics that we will use to make sense of and analyze numerical data. Based on the results of our data analysis, we will decide the importance (*significance*) of our research findings.

Decisions in Terms of Past Research and Theory

Once you have conducted your analyses, then you must interpret your results in light of past research and theory. Was your research hypothesis supported? Do your results agree with past research? How do they fit into the current theoretical structure in this research area? If your results do not fit perfectly, what changes need to be made in your interpretation or existing theory to accommodate them? Does lack of support for your hypothesis disconfirm the theory? We will have more to say about hypothesis testing and theories in subsequent chapters.

Researchers want to be able to extend or generalize their results as widely as they legitimately can. Would Driggers and Helms's (2000) results on the effect of salary level and willingness to date also generalize to other types of participants besides college students? This is the type of issue with which generalization deals.

Preparing the Research Report

Before you share the results of your research with the scientific community, you must prepare a written research report. You will prepare this research report according to the format prescribed by the American Psychological Association (APA). This format, often called APA format, is detailed in the *Publication Manual of the American Psychological Association* (2001).

Although many specific details of APA format have evolved over the years, University of Wisconsin psychologist Joseph Jastrow originally proposed the first structure of a research report in the early part of this century (Blumenthal, 1991). Jastrow's purpose in suggesting a standard format for all psychological papers was to make the communication of research results easier and more consistent. A standard form enables researchers to know exactly what to include in their papers and readers to know where to look for specific experimental details, procedures, and results. We will discuss APA format in detail in Chapter 14. We encourage you to look at that chapter now and refer to it throughout the course; the more familiar you are with this format, the easier it will be for you to prepare your own report.

Sharing Your Results: Presentation and Publication

Once you have conducted the project, analyzed the findings, and prepared the research report, it is time to share your results. The two most popular ways to accomplish this objective are (a) to present an oral paper or a poster at a psychological convention and (b) to publish an article in a professional journal.

Even though many of you may be shaking your heads and saying, "I could never do that in a million years," we believe (and know from experience) such accomplishments are within the grasp of most motivated undergraduate psychology students. In fact, such opportunities, especially for presenting papers and posters at psychological conventions, have increased dramatically in recent years. Paramount among these opportunities are a growing number of state and regional student psychology conventions. These events, summarized in Table 1-3, feature student presentations exclusively.

TABLE 1-3 Opportunities for Undergraduates to Present Their Research**State and Regional Conferences**

Georgia Undergraduate Research in Psychology Conference

Southeastern Undergraduate Psychology Research Conference

Arkansas Symposium for Psychology Students

ILLOWA Undergraduate Psychology Conference

Mid-America Undergraduate Psychology Research Conference

Great Plains Students' Psychology Convention

Joint Meeting of the Association for Psychological and Educational Research in Kansas and the Nebraska Psychological Society

Michigan Undergraduate Psychology Paper Reading Conference

Minnesota Undergraduate Psychology Conference

Carolinas Psychology Conference

Delaware Valley Undergraduate Research Conference

Lehigh Valley Undergraduate Psychology Research Conference

University of Winnipeg Undergraduate Psychology Research Conference

The journal *Teaching of Psychology* also carries a listing of undergraduate student conferences. For additional information you also might want to try the Society for the Teaching of Psychology Web page, which features an excellent list (<http://teachpsych.lemoyne.edu>).

If there is no student convention in your area, you can consider presenting a paper in one of the Psi Chi (National Honor Society in Psychology) sessions at a regional convention. One of the six regional association meetings held each year (Eastern, Midwestern, Rocky Mountain, Southeastern, Southwestern, and Western Psychological Associations) should be close enough to offer a potential forum for your research (see Table 1-4). In addition to the sessions held at these regional meetings, Psi Chi sponsors student paper sessions at the national meetings of the American Psychological Association and the American Psychological Society. Finally, if none of these options is a viable opportunity for you to present your research, then you should consider starting a paper-reading or poster presentation session on your own campus. Very successful annual events of this nature occur at many schools.

Although the opportunities for students to publish a journal article may be a bit more difficult to find than opportunities to present a paper at a convention, such opportunities do exist. For example, the *Journal of Psychological Inquiry* and the *Psi Chi Journal of Undergraduate Research* (see Table 1-5) are devoted to the publication of research conducted and

TABLE 1-4 Student Sessions Sponsored by Psi Chi (National Honor Society in Psychology)

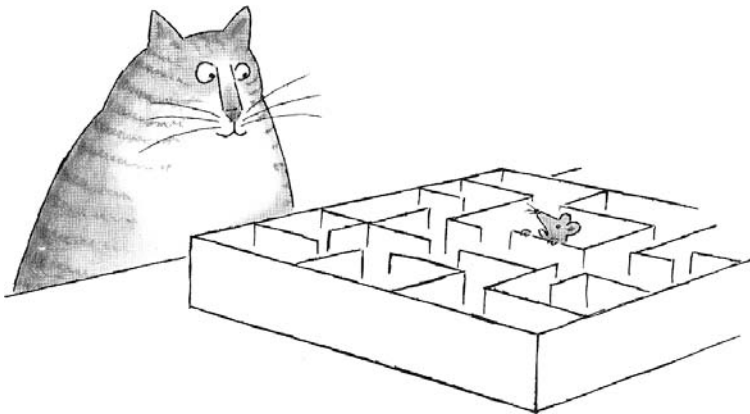
Psi Chi routinely features paper and/or poster sessions at regional and national conferences.

Eastern Psychological Association	Rocky Mountain Psychological Association
Southeastern Psychological Association	Western Psychological Association
Midwestern Psychological Association	American Psychological Association
Southwestern Psychological Association	American Psychological Society

For information on Psi Chi and these sessions, contact:

Psi Chi National Office
 P.O. Box 709
 Chattanooga, TN 37043-0709
 423-756-2044
 psichi@psichi.org

The dates and locations of these conferences are routinely published in the *American Psychologist* (faculty members who belong to the APA receive copies of this journal) and *Teaching of Psychology*.



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“Well, you don’t look like an experimental psychologist to me.”

Attending a psychological convention will convince you that experimental psychologists are a most diverse group. Although you may not feel like an experimental psychologist now, completing a research project or two will change that situation.

reported by undergraduate students. If your faculty advisor has made a significant contribution to the design and conduct of your project, you may want to include him or her as a coauthor. *The Journal of Psychology and the Behavioral Sciences* is an annual journal that solicits manuscripts by students and faculty. Your faculty advisor will be able to suggest other journals to which you can submit your paper. Although undergraduates typically do not

TABLE 1-5 Publication Opportunities for Students

Several journals publish papers authored by students. Contact each journal to determine specific submission procedures.

1. *The Journal of Psychology and the Behavioral Sciences*
Professor John Brandi, Faculty Editor
Department of Psychology
Fairleigh Dickinson University
Madison, NJ 07904
2. *Modern Psychological Studies*
Department of Psychology
University of Tennessee at Chattanooga
Chattanooga, TN 37043-2598
3. *Journal of Undergraduate Studies*
Department of Psychology
Pace University
861 Bedford Road
Pleasantville, NY 10570
4. *Psi Chi Journal of Undergraduate Research*
Psi Chi National Office
P.O. Box 709
Chattanooga, TN 37043-0709
423-756-2044
5. *Journal of Psychological Inquiry*
Dr. Susan R. Burns
Department of Psychology
Morningside College
Sioux City, IA 51106
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402-280-3193

publish by themselves in the professional journals, collaborative papers featuring student and faculty authors are not uncommon.

The main point of this discussion is to encourage you to take advantage of the opportunities to share your research results with others. Much of the research you will read about in this book was conducted by students and then presented at conventions or published in journals such as the *Psi Chi Journal of Undergraduate Research* and *Journal of Psychological Inquiry*. If they can do it, so can you! Once you are involved in the research process, you will quickly find that it is a highly stimulating endeavor that never seems to end. There are always new problems to investigate.

Finding a New Problem

As you consider the relation of your experimental results to past research and theory and share your results with others who give you feedback, new research ideas will present themselves (see Horvat & Davis, 1998). Why didn't the results turn out exactly as predicted? Did you fail to account for some factor or variable? What would happen if you manipulated this or that variable in a different manner? The more deeply you immerse yourself in a research area, the more questions and problems you will find to research. As you can see from Table 1-1, we have now come full circle to the start of a new research project.

Why Is the Research Methods Course Important?

When students are asked, "Why are you taking a course in research methods (or experimental psychology)?" typical responses might be these:

"It's required for the major."

"I really don't know; I'll never conduct any research after this course."

As we go through this text, we hope to convince you that an understanding of research methods and data analysis can give you some real advantages in the field of psychology. Here are a few of those advantages:

- 1. Assisting You in Other Psychology Classes.** Because psychology's knowledge base rests on a foundation of research, it makes sense that much of what you will cover in your other psychology classes will consist of research examples. The more completely you understand research methodology, the better you will be able to master the material in your other classes. Although this point might make sense to you for courses such as learning or perception, even courses such as personality and abnormal psychology are based on research.
- 2. Conducting an Original Research Project.** Frequently, the research methods course includes or is followed by conducting an original student research project. If you have such an opportunity, take advantage of it and then plan to present and publish your research findings (refer to our earlier discussion of the research process).
- 3. Conducting a Research Project After Graduation.** Your authors learned a long time ago that it is smart to "never say never." This caution also applies to you as students of psychology. Consider the following example: Several years ago, a very bright student took the research methods course with one of your authors. Although this student found the class sessions interesting and intellectually stimulating, she disliked the material and vowed that she would never think about conducting research in psychology after the class was over. How wrong she was—her first job following graduation was conducting research at the Medical College of Virginia! If your career plans even remotely relate to the field of psychology, then the chances are quite good that you may have to conduct some type of research project as part of your job. Clearly, a course in research methods will provide a good understanding of what you will need to do in such instances. Even students who go

into nonpsychological fields may use their training on the job to conduct research on nonpsychological topics.

4. Getting into Graduate School. There is no getting around the fact that psychology graduate admissions committees view a course in research methods or experimental psychology very positively (Keith-Spiegel & Wiederman, 2000; Landrum & Davis, 2006). Your having completed such a course tells the admissions committee that you have a good grasp of basic research methodology. Graduate programs in psychology value such knowledge. Having presented or published a research report is also rated very highly by graduate school admissions committees (Landrum & Davis, 2006; Thomas, Rewey, & Davis, 2002).

5. Becoming a Knowledgeable Consumer of Research. Our society is flooded with knowledge claims. Many of these claims deal with psychological research and phenomena, such as the claims that a particular type of diet will improve your disposition, that IQ tests are good (or bad), that scientific tests have proved that this brand of cola tastes best of all, or that this toothpaste fights cavities better than all the rest. How do you know which of these claims to believe?

If you understand the research on which these claims are based and the “facts” presented as supporting evidence (or that there is no supporting evidence), then you are in a position to make a more educated decision concerning such knowledge claims. The research methods course will give you the basic foundation from which you can make educated decisions concerning knowledge claims you encounter in your everyday life.

■ REVIEW SUMMARY

1. Psychologists use a variety of research methods to answer numerous questions about human and animal behavior.
2. The research process consists of several interrelated, sequential steps: finding the problem, doing a literature review, taking theoretical considerations into account, making a hypothesis, choosing a research design, conducting the experiment, doing the data analysis and making statistical decisions, reviewing decisions in terms of past research and theory, preparing the research report, sharing your results, and finding a new problem.
3. A **theory** is a formal statement of relations among variables in a particular research area, whereas a **hypothesis** attempts to state predicted relations among variables in a selected portion of a theory.
4. The **research** or **experimental hypothesis** is the experimenter’s predicted outcome of a to-be-conducted experiment.
5. The **research design** specifies how the experimenter will (a) select participants, (b) form groups, (c) control extraneous variables, and (d) gather data.
6. We encourage students to submit their research reports for presentation at professional society meetings and for publication in journals.
7. The research methods course can (a) assist you in understanding research in other courses, (b) prepare you to conduct research after graduation, (c) increase your chances of being accepted to graduate school, and (d) make you a knowledgeable consumer of the results of psychological research.

■ Check Your Progress

1. Briefly describe the steps involved in the research process.
2. "A formal statement of the relation among relevant variables in a research area" best describes
 - a. acquisition of knowledge by authority
 - b. a logical syllogism
 - c. acquisition of knowledge by experience
 - d. a theory
3. You believe that giving rats a dose of vitamin C will improve their learning ability. This statement represents your
 - a. theory
 - b. experimental design
 - c. problem
 - d. hypothesis
4. Which of the following is a method of sharing your results with the scientific community?
 - a. presenting a paper at an undergraduate research conference
 - b. presenting a paper or poster at a psychological convention
 - c. publishing an article in a professional journal
 - d. any of the above
5. What should you do after you find your research problem?
 - a. develop a hypothesis
 - b. review the relevant literature
 - c. design your research project
 - d. find a relevant theory
6. Which of the following is a method of sharing your research results with the scientific community?
 - a. presenting a paper at an undergraduate research conference
 - b. presenting a paper or poster at a psychological convention
 - c. publishing an article in a professional journal
 - d. any of the above
 - e. none of the above
7. Other than fulfilling a requirement, what are the reasons for taking a research methods or experimental psychology course? Describe them.

■ Key Terms

Theory, 5
Hypothesis, 6

Research or experimental
hypothesis, 6

Research design, 6

■ Looking Ahead

In this chapter we provided you with a general introduction to how psychologists gather data. Subsequent chapters will build on and expand this general introduction. In Chapter 2 we will examine how you can find a researchable problem. Once we have identified the sources of research problems, then we will discuss the formulation of a good research hypothesis.