General Psychology Summer Assignment 2022-2023

Welcome to General Psychology! I am ecstatic that you have decided to join this class and chosen to challenge yourself with the fascinating world of psychology. I am certain that you will find this course worthwhile and personally relevant. Although it is the summer, there is work to be done. Please note, General Psychology is an elective, college-level course with higher student expectations than most courses taken by high school students. With that being said, it is imperative that we get a jump start on the General Psychology curriculum. It is mandatory and in your best interest to complete the summer assignment. Your summer assignment consists of **THREE** mini-assignments. Each assignment will serve a specific purpose that will assist you throughout the school year and aid in your preparations for the year.

Please note, students who enroll in this course over the summer are NOT exempt from this assignment. ALL students are required to complete this assignment.

THIS ASSIGNMENT IS A MULTI PART ASSIGNMENT. YOU MUST COMPLETE ALL ASPECTS OF THE ASSIGNMENT TO RECEIVE CREDIT.

1. Chapter 1 Academic Vocabulary
2. Chapter 1 Notes/ Outline
3. Careers in Psychology Research Paper

If you have questions or concerns over the summer, please reach out to me through email. Note, it may take a few days to receive a response, as it is summer.

Email: Krusso@rtnj.org

PART 1: CHAPTER 1 ACADEMIC VOCABULARY

For this task, you are responsible for handwriting flashcards for all the following vocabulary terms. Please do not make a quizlet, as that will not be accepted. These are the bolded terms throughout the text. Place one term and definition per notecard. You will be tested on these terms within the first two weeks of school.

TERMS:

Psychology
Structuralism
Introspection
Functionalism
Gestalt Psychology
Neuroscience
Perspective
Psychodynamic Perspective
Behavioral Perspective
Cognitive Perspective
Humanistic Perspective
Free Will
Determinism
Scientific method
Theories
Hypothesis
Operational definition
Archival Research
Naturalistic Observation
Survey Research
Case Study
Variables
Correlational Research
Experiment
Experimental Manipulation
Treatment
Experimental Group
Control group
Independent variable
Dependent variable
Random assignment to condition
Significant outcome
Replicated research
Informed consent
Experimental bias
Placebo

PART 2: CHAPTER READING & NOTES

All students are responsible for picking up a copy of Chapter 1 prior to the end of the school year. Copies of the chapter will be provided during a Dual Enrollment meeting during lunch. If a copy of the text is not picked up, students can access the text on the RHS website OR print their own copy.

TASKS:

- Read Chapter 1: Introduction to Psychology in Robert Feldman's *Understanding Psychology 13th edition* (**pages 1-44**).
- Complete the following questions and graphic organizers for each module. This information will help you create a foundation of knowing the history and perspectives of General Psychology. Make sure to take clear and concise notes.

MODULE 1: PSYCHOLOGISTS AT WORK

What is psychology:

SUBFIELDS OF PSYCHOLOGY

SUBFIELD	DESCRIPTION
Behavioral Neuroscience	
Experimental Psychology	
Cognitive Psychology	
Developmental Psychology	
Personality Psychology	
Health Psychology	
Clinical Psychology	
Counseling Psychology	
Social Psychology	
Industrial Psychology	
Educational Psychology	

Explain the difference between a PhD & PsyD:

MODULE 2: A SCIENCE EVOLVES: THE PAST, THE PRESENT, AND THE FUTURE

Structuralism –

Functionalism –

Gestalt Psychology –

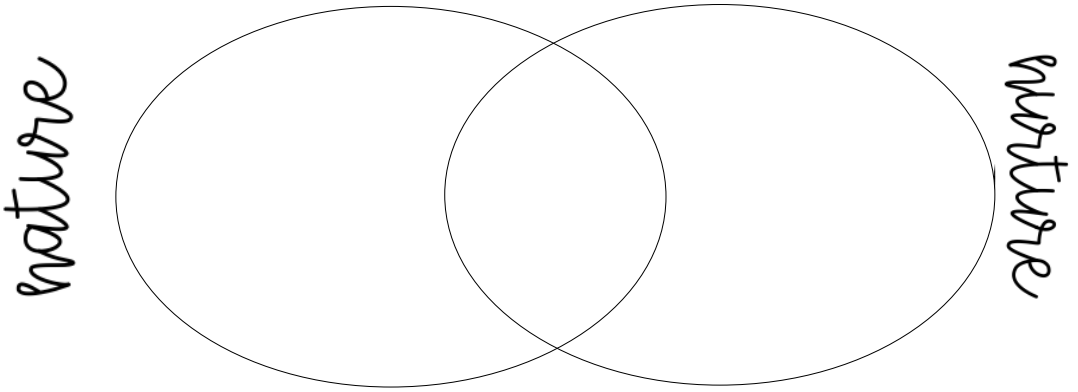
MARY CALKINS

MARGARET FLOY WASHBURN

FIVE MAJOR PERSPECTIVES

Neuroscience Perspective	
Psychodynamic Perspective	
Behavioral Perspective	
Cognitive Perspective	
Humanistic Perspective	

PSYCHOLOGY'S KEY ISSUES & CONTROVERSIES



CONSCIOUS VERSUS UNCONSCIOUS CAUSES OF BEHAVIOR	OBSERVABLE BEHAVIOR VERSUS MENTAL PROCESSES	FREE WILL VERSUS DETERMINISM	INDIVIDUAL DIFFERENCES VERSUS UNIVERSAL PRINCIPLES

MODULE 3: RESEARCH IN PSYCHOLOGY

Define the following:

- Theory
- Hypothesis

WHAT IS AN OPERATIONAL DEFINITION:

WHY IS IT SO IMPORTANT:

Case Study

Survey

Naturalistic Observation

CORRELATIONAL RESEARCH

Explain **Positive Correlations**:

- **Negative Correlations**:

- How do they enable prediction in psychology but not the use of cause and effect?

EXPERIMENTS

EXPERIMENTAL GROUP	CONTROL GROUP	INDEPENDENT VARIABLE	DEPENDENT VARIABLE

Random assignment

Random sampling

Significant Outcome

Explain **Replicated Research:**

MODULE 4: CRITICAL RESEARCH ISSUES

Explain Informed Consent:

WHAT IS EXPERIMENTAL BIAS:

WHAT CAN HAPPEN BECAUSE OF IT?:

Define placebo:

PART 3: CAREERS IN PSYCHOLOGY RESEARCH PAPER

For this assignment, you will conduct research on several careers in psychology and discuss them in your paper. You will find a list of various careers you can explore for this assignment. Next, select two particular career or career fields that you find to be intriguing. Go in depth on this field discussing what type of education/ training is required; what this field entails; pay rates; number of employees in the field; and what these individuals typically do on a daily basis.

Please **type** a 2–3-page summary of what you find. Be sure to include the following:

- What major careers are available in Psychology?
- How are these fields similar / different in terms of education, salary, job description, etc.?
- What particular field do you find most interesting and why?
- What does someone in this field do?
- What type of education/training is required?
- What is a typical salary for someone in this field?
- How many people work in this field?
- Are jobs in this field in demand or are they hard to obtain?
- What else do you find interesting about this field?

HELPFUL WEBSITES:

- www.psywww.com/careers/index.html
- www.apa.org
- www.careeroverview.com/psychology-careers
- www.psychology.about.com

PART 3: CAREERS IN PSYCHOLOGY RESEARCH PAPER

Use the list below to guide your research. In your initial discussion, you should discuss the subfields in general before choosing one specific career to focus on.

Basic Research Subfields:

- Cognitive Psychologists
- Developmental Psychologists
- Educational Psychologists
- Experimental Psychologists
- Psychometric and Quantitative Psychologists
- Social Psychologists

Applied Research Subfields:

- Forensic Psychologists
- Health Psychologists
- Industrial/Organizational Psychologists
- Neuropsychologists
- Rehabilitation Psychologists
- School Psychologists
- Sports Psychologists

The Helping Professions:

- Clinical Psychologists
- Community Psychologists
- Counseling Psychologists

Your research paper **MUST** be typed and will be run through a plagiarism checker (Turnitin.com). Plagiarism will result in a 0 on this portion of the assignment.

- Plagiarism includes copying another student's work, copying online resources without citation, and working in a group and handing in the same answers as your group members. Your work must be your own.

CHAPTER 1
Introduction to Psychology

LEARNING OUTCOMES FOR CHAPTER 1

MODULE 1

PSYCHOLOGISTS AT WORK

The Subfields of Psychology: Psychology's Family Tree

Working at Psychology

LO 1-1	What is the science of psychology?
LO 1-2	What are the major specialties in the field of psychology?
LO 1-3	Where do psychologists work?

MODULE 2

A SCIENCE EVOLVES: THE PAST, THE PRESENT, AND THE FUTURE

The Roots of Psychology

Today's Five Major Perspectives

Applying Psychology in the 21st Century: Psychology Matters

Psychology's Key Issues and Controversies

Psychology's Future

Neuroscience in Your Life: Enhancing Your Mind

LO 2-1	What are the origins of psychology?
LO 2-2	What are the major approaches in contemporary psychology?
LO 2-3	What are psychology's key issues and controversies?
LO 2-4	What is the future of psychology likely to hold?

MODULE 3

RESEARCH IN PSYCHOLOGY

The Scientific Method

Psychological Research

Descriptive Research

Experimental Research

LO 3-1	What is the scientific method?
LO 3-2	What role do theories and hypotheses play in psychological research?
LO 3-3	What research methods do psychologists use?

LO 3-4 How do psychologists establish cause-and-effect relationships in research studies?

MODULE 4

CRITICAL RESEARCH ISSUES

The Ethics of Research

Exploring Diversity: Choosing Participants Who Represent the Scope of Human Behavior

Neuroscience in Your Life: The Importance of Using Representative Participants

Should Animals Be Used in Research?

Threats to Experimental Validity: Avoiding Experimental Bias

Becoming an Informed Consumer of Psychology: Thinking Critically About Research

LO 4-1 What major issues confront psychologists conducting research?

PROLOGUE *HIGH SCHOOL MASSACRE*

It started like any other school day on a balmy Wednesday at the Marjory Stoneman Douglas High School campus in Parkland, Florida. But it ended with one of the most horrific school shootings in U.S. history. By the time the shooter, 19-year-old Nikolas Cruz, finished walking the halls with a blazing AR-15 rifle, 17 students and teachers lay dead, and many others were wounded.

In the midst of this carnage, the best of humanity was also on display. Teachers and staff put their own lives at risk in an effort to shield and protect their students, in some cases dying as a result. And despite the danger, first responders rushed to help the wounded, and many students sought to comfort and aid their wounded classmates. As people all around the world expressed their grief, many joined together to work toward legal change that would make such shootings less likely.

©Matt McClain/The Washington Post via Getty Images

LOOKING *Ahead*

The Florida school massacre gives rise to a host of important psychological issues. For example, consider these questions asked by psychologists following the catastrophe:

- What motivated the shooter's rampage? Was he driven by political, social, or religious beliefs, or was he psychologically disturbed?
- What internal, biologically based changes occurred in those fleeing for their lives from the shooter?
- What memories did people have of the massacre afterward? How accurate were they?
- What will be the long-term effects of the massacre on the psychological and physical health of the survivors and witnesses?
- What are the most effective ways to help people cope with the sudden and unexpected loss of friends and loved ones?
- Could this tragedy have been prevented if the shooter had received psychological treatment?

As you'll soon see, the field of psychology addresses questions like these—and many, many more. In this chapter, we begin our examination of psychology, the different types of psychologists, and the various roles that psychologists play.

Module 1
Psychologists at Work

LEARNING OUTCOMES

LO 1-1 What is the science of psychology?

LO 1-2 What are the major specialties in the field of psychology?

LO 1-3 Where do psychologists work?

Psychology is the scientific study of behavior and mental processes. The simplicity of this definition is in some ways deceiving, concealing ongoing debates about how broad the scope of psychology should be. Should psychologists limit themselves to the study of outward, observable behavior? Is it possible to scientifically study thinking? Should the field encompass the study of such diverse topics as physical and mental health, perception, dreaming, and motivation? Is it appropriate to focus solely on human behavior, or should the behavior of other species be included?

Most psychologists would argue that the field should be receptive to a variety of viewpoints and approaches. Consequently, the phrase *behavior and mental processes* in the definition of psychology must be understood to mean many things: It encompasses not just what people do but also their thoughts, emotions, perceptions, reasoning processes, memories, and even the biological activities that maintain bodily functioning.

Psychologists try to describe, predict, and explain human behavior and mental processes, as well as help to change and improve the lives of people and the world in which they live. They use scientific methods to find answers that are far more valid and legitimate than those resulting from intuition and speculation, which are often inaccurate (see Figure 1).

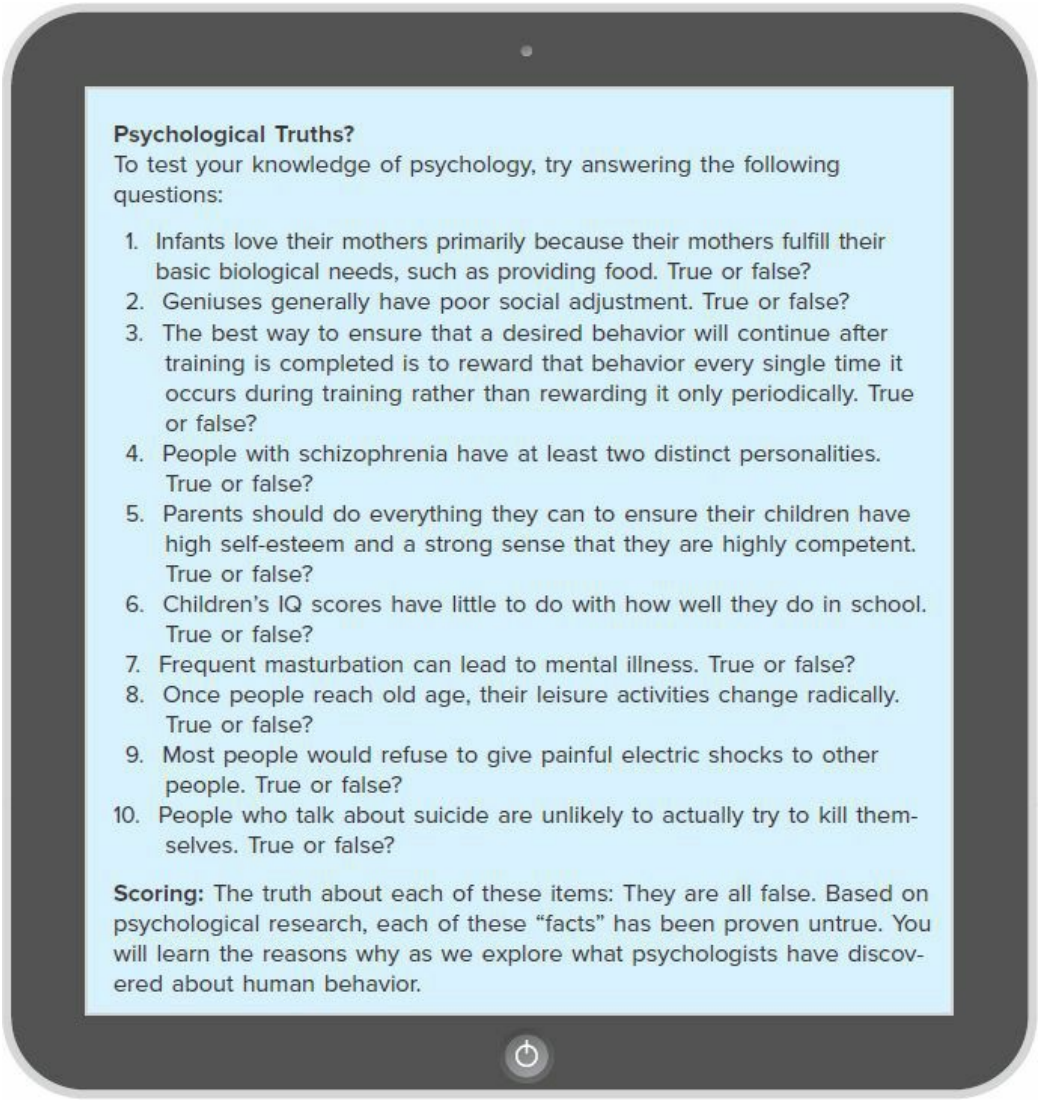


FIGURE 1 The scientific method is the basis of all psychological research and is used to find valid answers. Test your knowledge of psychology by answering these questions.
Source: Adapted from Lamal, P. A. (1979). College students' common beliefs about psychology. *Teaching of Psychology*, 6, 155–158.

The Subfields of Psychology: Psychology's Family Tree

As the study of psychology has grown, it has given rise to a number of subfields (described in Figure 2). The subfields of psychology can be likened to an extended family, with assorted nieces and nephews, aunts and uncles, and cousins who, although they may not interact on a day-to-day basis, are related to one another because they share a common goal: understanding behavior. One way to identify the key subfields is to look at some of the basic questions about behavior that they address.

Subfield	Description
Behavioral genetics	*Behavioral genetics* studies the inheritance of traits related to behavior.
Behavioral neuroscience	*Behavioral neuroscience* examines the biological basis of behavior.
Clinical psychology	*Clinical psychology* deals with the study, diagnosis, and treatment of psychological disorders.
Clinical neuropsychology	*Clinical neuropsychology* unites the areas of biopsychology and clinical psychology, focusing on the relationship between biological factors and psychological disorders.
Cognitive psychology	*Cognitive psychology* focuses on the study of higher mental processes.
Counseling psychology	*Counseling psychology* focuses primarily on educational, social, and career adjustment problems.
Cross-cultural psychology	*Cross-cultural psychology* investigates the similarities and differences in psychological functioning in and across various cultures and ethnic groups.
Developmental psychology	*Developmental psychology* examines how people grow and change from the moment of conception through death.
Educational psychology	*Educational psychology* is concerned with teaching and learning processes, such as the relationship between motivation and school performance.
Environmental psychology	*Environmental psychology* considers the relationship between people and their physical environment.
Evolutionary psychology	*Evolutionary psychology* considers how behavior is influenced by our genetic inheritance from our ancestors.
Experimental psychology	*Experimental psychology* studies the processes of sensing, perceiving, learning, and thinking about the world.
Forensic psychology	*Forensic psychology* focuses on legal issues, such as determining the accuracy of witness memories.
Health psychology	*Health psychology* explores the relationship between psychological factors and physical ailments or disease.
Industrial/ organizational psychology	*Industrial/organizational psychology* is concerned with the psychology of the workplace.
Personality psychology	*Personality psychology* focuses on the consistency in people's behavior over time and the traits that differentiate one person from another.
Program evaluation	*Program evaluation* focuses on assessing large-scale programs, such as the Head Start preschool program, to determine whether they are effective in meeting their goals.
Psychology of women	*Psychology of women* focuses on issues such as discrimination against women and the causes of violence against women.
School psychology	*School psychology* is devoted to counseling children in elementary and secondary schools who have academic or emotional problems.
Social psychology	*Social psychology* is the study of how people's thoughts, feelings, and actions are affected by others.
Sport psychology	*Sport psychology* applies psychology to athletic activity and exercise.

FIGURE 2 The major subfields of psychology.
Photos: (Top) ©Spencer Grant/Science Source; (Middle) ©Monkey Business Images/Shutterstock; (Bottom) ©Don Hammond/DesignPics

WHAT ARE THE BIOLOGICAL FOUNDATIONS OF BEHAVIOR?

In the most fundamental sense, people are biological organisms. *Behavioral neuroscience* is the subfield of psychology that focuses on how the brain and the nervous system, as well as other biological aspects of the body, determine behavior.

Study Alert

The different subfields of psychology allow psychologists to explain the same behavior in multiple ways. Review Figure 2 for a summary of the subfields.

Thus, neuroscientists consider how our body influences our behavior. For example, they may examine the link between specific sites in the brain and the muscular tremors of people affected by Parkinson's disease or attempt to determine how our emotions are related to physical sensations.

HOW DO PEOPLE SENSE, PERCEIVE, LEARN, AND THINK ABOUT THE WORLD?

If you have ever wondered why you are susceptible to optical illusions, how your body registers pain, or how to make the most of your study time, an experimental psychologist can answer your questions. *Experimental psychology* is the branch of psychology that studies the processes of sensing, perceiving, learning, and thinking about the world. (The term *experimental psychologist* is somewhat misleading: Psychologists in every specialty area use experimental techniques.)

PsychTech

We now know we cannot text and drive at the same time. Cognitive psychologists have demonstrated that it is impossible to do both without a serious and potentially deadly decline in driving ability.

Several subspecialties of experimental psychology have become specialties in their own right. One is *cognitive psychology*, which focuses on higher mental processes, including thinking, memory, reasoning, problem solving, judging, decision making, and language.

WHAT ARE THE SOURCES OF CHANGE AND STABILITY IN BEHAVIOR ACROSS THE LIFE SPAN?

A baby producing her first smile … taking his first step … saying her first word. These universal milestones in development are also singularly special and unique for each person. *Developmental psychology* studies how

people grow and change from the moment of conception through death. *Personality psychology* focuses on the consistency in people's behavior over time and the traits that differentiate one person from another.

HOW DO PSYCHOLOGICAL FACTORS AFFECT PHYSICAL AND MENTAL HEALTH?

Frequent depression, stress, and fears that prevent people from carrying out their normal activities are topics that interest health psychologists, clinical psychologists, and counseling psychologists. *Health psychology* explores the relationship between psychological factors and physical ailments or disease. For example, health psychologists are interested in assessing how long-term stress (a psychological factor) can affect physical health and in identifying ways to promote behavior that brings about good health (Yardley & Moss-Morris, 2009; Proyer et al., 2013; Sauter & Hurell, 2017).

Clinical psychology deals with the study, diagnosis, and treatment of psychological disorders. Page 5 Page 6 Clinical psychologists are trained to diagnose and treat problems that range from the crises of everyday life, such as unhappiness over the breakup of a relationship, to more extreme conditions, such as profound, lingering depression. Some clinical psychologists also research and investigate issues that vary from identifying the early signs of psychological disturbance to studying the relationship between family communication patterns and psychological disorders.

Like clinical psychologists, counseling psychologists deal with people's psychological problems, but the problems they deal with are more specific. *Counseling psychology* focuses primarily on educational, social, and career adjustment problems. Almost every college has a center staffed with counseling psychologists. This is where students can get advice on the kinds of jobs they might be best suited for, on methods of studying effectively, and on strategies for resolving everyday difficulties, such as problems with roommates and concerns about a specific professor's grading practices. Many large business organizations also employ counseling psychologists to help employees with work-related problems.

HOW DO OUR SOCIAL NETWORKS AFFECT BEHAVIOR?

Our complex networks of social interrelationships are the focus for many subfields of psychology. For example, *social psychology* is the study of how people's thoughts, feelings, and actions are affected by others. Social psychologists concentrate on such diverse topics as human aggression, liking and loving, persuasion, and conformity.

Cross-cultural psychology investigates the similarities and differences in psychological functioning in and across various cultures and ethnic groups. For example, cross-cultural psychologists examine how cultures differ in their use of punishment during child rearing.

EXPANDING PSYCHOLOGY'S FRONTIERS

The boundaries of the science of psychology are constantly growing. Three newer members of the field's family tree—evolutionary psychology, behavioral genetics, and clinical neuropsychology—have sparked particular excitement and debate within psychology.

Evolutionary Psychology

Evolutionary psychology considers how behavior is influenced by our genetic inheritance from our ancestors. The evolutionary approach suggests that the chemical coding of information in our cells not only determines traits such as hair color and race but also holds the key to understanding a broad variety of behaviors that helped our ancestors survive and reproduce.

Evolutionary psychology stems from Charles Darwin's arguments in his ground- breaking 1859 book, *On the Origin of Species.* Darwin suggested that a process of natural selection leads to the survival of the fittest and the development of traits that enable a species to adapt to its environment.

Evolutionary psychologists take Darwin's arguments a step further. They argue that our genetic

inheritance determines not only physical traits such as skin and eye color but certain personality traits and social behaviors as well. For example, evolutionary psychologists suggest that behavior such as shyness, jealousy, and cross-cultural similarities in qualities desired in potential mates are at least partially determined by genetics, presumably because such behavior helped increase the survival rate of humans' ancient relatives (Sefcek, Brumbach, & Vasquez, 2007; Fost, 2015; Lewis et al., 2017).

Although they are increasingly popular, evolutionary explanations of behavior have stirred controversy. By suggesting that many significant behaviors unfold automatically because they are wired into the human species, evolutionary approaches minimize the role of environmental and social forces. Still, the evolutionary approach has stimulated a significant amount of research on how our biological inheritance influences our traits and behaviors (Neher, 2006; Mesoudi, 2011; Flannelly, 2017).

Behavioral Genetics Another rapidly growing area in psychology focuses on the biological mechanisms, such as genes and chromosomes, that enable inherited behavior to unfold. *Behavioral genetics* seeks to understand how we might inherit certain behavioral traits and how the environment influences whether we actually display such traits (Maxson, 2013; Vukasović & Bratko, 2015; Krüger, Korsten, & Hoffman, 2017).

Clinical Neuropsychology *Clinical neuropsychology* unites the areas of neuroscience and clinical psychology: It focuses on the origin of psychological disorders in biological factors. Building on advances in our understanding of the structure and chemistry of the brain, this specialty has already led to promising new treatments for psychological disorders as well as debates over the use of medication to control behavior (Boake, 2008; Holtz, 2011; Craig, 2017).

Help Wanted: Assistant professor at a small liberal arts college. Teach undergraduate courses in introductory psychology and courses in specialty areas of cognitive psychology, perception, and learning. Strong commitment to quality teaching, as well as evidence of scholarship and research productivity, necessary.

Help Wanted: Industrial-organizational consulting psychologist. International firm seeks psychologists for full-time career positions as consultants to management. Candidates must have the ability to establish a rapport with senior business executives and help them find innovative and practical solutions to problems concerning people and organizations.

Help Wanted: Clinical psychologist. PhD, internship experience, and license required. Comprehensive clinic seeks psychologist to work with children and adults providing individual and group therapy, psychological evaluations, crisis intervention, and development of behavior treatment plans on multidisciplinary team.

As these job ads suggest, psychologists are employed in a variety of settings. Many doctoral-level psychologists are employed by institutions of higher learning (universities and colleges) or are self-employed, usually working as private practitioners treating clients (see Figure 3). Other work sites include hospitals, clinics, mental health centers, counseling centers, government human-services organizations, businesses, schools, and even prisons. Psychologists are employed in the military, working with soldiers, veterans, and their families, and they work for the federal government in the Department of Homeland Security, fighting terrorism. Psychologists who specialize in program evaluation are increasingly employed by foundations that want to assess the value of programs they fund (DeAngelis & Monahan, 2008; Moscoso et al., 2013; American Psychological Association, 2016).

Page 8

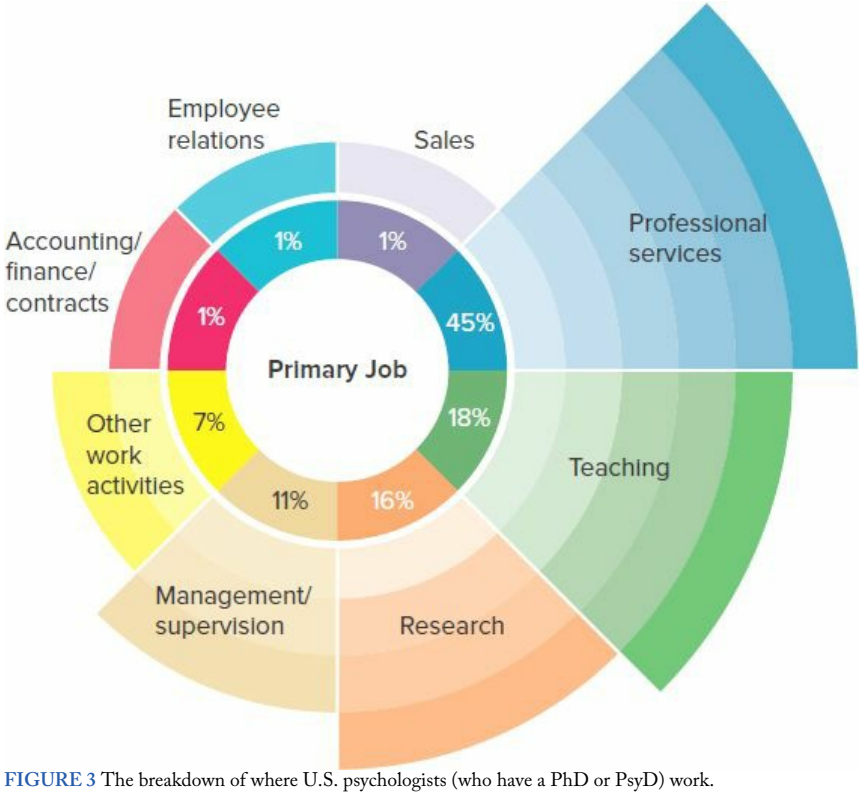


FIGURE 3 The breakdown of where U.S. psychologists (who have a PhD or PsyD) work.
Source: Stamm, K., Lin, Luona, and Cristidis, P. Datapoint, *Monitor on Psychology*, June 2016, 12.

Most psychologists, though, work in academic settings, allowing them to combine the three major roles played by psychologists in society: teacher, scientist, and clinical practitioner. Many psychology professors are also actively involved in research or in serving clients. Whatever the particular job site, however, psychologists

share a commitment to improving individual lives as well as society in general.

Keep in mind that professionals from a variety of occupations use the findings of psychologists. To understand how nonpsychologists use psychology, see the feature titled "From the Perspective of . . ." throughout the text.

From the perspective of …

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An Educator Imagine that a classroom teacher wants to improve the performance of a 10-year-old boy who is not doing well in math. What branches of psychology might she draw on to get ideas about how to help him?

PSYCHOLOGISTS: A PORTRAIT

Although there is no "average" psychologist in terms of personal characteristics, we can draw a statistical portrait of the field. There are nearly 200,000 active psychologists working today in the United States, but they are outnumbered by psychologists in other countries. Europe has more than 290,000 psychologists, and in Brazil alone, there are 140,000 licensed psychologists. Although most research is conducted in the United States, psychologists in other countries are increasingly influential in adding to the knowledge base and practices of psychology (Rees & Seaton, 2011; American Psychological Association, 2015; Takooshian et al., 2016).

In the United States, women outnumber men in the field, a big change from earlier years when women faced bias and were actively discouraged from becoming psychologists. Today, women far outnumber male psychologists: for every one male, there are 2.1 female psychologists. There is an active debate about whether and how to seek balance in the percentage of men and women in the field (Cynkar, 2007; Willyard, 2011; American Psychological Association, 2015).

Furthermore, despite the higher proportion of women in the field, women still lag behind when it comes to salaries and high-status positions within the field. For example, female psychologists working in four-year colleges and medical schools earn, on average, 82.7% of what males make (Clay, 2017).

The majority of psychologists in the United States are white, limiting the diversity of the field. Only around 16% of all professionally active psychologists are members of racial minority groups. Although the numbers of minority individuals entering the field are far greater than they were a decade ago and continue to grow, the numbers have not kept up with the dramatic growth of the minority population at large (Maton et al., 2006; Chandler, 2011; American Psychological Association, 2015).

Page 9

The underrepresentation of racial and ethnic minorities among psychologists is significant for several reasons. First, the field of psychology is diminished by a lack of the diverse perspectives and talents that minority-group members can provide. Furthermore, minority-group psychologists serve as role models for members of minority communities, and their underrepresentation in the profession might deter other minority-group members from entering the field. Finally, because members of minority groups often prefer to

receive psychological therapy from treatment providers of their own race or ethnic group, the rarity of minority psychologists can discourage some members of minority groups from seeking treatment (Bryant et al., 2005; Stevens, 2015; Stewart et al., 2017).

THE EDUCATION OF A PSYCHOLOGIST

Study Alert

Be sure you can differentiate between a PhD (doctor of philosophy) and a PsyD (doctor of psychology), as well as between psychologists and psychiatrists.

How do people become psychologists? The most common route is a long one. Most psychologists have a doctorate, either a *PhD* (doctor of philosophy) or, less frequently, a *PsyD* (doctor of psychology). The PhD is a research degree that requires a dissertation based on an original investigation. The PsyD is obtained by psychologists who want to focus on the treatment of psychological disorders. Note that psychologists are distinct from psychiatrists, who have a medical degree and specialize in the diagnosis and treatment of psychological disorders, often using treatments that involve the prescription of drugs.

Both the PhD and the PsyD typically take four or five years of work past the bachelor's level. Some fields of psychology involve education beyond the doctorate. For instance, doctoral-level clinical psychologists, who deal with people with psychological disorders, typically spend an additional year doing an internship.

About a third of people working in the field of psychology have a master's degree as their highest degree, which they earn after two or three years of graduate work. These psychologists teach, provide therapy, conduct research, or work in specialized programs dealing with drug abuse or crisis intervention. Some work in universities, government, and business, collecting and analyzing data.

CAREERS FOR PSYCHOLOGY MAJORS

Although some psychology majors head for graduate school in psychology or an unrelated field, the majority join the workforce immediately after graduation. Most report that the jobs they take after graduation are related to their psychology background.

An undergraduate major in psychology provides excellent preparation for a variety of occupations. Because undergraduates who specialize in psychology develop good analytical skills, are trained to think critically, and are able to synthesize and evaluate information well, employers in business, industry, and the government value their preparation (Kuther, 2003).

The most common areas of employment for psychology majors are in the social services, including working as administrators, serving as counselors, and providing direct care. Some 20% of recipients of bachelor's degrees in psychology work in the social services or in some other form of public affairs. In addition, psychology majors often enter the fields of education or business or work for federal, state, and local governments (see Figure 4; Murray, 2002; Rajecki & Borden, 2011; Sternberg, 2017).

Positions Obtained by Psychology Majors

Business Field	Education/ Academic Field	Social Field
Administrative assistant	Administration	Activities coordinator
Advertising trainee	Child-care provider	Behavioral specialist
Affirmative action officer	Child-care worker/supervisor	Career counselor
Benefits manager	Data management	Case worker
Claims specialist	Laboratory assistant	Child protection worker
Community relations officer	Parent/family education	Clinical coordinator
Customer relations	Preschool teacher	Community outreach worker
Data management	Public opinion surveyor	Corrections officer
Employee counselor	Research assistant	Counselor assistant
Employee recruitment	Teaching assistant	Crisis intervention counselor
Human resources coordinator/manager/specialist		Employment counselor
Labor relations manager/specialist		Group home attendant
Loan officer		Mental health assistant
Management trainee		Occupational therapist
Marketing		Probation officer
Personnel manager/officer		Program manager
Product and services research		Rehabilitation counselor
Programs/events coordination		Residence counselor
Public relations		Social service assistant
Retail sales management		Social worker
Sales representative		Substance abuse counselor
Special features writing/reporting		Youth counselor
Staff training and development		
Trainer/training office		

FIGURE 4 Although many psychology majors pursue employment in social services, a background in psychology can prepare one for many professions outside the social services field. What is it about the science and art of psychology that make it such a versatile field? Source: Adapted from Kuther, T. L. (2003). *Your career in psychology: Psychology and the law.* New York: Wadsworth.

RECAP/EVALUATE/RETHINK

RECAP

LO 1-1 What is the science of psychology?

- Psychology is the scientific study of behavior and mental processes, encompassing not just what people do but also their biological activities, feelings, perceptions, memory, reasoning, and thoughts.

LO 1-2 What are the major specialties in the field of psychology?

- Behavioral neuroscientists focus on the biological basis of behavior, and experimental psychologists study the processes of sensing, perceiving, learning, and thinking about the world.
- Cognitive psychology, an outgrowth of experimental psychology, studies higher mental processes, including memory, knowing, thinking, reasoning, problem solving, judging, decision making, and language.
- Developmental psychologists study how people grow and change throughout the life span.

- Personality psychologists consider the consistency and change in an individual's behavior, as well as the individual differences that distinguish one person's behavior from another's.
- Health psychologists study psychological factors that affect physical disease, whereas clinical psychologists consider the study, diagnosis, and treatment of abnormal behavior. Counseling psychologists focus on educational, social, and career adjustment problems.

- Social psychology is the study of how people's thoughts, feelings, and actions are affected by others.
- Cross-cultural psychology examines the similarities and differences in psychological functioning among various cultures.
- Other increasingly important fields are evolutionary psychology, behavioral genetics, and clinical neuropsychology.

LO 1-3 Where do psychologists work?

- Psychologists are employed in a variety of settings. Although the primary sites of employment are private practice and colleges, many psychologists are found in hospitals, clinics, community mental health centers, and counseling centers.

EVALUATE

Match each subfield of psychology with the issues or questions posed below.

a. Behavioral neuroscience
b. Experimental psychology
c. Cognitive psychology
d. Developmental psychology
e. Personality psychology
f. Health psychology
g. Clinical psychology
h. Counseling psychology
i. Educational psychology
j. School psychology
k. Social psychology
l. Industrial psychology

1. Joan, a college freshman, is worried about her grades. She needs to learn better organizational skills and study habits to cope with the demands of college.
2. At what age do children generally begin to acquire an emotional attachment to their fathers?
3. It is thought that pornographic films that depict violence against women may prompt aggressive behavior in some men.
4. What chemicals are released in the human body as a result of a stressful event? What are their effects on behavior?
5. Luis is unique in his manner of responding to crisis situations, with an even temperament and a positive outlook.
6. The teachers of 8-year-old Jack are concerned that he has recently begun to withdraw socially and to show little interest in schoolwork.
7. Janetta's job is demanding and stressful. She wonders if her lifestyle is making her more prone to certain illnesses, such as cancer and heart disease.
8. A psychologist is intrigued by the fact that some people are much more sensitive to painful stimuli than others are.
9. A strong fear of crowds leads a young man to seek treatment for his problem.
10. What mental strategies are involved in solving complex word problems?
11. What teaching methods most effectively motivate elementary school students to successfully accomplish academic tasks?
12. Jessica is asked to develop a management strategy that will

encourage safer work practices in an assembly plant.

RETHINK

Do you think intuition and common sense are sufficient for understanding why people act the way they do? In what ways is a scientific approach appropriate for studying human behavior?

Answers to Evaluate Questions

a-4; b-8; c-10; d-2; e-5; f-7; g-9; h-1; i-11; j-6; k-3; l-12

KEY TERMS

psychology

Module 2
A Science Evolves: The Past, the Present, and the Future

LEARNING OUTCOMES

LO 2-1 What are the origins of psychology?

LO 2-2 What are the major approaches in contemporary psychology?

LO 2-3 What are psychology's key issues and controversies?

LO 2-4 What is the future of psychology likely to hold?

> Seven thousand years ago, people assumed that psychological problems were caused by evil spirits. To allow those spirits to escape from a person's body, ancient healers chipped a hole in a patient's skull with crude instruments—a procedure called *trephining*.
>
> According to the 17th-century philosopher René Descartes, nerves were hollow tubes through which "animal spirits" conducted impulses in the same way that water is transmitted through a pipe. When a person put a finger too close to a fire, heat was transmitted to the brain through the tubes.
>
> Franz Josef Gall, an 18th-century physician, argued that a trained observer could discern intelligence, moral character, and other basic personality characteristics from the shape and number of bumps on a person's skull. His theory gave rise to the field of phrenology, employed by hundreds of practitioners in the 19th century.

Although these explanations might sound far-fetched, in their own times they represented the most advanced thinking about what might be called the psychology of the era. Our understanding of behavior has progressed tremendously since the 18th century, but most of the advances have been recent. As sciences go, psychology is one of the new kids on the block. (For highlights in the development of the field, see Figure 1.)

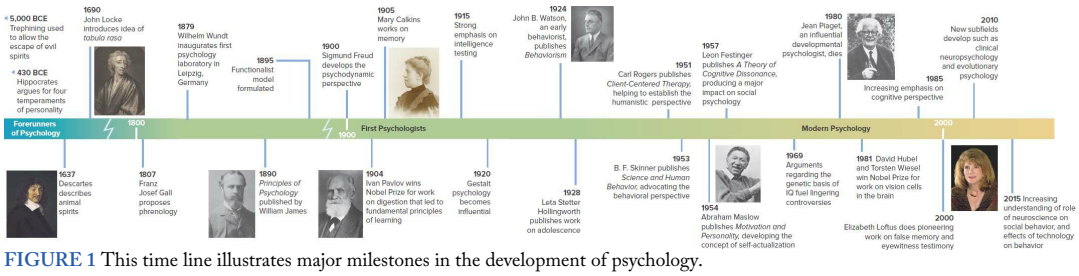
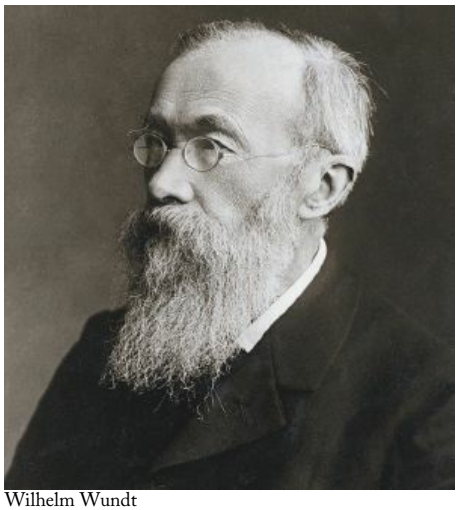


FIGURE 1 This time line illustrates major milestones in the development of psychology.
Sources: (Rene Descartes): ©Everett - Art/Shutterstock; (John Locke):
Source: National Gallery of Art; (William James): ©Paul Thompson/FPG/Getty Images; (Ivan Pavlov): ©Bettmann/Getty Images; (Mary Whiton Calkins):
Source: Wellesley College Archives; (John B. Watson): ©George Rinhart/Corbis via Getty Images; (Abraham Maslow and Jean Piaget): ©Bettmann/Getty Images; (Dr. Elizabeth Loftus): ©Elizabeth Loftus

The Roots of Psychology

We can trace psychology's roots back to the ancient Greeks, who considered the mind to be a suitable topic for scholarly contemplation. Later philosophers argued for hundreds of years about some of the questions psychologists grapple with today. For example, the 17th-century British philosopher John Locke believed that children were born into the world with minds like "blank slates" (*tabula rasa* in Latin) and that their experiences determined what kind of adults they would become. His views contrasted with those of Plato and Descartes, who argued that some knowledge was inborn in humans.



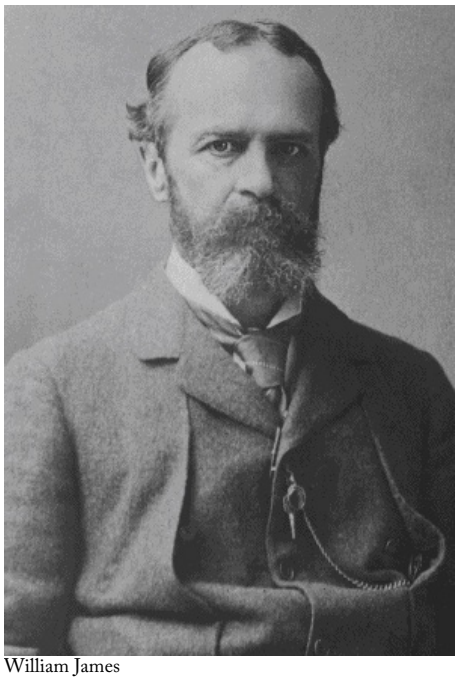
Wilhelm Wundt
©Bettmann/Getty Images

However, the formal beginning of psychology as a scientific discipline is generally considered to be in the late 19th century, when Wilhelm Wundt, in Leipzig, Germany, established the first experimental laboratory devoted to psychological phenomena. At about the same time, William James was setting up his laboratory in Cambridge, Massachusetts.

When Wundt set up his laboratory in 1879, his aim was to study the building blocks of the mind. He considered psychology to be the study of conscious experience. His perspective, which came to be known as **structuralism**, focused on uncovering the fundamental mental components of perception, consciousness, thinking, emotions, and other kinds of mental states and activities.

To determine how basic sensory processes shape our understanding of the world, Wundt and other structuralists used a procedure called introspection. **Introspection** is a procedure in which people are presented with a stimulus—such as an image or sentence—and asked to describe, in their own words and in as much detail as they could, what they were experiencing. Wundt argued that by analyzing people's reports, psychologists could come to a better understanding of the structure of the mind.

Over time, psychologists challenged Wundt's approach. They became increasingly dissatisfied with the assumption that introspection could reveal the structure of the mind. Introspection was not a truly scientific technique because there were few ways an outside observer could confirm the accuracy of others' introspections. Moreover, people had difficulty describing some kinds of inner experiences, such as emotional responses. Those drawbacks led to the development of new approaches, which largely replaced structuralism.



William James
©Paul Thompson/FPG/Getty Images

The perspective that replaced structuralism is known as functionalism. Rather than focusing on the mind's structure, **functionalism** concentrated on what the mind *does* and how behavior *functions*. Functionalists, whose perspective became prominent in the early 1900s, asked what role behavior plays in allowing people to adapt to their environments. For example, a functionalist might examine the function of the emotion of fear in preparing us to deal with emergency situations.

William James, an American psychologist, led the functionalist movement. Functionalists examined how people satisfy their needs through their behavior. The functionalists also discussed how our stream of consciousness—the flow of thoughts in our conscious minds—permits us to adapt to our environment. The American educator John Dewey drew on functionalism to develop the field of school psychology, proposing ways to best meet students' educational needs.

Another important reaction to structuralism was the development of Gestalt psychology in the early 1900s. **Gestalt (geh-SHTALLT) psychology** emphasizes how perception is organized. Instead of considering the individual parts that make up thinking, Gestalt psychologists took the opposite tack, studying how people consider individual elements together as units or wholes. Led by German scientists such as Hermann Ebbinghaus and Max Wertheimer, Gestalt psychologists proposed that "The whole is different from the sum of its parts," meaning that our perception, or understanding, of objects is greater and more meaningful than the individual elements that make up our perceptions. Gestalt psychologists have made substantial contributions to our understanding of perception.

WOMEN IN PSYCHOLOGY: FOUNDING MOTHERS

As in many scientific fields, social prejudices hindered women's participation in the early development of psychology. For example, many universities would not admit women to their graduate psychology programs in the early 1900s.

Despite the hurdles they faced, women made notable contributions to psychology, although their impact on the field was largely overlooked until recently. For example, Margaret Floy Washburn (1871–1939) was the first woman to receive a doctorate in psychology, and she did important work on animal behavior. Leta

Stetter Hollingworth (1886–1939) was one of the first psychologists to focus on child development and on women's issues. She collected data to refute the view, popular in the early 1900s, that women's abilities periodically declined during parts of the menstrual cycle (Hollingworth, 1943/1990; Denmark & Fernandez, 1993; Furumoto & Scarborough, 2002).

Study Alert

Knowing the basic outlines of the history of the field will help you understand how today's major perspectives have evolved.

Mary Calkins (1863–1930), who studied memory in the early part of the 20th century, became the first female president of the American Psychological Association. Karen Horney (pronounced "HORN-eye") (1885–1952) focused on the social and cultural factors behind personality, and she also founded the *American Journal of Psychoanalysis*. June Etta Downey (1875–1932) spearheaded the study of personality traits and became the first woman to head a psychology department at a state university. Anna Freud (1895–1982), the daughter of Sigmund Freud, also made notable contributions to the treatment of abnormal behavior, and Mamie Phipps Clark (1917–1983) carried out pioneering work on how children of color grew to recognize racial differences (Lal, 2002; Galdi, 2015).

Study Alert

Use Figure 2 to differentiate the five perspectives, which are important because they provide a foundation for every topic covered throughout the text.

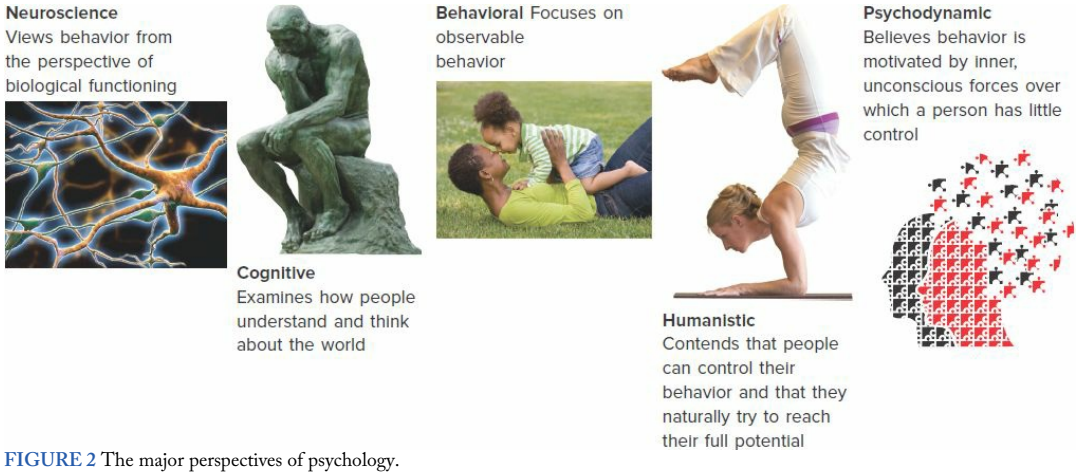


FIGURE 2 The major perspectives of psychology.

Today's Five Major Perspectives

The men and women who laid the foundations of psychology shared a common goal: to explain and understand behavior using scientific methods. Seeking to achieve the same goal, the tens of thousands of psychologists who followed those early pioneers embraced—and often rejected—a variety of broad perspectives.

The perspectives of psychology offer distinct outlooks and emphasize different factors. Just as we Page 15 can use more than one map to find our way around a particular region—for instance, a map that shows roads and highways and another map that shows major landmarks—psychologists developed a variety of approaches to understanding behavior. When considered jointly, the different perspectives provide the means to explain behavior in its amazing variety.

Today, the field of psychology includes five major perspectives (summarized in Figure 2). These broad perspectives emphasize different aspects of behavior and mental processes, and each takes our understanding of behavior in a somewhat different direction.

THE NEUROSCIENCE PERSPECTIVE: BLOOD, SWEAT, AND FEARS

When we get down to the basics, humans are animals made of skin and bones. The **neuroscience perspective** considers how people and nonhumans function biologically: how individual nerve cells are joined together, how the inheritance of certain characteristics from parents and other ancestors influences behavior, how the functioning of the body affects hopes and fears, which behaviors are instinctual, and so forth. Even more complex kinds of behaviors, such as a baby's response to strangers, are viewed as having critical biological components by psychologists who embrace the neuroscience perspective. This perspective includes the study of heredity and evolution, which considers how heredity may influence behavior, and behavioral neuroscience, which examines how the brain and the nervous system affect behavior.

Because every behavior ultimately can be broken down into its biological components, the neuroscience perspective has broad appeal. Psychologists who subscribe to this perspective have made major contributions to the understanding and betterment of human life, ranging from cures for certain types of deafness to drug treatments for people with severe mental disorders. Furthermore, advances in methods for examining the anatomy and functioning of the brain have permitted the neuroscientific perspective to extend its influence across a broad range of subfields in psychology. (We'll see examples of these methods throughout this Page 16 book in *Neuroscience in Your Life*.)

THE PSYCHODYNAMIC PERSPECTIVE: UNDERSTANDING THE INNER PERSON

To many people who have never taken a psychology course, psychology begins and ends with the psychodynamic perspective. Proponents of the **psychodynamic perspective** argue that behavior is motivated by inner forces and conflicts about which we have little awareness or control. They view dreams and slips of the tongue as indications of what a person is truly feeling within a seething cauldron of unconscious psychic activity.

The origins of the psychodynamic view are linked to one person: Sigmund Freud. Freud was an Austrian physician in the early 1900s whose ideas about unconscious determinants of behavior had a revolutionary effect on 20th-century thinking, not just in psychology but in related fields as well. Although some of the original Freudian principles have been roundly criticized, the contemporary psychodynamic perspective has provided a means not only to understand and treat some kinds of psychological disorders but also to understand everyday phenomena such as prejudice and aggression.

Sigmund Freud
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THE BEHAVIORAL PERSPECTIVE: OBSERVING THE OUTER PERSON

Whereas the neuroscience and psychodynamic approaches look inside the organism to determine the causes of its behavior, the behavioral perspective takes a different approach. Proponents of the behavioral perspective rejected psychology's early emphasis on the internal workings of the mind. Instead, the **behavioral perspective** suggests that the focus should be on external behavior that can be observed and measured objectively.

John B. Watson was the first major American psychologist to use a behavioral approach. Working in the 1920s, Watson believed that one could gain a complete understanding of behavior by studying the environment in which a person operated.

In fact, Watson believed rather optimistically that it was possible to bring about any desired type of behavior by controlling a person's environment. This philosophy is clear in his own words: "Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations and race of his ancestors" (Watson, 1924).

The behavioral perspective was championed by B. F. Skinner, a pioneer in the field. Much of our understanding of how people learn new behaviors is based on the behavioral perspective. As we will see, the behavioral perspective crops up along every byway of psychology. Along with its influence in the area of learning processes, this perspective has made contributions in such diverse areas as treating mental disorders, curbing aggression, resolving sexual problems, and ending drug addiction (Schlinger, 2011; Ruiz, 2015; Fryling, 2017).

THE COGNITIVE PERSPECTIVE: IDENTIFYING THE ROOTS OF UNDERSTANDING

Efforts to understand behavior lead some psychologists straight into the mind. Evolving in part from structuralism and in part as a reaction to behaviorism, which focused so heavily on observable behavior and the environment, the **cognitive perspective** focuses on how people think, understand, and know about the world. The emphasis is on learning how people comprehend and represent the outside world within

Page 17

themselves and how our ways of thinking about the world influence our behavior.

Many psychologists who adhere to the cognitive perspective compare human thinking to the workings of a computer, which takes in information and transforms, stores, and retrieves it. In their view, thinking is *information processing*.

Psychologists who rely on the cognitive perspective ask questions on subjects ranging from how people make decisions to whether a person can watch television and study at the same time. The common elements that link cognitive approaches are an emphasis on how people understand and think about the world and an interest in describing the patterns and irregularities in the operation of our minds.

From the perspective of …

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A Health-Care Provider How can a basic understanding of psychology improve your job performance in the health-care industry?

THE HUMANISTIC PERSPECTIVE: THE UNIQUE QUALITIES OF THE HUMAN SPECIES

The humanistic perspective rejects the view that behavior is determined largely by automatically unfolding biological forces, unconscious processes, or the environment. Instead, the **humanistic perspective** suggests that all individuals naturally strive to grow, develop, and be in control of their lives and behavior. Humanistic psychologists maintain that each of us has the capacity to seek and reach fulfillment.

According to Carl Rogers and Abraham Maslow, who were central figures in the development of the humanistic perspective, people strive to reach their full potential if they are given the opportunity. The emphasis of the humanistic perspective is on *free will*, the ability to freely make decisions about one's own behavior and life. The notion of free will stands in contrast to *determinism*, which sees behavior as caused, or determined, by things beyond a person's control.

The humanistic perspective assumes that people have the ability to make their own choices about their behavior rather than relying on societal standards. More than any other approach, it stresses the role of psychology in enriching people's lives and helping them achieve self-fulfillment. By reminding psychologists of their commitment to the individual person in society, the humanistic perspective has been an important influence (Nichols, 2011; Linley, 2013; Hayes, 2015).

Don't let the abstract qualities of the broad approaches we have discussed lull you into thinking that they are purely theoretical: These perspectives underlie ongoing work of a practical nature, as we discuss throughout this book. To start seeing how psychology can improve everyday life, read *Applying Psychology in the 21st Century*.

PSYCHOLOGY MATTERS

"Investigators search for clues at site of suicide bombing."

"Good jobs for college graduates remain hard to find."

"Eyewitness to killing proves unable to provide reliable clues."

"Social media like Facebook, Twitter, Snapchat, and Instagram change how people interact with others."

"Childhood obesity rates surge."

"Black suspect in robbery dies after scuffle with police."

A quick review of any day's news headlines reminds us that the world is beset by a variety of stubborn problems that resist easy solutions. At the same time, a considerable number of psychologists are devoting their energies and expertise to addressing these problems and improving the human condition. Let's consider some of the ways in which psychology has addressed and helped work toward solutions to major societal problems:

- What are the causes of terrorism? What motivates suicide bombers? Are they psychologically disordered, or can their behavior be seen as a rational response to a particular system of beliefs? As we'll see when we discuss psychological disorders, psychologists are gaining an understanding of the factors that lead people to embrace suicide and to engage in terrorism to further a cause in which they deeply believe (Post, 2015; Theriault, Krause, & Young, 2017; Choma et al., 2018).
- How are social media changing the way we live? Social networking media such as Facebook and Twitter have changed the way people communicate and the way news spreads around the world. How do social media affect the way people relate to each other? How do they affect our perceptions of world events? Psychologists are examining the motivations behind social networking, its influence on individuals and social institutions, and possible beneficial applications of the technology (Kosinski et al., 2015; Young et al., 2017; Zyoud et al., 2018).
- What are the roots of autism spectrum disorder, and why is it on the rise? Autism spectrum disorder is a severe developmental disability that impairs one's ability to communicate and relate to others. It exists on a continuum from mild symptoms, such as social awkwardness, to profound dysfunction, such as a complete inability to communicate or care for oneself. Psychologists are rapidly gaining insights into the hereditary and environmental factors that influence autism; the need for this understanding is urgent because the incidence of autism has been growing sharply in recent years and it's unclear why (Pelphrey & Shultz, 2013; Gillespie-Lynch et al., 2015; Commons et al., 2017).

What psychological forces led some to embrace the Black Lives Matter movement?
©Rena Schild/Shutterstock

- Why do eyewitnesses to crimes often remember the events inaccurately, and how can we increase the precision of eyewitness accounts? Psychologists' research has come to an important conclusion: Eyewitness testimony in criminal cases is often inaccurate and biased. Memories of crimes are often clouded by emotion, and the questions asked by police investigators often elicit inaccurate responses. Work by psychologists has been used to provide national guidelines for obtaining more accurate memories during criminal investigations (Beaudry et al., 2015; Wixted et al., 2015; Kassin et al., 2018).
- What are the roots of obesity, and how can healthier eating and better physical fitness be encouraged? Why are some people more predisposed to obesity than others are? What social factors might be at play in the rising rate of obesity in childhood? As is becoming increasingly clear, obesity is a complex problem with biological, psychological, and social underpinnings. Therefore, to be successful, approaches to treating obesity must take many factors into account. There is no magic bullet providing a quick fix, but psychologists recommend a number of strategies that help make weight-loss goals more achievable (MacLean et al., 2009; Neumark-Sztainer, 2009; Puhl & Liu, 2015).
- What are the roots of racism in the United States? Psychologists have discovered that even subtle forms of prejudice and discrimination can cause significant harm in recipients. Furthermore, they have learned that people who sincerely believe themselves to not be racist still harbor unconscious racist thoughts that can translate into discriminatory behavior. On the positive side, they are developing strategies that break down racial barriers and heal the hurt and stigma of decades of racism (Fisher et al., 2017; Mason et al., 2017; David & Derthick, 2018).
- What gives people satisfaction with life and a sense of well being? Research has found that during difficult economic times, it's important to understand that wealth and possessions don't make people happy. Instead, happiness comes from enjoying life's little moments and finding purpose and meaning in what you do (Pavot & Diener, 2013; Crespo & Mesurado, 2015; Jin & Kim, 2017).

These topics represent just a few of the issues that psychologists address daily. To further explore the many ways that psychology has an impact on everyday life, check out the American Psychological Association (APA) website, at www.apa.org, which features psychological applications in everyday life.

RETHINK

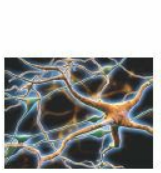
- What do *you* think are the major problems affecting society today?
- What are the psychological issues involved in these problems, and how might psychologists help find solutions to them?

Psychology's Key Issues and Controversies

As you consider the many topics and perspectives that make up psychology, ranging from a narrow focus on minute biochemical influences on behavior to a broad focus on social behaviors, you might find yourself thinking that the discipline lacks cohesion. However, the field is more unified than a first glimpse might suggest. For one thing, no matter what topical area a psychologist specializes in, he or she relies primarily on one of the five major perspectives. For example, a developmental psychologist who specializes in the study of children could make use of the cognitive perspective or the psychodynamic perspective or any of the other major perspectives.

Study Alert

Use Figure 3 to learn the key issues that underlie every subfield of psychology.





Issue	Neuroscience	Cognitive	Behavioral	Humanistic	Psychodynamic
Nature (heredity) vs. nurture (environment)	Nature (heredity)	Both	Nurture (environment)	Nurture (environment)	Nature (heredity)
Conscious vs. unconscious determinants of behavior	Unconscious	Both	Conscious	Conscious	Unconscious
Observable behavior vs internal mental processes	Internal emphasis	Internal emphasis	Observable emphasis	Internal emphasis	Internal emphasis
Free will vs. determinism	Determinism	Free will	Determinism	Free will	Determinism
Individual differences vs. universal principles	Universal emphasis	Individual emphasis	Both	Individual emphasis	Universal emphasis

FIGURE 3 Key issues in psychology and the positions taken by psychologists subscribing to the five major perspectives of psychology. (Neuroscience): ©Science Photo Library/Alamy Stock Photo; (Cognitive): ©David Sanger/The Image Bank/Getty Images; (Behavioral): ©Ariel Skelley/Blend Images; (Humanistic): ©White Packert/The Image Bank/Getty Images; (Psychodynamic): ©Athanasia Nomikou/Shutterstock

Psychologists also agree on what the key issues of the field are (see Figure 3). Although there are major arguments regarding how best to address and resolve the key issues, psychology is a unified science because psychologists of all perspectives agree that the issues must be addressed if the field is going to advance. As you contemplate these key issues, try not to think of them in "either/or" terms. Instead, consider the opposing viewpoints on each issue as the opposite ends of a continuum, with the positions of individual psychologists typically falling somewhere between the two ends.

Issue 1: *Nature (heredity) versus nurture (environment).* How much of people's behavior is due to their genetically determined nature (heredity), and how much is due to nurture, the influences of the physical and

social environment in which a child is raised? Furthermore, what is the interplay between heredity and environment? These questions have deep philosophical and historical roots, and they are involved in many topics in psychology.

A psychologist's take on this issue depends partly on which major perspective he or she subscribes to. For example, developmental psychologists whose focus is on how people grow and change throughout the course of their lives may be most interested in learning more about hereditary influences if they follow a neuroscience perspective. In contrast, developmental psychologists who are proponents of the behavioral perspective are more likely to focus on environment (Rutter, 2002; Moffitt, Caspi, & Rutter, 2006; Barrett, 2011).

However, every psychologist would agree that neither nature nor nurture alone is the sole determinant of behavior; rather, it is a combination of the two. In a sense, then, the real controversy involves how much of our behavior is caused by heredity and how much is caused by environmental influences.

Issue 2: *Conscious versus unconscious causes of behavior*. How much of our behavior is produced by forces of which we are fully aware, and how much is due to unconscious activity—mental processes that are not accessible to the conscious mind? This question represents one of the great controversies in the field of psychology. For example, clinical psychologists adopting a psychodynamic perspective argue that psychological disorders are brought about by unconscious factors, whereas psychologists employing the cognitive perspective suggest that psychological disorders largely are the result of faulty thinking processes.

Issue 3: *Observable behavior versus internal mental processes*. Should psychology concentrate solely on behavior that can be seen by outside observers, or should it focus on unseen thinking processes? Some psychologists, particularly those relying on the behavioral perspective, contend that the only legitimate source of information for psychologists is behavior that can be observed directly. Other psychologists, building on the cognitive perspective, argue that what goes on inside a person's mind is critical to understanding behavior, and so we must concern ourselves with mental processes.

Issue 4: *Free will versus determinism.* How much of our behavior is a matter of **free will** (choices made freely by an individual), and how much is subject to **determinism**, the notion that behavior is largely produced by factors beyond people's willful control? An issue long debated by philosophers, the free-will/determinism argument is also central to the field of psychology (Goto et al., 2015; Moynihan, Igou, & van Tilburg, 2017).

For example, some psychologists who specialize in psychological disorders argue that people make intentional choices and that those who display so-called abnormal behavior should be considered responsible for their actions. Other psychologists disagree and contend that such individuals are the victims of forces beyond their control. The position psychologists take on this issue has important implications for the way they treat psychological disorders, especially in deciding whether treatment should be forced on people who don't want it.

Issue 5: *Individual differences versus universal principles*. Specifically, how much of our behavior is a consequence of our unique and special qualities, the individual differences that differentiate us from other people? Conversely, how much reflects the culture and society in which we live, stemming from universal principles that underlie the behavior of all humans? Psychologists who rely on the neuroscience perspective tend to look for universal principles of behavior, such as how the nervous system operates or the way certain hormones automatically prime us for sexual activity. Such psychologists concentrate on the similarities in our behavioral destinies despite vast differences in our upbringing. In contrast, psychologists who employ the humanistic perspective focus more on the uniqueness of every individual. They consider every person's behavior a reflection of distinct and special individual qualities.

The question of the degree to which psychologists can identify universal principles that apply to all people has taken on new significance in light of the tremendous demographic changes now occurring in the United States and around the world. As we discuss next, these changes raise new and critical issues for the

discipline of psychology in the 21st century.

From the perspective of …

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A Social Worker Imagine that you have a caseload of clients who come from diverse cultures, ethnicities, and races. How might you consider their diverse backgrounds when assisting them?

Psychology's Future

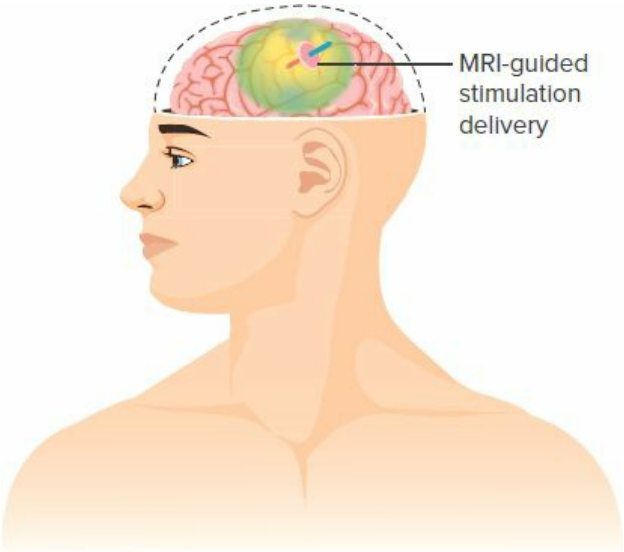
We have examined psychology's foundations, but what does the future hold for the discipline? Although the course of scientific development is notoriously difficult to predict, several trends seem likely:

- As its knowledge base grows, psychology will become increasingly specialized, and new perspectives will evolve. For example, our growing understanding of the brain and the nervous system, combined with scientific advances in genetics and gene therapy, will allow psychologists to focus on *prevention* of psychological disorders rather than only on their treatment (Cuijpers et al., 2008).
- The evolving sophistication of neuroscientific approaches is likely to have an increasing influence over other branches of psychology. For instance, social psychologists already are increasing their understanding of social behaviors such as persuasion by using brain scans as part of an evolving field known as *social neuroscience.* Furthermore, as neuroscientific techniques become more sophisticated, there will be new ways of applying that knowledge, as we discuss in *Neuroscience in Your Life* (Cacioppo & Decety, 2009; Di Ieva et al., 2015; Mattan, Kubota, & Cloutier, 2017).
- Psychology's influence on issues of public interest also will grow. The major problems of our time—such as violence, terrorism, racial and ethnic prejudice, poverty, and environmental changes, and technological disasters—have important psychological components Already, psychology has had significant influences on social policy, informing lawmakers' decision-making, a trend that is likely to increase (Zimbardo, 2004; Dweck, 2017; Fiske, 2017).
- Psychologists will follow increasingly strict ethical and moral guidelines. When it was revealed in 2015 that several psychologists participated in the interrogation and torture of military prisoners in the aftermath of the 9/11 terrorist attacks and that some of the leaders of the American Psychological Association (APA) were aware of these activities, a national scandal ensued. As a consequence, the APA adopted strict new guidelines that prohibit psychologists from participating in national security interrogations. In addition, psychologists are barred from working at the Guantánamo base in Cuba and at CIA black sites (Risen, 2015; Fink, 2017).
- The public's view of psychology will become more informed. Surveys show that the public at large does not fully understand the scientific underpinnings of the field. However, as the field itself embraces such practices as using scientific evidence to choose the best treatments for psychological disorders, psychology's reputation will grow (Lilienfeld, 2012; Ferguson, 2015).
- Finally, as the population becomes more diverse, issues of diversity—embodied in the study of racial, ethnic, linguistic, and cultural factors—will become more important to psychologists providing services and doing research. The result will be a field that can provide an understanding of *human* behavior in its broadest sense (Quintana et al., 2006; Richmond et al., 2015).

Page 22

NEUROSCIENCE IN YOUR LIFE: ENHANCING YOUR MIND

Neuroscientists have strived to understand how the normal brain works, as well as what happens to it following injury or disease. Recently, they have begun to use technologies to enhance people's typical existing abilities. For example, researchers are exploring how repetitive transcranial magnetic stimulation (TMS), a form of noninvasive brain stimulation, can enhance cognitive abilities. In one study, researchers used repetitive TMS to stimulate the hippocampus, a brain region involved in memory (see the image below of the area targeted for stimulation). Stimulation over the course of a week led to increased brain connectivity and improved memory (Wang et al., 2014).



Source: Adapted from Wang, J. X., Rogers, L. M., Gross, E. Z., Ryals, A. J., Dokucu, M. E., Brandstatt, K. L., … Voss, J. L. "Targeted enhancement of cortical-hippocampal brain networks and associative memory." Science, 345(6200), 2014, 1054–1057.

RECAP/EVALUATE/RETHINK

RECAP

LO 2-1 What are the origins of psychology?

- Wilhelm Wundt laid the foundation of psychology in 1879, when he opened his laboratory in Germany.
- Early perspectives that guided the work of psychologists were structuralism, functionalism, and Gestalt theory.

LO 2-2 What are the major approaches in contemporary psychology?

- The neuroscience approach focuses on the biological components of the behavior of people and animals.
- The psychodynamic perspective suggests that powerful, unconscious inner forces and conflicts about which people have little or no awareness are the primary determinants of behavior.
- The behavioral perspective deemphasizes internal processes and concentrates instead on observable, measurable behavior, suggesting that understanding and control of a person's environment are sufficient to fully explain and modify behavior.
- Cognitive approaches to behavior consider how people know, understand, and think about the world.
- The humanistic perspective emphasizes that people are uniquely inclined toward psychological growth and higher levels of functioning and that they will strive to reach their full potential.

LO 2-3 What are psychology's key issues and controversies?

- Psychology's key issues and controversies center on how much of human behavior is a product of nature or nurture, conscious or unconscious thoughts, observable actions or internal mental processes, free will or determinism, and individual differences or universal principles.

LO 2-4 What is the future of psychology likely to hold?

- Psychology will become increasingly specialized, will pay greater attention to prevention instead of just treatment, will become more and more concerned with the public interest, and will take the growing diversity of the country's population into account more fully.

EVALUATE

Page 23

1. Wundt described psychology as the study of conscious experience, a perspective he called _____.
2. Early psychologists studied the mind by asking people to describe what they were experiencing when exposed to various stimuli. This procedure was known as _____.
3. The statement "In order to study human behavior, we must consider the whole of perception rather than its component parts" might be made by a person subscribing to which perspective of psychology?
4. Jeanne's therapist asks her to recount a violent dream she recently experienced in order to gain insight into the unconscious forces affecting her behavior. Jeanne's therapist is working from a _____ perspective.
5. "It is behavior that can be observed that should be studied, not the suspected inner workings of the mind." This statement was most likely made by someone with which perspective?
   a. Cognitive perspective
   b. Neuroscience perspective
   c. Humanistic perspective
   d. Behavioral perspective
6. "My therapist is wonderful! He always points out my positive traits. He dwells on my uniqueness and strength as an individual. I feel much more confident about myself—as if I'm really growing and reaching my potential." The therapist being described most likely follows a _____ perspective.
7. In the nature-nurture issue, nature refers to heredity, and nurture refers to the _____.
8. Race is a biological concept, not a psychological one. True or false?

RETHINK

Focusing on one of the five major perspectives in use today (that is, neuroscience, psychodynamic, behavioral, cognitive, and humanistic), can you describe the kinds of research questions and studies that researchers using that perspective might pursue?

Answers to Evaluate Questions

1. structuralism; **2.** introspection; **3.** Gestalt; **4.** psychodynamic; **5.** d; **6.** humanistic; **7.** environment; **8.** true

KEY TERMS

structuralism
introspection
functionalism
Gestalt (geh-SHTALLT) psychology
neuroscience perspective

psychodynamic perspective
behavioral perspective
cognitive perspective
humanistic perspective
free will
determinism

Module 3
Research in Psychology

LEARNING OUTCOMES

LO 3-1 What is the scientific method?

LO 3-2 What role do theories and hypotheses play in psychological research?

LO 3-3 What research methods do psychologists use?

LO 3-4 How do psychologists establish cause-and-effect relationships in research studies?

The Scientific Method

"Birds of a feather flock together"… or "Opposites attract"? "Two heads are better than one"… or "If you want a thing done well, do it yourself"? "The more the merrier"… or "Two's company, three's a crowd"?

If we were to rely on common sense to understand behavior, we'd have considerable difficulty—especially because commonsense views are often contradictory. In fact, one of the major undertakings for the field of psychology is to develop suppositions about behavior and to determine which of those suppositions are accurate (Ferguson, 2015).

Psychologists—as well as scientists in other disciplines—meet the challenge of posing appropriate questions and properly answering them by relying on the scientific method. The **scientific method** is the approach used by psychologists to systematically acquire knowledge and understanding about behavior and other phenomena of interest. As illustrated in Figure 1, it consists of four main steps: (1) identifying questions of interest, (2) formulating an explanation, (3) carrying out research designed to support or refute the explanation, and (4) communicating the findings.

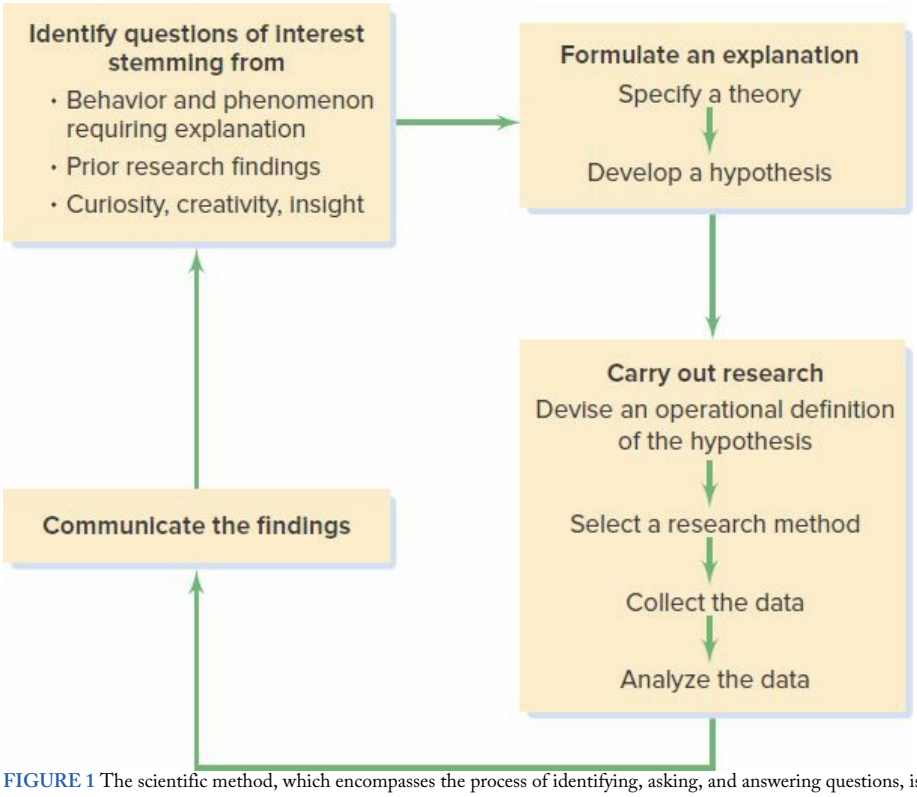


FIGURE 1 The scientific method, which encompasses the process of identifying, asking, and answering questions, is used by psychologists and by researchers from every other scientific discipline to come to an understanding about the world. What do you think are the advantages of this method?

Study Alert

Use Figure 1 to remember the four steps of the scientific method (identifying questions, formulating an explanation, carrying out research, and communicating the findings).

THEORIES: SPECIFYING BROAD EXPLANATIONS

In using the scientific method, psychologists start by identifying questions of interest. We have all been curious at some time about our observations of everyday behavior. If you have ever asked yourself why a particular teacher is so easily annoyed, why a friend is always late for appointments, or how your dog understands your commands, you have been formulating questions about behavior.

Psychologists, too, ask questions about the nature and causes of behavior. They may want to explore explanations for everyday behaviors or for various phenomena. They may also pose questions that build on findings from their previous research or from research carried out by other psychologists. Or they may produce new questions that are based on curiosity, creativity, or insight.

After a question has been identified, the next step in the scientific method is to develop a theory to explain the observed phenomenon. **Theories** are broad explanations and predictions concerning observations of interest. They provide a framework for understanding the relationships among a set of otherwise unorganized facts or principles.

All of us have developed our own informal theories of human behavior, such as "People are basically good" or "People's behavior is usually motivated by self-interest." However, psychologists' theories are more formal and focused. They are established on the basis of a careful study of the psychological literature to identify earlier relevant research and previously formulated theories, as well as psychologists' general knowledge of the field.

Growing out of the diverse approaches employed by psychologists, theories vary both in their breadth and in their level of detail. For example, one theory might seek to explain and predict a phenomenon as broad as emotional experience. A narrower theory might attempt to explain why people display the emotion of fear nonverbally after receiving a threat (Anker & Feeley, 2011; Croom, 2015; Smith et al., 2017).

Psychologists Bibb Latané and John Darley, responding to the failure of bystanders to intervene when Kitty Genovese was murdered in New York, developed what they called a theory of *diffusion of responsibility* (Latané & Darley, 1970). According to their theory, the greater the number of bystanders or witnesses to an event that calls for helping behavior, the more the responsibility for helping is perceived to be shared by all the bystanders. Thus, the greater the number of bystanders in an emergency situation, the smaller the share of the responsibility each person feels—and the less likely that any single person will come forward to help.

HYPOTHESES: CRAFTING TESTABLE PREDICTIONS

Although the diffusion of responsibility theory seems to make sense, it represented only the beginning phase of Latané and Darley's investigative process. Their next step was to devise a way to test their theory. To do this, they needed to create a hypothesis. A **hypothesis** is a prediction stated in a way that allows it to be tested. Hypotheses stem from theories; they help test the underlying soundness of theories.

In the same way that we develop our own broad theories about the world, we also construct hypotheses about events and behavior. Those hypotheses can range from trivialities (such as why our English instructor wears those weird shirts) to more meaningful matters (such as what is the best way to study for a test). Although we rarely test these hypotheses systematically, we do try to determine whether they are right. Perhaps we try comparing two strategies: cramming the night before an exam versus spreading out our study over several nights. By assessing which approach yields better test performance, we have created a way to compare the two strategies.

A hypothesis must be stated in a way that will allow it to be tested, which involves creating an operational definition. An **operational definition** is the translation of a hypothesis into specific, testable

procedures that can be measured and observed in an experiment.

There is no single way to go about devising an operational definition for a hypothesis; it depends Page 26 on logic, the equipment and facilities available, the psychological perspective being employed, and ultimately the creativity of the researcher. For example, one researcher might develop a hypothesis that uses as an operational definition of "fear" an increase in heart rate. In contrast, another psychologist might use as an operational definition of "fear" a written response to the question "How much fear are you experiencing at this moment?"

Latané and Darley's hypothesis was a straightforward prediction from their more general theory of diffusion of responsibility: The more people who witness an emergency situation, the less likely it is that help will be given to a victim. They could, of course, have chosen another hypothesis (try to think of one!), but their initial formulation seemed to offer the most direct test of the theory.

Psychologists rely on formal theories and hypotheses for many reasons. For one thing, theories and hypotheses allow them to make sense of unorganized, separate observations and bits of data. They permit them to place observations and data within a coherent framework. In addition, theories and hypotheses allow psychologists to move beyond known facts and make deductions about unexplained phenomena and develop ideas for future investigation (van Wesel, Boeije, & Hoijtink, 2013; Barrett & Russell, 2015).

Study Alert

Remember that a theory is a broad explanation, whereas a hypothesis is a more narrow prediction.

In short, the scientific method, with its emphasis on theories and hypotheses, helps psychologists pose appropriate questions. With properly stated questions in hand, psychologists then can choose from a variety of research methods to find answers.

Psychological Research

Research—systematic inquiry aimed at the discovery of new knowledge—is a central ingredient of the scientific method in psychology. It provides the key to understanding the degree to which hypotheses (and the theories behind them) are accurate.

Just as we can apply different theories and hypotheses to explain the same phenomena, we can use a number of alternative methods to conduct research. As we consider the major tools that psychologists use to conduct research, keep in mind that their relevance extends beyond testing and evaluating hypotheses in psychology. All of us carry out elementary forms of research on our own. For instance, a supervisor might evaluate an employee's performance; a physician might systematically test the effects of different doses of a drug on a patient; a salesperson might compare different persuasive strategies. Each of these situations draws on the research practices we are about to discuss.

Descriptive Research

Let's begin by considering several types of *descriptive research* designed to systematically investigate a person, group, or patterns of behavior. These methods include archival research, naturalistic observation, survey research, and case studies.

ARCHIVAL RESEARCH

Suppose that, like the psychologists Latané and Darley (1970), you were interested in finding out more about emergency situations in which bystanders did not provide help. One of the first places you might turn to would be historical accounts. By searching newspaper records, for example, you might find support for the notion that a decrease in helping behavior historically has accompanied an increase in the number of bystanders.

Using newspaper articles is an example of archival research. In **archival research**, existing data, such as census documents, college records, online databases, and newspaper articles, are examined to test a hypothesis. For example, college transcripts may be used to determine if there are gender differences in academic performance. Similarly, Facebook provides a huge pool of data from millions of users that can be used to collect data (Sullivan, Riccio, & Reynolds, 2008; Fisher & Barnes-Farrell, 2013; Kosinski et al., 2015).

Page 27

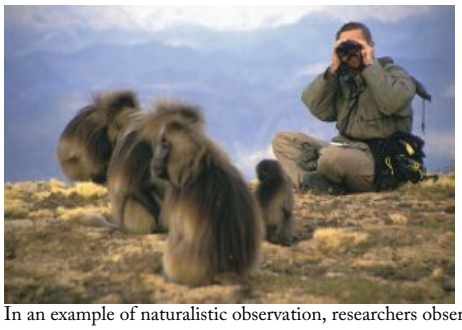
Archival research is a relatively inexpensive means of testing a hypothesis because someone else has already collected the basic data. Of course, the use of existing data has several drawbacks. For one thing, the data may not be in a form that allows the researcher to test a hypothesis fully. The information could be incomplete, or it could have been collected haphazardly (Riniolo et al., 2003; Vega, 2006; Zickar, 2015).

Most attempts at archival research are hampered by the simple fact that records with the necessary information often do not exist. In these instances, researchers often turn to another research method: naturalistic observation.

NATURALISTIC OBSERVATION

In **naturalistic observation**, the investigator observes some naturally occurring behavior and does not make a change in the situation. For example, a researcher investigating helping behavior might observe the kind of help given to victims in a high-crime area of a city. The important point to remember about naturalistic observation is that the researcher simply records what occurs, making no modification in the situation that is being observed (Kennison & Bowers, 2011; Haas et al., 2015; Wilson & Joye, 2017).

Although the advantage of naturalistic observation is obvious—we get a sample of what people do in their "natural habitat"—there is also an important drawback: the inability to control any of the factors of interest. For example, we might find so few naturally occurring instances of helping behavior that we would be unable to draw any conclusions. Because naturalistic observation prevents researchers from making changes in a situation, they must wait until the appropriate conditions occur. Furthermore, if people know they are being watched, they may alter their reactions and produce behavior that is not truly representative.



In an example of naturalistic observation, researchers observe primates in their natural habitat.
©Suzanne Long/Alamy Stock Photo

SURVEY RESEARCH

There is no more straightforward way of finding out what people think, feel, and do than asking them directly. For this reason, surveys are an important research method. In **survey research**, a *sample* of people chosen to represent a larger group of interest (a *population*) is asked a series of questions about their behavior, thoughts, or attitudes. Survey methods have become so sophisticated that even with a very small sample researchers are able to infer with great accuracy how a larger group would respond. For instance, a sample of just a few thousand voters is sufficient to predict within one or two percentage points who will win a presidential election—if the representative sample is chosen with care (Sommer & Sommer, 2001; Groves et al., 2004; Igo, 2006).

Researchers investigating helping behavior might conduct a survey by asking people to complete a questionnaire in which they indicate their reluctance for giving aid to someone. Similarly, researchers interested in learning about sexual practices have carried out surveys to learn which practices are common and which are not and to chart changing notions of sexual morality over the last several decades (Reece et al., 2009; Santelli et al., 2009).

However, survey research has several potential pitfalls. For one thing, if the sample of people who are surveyed is not representative of the broader population of interest, the results of the survey will have little meaning. For instance, if a sample of voters in a town includes only Republicans, it would hardly be useful for predicting the results of an election in which both Republicans and Democrats are voting. Consequently, researchers using surveys strive to obtain a *random sample* of the population in question in which every voter in the town has an equal chance of being included in the sample receiving the survey (Davern, 2013; Engel et al., 2015; Nedelec, 2017).

Page 28

PsychTech

One of the most efficient ways to conduct surveys is via the web. But web surveys may have sampling problems, given that not everyone has easy access to the web, such as people living in poverty. Consequently, web surveys may not be representative of the broader population.

In addition, survey respondents may not want to admit to holding socially undesirable attitudes. (Most racists know they are racists and might not want to admit it.) Furthermore, people may not want to admit they engage in behaviors that they feel are somehow abnormal—a problem that plagues surveys of sexual

behavior because people are often reluctant to admit what they really do in private. Finally, in some cases, people may not even be consciously aware of what their true attitudes are or why they hold them.

From the perspective of …

©Jack Hollingsworth/Getty Images

A Marketing Manager How would you design a survey that targets the customers in which you are most interested?

THE CASE STUDY

When they read of a suicide bomber in the Middle East, many people wonder what it is about the terrorist's personality or background that leads to such behavior. To answer this question, psychologists might conduct a case study. In contrast to a survey, in which many people are studied, a **case study** is an in-depth, intensive investigation of a single individual or a small group. Case studies often include *psychological testing*, a procedure in which a carefully designed set of questions is used to gain some insight into the personality of the individual or group (Gass et al., 2000; Addus, Chen, & Khan, 2007).

When case studies are used as a research technique, the goal is to use the insights gained from the study of a few individuals to improve our understanding of people in general. Sigmund Freud developed his theories through case studies of individual patients. Similarly, case studies of terrorists might help identify others who are prone to violence.

The drawback to case studies? If the individuals examined are unique in certain ways, it is impossible to make valid generalizations to a larger population. Still, case studies sometimes lead the way to new theories and treatments for psychological disorders.

CORRELATIONAL RESEARCH

In using the descriptive research methods we have discussed, researchers often wish to determine the relationship between two variables. **Variables** are behaviors, events, or other characteristics that can change, or vary, in some way. For example, in a study to determine whether the amount of studying makes a difference in test scores, the variables would be study time and test scores.

In **correlational research**, two sets of variables are examined to determine whether they are associated, or "correlated." The strength and direction of the relationship between the two variables are represented by a mathematical statistic known as a *correlation* (or, more formally, a *correlation coefficient*), which can range from +1.0 to −1.0.

A *positive correlation* indicates that as the value of one variable increases, we can predict that the value of the other variable will also increase. For example, if we predict that the more time students spend studying for a test, the higher their grades on the test will be and that the less they study, the lower their test scores will be, we are expecting to find a positive correlation. (Higher values of the variable "amount of study time"

Page 29

would be associated with higher values of the variable "test score," and lower values of "amount of study time" would be associated with lower values of "test score.") The correlation, then, would be indicated by a positive number, and the stronger the association was between studying and test scores, the closer the number would be to +1.0. For example, we might find a correlation of +.85 between test scores and amount of study time, indicating a strong positive association.

In contrast, a *negative correlation* tells us that as the value of one variable increases, the value of the other decreases. For instance, we might predict that as the number of hours spent studying increases, the number of hours spent partying decreases. Here we are expecting a negative correlation, ranging between 0 and −1.0. More studying is associated with less partying, and less studying is associated with more partying. The stronger the association between studying and partying is, the closer the correlation will be to −1.0. For instance, a correlation of −.85 would indicate a strong negative association between partying and studying.

Of course, it's quite possible that little or no relationship exists between two variables. For instance, we would probably not expect to find a relationship between number of study hours and height. Lack of a relationship would be indicated by a correlation close to 0. For example, if we found a correlation of −.02 or +.03, it would indicate that there is virtually no association between the two variables; knowing how much someone studies does not tell us anything about how tall he or she is.

When two variables are strongly correlated with each other, it is tempting to assume that one variable causes changes in the other variable. For example, if we find that more study time is associated with higher grades, we might guess that more studying *causes* higher grades. Although this is not a bad guess, it remains just a guess—because finding that two variables are correlated does not mean that there is a causal relationship between them. The strong correlation suggests that knowing how much a person studies can help us predict how that person will do on a test, but it does not mean that the studying *causes* the test performance. Instead, for instance, people who are more interested in the subject matter might study more than do those who are less interested, and so the amount of interest, not the number of hours spent studying, would predict test performance. The mere fact that two variables occur together does not mean that one causes the other.

Study Alert

The concept that "correlation does not imply causation" is a key principle.

Similarly, suppose you learned that the number of houses of worship in a large sample of cities was positively correlated with the number of people arrested, meaning that the more houses of worship, the more arrests there were in a city. Does this mean that the presence of more houses of worship caused the greater number of arrests? Almost surely not, of course. In this case, the underlying cause is probably the size of the city: In bigger cities, there are both more houses of worship *and* more arrests.

One more example illustrates the critical point that correlations tell us nothing about cause and effect but only provide a measure of the strength of a relationship between two variables. We might find that children who watch a lot of television programs featuring high levels of aggression are likely to demonstrate a relatively high degree of aggressive behavior and that those who watch few television shows that portray aggression are apt to exhibit a relatively low degree of such behavior (see Figure 2). But we cannot say that the aggression is *caused* by the TV viewing because many other explanations are possible.

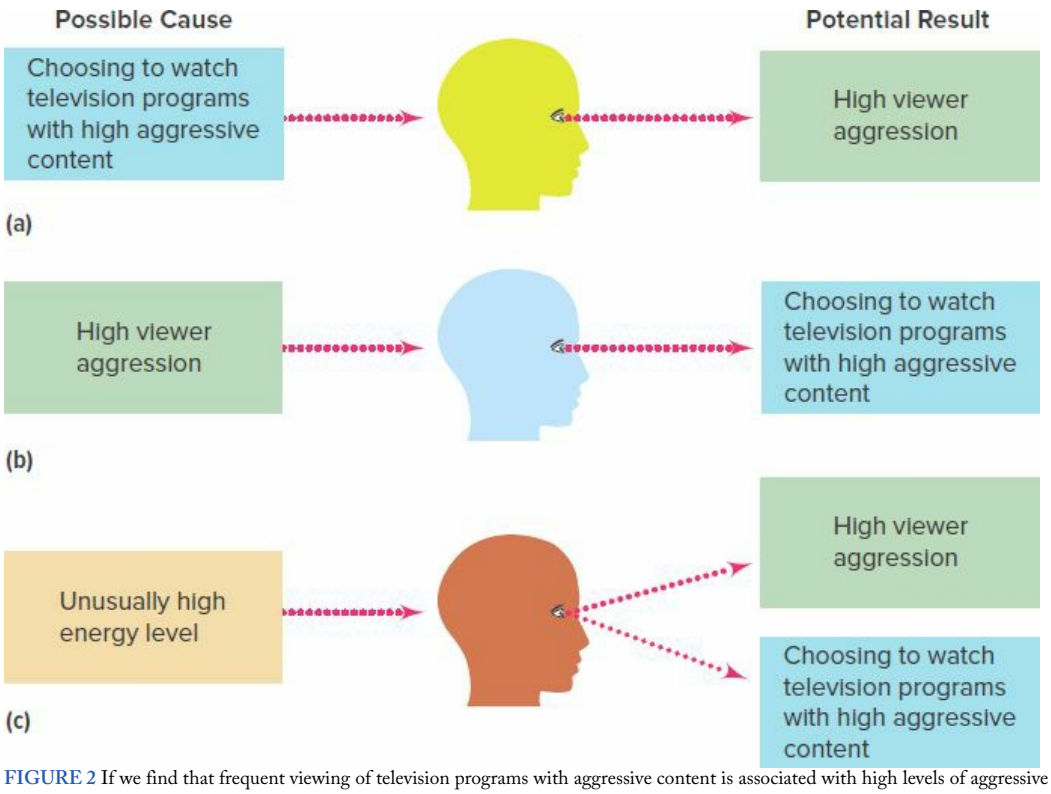


FIGURE 2 If we find that frequent viewing of television programs with aggressive content is associated with high levels of aggressive behavior, we might cite several plausible causes, as suggested in this figure. For example, (a) choosing to watch shows with aggressive content could produce aggression; or (b) being a highly aggressive person might cause one to choose to watch televised aggression; or (c) having a high energy level might cause a person to both choose to watch aggressive shows and to act aggressively. Correlational findings, then, do not permit us to determine causality. Can you think of a way to study the effects of televised aggression on aggressive behavior that is not correlational?

Many studies show that the observation of violence in the media is associated with aggression in viewers. Can we conclude that the observations of violence cause aggression?
©Andrey_Popov/Shutterstock

For instance, it could be that children who have an unusually high level of energy seek out programs with aggressive content *and* are more aggressive. The children's energy level, then, could be the true cause of the children's higher incidence of aggression. Also, people who are already highly aggressive might choose to watch shows with a high aggressive content *because* they are aggressive. Clearly, then, any number of causal sequences are possible—none of which can be ruled out by correlational research (Feshbach & Tangney, 2008; Grimes & Bergen, 2008).

The inability of correlational research to demonstrate cause-and-effect relationships is a crucial drawback to its use. There is, however, an alternative technique that does establish causality: the experiment.

Experimental Research

Carrying out experiments is the *only* way psychologists can establish cause-and-effect relationships. In a formal **experiment**, the researcher investigates the relationship between two (or more) variables by deliberately changing one variable in a controlled situation and observing the effects of that change on other aspects of the situation. In an experiment, then, the conditions are created and controlled by the researcher, who deliberately makes a change in those conditions in order to observe the effects of that change.

The **experimental manipulation** is the change that a researcher deliberately makes in an experiment. Experimental manipulations are used to detect relationships between different variables (Salazar, Crosby, & DiClemente, 2015).

Several steps are involved in carrying out an experiment, but the process typically begins with the development of one or more hypotheses for the experiment to test. For example, Latané and Darley, in testing their theory of the diffusion of responsibility in bystander behavior, developed this hypothesis: The higher the number of people who witness an emergency situation is, the less likely it is that any of them will help the victim. They then designed an experiment to test this hypothesis.

Their first step was to formulate an operational definition of the hypothesis by conceptualizing it in a way that could be tested. Latané and Darley had to take into account the fundamental principle of experimental research mentioned earlier: Experimenters must manipulate at least one variable in order to observe the effects of the manipulation on another variable while keeping other factors in the situation constant. However, the manipulation cannot be viewed by itself, in isolation; if a cause-and-effect relationship is to be established, the effects of the manipulation must be compared with the effects of no manipulation or a different kind of manipulation.

EXPERIMENTAL GROUPS AND CONTROL GROUPS

Experimental research requires, then, that the responses of at least two groups be compared. One group will receive some special **treatment**—the manipulation implemented by the experimenter—and another group will receive either no treatment or a different treatment. Any group that receives a treatment is called an **experimental group**; a group that receives no treatment is called a **control group**. (In some experiments, there are multiple experimental and control groups, each of which is compared with another group.)

By employing both experimental and control groups in an experiment, researchers are able to rule out the possibility that something other than the experimental manipulation produced the results observed in the experiment. Without a control group, we couldn't be sure that some other variable, such as the temperature at the time we were running the experiment, the color of the experimenter's hair, or even the mere passage of time, wasn't causing the changes observed.

For example, consider a medical researcher who thinks he has invented a medicine that cures the common cold. To test his claim, he gives the medicine one day to a group of 20 people who have colds and finds that 10 days later all of them are cured.

Eureka? Not so fast. An observer viewing this flawed study might reasonably argue that the people would have gotten better even without the medicine. What the researcher obviously needed was a control group consisting of people with colds who *don't* get the medicine and whose health is also checked 10 days later. Only if there is a significant difference between experimental and control groups can the effectiveness of the medicine be assessed. Through the use of control groups, then, researchers can isolate specific causes for their findings—and draw cause-and-effect inferences.

In this experiment, preschoolers' reactions to the puppet are monitored. Can you think of a hypothesis that might be tested in this way?
©Thierry Berrod, Mona Lisa Production/Science Source

Returning to Latané and Darley's experiment, we see that the researchers needed to translate their hypothesis into something testable. To do this, they decided to create a false emergency situation that would appear to require the aid of a bystander. As their experimental manipulation, they decided to vary the number of bystanders present. They could have had just one experimental group with, say, two people present and a control group for comparison purposes with just one person present. Instead, they settled on a more complex procedure involving the creation of groups of three sizes—consisting of two, three, and six people—that could be compared with one another.

INDEPENDENT AND DEPENDENT VARIABLES

Latané and Darley's experimental design now included an operational definition of what is called the **independent variable**. The independent variable is the condition that is manipulated by an experimenter. (You can think of the independent variable as being independent of the actions of those taking part in an experiment; it is controlled by the experimenter.) In the case of the Latané and Darley experiment, the independent variable was the number of people present, which was manipulated by the experimenters.

The next step was to decide how they were going to determine the effect that varying the number of bystanders had on behavior of those in the experiment. Crucial to every experiment is the **dependent variable**. The dependent variable is the variable that is measured in a study. The dependent variable is expected to change as a result of the experimenter's manipulation of the independent variable. The dependent variable is dependent on the actions of the *participants* or *subjects*—the people taking part in the experiment.

Latané and Darley had several possible choices for their dependent measure. One might have been a simple yes/no measure of the participants' helping behavior. But the investigators also wanted a more precise analysis of helping behavior. Consequently, they also measured the amount of time it took for a participant to provide help.

Latané and Darley now had all the necessary components of an experiment. The independent variable, manipulated by them, was the number of bystanders present in an emergency situation. The dependent variable was the measure of whether bystanders in each of the groups provided help and the amount of time it took them to do so. Consequently, like all experiments, this one had both an independent variable and a dependent variable. *All* true experiments in psychology fit this straightforward model.

Study Alert

To remember the difference between dependent and independent variables, recall that a hypothesis predicts how a dependent variable *depends* on the manipulation of the independent variable.

RANDOM ASSIGNMENT OF PARTICIPANTS

To make the experiment a valid test of the hypothesis, Latané and Darley needed to add a final step to the design: properly assigning participants to a particular experimental group.

The significance of this step becomes clear when we examine various alternative procedures. For example, the experimenters might have assigned just males to the group with two bystanders, just females to the group with three bystanders, and both males and females to the group with six bystanders. If they had done this, however, any differences they found in helping behavior could not be attributed with any certainty solely to group size because the differences might just as well have been due to the composition of the group. A more reasonable procedure would be to ensure that each group had the same composition in terms of gender; then the researchers would be able to make comparisons across groups with considerably more accuracy.

Participants in each of the experimental groups ought to be comparable, and it is easy enough to create groups that are similar in terms of gender. The problem becomes a bit more tricky, though, when we consider other participant characteristics. How can we ensure that participants in each experimental group will be equally intelligent, extroverted, cooperative, and so forth, when the list of characteristics—any one of which could be important—is potentially endless?

The solution is a simple but elegant procedure called **random assignment to condition**. Participants are assigned to different experimental groups, or "conditions," on the basis of chance and chance alone. The experimenter might, for instance, flip a coin for each participant and assign a participant to one group when "heads" came up and to the other group when "tails" came up. The advantage of this technique is that there is an equal chance that participant characteristics will be distributed across the various groups. When a researcher uses random assignment—which in practice is usually carried out using computer-generated random numbers—chances are that each of the groups will have approximately the same proportion of intelligent people, cooperative people, extroverted people, males and females, and so on.

Figure 3 provides another example of an experiment. Like all experiments, it includes the following set of key elements, which you should keep in mind as you consider whether a research study is truly an experiment:

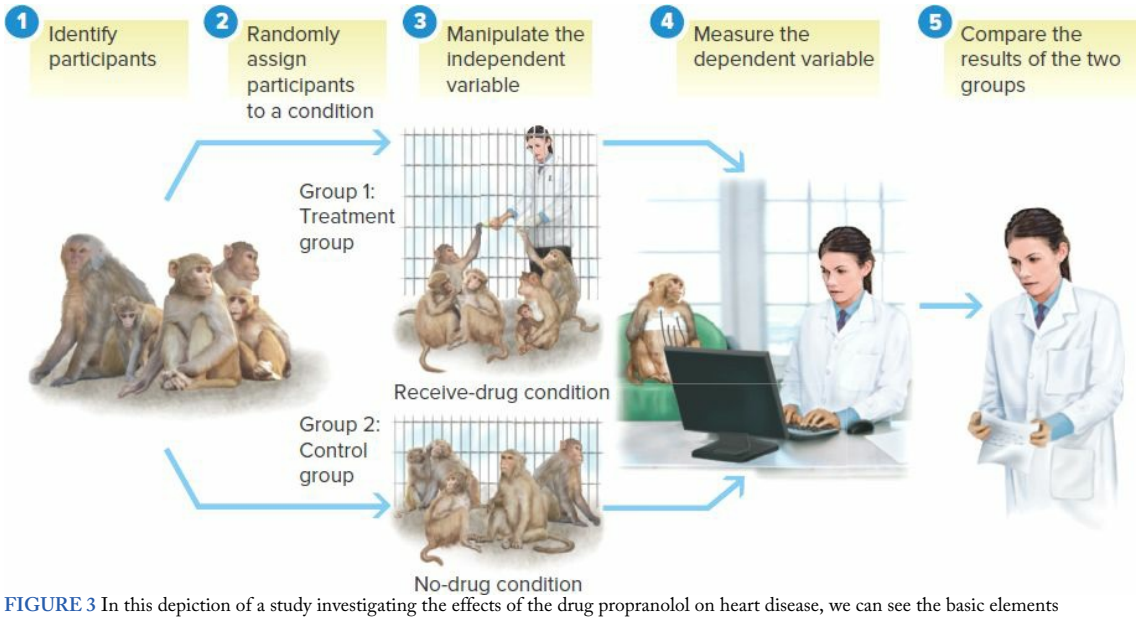


FIGURE 3 In this depiction of a study investigating the effects of the drug propranolol on heart disease, we can see the basic elements of all true experiments. The participants in the experiment were monkeys that were randomly assigned to one of two groups. Monkeys assigned to the treatment group were given propranolol, hypothesized to prevent heart disease, whereas those in the control group were not given the drug. Administration of the drugs, then, was the independent variable.

All the monkeys were given a high-fat diet that was the human equivalent of two eggs with bacon every morning, and they occasionally were reassigned to different cages to increase their stress. To determine the effects of the drug, the monkeys' heart rates and other measures of heart disease were assessed after 26 months. These measures constituted the dependent variable. The results? As hypothesized, monkeys that received the drug showed slower heart rates and fewer symptoms of heart disease than those that did not.

Source: Based on Kaplan, J. R., & Manuck, S. B. (1989). The effect of propranolol on behavioral interactions among adult male cynomolgus monkeys *(Macacafascicularis)* housed in disrupted social groupings. *Psychosomatic Medicine, 51*, 449–462.

- An independent variable, the variable that is manipulated by the experimenter
- A dependent variable, the variable that is measured by the experimenter and that is expected to change as a result of the manipulation of the independent variable
- A procedure that randomly assigns participants to different experimental groups, or "conditions," of the independent variable
- A hypothesis that predicts the effect the independent variable will have on the dependent variable

Only if each of these elements is present can a research study be considered a true experiment in Page 33 which cause-and-effect relationships can be determined. (For a summary of the different types of research that we've discussed, see Figure 4.)

Research Method	Description	Advantages	Shortcomings
Descriptive and correlational research	Researcher observes a previously existing situation but does not make a change in the situation.	Offers insight into relationships between variables	Cannot determine causality
Archival research	Examines existing data to confirm hypothesis	Ease of data collection because data already exist	Dependent on availability of data
Naturalistic observation	Observation of naturally occurring behavior, without making a change in the situation	Provides a sample of people in their natural environment	Cannot control the "natural habitat" being observed
Survey research	A sample is chosen to represent a larger population and asked a series of questions.	A small sample can be used to infer attitudes and behavior of a larger population.	Sample may not be representative of the larger population; participants may not provide accurate responses to survey questions.
Case study	Intensive investigation of an individual or small group	Provides a thorough, in-depth understanding of participants	Results may not be generalizable beyond the sample.
Experimental research	Investigator produces a change in one variable to observe the effects of that change on other variables.	Experiments offer the only way to determine cause-and-effect relationships.	To be valid, experiments require random assignment of participants to conditions, well-conceptualized independent and dependent variables, and other careful controls.

FIGURE 4 Research strategies.
(top): ©Bill Aron/PhotoEdit; (bottom): ©Marc Steinmetz/Visum/The Image Works

WERE LATANÉ AND DARLEY RIGHT?

To test their hypothesis that increasing the number of bystanders in an emergency situation would lower the degree of helping behavior, Latané and Darley placed the participants in a room and told them that the purpose of the experiment was to talk about personal problems associated with college. The discussion was to be held over an intercom, supposedly to avoid the potential embarrassment of face-to-face contact. Chatting about personal problems was not, of course, the true purpose of the experiment, but telling the participants that it was provided a way of keeping their expectations from biasing their behavior. (Consider how they would have been affected if they had been told that their helping behavior in emergencies was being tested. The experimenters could never have gotten an accurate assessment of what the participants would actually do in an emergency. By definition, emergencies are rarely announced in advance.)

The sizes of the discussion groups were two, three, and six people, which constituted the manipulation of the independent variable of group size. Participants were randomly assigned to these groups upon their arrival at the laboratory. Each group included one trained confederate of the experimenters. A *confederate* is an actor employed by a researcher who participates in a psychological experiment, pretending to be a participant. The researcher trains the confederate to act in a particular way during the experiment.

Page 34

As the participants in each group were holding their discussion, they suddenly heard through the intercom one of the other participants—but who in reality was the confederate—having what sounded like an epileptic seizure. The confederate then called for help.

The actual participants' behavior was now what counted. The dependent variable was the time that elapsed from the start of the "seizure" to the time a participant began trying to help the "victim." If 6 minutes

went by without a participant offering help, the experiment was ended.

As predicted by the hypothesis, the size of the group had a significant effect on whether a participant provided help. The more people who were present, the less likely it was that someone would supply help, as you can see in Figure 5 (Latané & Darley, 1970).

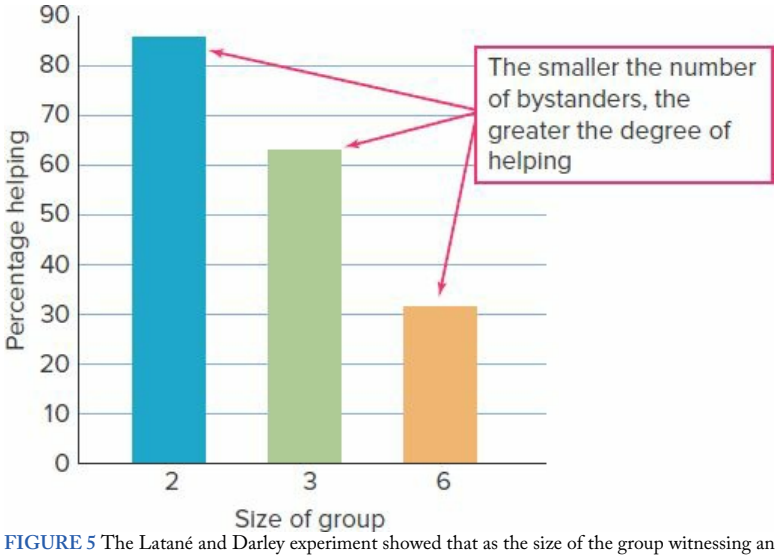


FIGURE 5 The Latané and Darley experiment showed that as the size of the group witnessing an emergency increased, helping behavior decreased.

Source: Adapted from Darley, J. M., & Latané, B. (1968). Bystanders' intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology, 8*, 377–383.

Because these results are straightforward, it seems clear that the experiment confirmed the original hypothesis. However, Latané and Darley could not be sure that the results were truly meaningful until Page 35 they determined whether the results represented what statisticians call a significant outcome. A **significant outcome** indicates that the findings are statistically meaningful, making it possible for researchers to feel confident that they have confirmed their hypotheses. Using statistical analysis, researchers can determine whether a numeric difference is a real difference or is due merely to chance. Only when differences between groups are large enough that statistical tests show them to be significant is it possible for researchers to confirm a hypothesis (Cwikel, Behar, & Rabson-Hare, 2000; Cohen, 2002).

MOVING BEYOND THE STUDY

The Latané and Darley study contains all the elements of an experiment: an independent variable, a dependent variable, random assignment to conditions, and multiple experimental groups. Consequently, we can say with some confidence that group size *caused* changes in the degree of helping behavior.

Of course, one experiment alone does not forever resolve the question of bystander intervention in emergencies. Psychologists—like other scientists—require that findings be **replicated**, or repeated, sometimes using other procedures, in other settings, with other groups of participants, before full confidence can be placed in the results of any single experiment. For example, follow-up research shows that college students aren't the only ones who show the bystander effect; young children do as well. Furthermore, a procedure called *meta-analysis* permits psychologists to combine the results of many separate studies into one overall conclusion (Kisely et al., 2015; Plotner et al., 2015; Stone & Rosopa, 2017).

Replication is a critical activity, and many researchers believe that psychologists need to increase the number of studies that are replications of earlier research in order to have greater confidence in their findings. They point to an influential study that attempted to replicate 100 previous findings but that found that only

36% of the replications yielded similarly significant findings as in the original studies. The takeaway message: in order to be fully confident about the meaning of research studies, they need to be replicated (Maxwell, Lau, & Howard, 2015; Open Science Collaboration, 2015; Card, 2017).

In addition to replicating experimental results, psychologists need to test the limitations of their theories and hypotheses to determine under which specific circumstances they do and do not apply. It seems unlikely, for instance, that increasing the number of bystanders *always* results in less helping. In fact, follow-up research shows that bystander intervention is more likely to occur in situations viewed as clear-cut and dangerous because bystanders are more likely to perceive that the presence of others will provide resources for helping. In short, it is critical to continue carrying out experiments to understand the conditions in which exceptions to this general rule occur and other circumstances in which the rule holds (Garcia-Palacios, Hoffman, & Carlin, 2002; Fischer et al., 2011).

Page 36

Before leaving the Latané and Darley study, note that it represents a good illustration of the basic principles of the scientific method. The two psychologists began with a *question of interest*, in this case stemming from a real-world incident in which bystanders in an emergency did not offer help. They then *formulated an explanation* by specifying a theory of diffusion of responsibility and from that formulated the specific hypothesis that increasing the number of bystanders in an emergency situation would lower the degree of helping behavior. Finally, they *carried out research* to confirm their hypothesis, and they eventually *communicated their findings* by publishing their results. This four-step process embodied in the scientific method underlies all scientific inquiry, allowing us to develop a valid understanding of others'—and our own—behavior.

RECAP/EVALUATE/RETHINK

RECAP

LO 3-1 What is the scientific method?

- The scientific method is the approach psychologists use to understand behavior. It consists of four steps: identifying questions of interest, formulating an explanation, carrying out research that is designed to support or refute the explanation, and communicating the findings.
- To test a hypothesis, researchers must formulate an operational definition, which translates the abstract concepts of the hypothesis into the actual procedures used in the study.

LO 3-2 What role do theories and hypotheses play in psychological research?

- Research in psychology is guided by theories (broad explanations and predictions regarding phenomena of interest) and hypotheses (theory-based predictions stated in a way that allows them to be tested).

LO 3-3 What research methods do psychologists use?

- Archival research uses existing records, such as old newspapers, online databases, or other documents, to test a hypothesis. In naturalistic observation, the investigator acts mainly as an observer, making no change in a naturally occurring situation. In survey research, people are asked a series of questions about their behavior, thoughts, or attitudes. The case study is an in-depth interview and examination of one person or group.
- These descriptive research methods rely on correlational techniques, which describe associations between variables but cannot determine cause-and-effect relationships.

LO 3-4 How do psychologists establish cause-and-effect relationships in research studies?

- In a formal experiment, the relationship between variables is investigated by deliberately producing a change—called the experimental manipulation—in one variable and observing changes in the other variable.
- In an experiment, at least two groups must be compared to assess cause-and-effect relationships. The group receiving the treatment (the special procedure devised by the experimenter) is the experimental group; the second group (which receives no treatment) is the control group. There also may be multiple experimental groups, each of which is subjected to a different procedure and then compared with the others.
- The variable that experimenters manipulate is the independent variable. The variable that they measure and expect to change as a result of manipulation of the independent variable is called the dependent variable.
- In a formal experiment, participants must be assigned randomly to treatment conditions, so that participant characteristics are distributed evenly across the different conditions.
- Psychologists use statistical tests to determine whether research findings are significant.

EVALUATE

1. An explanation for a phenomenon of interest is known as a _____.
2. To test this explanation, a researcher must state it in terms of a testable question known as a _____.
3. An experimenter is interested in studying the relationship between hunger and aggression. She decides that she will measure aggression by counting the number of times a participant will hit a punching bag. In this case, her _____definition of aggression is the number of times the participant hits the bag.

4. Match the following forms of research to their definitions:

1. Archival research	**a.** Directly asking a sample of people questions about their behavior
2. Naturalistic observation	**b.** Examining existing records to test a hypothesis
3. Survey research	**c.** Looking at behavior in its true setting without intervening in the setting
4. Case study	**d.** Doing an in-depth investigation of a person or small group

5. Match each of the following research methods with its primary disadvantage:

1. Archival research	**a.** The researcher may not be able to generalize to the population at large.
2. Naturalistic observation	**b.** People's behavior can change if they know they are being watched.
3. Survey research	**c.** The data may not exist or may be unusable.
4. Case study	**d.** People may lie in order to present a good image.

6. A psychologist wants to study the effect of attractiveness on willingness to help a person with a math problem. Attractiveness would be the _____variable, and the amount of helping would be the _____variable.

7. The group in an experiment that receives no treatment is called the _____group.

RETHINK

Starting with the theory that diffusion of responsibility causes responsibility for helping to be shared among bystanders, Latané and Darley derived the hypothesis that the more people who witness an emergency situation, the less likely it is that help will be given to a victim. Can you think of other hypotheses that are based on the same theory of diffusion of responsibility?

Answers to Evaluate Questions

1. theory; **2.** hypothesis; **3.** operational; **4.** 1. b, 2. c, 3. a, 4. d **5.** 1. c, 2. b, 3. d, 4. a **6.** independent, dependent; **7.** control

KEY TERMS

scientific method
theories
hypothesis
operational definition
archival research
naturalistic observation
survey research
case study
variables
correlational research
experiment
experimental manipulation
treatment
experimental group
control group
independent variable
dependent variable
random assignment to condition
significant outcome
replicated research

Module 4
Critical Research Issues

LEARNING OUTCOME

LO 4-1 What major issues confront psychologists conducting research?

You probably realize by now that there are few simple formulas for psychological research. Psychologists must make choices about the type of study to conduct, the measures to take, and the most effective way to analyze the results. Even after they have made these essential decisions, they must still consider several critical issues. We turn first to the most fundamental of these issues: ethics.

The Ethics of Research

Put yourself in the place of one of the participants in the experiment conducted by Latané and Darley to examine the helping behavior of bystanders, in which another "bystander" simulating a seizure turned out to be a confederate of the experimenters (Latané & Darley, 1970). How would you feel when you learned that the supposed victim was in reality a paid accomplice?

Study Alert

Because the protection of experiment participants is essential, remember the key ethical guideline of informed consent.

Although you might at first experience relief that there had been no real emergency, you might also feel some resentment that you had been deceived by the experimenter. You might also experience concern that you had been placed in an embarrassing or compromising situation—one that might have dealt a blow to your self-esteem, depending on how you had behaved.

Most psychologists argue that deception is sometimes necessary to prevent participants from being influenced by what they think a study's true purpose is. (If you knew that Latané and Darley were actually studying your helping behavior, wouldn't you automatically have been tempted to intervene in the emergency?) To avoid such outcomes, a small proportion of research involves deception.

Nonetheless, because research has the potential to violate the rights of participants, psychologists are expected to adhere to a strict set of ethical guidelines aimed at protecting participants (American Psychological Association, 2002). Those guidelines involve the following safeguards:

- Protection of participants from physical and mental harm
- The right of participants to privacy regarding their behavior
- The assurance that participation in research is completely voluntary
- The necessity of informing participants about the nature of procedures before their participation in the experiment
- All experiments must be reviewed by an independent panel before being conducted (Fisher, 2003; Coventry et al., 2003; Crano, Brewer, & Lac, 2015).

One of psychologists' key ethical principles is **informed consent**. Before participating in an experiment, the participants must sign a document affirming that they have been told the basic outlines of the study and are aware of what their participation will involve, what risks the experiment may hold, and the fact that their participation is purely voluntary and they may terminate it at any time. Furthermore, after participation in a study, they must be given a debriefing in which they receive an explanation of the study and the procedures that were involved. The only time informed consent and a debriefing can be eliminated is in experiments in which the risks are minimal, as in a purely observational study in a public place (Barnett, Wise, & Johnson-Greene, 2007; Nagy, 2011; Hetzel-Riggin, 2017).

Exploring Diversity

Choosing Participants Who Represent the Scope of Human Behavior

When Latané and Darley, both college professors, decided who would participate in their experiment, they turned to the people most easily available: college students. Using college students as participants has advantages as well as drawbacks. The big benefit is that because most research occurs in university settings, college students are readily available. Typically, they cost the researcher very little: They participate for either extra course credit or a relatively small payment.

The problem is that college students may not represent the general population adequately. In fact, undergraduate research participants are typically a special group of people: Relative to the general population, college students tend to be from **W**estern, **e**ducated, **i**ndustrialized, **r**ich, and **d**emocratic cultures. That description forms the acronym WEIRD, which led one researcher to apply the nickname to research participants (Jones, 2010; Lancy, 2015).

It's not that there's anything particularly wrong with WEIRD participants. It's just that they may be different from most other people—those who don't go to college or who didn't grow up in a democratic Western culture, who are less affluent, and so forth. All these characteristics could be psychologically relevant. Yet one review found that most research participants do come from the United States, and about the same proportion of those are psychology majors (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010; Kaiser, Thomas, & Bowers, 2017).

Because psychology is a science whose goal is to explain *all* human behavior generally, its studies must use participants who are fully representative of the general population in terms of gender, age, race, ethnicity, socioeconomic status, and educational level (see *Neuroscience in Your Life*). To encourage a wider range of participants, the National Institute of Mental Health and the National Science Foundation—the primary U.S. funding sources for psychological research—now require that experiments address issues of diverse populations (Carpenter, 2002; Lindley, 2006).

Page 40

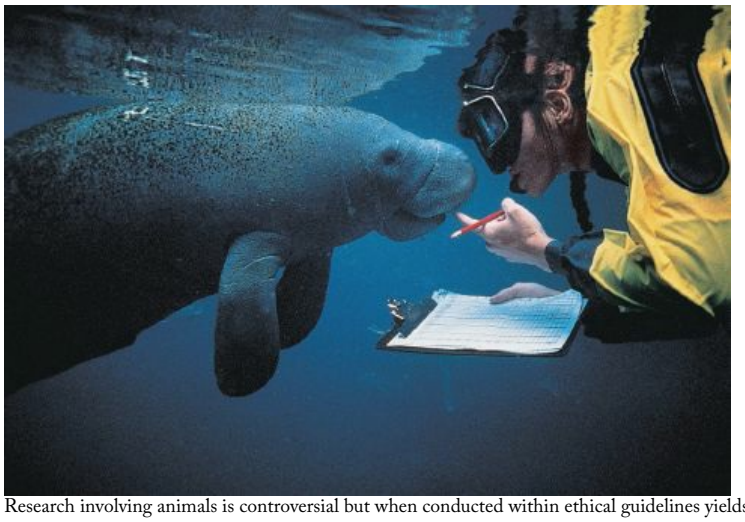
NEUROSCIENCE IN YOUR LIFE: THE IMPORTANCE OF USING REPRESENTATIVE PARTICIPANTS

Most neuroscience research is conducted to understand the brains of all individuals. But people differ significantly in the way they process information. For example, culture and experiences shape the way our brains process information. A recent review of seven studies showed that individuals raised in Eastern countries, such as Japan, and individuals raised in Western countries, such as the United States, process information differently during cognitive tasks. In the images below, each brain indicates a different area in which differences were seen. The key indicates within a brain whether Easterners showed greater activation (yellow) or vice versa (green). Overall, Easterners show more activity in the left hemisphere (yellow), whereas Westerners show more activity in the right hemisphere (green). Therefore, to understand the brains of all people, researchers must include participants who represent the rich diversity of the humanity (Han & Ma, 2014).

The areas of the brain in which differences between Easterners and Westerners were seen. Yellow areas indicate that Easterners showed greater activation than Westerners, and green areas indicate that Westerners showed greater activation than Easterners.

Should Animals Be Used in Research?

Like those who work with humans, researchers who use nonhuman animals in experiments have their own set of exacting guidelines to ensure that the animals do not suffer. Specifically, researchers must make every effort to minimize discomfort, illness, and pain. Procedures that subject animals to distress are permitted only when an alternative procedure is unavailable and when the research is justified by its prospective value. Moreover, researchers strive to avoid causing physical discomfort, but they are also required to promote the *psychological* well-being of some species of research animals, such as primates (Lutz & Novak, 2005; Miller & Williams, 2011; Herzog, 2017).



Research involving animals is controversial but when conducted within ethical guidelines yields significant benefits for humans.
©Douglas Faulkner/Science Source

But why should animals be used for research in the first place? Can we really learn about human behavior from the results of research employing rats, gerbils, and pigeons?

The answer is that psychological research that does employ nonhumans is designed to answer questions different from those posed in research with humans. For example, the shorter life span of animals (rats live an average of 2 years) allows researchers to learn about the effects of aging in a relatively short time frame. Researchers can also provide greater experimental control over nonhumans and carry out procedures that might not be possible with people. For example, some studies require large numbers of participants that share similar backgrounds or have been exposed to particular environments—conditions that could not practically be met with human beings.

Research with animals has provided psychologists with information that has profoundly benefited humans. For instance, it furnished the keys to detecting eye disorders in children early enough to prevent permanent damage, to communicating more effectively with children with severe intellectual disability, and to reducing chronic pain in people. Still, the use of research using nonhumans is controversial, involving complex moral and philosophical concerns. Consequently, all research involving nonhumans must be carefully reviewed beforehand to ensure that it is conducted ethically (Baker & Serdikoff, 2013; Grundy, 2015; Guidelines for the Treatment of Animals, 2017).

Page 41

Threats to Experimental Validity: Avoiding Experimental Bias

Even the best-laid experimental plans are susceptible to experimental bias. **Experimental bias** refers to factors that distort the way the independent variable affects the dependent variable in an experiment.

One of the most common forms of experimenter bias relates to the unintentional transmission of expectations to participants by the experimenter, thereby affecting the results. When *experimenter expectations* occur, an experimenter unintentionally transmits cues to participants about the way the experimenter expects them to behave. The danger is that those expectations actually cause the expected result to happen—results that otherwise might not have occurred (Rosenthal, 2003).

A related problem is participant expectations. If you have ever been a participant in an experiment, you probably developed *participant expectations*, guesses about what was expected of you. In fact, participants often develop their own hypotheses about what the experimenter hopes to learn from the study. If participants form their own hypotheses and then act on their hunches, it may be their expectations, rather than the experimental manipulation, that produce the results (Rutherford et al., 2009).

Study Alert

Learn the main types of potential bias in experiments: experimenter expectations, participant expectations, and placebo effects.

To guard against participant expectations biasing the results of an experiment, the experimenter may try to disguise the true purpose of the experiment. Participants who do not know that helping behavior is being studied, for example, are more apt to act in a "natural" way than they would if they knew.

Sometimes it is impossible to hide the actual purpose of research; when that is the case, other techniques are available to prevent bias. Suppose you were interested in testing the ability of a new drug to alleviate the symptoms of severe depression. If you simply gave the drug to half your participants and not to the other half, the participants who were given the drug might report feeling less depressed merely because they knew they were getting a drug. Similarly, the participants who got nothing might report feeling no better because they knew that they were in a no-treatment control group.

To solve this problem, psychologists typically use a procedure in which all the participants receive a treatment, but those in the control group receive only a **placebo**— a false treatment, such as a pill, "drug," or other substance that has no significant chemical properties or active ingredient. Because members of both groups are kept in the dark about whether they are getting a real or a false treatment, any differences in outcome can be attributed to the quality of the drug and not to the possible psychological effects of being administered a pill or other substance (Justman, 2011; Keränen et al., 2015).

However, a careful researcher must apply one more safeguard in an experiment such as this. To overcome the possibility that *experimenter* expectations will affect the participant, the person who administers the drug shouldn't know whether it is actually the true drug or the placebo. By keeping both the participant and the experimenter who interacts with the participant "blind" to the nature of the drug that is being administered, researchers can more accurately assess the effects of the drug. This method is known as the *double-blind procedure*.

BECOMING AN INFORMED CONSUMER of Psychology

Thinking Critically About Research

If you were about to purchase an automobile, you would not likely stop at the nearest car dealership and drive off with the first car a salesperson recommended. Instead, you would probably mull over the purchase, read about automobiles, consider the alternatives, talk to others about their experiences, and ultimately put in a fair amount of thought before you made such a major purchase.

In contrast, many of us are considerably less conscientious when we hear about research findings. People often jump to conclusions on the basis of incomplete and inaccurate information, and only rarely do they take the time to critically evaluate the research and data to which they are exposed.

Because the field of psychology is based on an accumulated body of research, we must scrutinize thoroughly the methods, results, and claims of researchers. Several basic questions can help us sort through what is valid and what is not. Among the most important questions to ask are these:

- *What was the purpose of the research?* Research studies should evolve from a clearly specified theory. Furthermore, we must take into account the specific hypothesis that is being tested. Unless we know what hypothesis is being examined, we cannot judge how successful a study has been.
- *How well was the study conducted?* Consider who the participants were, how many were involved, what methods were employed, and what problems the researcher encountered in collecting the data. There are important differences, for example, between a case study that reports the anecdotes of a handful of respondents and a survey that collects data from several thousand people.
- *Are the results presented fairly?* Statements must be assessed on the basis of the actual data they reflect and their logic. For instance, when the manufacturer of car X boasts that "no other car has a better safety record than car X," this does not mean that car X is safer than every other car. It just means that no other car has been proved safer, though many other cars could be just as safe as car X. Expressed in the latter fashion, the finding doesn't seem worth bragging about.

These three basic questions can help you assess the validity of research findings you come across—both within and outside the field of psychology. The more you know how to evaluate research, the better you will be able to assess what the field of psychology has to offer.

RECAP/EVALUATE/RETHINK

RECAP

LO 4-1 What major issues confront psychologists conducting research?

- One of the key ethical principles followed by psychologists is that of informed consent. Participants must be informed, before participation, about the basic outline of the experiment and the risks and potential benefits of their participation.
- Although the use of college students as participants has the advantage of easy availability, there are drawbacks, too. For instance, students do not necessarily represent the population as a whole. The use of nonhuman animals as participants may also have costs in terms of the ability to generalize to

humans, although the benefits of using animals in research have been profound.

- Experiments are subject to a number of biases, or threats. Experimenter expectations can produce bias when an experimenter unintentionally transmits cues to participants about her or his expectations regarding their behavior in a given experimental condition. Participant expectations can also bias an experiment. Among the tools experimenters use to help eliminate bias are placebos and double-blind procedures.

EVALUATE

Page 43

1. Ethical research begins with the concept of informed consent. Before signing up to participate in an experiment, participants should be informed of:
   a. the procedure of the study, stated generally.
   b. the risks that may be involved.
   c. their right to withdraw at any time.
   d. all of these.
2. List three benefits of using animals in psychological research.
3. Deception is one means experimenters can use to try to eliminate participants' expectations. True or false?
4. A false treatment, such as a pill that has no significant chemical properties or active ingredient, is known as a _____.
5. A study has shown that men differ from women in their preference for ice cream flavors. This study was based on a sample of two men and three women. What might be wrong with this study?

RETHINK

A researcher strongly believes that college professors tend to show female students less attention and respect in the classroom than they show male students. He sets up an experimental study involving observations of classrooms in different conditions. In explaining the study to the professors and the students who will participate, what steps should the researcher take to eliminate experimental bias based on both experimenter expectations and participant expectations?

Answers to Evaluate Questions

1. d; **2.** (1) We can study some phenomena in animals more easily than we can in people, because with animal subjects we have greater control over environmental and genetic factors. (2) Large numbers of similar participants can be easily obtained. (3) We can look at generational effects much more easily in animals, because of their shorter life span, than we can with people.; **3.** true; **4.** placebo; **5.** There are far too few participants. Without a larger sample, no valid conclusions can be drawn about ice cream preferences based on gender.

KEY TERMS

informed consent
experimental bias
placebo

EPILOGUE

The field of psychology, as you have seen, is broad and diverse. It encompasses many different subfields and specialties practiced in a variety of settings, with new subfields continually arising. You have also seen that even within the various subfields of the field, it is possible to adopt several different approaches, including the neuroscience, psychodynamic, behavioral, cognitive, and humanistic perspectives.

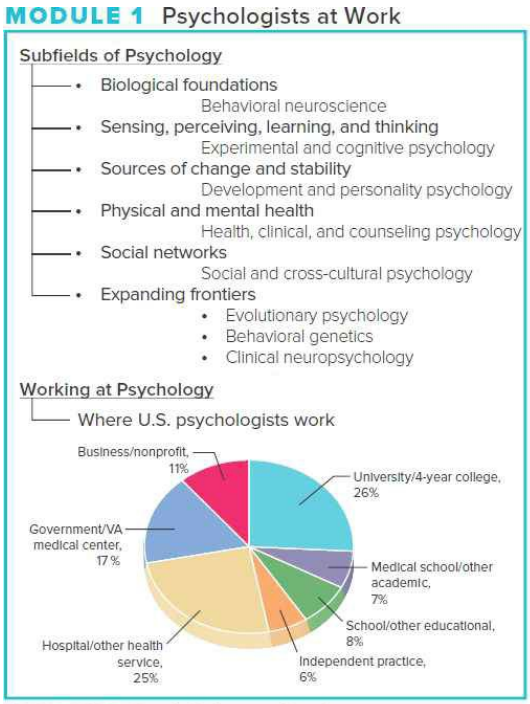
For all its diversity, though, psychology focuses on certain key issues that serve to unify the field along common lines and shared findings. These issues will reappear as themes throughout this course as you learn about the work and accomplishments of psychologists in the many subfields of the discipline.

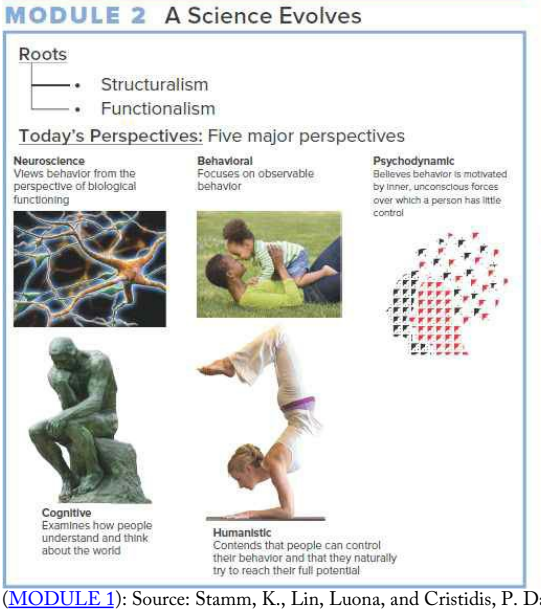
In light of what you've already learned about the field of psychology, reconsider the Florida high school massacre described in the prologue of the chapter and answer the following questions:

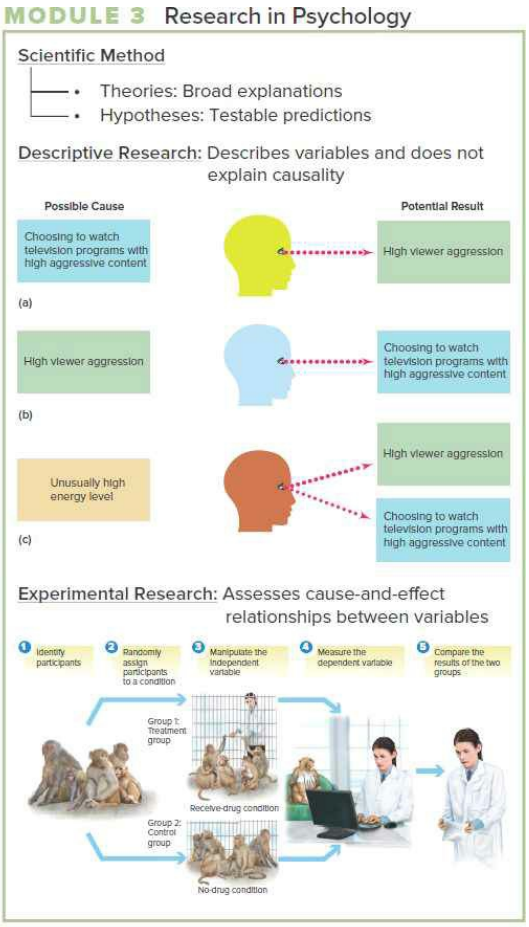
1. If they were using the neuroscience perspective, how might psychologists explain people's fear responses to the shooter?
2. How would a psychologist using the psychodynamic perspective explain the shooter's behavior differently from a psychologist using the cognitive perspective?
3. What aspects of the shooting would most interest a clinical psychologist? A social psychologist? A forensic psychologist?
4. What might be some ways in which both nature and nurture could have contributed to the shooter's behavior?

Page 44

VISUAL SUMMARY 1 Introduction to Psychology







(MODULE 1): Source: Stamm, K., Lin, Luona, and Cristidis, P. Datapoint, Monitor on Psychology, June 2016, 12. (MODULE 2): (Neuroscience): ©Science Photo Library/Alamy Stock Photo; (Cognitive): ©David Sanger/The Image Bank/Getty Images; (Behavioral): ©Ariel Skelley/Blend Images; (Humanistic): ©White Packert/The Image Bank/Getty Images; (Psychodynamic): ©Athanasia Nomikou/Shutterstock; (MODULE 4): ©annedde/Getty Images