



THIRD EDITION

PSYCHOLOGY

from inquiry to understanding

Lilienfeld • Lynn • Namy • Woolf

SIX PRINCIPLES OF SCIENTIFIC THINKING

These six principles of scientific thinking, introduced on page 21 and used throughout the text, will help you evaluate claims in research and everyday life.

What Scientific Thinking Principle Should We Use?

When Might We Use It?

How Do We Use It?

RULING OUT RIVAL HYPOTHESES

HAVE IMPORTANT ALTERNATIVE EXPLANATIONS FOR THE FINDINGS BEEN EXCLUDED?

You're reading the newspaper and come across the headline: "Study shows depressed people who receive a new medication improve more than equally depressed people who receive nothing."

The results of the study could be due to the fact that people who received the medication expected to improve.



CORRELATION VS. CAUSATION

CAN WE BE SURE THAT A CAUSES B?

A researcher finds that people eat more ice cream on days when crimes are committed than when they aren't, and concludes that eating ice cream causes crime.

Eating ice cream (A) might not cause crime (B). Both could be due to a third factor (C), such as higher temperatures.



FALSIFIABILITY

CAN THE CLAIM BE DISPROVED?

A self-help book claims that all human beings have an invisible energy field surrounding them that influences their moods and well-being.

We can't design a study to disprove this claim.



REPLICABILITY

CAN THE RESULTS BE DUPLICATED IN OTHER STUDIES?

A magazine article highlights a study that shows people who practice meditation score 50 points higher on an intelligence test than those who don't.

We should be skeptical if no other scientific studies have reported the same findings.



EXTRAORDINARY CLAIMS

IS THE EVIDENCE AS STRONG AS THE CLAIM?

You come across a website that claims that a monster, like Bigfoot, has been living in the American Northwest for decades without being discovered by researchers.

This extraordinary claim requires more rigorous evidence than a less remarkable claim, such as the assertion that people remember more words from the beginning than from the end of a list.



OCCAM'S RAZOR

DOES A SIMPLER EXPLANATION FIT THE DATA JUST AS WELL?

Your friend, who has poor vision, claims that he spotted a UFO while attending a Frisbee tournament.

Is it more likely that your friend's report is due to a simpler explanation—his mistaking a Frisbee for a UFO—than to alien visitation?





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“What are infants’ earliest memories?” “Does watching violence on TV really teach children to become violent?” “Is human intelligence related to brain size?” “Is it usually dangerous to wake up sleepwalkers?” “Do genes contribute to obesity?” “Is the polygraph test really a ‘lie detector’?” “Should we trust most self-help books?”

Every day, our students encounter a host of questions that challenge their understanding of themselves and others. Whether it’s from the Internet, YouTube, cable television, radio call-in shows, movies, self-help books, or advice from friends, our students’ daily lives are a steady stream of information—and often misinformation—about intelligence testing, parenting, romantic relationships, mental illness, drug abuse, psychotherapy, and scores of other topics. Much of the time, the questions about these issues that most fascinate students are precisely those that psychologists routinely confront in their research, teaching, and practice.

As we begin our study of psychology, it’s crucial to understand that we’re *all* psychologists. We need to be able to evaluate the bewildering variety of claims from the vast world of popular psychology. Without a framework for evaluating evidence, making sense of these often contradictory findings can be a bewildering task for anyone. It’s no surprise that the untrained student can find claims regarding memory- and mood-enhancing drugs, the overprescription of stimulants, the effectiveness of Paxil, and the genetic bases of psychiatric disorders, to name only a few examples, difficult to evaluate. Moreover, it is challenging for those who haven’t been taught to think scientifically to make sense of extraordinary psychological claims that lie on the fringes of scientific knowledge, such as extrasensory perception, subliminal persuasion, astrology, alien abductions, lie-detector testing, handwriting analysis, and inkblot tests, among many others. Without a guide for distinguishing good from bad evidence, our students are left to their own devices when it comes to weighing the merits of these claims.

Our goal in this text, therefore, is to empower student readers of the twenty-first century to apply scientific thinking to the psychology of their everyday lives. By applying scientific thinking—thinking that helps protect us against our tendencies to make mistakes—we can better evaluate claims about both laboratory research and daily life. In the end, we hope that students will emerge with the “psychological smarts,” or open-minded skepticism, needed to distinguish psychological misinformation from psychological information. We’ll consistently urge students to keep an open mind to new claims, but to insist on evidence. Indeed, our overarching motto is that of space scientist James Oberg (sometimes referred to as “Oberg’s dictum”): *Keeping an open mind is a virtue, just so long as it is not so open that our brains fall out.*

What’s New In This Edition?

Psychology: From Inquiry to Understanding continues its commitment to emphasize the importance of scientific-thinking skills. In the Third Edition, our focus has been to better convey the excitement of psychological science to the reader and to help the reader to connect the dots between inquiry and understanding. In addition, thanks to the ongoing support and feedback from instructors and students of our text, the Third Edition reflects many insightful and innovative updates that we believe enhance the text. Among the key changes made to the Third Edition are the following:

General Changes

- For the Third Edition, we took great care to revise the narrative throughout to improve flow and to strike a better balance between presenting the value and fun of sound psychological science on the one hand, and the warning signs and dangers of pseudoscience on the other.

- New “From Inquiry to Understanding” feature in every chapter shows the power of psychological science to answer enduring mysteries about human behavior, emotion, and thought. Features examine such questions as “How do we recognize faces?”; “How do magic tricks work?”; and “Why do we experience déjà vu?”
- New correlation guide shows how the learning objectives in the text correspond to the latest *APA Guidelines for the Undergraduate Psychology Major*.
- Updated coverage throughout based on the Fifth Edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*.
- “Your Complete Review System” now features a section called “Further Your Understanding” that directs students to learning apps in MyPsychLab that include new videos, simulations, and writing assessments.
- New online Annotated Instructor’s Edition lists the best of our instructor ClassPrep resources at the beginning of each eText chapter to help instructors prepare for their lectures in a more efficient fashion.
- MyPsychLab icons integrated in the text guide students to the best of our Web-based practice quizzes, tutorials, videos, and simulations that consolidate the knowledge they acquired from the textbook. The icons are not exhaustive—many more resources are available than those highlighted in the text—but they draw attention to some of the most high-interest materials available at www.mypsychlab.com.

New Content and Updated Research

- **Chapter 1 (Psychology and Scientific Thinking)** features new coverage of sources of public skepticism of psychology (and why such skepticism is often unwarranted) as well as updated coverage on recent challenges to psychology’s scientific status (e.g., the decline effect) and on how psychology is responding to them.
- **Chapter 2 (Research Methods)** includes a new section on Daniel Kahneman’s two modes of thinking (“System 1” and “System 2”) and a revised discussion of correlation versus causation.
- **Chapter 3 (Biological Psychology)** includes new research on oxytocin, a reorganized discussion of the brain, and more case studies and real-life examples throughout.
- **Chapter 4 (Sensation and Perception)** has been fully reorganized so that sensation and perception are discussed separately. The section on ESP now includes coverage of the controversy surrounding recent efforts to replicate Bem’s research findings.
- **Chapter 5 (Consciousness)** includes an updated discussion of substance use disorders, reflecting language and categories identified in the *DSM-5*. New or expanded findings or discussion of locked-in syndrome, sleep and dreaming, déjà vu, mystical experiences, hypnosis, and substance use.
- **Chapter 6 (Learning)** includes a reorganized and updated section on schedules of reinforcement, new research on sleep-assisted learning, and a new table on phobias.
- **Chapter 7 (Memory)** includes updated coverage on the reconstructive nature of memory and the false memory debate.
- **Chapter 8 (Thinking, Reasoning, and Language)** has been reorganized to begin with thinking and reasoning topics, including coverage of heuristics and biases (formerly in Chapter 2). The section on language and reading has also been reorganized and updated with new research on language acquisition and bilingualism.
- **Chapter 9 (Intelligence and IQ Testing)** includes new research on working memory and intelligence and an updated discussion of how poverty may impact the heritability of intelligence.
- **Chapter 10 (Human Development)** includes updated research and examples regarding gene-environment interaction and physical development, more comprehensive explanation of the Strange Situation paradigm as a measure of infant attachment, and

increased coverage of cross-cultural variability in parenting practices and their impact on child development.

- **Chapter 11 (Emotion and Motivation)** features updated coverage of challenges to discrete emotion theories and alternative models of emotion.
- **Chapter 12 (Stress, Coping, and Health)** includes new research on resilience in the face of stressors, how healthy people can become convinced they are seriously ill, achieving a healthy weight, and complementary and alternative medicine.
- **Chapter 13 (Social Psychology)** features expanded coverage of prejudice, including sexual orientation; new research on the psychological effects of social rejection; and new work on persuasion techniques.
- **Chapter 14 (Personality)** includes updated coverage on cultural influences on personality and on new models of personality structure.
- **Chapter 15 (Psychological Disorders)** has been fully updated based on the *DSM-5*, and includes revised discussions of disorders and of statistics regarding the epidemiology of mental disorders. The chapter includes new findings concerning hoarding and body dysmorphic disorder, depressive realism, sleep disturbances and dissociation, and autism spectrum disorders. The chapter includes new findings—and controversies—concerning autism, attention deficit disorder, auditory hallucinations, delusions, posttraumatic stress disorder, and major depression and bipolar disorder.
- **Chapter 16 (Psychological and Biological Treatments)** includes new research or expanded discussion of culture and psychotherapy; mindfulness, acceptance, and third wave cognitive-behavioral therapies; virtual reality and cycloserine; placebos; pharmacotherapy; and deep brain stimulation.

RULING OUT RIVAL HYPOTHESES ►

Have important alternative explanations for the findings been excluded?

CORRELATION VS. CAUSATION ►

Can we be sure that A causes B?

FALSIFIABILITY ►

Can the claim be disproved?

REPLICABILITY ►

Can the results be duplicated in other studies?

EXTRAORDINARY CLAIMS ►

Is the evidence as strong as the claim?

OCCAM'S RAZOR ►

Does a simpler explanation fit the data just as well?

From Inquiry to Understanding: The Framework in Action

As instructors, we find that students new to psychology tend to learn best when information is presented within a clear, effective, and meaningful framework—one that encourages inquiry along the path to understanding. As part of the inquiry to understanding framework, our pedagogical features and assessment tools work to empower students to develop a more critical eye in understanding the psychological world and their place in it.

Thinking Scientifically

In Chapter 1, we introduce readers to the **Six Principles of Scientific Thinking** that are the framework for lifelong learning of psychology. Colored arrows appear in the margins whenever the principles are referenced to reinforce these scientific thinking principles in readers' minds. In this way, readers come to understand these principles as key skills for evaluating claims in scientific research and in everyday life.

A new feature for the Third Edition, **From Inquiry to Understanding**, tells the story of how psychological science has helped to shed light on a longstanding psychological mystery. We begin with a question that many students may have asked at some point prior to their study of psychology, and then we step through the methods and processes used by psychological scientists to gain a better understanding of human behavior and thought.

from inquiry to understanding

HOW DO WE RECOGNIZE FACES?

Imagine what it would be like to pass your best friend on the street and not recognize her, or to mistake your date for a complete stranger—or vice-versa! Face recognition is vital to our ability to navigate our social worlds, not to mention follow the plot of a movie containing a slew of characters (Russell et al., 2009). It's a remarkable capacity that we typically take for granted. How can psychological science help to explain our ability to recognize faces?

Applications of Scientific Thinking

In keeping with the text's theme, the **Evaluating Claims** feature prompts students to use scientific thinking skills to evaluate claims they are likely to encounter in various forms of media. Answers are provided at the end of the text.

Apply Your Scientific Thinking Skills questions (located at the end of each chapter) invite students to investigate current topics of debate or controversy and use their scientific thinking skills to make informed judgments about them. Rubrics for scoring student responses appear in the Instructor's Resource Manual, making them ideal for outside research and writing assignments.

Each chapter also contains a **PsychoMythology** box focusing in depth on a widespread psychological misconception. In this way, students will come to recognize that their commonsense intuitions about the psychological world are not always correct and that scientific methods are needed to separate accurate from inaccurate claims. Located in the margins of every chapter, **Factoids** present interesting and surprising facts.

Integrated Cultural Content

Wherever relevant, we highlight noteworthy and well-replicated research findings bearing on cultural and ethnic differences. By doing so, students should come to understand that many psychological principles have boundary conditions and that much of scientific psychology focuses as much on differences as commonalities.

A Focus on Meaningful Pedagogy: Helping Students Succeed in Psychology

Our goal of applying scientific thinking to the psychology of everyday life is reflected in the text's pedagogical plan. The features in the text, the end-of-chapter review, our online MyPsychLab resource, and the print and media supplements were designed to help students achieve a mastery of the subject and succeed in the course.

Think About It questions, located at the start of every chapter, highlight some of the common questions that students have about psychology. Together with the **Chapter Outline**, they also serve to preview the key topics that will be discussed in each chapter. Each chapter is organized around **Numbered Learning Objectives**, which are listed at the start of each major section. (All instructor supplements are also keyed to these learning objectives.) The end-of-chapter summary and assessment material is also organized around these objectives. Students' understanding of important terminology is enhanced with our on-page **Glossary**.

Answers are located at the end of the text.

evaluating **CLAIMS**

SLEEP-ASSISTED LEARNING


When you think of learning, what's the first thing that pops into your head—textbooks, classrooms, or late-night study sessions? For proponents of sleep-assisted learning, it might be a comfy bed. Numerous websites and books claim that you can master a foreign language, become a better public speaker, and even improve your marriage while you're sound asleep. Let's evaluate some of these claims, which are modeled after actual ads for sleep-assisted learning products.

"Join the thousands of people who have increased their learning."

Does the fact that thousands of people believe in a claim make it true? What logical fallacy does this ad commit (see Chapter 1)?

"Sleep learning is a more efficient way to learn because the information flows directly to our subconscious mind. (While your conscious mind relaxes!)"

What's the problem with this extraordinary claim?



"Designed using proven research conducted all over the world ..."

What questions should you ask about how this research was conducted? Can we assume that "proven" means the research has been replicated?

"Risk-free, 100% money-back guarantee."

We should be skeptical of guarantees, as virtually no psychological technique is foolproof.

"Use your brain's full potential. The average mind uses only 5% of its capacity."

Is there scientific support for the claim that we use only a small portion of our brain (see Chapter 3)?

"Use your brain's full potential. The average mind uses only 5% of its capacity."

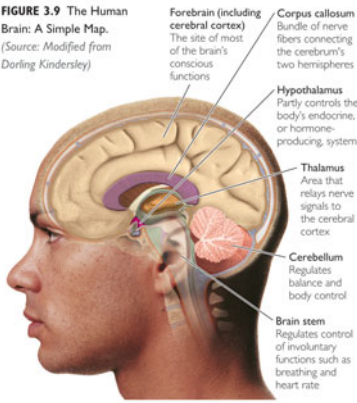
Is there scientific support for the claim that we use only a small portion of our brain (see Chapter 3)?

psychomythology

ARE SOME PEOPLE LEFT-BRAINED AND OTHERS RIGHT-BRAINED?

Despite the great scientific contribution of split-brain studies, the popular notion that people are either "left-brained" or "right-brained" is a misconception (Lilienfeld et al., 2010). According to this myth, left-brained people are scholarly, logical, and analytical, and right-brained people are artistic, creative, and emotional. One Internet blogger tried to explain the differences between people's political beliefs in terms of the left-right brain distinction: conservatives, he claimed, tend to be left-brained and liberals right-brained (Block, 2006). Yet these claims are vast oversimplifications of a small nugget of truth, because research demonstrates that we use both sides of our brain in a complementary way (Corballis, 1999; Hines, 1987). Furthermore, the corpus callosum and other interconnections ensure that both hemispheres are in continual communication.

FIGURE 3.9 The Human Brain: A Simple Map.
(Source: Modified from Dorling Kindersley)



Assess Your Knowledge

FACT or FICTION?

1. Nonstandard dialects of English follow syntactic rules that differ from but are just as valid as the rules in standard American English. True / False
2. Children's two-word utterances typically violate syntactic rules. True / False
3. Children who are deaf learn to sign at an older age than hearing children who are learning to talk. True / False
4. Bilingual individuals usually have one dominant language, which they learned earlier in development. True / False
5. Few nonhuman animal communication systems involve exchanges of information beyond the here and now. True / False

Color-coded biological art orients students at both the micro and macro levels as they move throughout the text and forge connections among concepts. **Interactive photo captions** test students on their scientific-thinking skills and invite them to evaluate whether or not the photo is an accurate depiction of psychological phenomena. Answers appear at the bottom of the page.

At the end of each major topic heading, we provide an **Assess Your Knowledge: Fact or Fiction?** review of selected material to further reinforce concept comprehension and foster students' ability to distinguish psychological fact from fiction. Throughout the text, **MyPsychLab** icons direct students to additional online study and review material such as videos, simulations, and practice quizzes and customized study plans.

Your Complete Review System, located at the end of every chapter, includes a summary, quiz questions, and visual activities, all organized by the major chapter sections and tied to chapter learning objectives. **Apply Your Scientific Thinking Principles** questions challenge students to research and evaluate current event topics. **Further Your Learning** highlights for students three key online learning apps that they can use to deepen their knowledge of chapter material: MyPsychLab Video Series, MyPsychLab Simulations, and MyPsychLab Writing Assessments.

Your Complete Review System

Study and Review in MyPsychLab

How Memory Operates: The Memory Assembly Line (246-258)

7.1 IDENTIFY THE WAYS THAT MEMORIES DO AND DON'T ACCURATELY REFLECT EXPERIENCES.

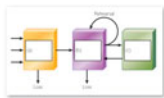
Memories can be surprisingly accurate over very long periods of time, but tend to be reconstructive rather than reproductive.

1. A(n) _____ is a false but subjectively compelling memory. (p. 248)
2. Our memories are far more (reproductive/reconstructive) rather than (reproductive/reconstructive). (p. 248)

7.2 EXPLAIN THE FUNCTION, SPAN, AND DURATION OF EACH OF THE THREE MEMORY SYSTEMS.

Sensory memory, short-term memory, and long-term memory are stages of information processing that vary in how much information they hold and for how long they retain it. Short-term memory has a limited span of seven plus or minus two items that can be extended by grouping things into larger, meaningful units called chunks.

3. The three major systems of memory are measured by _____ or how much information each system can hold, and _____ or how long a period of time the system can hold information. (p. 249)
4. Map out the three-memory model process proposed by Atkinson and Shiffrin depicting memory flow. (p. 249)



5. _____ memory is the brief storage of perceptual information before it's passed to _____ memory. (p. 249)
6. _____ is a type of sensory memory that applies to vision. (p. 250)
7. To extend the span of short-term memory, we organize information into meaningful groupings using a process called _____. (p. 253)
8. The tendency to remember words at the beginning of a list better than those in the middle of the list is known as the _____. (p. 255)

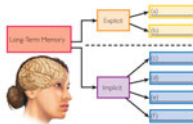
7.3 DIFFERENTIATE THE SUBTYPES OF LONG-TERM MEMORY.

Explicit memory subtypes include semantic and episodic memory. Implicit memory types include procedural and priming memory.

9. _____ memory is the process of recalling information intentionally, and _____ memory is the process of recalling information we don't remember deliberately. (p. 256)

Listen in MyPsychLab to chapter audio

10. Complete the diagram to show the major subtypes of explicit and implicit memory. (p. 257)



The Three Processes of Memory (258-267)

7.4 IDENTIFY METHODS FOR CONNECTING NEW INFORMATION TO EXISTING KNOWLEDGE.

Mnemonics are memory aids that link new information to more familiar knowledge. There are many kinds of mnemonics; they take effort to use but can assist recall.

11. The three major processes of memory are _____, _____, and _____. (p. 258)
12. _____ is the process of organizing information in a format that our memories can use. (p. 259)
13. If we use the phrase "Every good boy does fine" to remember the names of the lines (E, G, B, D, F) in the treble clef, we're using a(n) _____. (p. 259)



7.5 IDENTIFY THE ROLE THAT SCHEMAS PLAY IN THE STORAGE OF MEMORIES.

Schemas equip us with frames of reference for interpreting new situations. Nevertheless, they can sometimes lead to memory errors.

14. Organized knowledge structures that we've stored in memory are called _____. (p. 262)

7.6 DISTINGUISH WAYS OF MEASURING MEMORY.

Recall requires generating previously encountered information on our own, whereas recognition simply requires selecting the correct information from an array of choices. How quickly we relearn material previously learned and forgotten provides another measure of memory.

15. _____ is the reactivation or reconstruction of experiences from our memory stores. (p. 264)

Apply Your Scientific Thinking Skills

Use your scientific thinking skills to answer the following questions, referencing specific scientific thinking principles and common errors in reasoning whenever possible.

1. As we've learned, our memories are often not as accurate as we assume. Think back to an early memory of an event (such as a childhood vacation) that you shared with friends or family. Write down as many details of the memory as you can. Now ask those friends or family members to write down their memories of the same event. In what ways do the memories differ? How can you explain the differences given what you now know about memory?
2. Search the Internet or popular magazines and find several examples of products designed to improve your memory, such as so-called "memory pills" or "smart pills." What kinds of claims do the promoters of these products make? Are their claims scientifically plausible given what you've learned about how memory works?
3. Locate at least three magazine articles or Internet sites that discuss repressed and recovered memory. What arguments do they make to support the existence and accuracy of these memories? Are these arguments supported by scientific knowledge? Are there rival hypotheses to consider? Explain your answers.

Further Your Understanding

EXTEND YOUR KNOWLEDGE WITH THE MYPsYCHLAB VIDEO SERIES
Watch these videos in MyPsychLab. Follow the "Video Series" link.

- The Big Picture: The Woman Who Cannot Forget** Hear the story of Jill Price, a woman with a phenomenal ability to remember things.
- The Basics: Do You Remember When...** Learn how the brain is able to receive and retrieve information when it is needed.
- Special Topics: When Memory Falls** Learn about the famous case of "H.M.," the man whose memory only allowed him to live in 20-second increments.
- Thinking Like a Psychologist: Police Lineup** Learn how stress can affect the accuracy of eyewitness testimony.
- What's in It for Me: Making It Stick** Perform well on tests by learning about study habits and whether "blocking" or "interleaving" is a better method for remembering information long term.

EXPERIENCE PSYCHOLOGICAL RESEARCH WITH MYPsYCHLAB SIMULATIONS

Access these simulations in MyPsychLab. Follow the "Simulations" link.

- Digit Span** Use chunking to increase your working memory capacity and recall series of digits and letters.
- Serial Position Effect** Test the limits of your working memory with lists.
- What Do You Remember?** Participate in a survey to discover how and what you remember and the strategies you use to aid long- and short-term memory.

APPLY YOUR CRITICAL THINKING SKILLS WITH MYPsYCHLAB WRITING ASSESSMENTS

Complete these writing assignments in MyPsychLab. You are reading your text and studying for an upcoming exam in psychology. Identify and describe each step in the process required for remembering information from your text in order to do well on the exam. Discuss a strategy for improving memory and provide an example of how it could help you on the exam.

Putting Scientific Thinking to the Test: Innovative and Integrated Supplements

Psychology: From Inquiry to Understanding is accompanied by a collection of teaching and learning supplements designed to reinforce the scientific thinking skills from the text. These supplements “put scientific thinking to the test” by reinforcing our framework for evaluating claims and assessing students’ ability to think scientifically in a variety of psychological and real-world situations.

Teaching Resources

The Instructor’s Resource Center (<http://www.pearsonhighered.com/irc>) provides information and the following downloadable supplements.

INSTRUCTOR’S RESOURCE DVD (ISBN 0-205-95903-2)

Bringing all of the instructor resources together in one place, the Instructor’s DVD offers three versions of the PowerPoint presentations, the Classroom Response System (CRS), the electronic files for the Instructor’s Resource Manual materials, and the Test Item File to help instructors customize their lecture notes.

TEST BANK

This test bank contains over 3,000 multiple-choice, true/false, matching, short-answer, and essay questions, each referenced to the relevant page in the textbook. All test items are mapped to the chapter learning objectives. An additional feature for the test bank is the inclusion of rationales for the *conceptual and applied* multiple-choice questions. The rationales help instructors to evaluate the questions they are choosing for their tests and give instructors the option to use the rationales as an answer key for their students.

A Total Assessment Guide chapter overview makes creating tests easier by listing all of the test items in an easy-to-reference grid. All multiple-choice questions are categorized as factual, conceptual, or applied, and are correlated to each of the chapter’s learning objectives. The Test Bank is available for download and on the Instructor’s Resource DVD.

MyTest **mypearsontest**

The Third Edition test bank is also available through Pearson MyTest (www.pearsonmytest.com), a powerful assessment-generation program that helps instructors easily create and print quizzes and exams. Instructors can write questions and tests online, allowing them flexibility and the ability to efficiently manage assessments at any time, anywhere. Instructors can easily access existing questions and edit, create, and store using simple drag-and-drop and Word-like controls. Data on each question provide answers, textbook page number, and question types, mapped to the appropriate learning objective.

INSTRUCTOR’S RESOURCE MANUAL

The Instructor’s Resource Manual includes a detailed Chapter Lecture Outline, list of key terms, learning objectives for each chapter, and direct links to the instructor resources in *Class Prep*. The IRM is available for download and on the Instructor’s DVD.

INTERACTIVE POWERPOINT SLIDES

These slides available only on the Instructor’s DVD, draw students into the lecture and provide wonderful interactive activities, visuals, and videos. The slides are built around the text’s learning objectives. Icons integrated throughout the slides indicate interactive exercises, simulations, videos, and activities that can be accessed directly from the slides if instructors want to use these resources in the classroom. Many of the textbook figures are presented in layers (like a set of transparency overlays) within the slides to allow instructors to step through more complex diagrams or processes.

STANDARD LECTURE POWERPOINT SLIDES

PowerPoint slides with lecture notes, photos, and figures are also available for download and on the Instructor’s DVD.

CLASSROOM RESPONSE SYSTEM (CRS) POWERPOINT SLIDES

These slides are intended to be the basis for class discussions as well as lectures. These are available for download and on the Instructor's DVD.

PEARSON ASSESSMENT BANK FOR THE APA GUIDELINES FOR THE UNDERGRADUATE PSYCHOLOGY MAJOR 2.0

A unique bank of assessment items allows instructors to assess student progress against the American Psychological Association's (APA) Guidelines for the Undergraduate Psychology Major 2.0 (2013).

APA CORRELATION GUIDE

This detailed correlation guide, which appears in the Instructor's Manual, shows how the learning outcomes in the text and the test bank questions correspond to the APA Learning Goals and Outcomes.

ONLINE ANNOTATED INSTRUCTOR'S EDITION

Instructors also have access to an online Annotated Instructor's Edition that has instructor-only links on the first page of each chapter to a curated selection of Class Prep resources for that chapter.

CLASS PREP

Instructors who adopt this textbook gain access to a wealth of additional resources beyond the textbook's standard instructor resources. Class Prep, available through MyPsychLab, collects the very best class presentation resources, from across *all* of Pearson's offerings across the entire psychology curriculum, in one convenient online destination. Instructors can search by topic, keyword, or asset type for images, lecture launchers, activities, videos, animations, simulations, crossword puzzles, and readings from thousands of Pearson instructor resources.

TEST ITEM FILE FOR YOUR LEARNING MANAGEMENT SYSTEM

For instructors who only need the test item file, we offer the complete test item file in Blackboard, WebCT and other LMS formats at www.pearsonhighered.com/irc.

Online Options for Instructors and Students

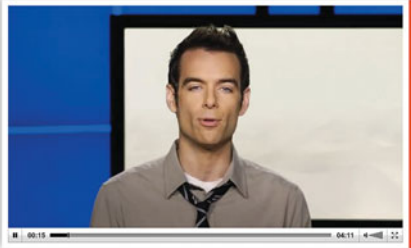
The new MyPsychLab delivers proven results in helping students succeed, provides engaging experiences that personalize learning, and comes from a trusted partner with educational expertise and a deep commitment to helping students and instructors achieve their goals. MyPsychLab has a wealth of instructor and student resources, including the following:

MyPsychLab Video Series is a comprehensive, and cutting edge set of more than 100 original videos clips covering the most recent research, science, and applications across the general psychology curriculum, many using the latest in film and animation technology. Each 4–6 minute video clip has automatically graded assessment questions tied to it.

MyPsychLab Writing Assessments provide students with instant feedback on both content and mechanics, helping to improve their writing and assess their knowledge of important psychological concepts. A collection of conceptual and applied writing prompts corresponding with videos from the MyPsychLab Video Series cover key concepts across the general psychology curriculum.

WRITING ASSESSMENT FOR INTRODUCTION TO PSYCHOLOGY

Welcome to the MyPsychLab auto-graded writing assessment for Introduction to Psychology. Please refer to your text and other course materials while answering this question. Please also consider the following video which will help you form your response.



You can also view the above video on [YouTube](#).

Your response must contain a minimum of 150 words and a maximum of 950 words. Your response will be automatically scored by the system within 8-10 seconds after you click "Get Essay Feedback," and you will receive immediate feedback. After reviewing your feedback and revising your essay, remember to click "FINISH: Submit for Grading" to ensure your score reports to your instructor.

For more information on how this automated system works and how your response will be scored please [click here](#).


Click the Start button below to view the essay question and submit your response.

Start Close

MyPsychLab Simulations allow students to participate in online simulations of virtual classic psychology experiments and research-based inventories, helping to reinforce what they are learning in class and in their book.

EXPERIMENT: LEARNING

INTRODUCTION INSTRUCTIONS EXPERIMENT RESULTS DISCUSSION REFERENCE



Imagine you have joined your friend to watch him/her play in a bowling tournament. You've never had an opportunity to bowl, so you are fascinated by the great skill all of the players are showing when they bowl. Suddenly, your friend slips and falls, spraining his/her ankle. Not wanting to forfeit the game, the team begs you to fill in so they can keep on playing. In this circumstance, how would you answer these questions?

Even though you've never played, will you be able to throw the ball down the alley?

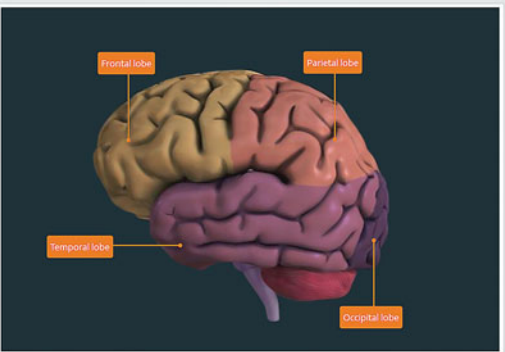
Page 1 of 5 :: Question 1 of 2 [NEXT QUESTION](#)

MyPsychLab Brain is an interactive virtual brain designed to help students better understand neuroanatomy, physiology, and human behavior. Fourteen virtual brain modules bring to life challenging topics.

Anatomy Physiology Case-Studies Assessments

MyPsychLab BRAIN

Choose Module Nervous System



The Cerebral Cortex is the outermost sheath of the cerebrum. It can be divided into the Frontal, Parietal, Occipital and Temporal cortices.

An audio version of the textbook increases accessibility of the textbook.

A personalized study plan for each student, based on Bloom's Taxonomy, arranges content from lower order thinking—such as remembering and understanding—to higher order thinking—such as applying and analyzing the material. This layered approach promotes better critical thinking skills and helps students succeed in the course and beyond.

Assessment tied to videos, applications, and every chapter enables both instructors and students to track progress and get immediate feedback. With results feeding into a powerful grade book, the assessment program helps instructors identify student challenges early—and find the best resources with which to help them.

An assignment calendar allows instructors to assign graded activities with specific deadlines, and measure student progress.

MyPsychLab and Your Campus Learning Management System MyPsychLab and text-specific instructor resources such as the test bank are available for integration with a number of Learning Management Systems, including Blackboard. Please contact your Pearson representative to learn more.

CourseSmart Learn Smart. Choose Smart. TEXTBOOKS ONLINE

is an exciting new choice for students looking to save money. Students can subscribe to the same content online and save up to 50 percent off the suggested list price of the print text. Students can search the text, make notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages for later review. For more information, or to subscribe to the CourseSmart eTextbook, visit www.coursesmart.com/.

CUSTOMIZE PSYCHOLOGY: FROM INQUIRY TO UNDERSTANDING TO MEET THE NEEDS OF YOUR COURSE

Pearson offers the broadest array of options for you to customize your adopted text to suit the unique needs of your course.

Pearson Custom Library For enrollments of at least 25, you can create your own textbook by combining chapters from a library of best-selling Pearson textbooks and readings. To begin building your custom text, visit www.pearsoncustomlibrary.com.

Pearson Custom Editions Working with a dedicated Pearson Custom editor, create your ideal text by publishing your own original content or mixing and matching Pearson content. *Contact your Pearson Publisher's Representative to get started.*

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A Final Word & Thanks

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*We dedicate this book to Barry Lane
Beyerstein (1947–2007), great scholar
and valued friend.*

*My deepest gratitude to David Lykken,
Paul Meehl, Tom Bouchard, Auke Tellegen,
and my other graduate mentors for an
invaluable gift that I will always cherish:
scientific thinking.
—Scott Lilienfeld*

*To Fern Pritikin Lynn, my heart and
my soul.
—Steven Jay Lynn*

*To DJ, who inspires me every day.
—Laura Namy*

*To Larry, Lawson, and Ashley.
—Nancy Woolf*

Our Review Panel

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Steven Jay Lynn received his B.A. in psychology from the University of Michigan and his Ph.D. in clinical psychology from Indiana University. He completed an NIMH Postdoctoral Fellowship at Lafayette Clinic, Detroit, Michigan, in 1976 and is now Distinguished Professor of Psychology at Binghamton University (SUNY), where he is the director of the Psychological Clinic. Dr. Lynn is a fellow of numerous professional organizations, including the American Psychological Association and the American Psychological Society, and he was the recipient of the Chancellor's Award of the State University of New York

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Nancy J. Woolf received her B.S. in psychobiology at UCLA in 1978 and her Ph.D. in neuroscience at UCLA School of Medicine in 1983. She is Adjunct Professor in the Department of Psychology at UCLA. Her specialization is behavioral neuroscience, and her research spans the organization of acetylcholine systems, neural plasticity, memory, neural degeneration, Alzheimer's disease, and consciousness. In 1990 she won the Colby Prize from the Sigma Kappa Foundation, awarded for her achievements in scientific research in Alzheimer's disease. In 2002 she received the Academic Advancement Program Faculty Recognition Award. She also received a Distinguished Teaching Award from the Psychology Department at UCLA in 2008. Dr. Woolf is currently on the editorial boards of *Science and Consciousness Review* and *Journal of Nanoneuroscience*.

APA Correlation

The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
GOAL 1: Scientific Inquiry and Critical Thinking		
Understand scientific reasoning and problem solving, including effective research methods.		
1.1 Use scientific reasoning to interpret behavior		
1.1a Identify basic biological, psychological, and social components of behavioral explanations (e.g., inferences, observations, operational definitions, interpretations)	<i>Learning Objectives:</i> 3.7 Chapter 12: From Inquiry to Understanding: Morgellon's Disease	MyPsychLab Video Series Basics: Scientific Research Methods Thinking Like a Psychologist: Thinking Critically The Pre-Frontal Cortex: The Good, the Bad, and the Criminal Evolutionary Psychology—Why We Do the Things We Do Can Smells Alter Mood and Behavior? The Uses and Limitations of Hypnosis Police Line-Up Babies by Design Speaking One's Mind Intelligence Tests and Success Predicting Future Emotion and Desire Measuring Personality Personality and Health Assessing Treatment Effectiveness In the Real World: Neurotransmitters Taking Control of Our Genes Pain Management Sleep, Memory, and Learning The Memories We Don't Want Changing Your Mind Eating Disorders Putting Popular Personality Assessments to the Test Sexual Problems and Dysfunction Reducing Stress, Improving Health Cognitive Behavioral Therapy What's In It for Me?: The Myth of Multitasking Perceptual Magic in Art and Movies Altered States of Consciousness How to Make Healthier Choices Making It Stick Making Choices How Resilient Are You? Meeting Our Needs Psychological Resilience The Challenge of Quitting Bad Health Habits Finding a Therapist if You Need One
1.1b Use psychology concepts to explain personal experiences and recognize the potential for flaws in behavioral explanations based on simplistic, personal theories	<i>Learning Objectives:</i> 3.9, 16.13, 16.14 Chapter 3: Psychomythology: Are Some People Left-Brained and Others Right-Brained?, Chapter 14: Evaluating Claims: Online Personality Tests	
1.1c Use an appropriate level of complexity to interpret behavior and mental processes	<i>Learning Objectives:</i> 3.11, 16.12 Chapter 4: Psychomythology: Psychic Healing of Chronic Pain	
1.1d Ask relevant questions to gather more information about behavioral claims	<i>Learning Objectives:</i> 5.7, 13.10, 16.10, 16.11 Think About It, Apply Your Scientific Thinking Skills, Fact or Fiction?, Chapter 1: Thinking Scientifically, Chapter 4: Evaluating Claims: Subliminal Persuasion, Chapter 6: From Inquiry to Understanding: Why Are We Superstitious?, Chapter 10: Evaluating Claims: Anti-Aging Treatments, Chapter 16: From Inquiry to Understanding: Why Can Ineffective Therapies Appear to be Helpful?, Chapter 16: Evaluating Claims: Psychotherapy	
1.1e Describe common fallacies in thinking (e.g., confirmation bias, post hoc explanations, implying causation from correlation) that impair accurate conclusions and predictions	<i>Learning Objectives:</i> 1.2, 1.5, 1.6 Think About It, Apply Your Scientific Thinking Skills, Chapter 6: Evaluating Claims: Sleep-Assisted Learning, Chapter 10: Psychomythology: The Mozart Effect	
1.2 Demonstrate psychology information literacy		
1.2a Read and summarize general ideas and conclusions from psychological sources accurately	<i>Learning Objectives:</i> 6.12 Chapter 1: Psychomythology: The Hot Hand: Reality or Illusion?	
1.2b Describe what kinds of additional information beyond personal experience are acceptable in developing behavioral explanations (i.e., popular press reports vs. scientific findings)	<i>Learning Objectives:</i> 1.4, 2.11 Chapter 1: Evaluating Claims: Health Benefits of Fruits and Vegetables, Chapter 9: Evaluating Claims: IQ Boosters	
1.2c Identify and navigate psychology databases and other legitimate sources of psychology information	<i>Learning Objectives:</i> 1.3 Chapter 7: Evaluating Claims: Memory Boosters	
1.2d Articulate criteria for identifying objective sources of psychology information	<i>Learning Objectives:</i> 2.9, 4.15 Chapter 1: From Inquiry to Understanding: Why Do We Perceive Patterns Even When They Don't Exist?	
1.2e Interpret simple graphs and statistical findings	<i>Learning Objectives:</i> 2.3 Factoids, Throughout Chapters Within Text	
1.3 Engage in innovative and integrative thinking and problem-solving		
1.3a Recognize and describe well-defined problems	<i>Learning Objectives:</i> 4.12 Chapter 8: Psychomythology: Do Twins Have Their Own Language?	
1.3b Apply simple problem-solving strategies to improve efficiency and effectiveness		

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The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
1.3c Describe the consequences of problem-solving attempts		MyPsychLab Simulations Implicit Association Test: Cats and Dogs Hemispheric Specialization Ambiguous Figures Weber's Law Müller-Lyer Illusion Learning Digit Span Serial Position Effect Depth of Processing Mental Rotation Selective Attention Stroop Effect Implicit Association Test: Food IPIP Neo Personality Inventory
1.4 Interpret, design and conduct basic psychological research		
1.4a Describe research methods used by psychologists including their respective advantages and disadvantages	Learning Objectives: 2.1, 2.2, 3.8, 5.6, 9.3	
1.4b Discuss the value of experimental design (i.e., controlled comparisons) in justifying cause-effect relationships	Learning Objectives: 2.4	
1.4c Define and explain the purpose of key research concepts that characterize psychological research (e.g., hypothesis, operational definition)	Chapter 2: From Inquiry to Understanding: How Do Placebos Work?	
1.4d Replicate or design and conduct simple scientific studies (e.g., correlational or two-factor) to confirm a hypothesis based on operational definitions		
1.4e Explain why conclusions in psychological projects must be both reliable and valid	Learning Objectives: 14.10, 14.11 Chapter 14: Psychomythology: How accurate is Criminal Profiling?	
1.4f Explain why quantitative analysis is relevant for scientific problem solving	Learning Objectives: 7.6	
1.4g Describe the fundamental principles of research design	Learning Objectives: 9.5	
1.5 Incorporate sociocultural factors in scientific inquiry		
1.5a Relate examples of how a researcher's value system, sociocultural characteristics, and historical context influence the development of scientific inquiry on psychological questions	Learning Objectives: 2.1 Chapter 5: Psychomythology: Age Regression and Past Lives, Chapter 6: Psychomythology: Are We What We Eat?	
1.5b Analyze potential challenges related to sociocultural factors in a given research study	Learning Objectives: 8.1	
1.5c Describe how individual and sociocultural differences can influence the applicability/generalizability of research findings	Learning Objectives: 7.7, 14.12	
1.5d Identify under what conditions research findings can be appropriately generalized	Learning Objectives: 2.8 Chapter 2: Psychomythology: Laboratory Research Doesn't Apply to the Real World, Right?	
GOAL 2: Ethical and Social Responsibility		
Develop ethically and socially responsible behaviors for professional and personal settings.		
2.1 Apply ethical standards to psychological science and practice		MyPsychLab Video Series Special Topics: Ethics and Psychological Research Thinking Like a Psychologist: Physical Punishment—You Decide! Sexual Orientation Changing Attitudes and Behaviors In the Real World: Speed Dating Resolving Conflict Socialization Are Stereotypes and Prejudices Inevitable? How Am I being Influenced? Learning Aggression What's In It for Me?: Identity The Dating Game Attraction Persuasion
2.1a Describe key regulations in the APA Ethics Code for protection of human or nonhuman research participants	Learning Objectives: 2.5 Chapter 15: Evaluating Claims: Online Tests for Mental Disorders	
2.1b Identify obvious violations of ethical standards in psychological contexts	Learning Objectives: 13.5 Chapter 11: Psychomythology: Is Truth Serum Really a Truth Serum?	
2.1c Discuss relevant ethical issues that reflect principles in the APA Code of Ethics	Learning Objectives: 2.6, 7.13, 11.4	
2.1d Define the role of the institutional review board		
2.2 Promote values that build trust and enhance interpersonal relationships		
2.2a Describe the need for positive personal values (e.g., integrity, benevolence, honesty, respect for human dignity) in building strong relationships with others	Learning Objectives: 11.12, 11.13	
2.2b Treat others with civility	Learning Objectives: 11.3	
2.2c Explain how individual differences, social identity, and world view may influence beliefs, values, and interaction with others and vice versa	Learning Objectives: 13.1, 13.2 Chapter 15: Psychomythology: The Insanity Defense: Free Will Versus Determinism	
2.2d Maintain high standards for academic integrity, including honor code requirements		
2.3 Adopt values that build community at local, national, and global levels		
2.3a Identify human diversity in its many forms and the interpersonal challenges that often result from the diversity	Learning Objectives: 8.3, 13.7 Chapter 15: From Inquiry to Understanding: More Than a Pack Rat: Why Do People Hoard?	

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The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
2.3b Recognize potential for prejudice and discrimination in oneself and others	<i>Learning Objectives: 9.4, 15.2, 15.3</i>	
2.3c Explain how psychology can promote civic, social, and global outcomes that benefit others	<i>Learning Objectives: 8.1, 8.2, 12.2, 13.6, 16.7</i>	
2.3d Describe psychology-related issues of global concern (e.g., poverty, health, migration, human rights, international conflict, sustainability)	<i>Learning Objectives: 9.8, 10.3, 10.11, 12.7, 14.1, 15.11, 15.12</i> Chapter 8: From Inquiry to Understanding: Why Do We Worry About the Wrong Things?, Chapter 14: From Inquiry to Understanding: Where is the Environmental Influence on Personality?	
2.3e Articulate psychology's role in developing, designing, and disseminating public policy		
2.3f Accept opportunity to serve others through civic engagement, including volunteer service	<i>Learning Objectives: 8.4</i>	
GOAL 3: Communication		
Demonstrate competence in written, oral, and interpersonal communication skills and be able to develop and present a scientific argument.		
3.1 Demonstrate effective writing in multiple formats		MyPsychLab Writing Assignments
3.1a Express ideas in written formats that reflect basic psychological concepts and principles	<i>Learning Objectives: 3.4</i> Assess Your Knowledge, Your Complete Review System, Apply Your Scientific Thinking Skills, Further Your Understanding	Diagnosing Anxiety Designing an Experiment Parts of the Brain on Pizza Night Musical Talent as a Heritable Trait The Gestalt Perspective Effects of Sleep Deprivation in College Operant Conditioning and Weight Loss Memory and Study Strategies Describing Thinking Patterns with Piaget's Theory of Cognitive Development Mental Sets and Studying a Foreign Language Exploring Gardner's Types of Intelligence Describing Theories of Emotion Describing Theories of Personality Comparing Gender Concepts Analyzing Stress Assessing Work Environments and Motivation Discussing Prejudice and Discrimination Considering Schizophrenia Comparing Psychotherapy Approaches
3.1b Recognize writing content and format differ based on purpose (e.g., blogs, memos, journal articles) and audience		
3.1c Use generally accepted grammar	Apply Your Scientific Thinking Skills, Further Your Understanding	
3.1d Describe how writing using APA writing style is different from regular writing or writing in other conventions		
3.1e Recognize and develop overall organization (e.g., beginning, development, ending) that fits the purpose		
3.1f Interpret quantitative data displayed in statistics, graphs, and tables, including statistical symbols in research reports	<i>Learning Objectives: 2.7, 16.6</i> Apply Your Scientific Thinking Skills, Further Your Understanding, Throughout Chapters Within Text	
3.1g Use expert feedback to revise writing of a single draft		
3.2 Exhibit effective presentation skills in multiple formats		
3.2a Construct plausible oral argument based on a psychological study		
3.2b Deliver brief presentations within appropriate constraints (e.g., time limit, appropriate to audience)	Apply Your Scientific Thinking Skills, Further Your Understanding	
3.2c Describe effective delivery characteristics of professional oral performance	Apply Your Scientific Thinking Skills, Further Your Understanding	
3.2d Incorporate appropriate visual support		
3.2e Pose questions about psychological content	<i>Learning Objectives: 9.12</i> Chapter 4: From Inquiry to Understanding: How Does Magic Work?, Chapter 5: From Inquiry to Understanding: Do We Experience Déjà Vu?, Chapter 11: From Inquiry to Understanding: Why Do We Cry?	
3.3 Interact Effectively with Others		
3.3a Identify key message elements in communication through careful listening		
3.3b Recognize that culture, values, and biases may produce misunderstandings in communication	<i>Learning Objectives: 9.7</i>	
3.3c Attend to language and nonverbal cues to interpret meaning		

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The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
3.3d Ask questions to capture additional detail	Apply Your Scientific Thinking Skills, Further Your Understanding, Fact or Fiction?, Chapter 9: From Inquiry to Understanding: Why Smart People Believe Strange Things	
3.3e Respond appropriately to electronic communications		
GOAL 4: Professional Development		
Apply psychology-specific content and skills, effective self-reflection, project management skills, teamwork skills and career preparation to support occupational planning and pursuit.		
4.1 Apply psychological content and skills to professional work		MyPsychLab Simulations
4.1a Recognize the value and application of research and problem-solving skills in providing evidence beyond personal opinion to support proposed solutions	Learning Objectives: 4.14	Which Sense Do You Use? Do You Fly or Fight? What Altered States Have You Experienced? Are Dreams Meaningful?
4.1b Identify range of possible factors that influence beliefs and conclusions	Learning Objectives: 10.2	What Drugs Have You Used? What Learning Techniques Do You Use? What Do You Remember?
4.1c Expect to deal with differing opinions and personalities in the college environment	Learning Objectives: 11.11	What Has Your Father Done for You? What is Creativity?
4.1d Describe how psychology's content applies to business, healthcare, educational, and other workplace settings	Learning Objectives: 6.9, 6.10, 7.10 Chapter 7: Psychomythology: Smart Pills	What is Intelligence? How To Deal with Your Emotions? What Motivates You?
4.1e Recognize and describe broad applications of information literacy skills obtained in the psychology major		What Has Shaped Your Personality? How Does Gender Affect You? Will This Survey Stress You Out? Could You Be a Hero?
4.1f Describe how ethical principles of psychology have relevance to non-psychology settings	Learning Objectives: 8.9	Are You Normal? How Do You Take Care of Your Mental Health?
4.2 Exhibit self-efficacy and self-regulation		
4.2a Recognize the link between effort and achievement	Learning Objectives: 8.12 Chapter 13: Evaluating Claims: Work From Home Jobs	
4.2b Accurately self-assess performance quality by adhering to external standards (e.g., rubric criteria, teacher expectations)		
4.2c Incorporate feedback from educators and mentors to change performance		
4.2d Describe self-regulation strategies (e.g., reflection, time management)	Chapter 8: Evaluating Claims: Speed-Reading Courses	
4.3 Refine project management skills		
4.3a Follow instructions, including timely delivery, in response to project criteria		
4.3b Identify appropriate resources and constraints that may influence project completion		
4.3c Anticipate where potential problems can hinder successful project completion	Learning Objectives: 12.4	
4.3d Describe the processes and strategies necessary to develop a project to fulfill its intended purpose		
4.4 Enhance teamwork capacity		
4.4a Collaborate successfully on small group classroom assignments		
4.4b Recognize the potential for developing stronger solutions through shared problem-solving	Chapter 13: Psychomythology: Is Brainstorming in Groups a Good Way to Generate Ideas?	
4.4c Articulate problems that develop when working with teams	Learning Objectives: 13.4	
4.4d Assess one's strengths and weaknesses in performance as a project team member	Learning Objectives: 13.8	
4.4e Describe strategies used by effective group leaders		

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The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
4.4f Describe the importance of working effectively in diverse environments		
4.5 Develop meaningful professional direction for life after graduation		
4.5a Describe the types of academic experiences and advanced course choices that will best shape career readiness	<i>Learning Objectives: 4.11, 11.6, 16.1, 16.2</i> Chapter 10: From Inquiry to Understanding: Why is Science Difficult?	
4.5b Articulate the skills sets desired by employers who hire people with psychology backgrounds		
4.5c Recognize the importance of having a mentor		
4.5d Describe how a curriculum vitae or resume is used to document the skills expected by employers		
4.5e Recognize how rapid social change influences behavior and affects one's value in the workplace		
GOAL 5: Knowledge Base in Psychology		
Demonstrate fundamental knowledge and comprehension of major concepts, theoretical perspectives, historical trends, and empirical findings to discuss how psychological principles apply to behavioral problems.		
5.1 Describe key concepts, principles, and overarching themes in psychology		MyPsychLab Video Series
5.1a Use basic psychological terminology, concepts, and theories in psychology to explain behavior and mental processes	<i>Learning Objectives: 1.7, 3.5, 3.10, 4.9, 6.2, 6.4, 7.1, 7.2, 7.3, 8.5, 9.1, 9.2, 9.6, 10.4, 10.5, 10.6, 11.9, 11.10, 12.1, 13.9, 15.1, 15.4</i>	The Big Picture: Asking the Tough Questions How to Answer Psychological Questions My Brain Made Me Do It Genes, Evolution, and Human Behavior Taking in the World Around Us States of Consciousness What Does It Mean to Learn? The Woman Who Cannot Forget Different Perspectives on the World I Am, Therefore I Think What is Intelligence? Motivation and Emotion What is Personality?
5.1b Explain why psychology is a science with the primary objectives of describing, understanding, predicting, and controlling behavior and mental processes	<i>Learning Objectives: 1.1, 3.1, 3.2, 3.3, 4.5, 4.7, 5.2, 5.9, 7.8, 7.9, 11.8</i> Chapter 13: From Inquiry to Understanding: Why Are Yawns Contagious?	The Power of Sex Health Psychology The Social World What Does it Mean to Have a Mental Disorder?
5.1c Interpret behavior and mental processes at an appropriate level of complexity	<i>Learning Objectives: 4.1, 4.3, 4.4, 4.6, 8.11</i>	
5.1d Recognize the power of the context in shaping conclusions about individual behavior	<i>Learning Objectives: 4.14</i>	
5.1e Identify fields other than psychology that address behavioral concerns	<i>Learning Objectives: 6.11, 10.10</i> Chapter 5: Evaluating Claims: Dream Interpretations	
5.2 Develop a working knowledge of the content domains of psychology		
5.2a Identify key characteristics of major content domains in psychology (e.g., cognition and learning, developmental, biological, and sociocultural)	<i>Learning Objectives: 5.3, 6.1, 6.5, 7.5, 8.6, 8.7, 10.7, 10.8, 15.5, 15.6, 15.7, 15.8, 15.9, 15.10, 16.8, 16.9</i>	

Basics:
Diverse Perspectives
How the Brain Works
Genetic Mechanisms and Behavioral Genetics
In Full Appreciation of the Cookie
Rhythms of Consciousness

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The APA Guidelines for the Undergraduate Psychology Major Version 2.0		
APA Learning Outcomes and Objectives	Text Learning Objectives and Features	MyPsychLab Videos, Simulations and Assessments
5.2b Identify principle research methods and types of questions that emerge in specific content domains	<i>Learning Objectives: 4.1</i>	Classical Conditioning: An Involuntary Response Operant Conditioning: Learning from Consequences
5.2c Recognize major historical events, theoretical perspectives, and figures in psychology and their link to trends in contemporary research	<i>Learning Objectives: 1.8, 5.4, 5.5, 11.1, 11.7, 12.3, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 16.3, 16.4, 16.5</i>	Do You Remember When...? How Thinking Develops Attachment
5.2d Provide examples of unique contributions of content domain to the understanding of complex behavioral issues	<i>Learning Objectives: 1.9, 4.2</i>	The Mind is What the Brain Does Theories of Intelligence Theories of Emotion and Motivation
5.2e Recognize content domains as having distinctive sociocultural origins and development	<i>Learning Objectives: 7.11, 10.12</i> Chapter 7: From Inquiry to Understanding: Why Can't We Remember Anything from the First Few Years of Our Lives?	Personality Theories Sex and Gender Differences Stress and Your Health Under the Influence of Others Living with a Disorder Therapies in Action
5.3 Describe applications that employ discipline-based problem solving		
5.3a Describe examples of relevant and practical applications of psychological principles to everyday life	<i>Learning Objectives: 1.10, 3.6, 6.3, 6.8, 7.4, 10.1, 12.8, 12.9, 12.10</i> Chapter 3: From Inquiry to Understanding: How Do We Recognize Faces?, Chapter 12: Psychomythology: Are Almost All People Traumatized By highly Adverse Events?	Special Topics: The Plastic Brain Epigenetics: A Revolutionary Science Recognizing Faces Sleep Disorders Learning to Overcome Phobias When Memory Fails
5.3b Summarize psychological factors that can influence the pursuit of a healthy lifestyle	<i>Learning Objectives: 5.1, 9.11, 11.5, 12.5, 12.6</i> Chapter 2: Evaluating Claims: Hair-Loss Remedies, Chapter 3: Evaluating Claims: Diagnosing Your Own Brain Orientation, Chapter 11: Evaluating Claims: Diets and Weight-Loss Plans, Chapter 12: Evaluating Claims: Stress Reduction and Relaxation Claims, Chapter 16: Psychomythology: Are Self-Help Books Always Helpful?	Risky Behavior and Brain Development Mental Imagery: In the Mind's Eye Intelligence Testing, Then and Now Detecting Lies Twins and Personality
5.3c Correctly identify antecedents and consequences of behavior and mental processes	<i>Learning Objectives: 5.8, 6.6, 6.7, 11.2, 12.11, 12.12</i>	Cultural Norms and Sexual Behavior Health Disparities Mental Shortcuts in a Social Context Diagnosing Mental Disorders
5.3d Predict how individual differences influence beliefs, values, and interactions with others, including the potential for prejudicial and discriminatory behavior in oneself and others	<i>Learning Objectives: 7.12, 8.8, 9.9, 9.10, 10.9, 10.13, 10.14, 13.3, 13.11, 13.12</i> Chapter 9: Psychomythology: Do College Admissions Tests Predict Grades?	



Psychology and Scientific Thinking

A FRAMEWORK FOR EVERYDAY LIFE

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Think About It

Is psychology mostly just common sense?

Should we trust most self-help books?

Is psychology really a science?

Are claims that can't be proven wrong scientific?

Are all clinical psychologists psychotherapists?


 Listen in MyPsychLab to chapter audio

Test of Popular Psychology Knowledge

1. Most people use only about 10 percent of their brain capacity. **True / False**
2. Newborn babies are virtually blind and deaf. **True / False**
3. Hypnosis enhances the accuracy of our memories. **True / False**
4. All people with dyslexia see words backward (like *tac* instead of *cat*). **True / False**
5. In general, it's better to express anger than to hold it in. **True / False**
6. The lie-detector (polygraph) test is 90–95 percent accurate at detecting falsehoods. **True / False**
7. People tend to be romantically attracted to individuals who are opposite them in personality and attitudes. **True / False**
8. The more people present at an emergency, the more likely it is that at least one of them will help. **True / False**
9. People with schizophrenia have more than one personality. **True / False**
10. All effective psychotherapies require clients to get to the root of their problems in childhood. **True / False**

For most of you reading this text, it's your first psychology course. If you're like most people, much of what you've learned about psychology comes from watching television programs and movies, listening to radio call-in shows, reading self-help books and popular magazines, surfing the Internet, and talking to friends. In short, most of your psychology knowledge probably derives from the popular psychology industry: a sprawling network of everyday sources of information about human behavior.

Take a moment to review the preceding ten questions. Beginning psychology students typically assume that they know the answers to most of them. That's hardly surprising, as these assertions have become part of popular psychology lore. Yet most students are surprised to learn that *all* ten of these statements are false! This little exercise illustrates a take-home message we'll emphasize throughout the text: *Although common sense can be enormously useful for some purposes, it's sometimes completely wrong* (Chabris & Simons, 2010). This can be especially true in psychology, a field that strikes many of us as self-evident, even obvious. In a sense, we're *all* psychologists, because we deal with psychological phenomena like love, friendship, anger, stress, happiness, sleep, memory, and language in our daily lives (Lilienfeld et al., 2009). As we'll discover, everyday experience can often be helpful in allowing us to navigate the psychological world, but it doesn't necessarily make us an expert (Kahneman & Klein, 2009).

 Watch in MyPsychLab the Video:
Thinking Like a Psychologist: Debunking Myths

Each of these panels from everyday life poses a different psychological question: (1) Why do we fall in love? (2) Why do some of us become depressed for no apparent reason? (3) What makes us angry? Although the science of psychology doesn't provide easy answers to any of these questions, it does offer valuable insights into them.



What Is Psychology? Science Versus Intuition

- 1.1 Explain why psychology is more than just common sense.
- 1.2 Explain the importance of science as a set of safeguards against biases.

William James (1842–1910), often regarded as the founder of American psychology, once described psychology as a “nasty little subject.” As James noted, psychology is difficult to study, and simple explanations of behavior are few and far between. If you

enrolled in this course expecting cut-and-dried answers to psychological questions, such as why you become angry or fall in love, you might emerge disappointed. But if you enrolled in the hopes of acquiring more insight into the hows and whys of human behavior, stay tuned, because a host of delightful surprises are in store. When reading this textbook, prepare to find many of your preconceptions about psychology challenged; to encounter new ways of thinking about the causes of your everyday thoughts, feelings, and actions; and to apply these ways of thinking to evaluating psychological claims in everyday life.

Psychology and Levels of Analysis

The first question often posed in introductory psychology textbooks could hardly seem simpler: “what is psychology?” Although psychologists disagree about many things, they agree on one thing: psychology isn’t easy to define (Henriques, 2004; Lilienfeld, 2004). For the purposes of this text, though, we’ll simply refer to **psychology** as the scientific study of the mind, brain, and behavior.

Psychology is a discipline that spans multiple **levels of analysis**. We can think of levels of analysis as rungs on a ladder, with the lower rungs tied most closely to biological influences and the higher rungs tied most closely to social influences (Ilardi & Feldman, 2001; Kendler, 2005). The levels of analysis in psychology stretch all the way from molecules to brain structures on the low rungs to thoughts, feelings, and emotions and to social and cultural influences on the high rungs, with many levels in between (Cacioppo et al., 2000; Satel & Lilienfeld, 2013) (see **FIGURE 1.1**). The lower rungs are more closely tied to what we traditionally call “the brain”; the higher rungs to what we traditionally call “the mind.” But it’s crucial to understand that “brain” and “mind” are just different ways of describing the same material “stuff” at different levels of analysis: the “mind” is really just the brain in action. Although psychologists may differ in which rungs they choose to investigate, they’re united by a shared commitment to understanding the causes of human and animal behavior.

We’ll cover all of these levels of analysis in coming chapters. When doing so, we’ll keep one crucial guideline in mind: *to fully understand psychology, we must consider multiple levels of analysis*. That’s because each level tells us something different, and we gain new knowledge from each vantage point. Some psychologists believe that biological factors—like the actions of the brain and its billions of nerve cells—are most critical for understanding the causes of behavior. Others believe that social factors—like parenting practices, peer influences, and culture—are most critical for understanding the causes of behavior (Meehl, 1972). In this text, we’ll steer away from these two extremes, because both biological and social factors are essential for a complete understanding of psychology (Kendler, 2005).

What Makes Psychology Distinctive—and Fascinating

A key theme of this textbook is that we can approach psychological questions scientifically, and in much the same way as we can approach questions in biology, chemistry, and physics. Yet in some ways, psychology is distinctive, if not unique, from other sciences. A host of challenges make the study of mind, brain, and behavior especially complex; yet it’s precisely these challenges that also make psychology fascinating, because they contribute to scientific mysteries that psychologists have yet to solve. Here, we’ll touch briefly on five especially intriguing challenges that we’ll be revisiting throughout the text.

First, human behavior is difficult to predict, in part because almost all actions are **multiply determined**, that is, produced by many factors. That’s why we need to be skeptical of *single-variable explanations* of behavior, which are widespread in popular psychology. Although it’s tempting to explain complex human behaviors like violence in terms of a single causal factor like poverty, bad upbringing, or genes, such behaviors are almost surely due to the interplay of an enormous array of factors (Stern, 2002).

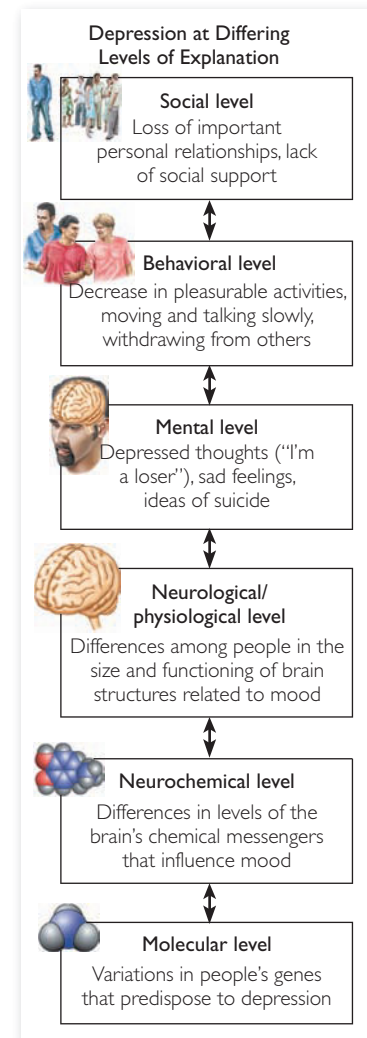


FIGURE 1.1 Levels of Analysis in Depression. We can view psychological phenomena, in this case the disorder of depression, at multiple levels of analysis, with lower levels being more biological and higher levels being more social. Each level provides unique information and offers a distinctive view of the phenomenon at hand. (Based on data from Ilardi, Rand, & Karwoski, 2007)

 **Watch in MyPsychLab the Video:** The Big Picture: Asking the Tough Questions

psychology

the scientific study of the mind, brain, and behavior

levels of analysis

rungs on a ladder of analysis, with lower levels tied most closely to biological influences and higher levels tied most closely to social influences

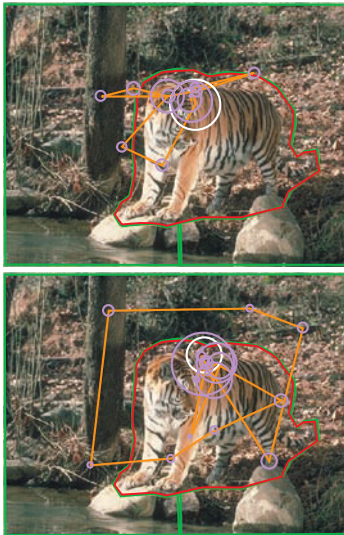
multiply determined

caused by many factors

Psychology may not be one of the traditional hard sciences like chemistry, but many of its fundamental questions are even more difficult to answer.



In the museum of everyday life, causation isn't a one-way street. In conversations, one person influences a second person, who in turn influences the first person, who in turn influences the second person, and so on. This principle, called *reciprocal determinism*, makes it challenging to pinpoint the causes of behavior.



In a study by Chua, Boland, and Nisbett (2005), European Americans tend to focus more on the central details of photographs, like the tiger itself (top), whereas Asian Americans tend to focus more on the peripheral details, like the rocks and leaves surrounding the tiger (bottom).

individual differences

variations among people in their thinking, emotion, personality, and behavior



Second, psychological influences are rarely independent of each other, making it difficult to pin down which cause or causes are operating. Imagine yourself a scientist attempting to explain why some women develop *anorexia nervosa*, a severe eating disorder we'll discuss in Chapter 11. You could start by identifying several factors that might contribute to anorexia nervosa, like anxiety-proneness, compulsive exercise, perfectionism, excessive concern with body image, and exposure to television programs that feature thin models. Let's say that you want to focus on just one of these potential influences, like perfectionism. Here's the problem: women who are perfectionists also tend to be anxious, to exercise a lot, to be overly concerned with their body image, to watch television programs that feature thin models, and so on (Egan et al., 2013). The fact that all of these factors tend to be interrelated makes it tricky to pinpoint which one actually contributes to anorexia nervosa. The odds are high that they all play at least some role.

Third, people differ from each other in thinking, emotion, personality, and behavior. These **individual differences** help to explain why we each person responds in different ways to the same objective situation, such as an insulting comment from a boss (Harkness & Lilienfeld, 1997). Entire fields of psychology, such as the study of intelligence, interests, personality, and mental illness, focus on individual differences (Lubinski, 2000). Individual differences make psychology challenging because they make it difficult to come up with explanations of behavior that apply to everyone; at the same time, they make psychology exciting, because people we might assume we understand well often surprise us in their reactions to life events.

Fourth, people often influence each other, often making it difficult to pin down what causes what (Wachtel, 1973). For example, if you're an extraverted person, you're likely to make the people around you more outgoing. In turn, their outgoing behavior may "feed back" to make you even more extraverted, and so on. This is an example of what Albert Bandura (1973) called *reciprocal determinism*—the fact that we mutually influence each other's behavior (see Chapter 14). Reciprocal determinism can make it challenging to isolate the causes of human behavior.

Fifth, people's behavior is often shaped by culture. Cultural differences, like individual differences, place limits on the generalizations that psychologists can draw about human nature (Henrich, Heine, & Norenzayan, 2010). To take one example, Richard Nisbett and his colleagues found that European-American and Chinese participants often attend to strikingly different things in pictures (Chua, Boland, & Nisbett, 2005). In one case, the researchers showed people a photograph of a tiger walking on rocks next to a river. Using eye-tracking technology, which allows researchers to determine where people are moving their eyes, they found that European Americans tend to look mostly at the tiger, whereas Chinese tend to look mostly at the plants and rocks surrounding it. This finding dovetails with evidence that European Americans tend to focus on central details, whereas Asian Americans tend to focus on peripheral or incidental details (Nisbett, 2003; Nisbett et al., 2001).

All five of these challenges are worth bearing in mind as we move onto later chapters. The good news is that psychologists have made substantial progress toward solving all of them and that a deeper and richer appreciation of these challenges helps us to better predict—and in some cases understand—behavior.

Why We Can't Always Trust Our Common Sense

To understand why others act as they do, most of us trust our common sense—our gut intuitions about how the social world works. Yet, as we've already discovered, our intuitive understanding of ourselves and the world is frequently mistaken (Cacioppo, 2004; Van Hecke, 2007). As the quiz at the start of this chapter showed us, sometimes our commonsensical understanding of psychology isn't merely incorrect but entirely backward. For example, although many people believe the old adage "There's safety in numbers,"

psychological research actually shows that the more people present at an emergency, the *less* likely at least one of them will help (Darley & Latané, 1968a; Fischer et al., 2011; Latané & Nida, 1981).

Here's another illustration of why we can't always trust our common sense. Read the following well-known proverbs, most of which deal with human behavior, and ask yourself whether you agree with them:

- | | |
|---|---|
| 1. Birds of a feather flock together. | 6. Opposites attract. |
| 2. Absence makes the heart grow fonder. | 7. Out of sight, out of mind. |
| 3. Better safe than sorry. | 8. Nothing ventured, nothing gained. |
| 4. Two heads are better than one. | 9. Too many cooks spoil the broth. |
| 5. Actions speak louder than words. | 10. The pen is mightier than the sword. |

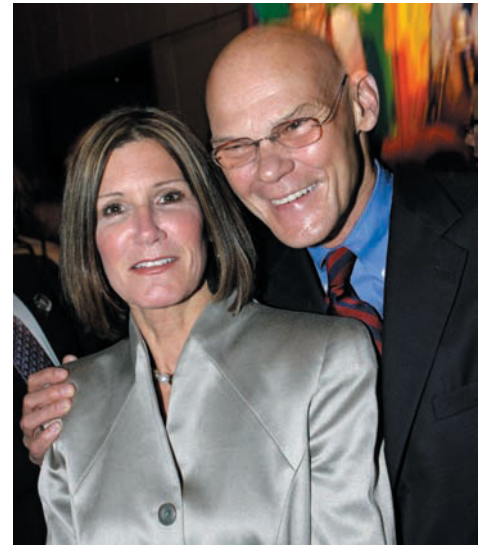
To most of us, these proverbs all ring true. Yet in fact, each proverb contradicts the proverb across from it. So our common sense can lead us to believe two things that can't both be true simultaneously—or at least that are largely at odds with each other. Strangely enough, in most cases, we never notice the contradictions until other people, like the authors of an introductory psychology textbook, point them out to us. This example reminds us of why scientific psychology doesn't rely exclusively on intuition, speculation, or common sense.

NAIVE REALISM: IS SEEING BELIEVING? We trust our common sense largely because we're prone to **naive realism**: the belief that we see the world precisely as it is (Lilienfeld, Lohr, & Olatunji, 2008; Ross & Ward, 1996). We assume that “seeing is believing” and trust our intuitive perceptions of the world and ourselves. In daily life, naive realism often serves us well. If we're driving down a one-lane road and see a tractor trailer barreling toward us at 85 miles per hour, it's a good idea to get out of the way. Much of the time, we *should* trust our perceptions.

Yet appearances can sometimes be deceiving. The earth *seems* flat. The sun *seems* to revolve around the earth (see **FIGURE 1.2** for another example of deceptive appearances). Yet in both cases, our intuitions are wrong. Similarly, naive realism can trip us up when it comes to evaluating ourselves and others. Our common sense assures us that people who don't share our political views are biased but that we're objective. Yet psychological research demonstrates that just about all of us tend to evaluate political issues in a biased fashion (Pronin, Gilovich, & Ross, 2004). So our tendencies toward naive realism can lead us to draw incorrect conclusions about human nature. In many cases, “believing is seeing” rather than the reverse: our beliefs shape our perceptions of the world, often in ways we don't realize (Gilovich, 1991).

WHEN OUR COMMON SENSE IS RIGHT. That's not to say that our common sense is always wrong. Our intuition comes in handy in many situations and sometimes guides us to the truth (Gigerenzer, 2007; Gladwell, 2005; Myers, 2002). For example, our snap (five-second) judgments about whether someone we've just watched on video is trustworthy or untrustworthy tend to be right more often than we'd expect by chance (Fowler, Lilienfeld, & Patrick, 2009). Common sense can also be a helpful guide for generating hypotheses that scientists can later test in rigorous investigations (Redding, 1998). Moreover, some everyday psychological notions are indeed correct. For example, most people believe that happy employees tend to be more productive on the job compared with unhappy employees, and research shows that they're right (Kluger & Tikochinsky, 2001).

But to think scientifically, we must learn when—and when not—to trust our common sense. Doing so will help us to become more informed consumers of popular psychology and make better real-world decisions. One of our major goals in this text is to provide you with a framework of scientific thinking tools for making this crucial distinction. This thinking framework can help you to better evaluate psychological claims in everyday life.



? Why are marriages like that of Mary Matalin, a prominent conservative political strategist, and James Carville, a prominent liberal political strategist, rare?



FIGURE 1.2 Naive Realism Can Fool Us. Even though our perceptions are often accurate, we can't always trust them to provide us with an error-free picture of the world. In this case, take a look at *Shepard's tables*, courtesy of psychologist Roger Shepard (1990). Believe it or not, the tops of these tables are identical in size: One can be directly superimposed on top of the other (get out a ruler if you don't believe us!).

naive realism

belief that we see the world precisely as it is

Answer: Despite the commonsense belief that opposites attract, psychological research shows that people are generally drawn to others who are similar to them in beliefs and values.



Here's another case in which our naive realism can trick us. Take a look at these two upside-down photos. They look quite similar, if not identical. Now turn your book upside down.



Watch in MyPsychLab the Video: John Cacioppo: Can you explain psychology as a hub science?

scientific theory

explanation for a large number of findings in the natural world

hypothesis

testable prediction derived from a scientific theory

Psychology as a Science

A few years ago, one of our academic colleagues was advising a psychology major about his career plans. Out of curiosity, he asked the student, “So why did you decide to go into psychology?” The student responded, “Well, I took a lot of science courses and realized I didn’t like science, so I picked psychology instead.”

We’re going to try to persuade you that the student was wrong—not about selecting a psychology major, that is, but about psychology not being a science. A central theme of this text is that modern psychology, or at least a hefty chunk of it, is scientific. But what does the word *science* really mean, anyway?

We might assume that *science* is just a word for all of that really complicated stuff people learn in their biology, chemistry, and physics classes. But science isn’t a body of knowledge. Instead, it’s a systematic *approach* to evidence (Bunge, 1998). Specifically, science consists of a set of attitudes and skills designed to prevent us from fooling ourselves. Science begins with *empiricism*, the premise that knowledge should initially be acquired through observation. Yet such observation is only a rough starting point for obtaining psychological knowledge. As the phenomenon of naive realism reminds us, it isn’t sufficient by itself, because our observations can fool us. So science refines our initial observations, subjecting them to stringent tests to determine whether they are accurate. The observations that stand up to rigorous examination are retained; those that don’t are revised or discarded.

Survey data show that a large percentage, and perhaps even a majority, of the general public doubts that psychology is truly scientific (Janda et al., 1998; Lilienfeld, 2012). Some of this skepticism probably reflects the fact that when psychologists appear on the news or other popular media outlets, they’re rarely scientists. So it’s not entirely surprising that in a recent poll of the American public, only 30 percent agreed that “psychology attempts to understand the way people behave through scientific research”; in contrast, 52 percent believed that “psychology attempts to understand the way people behave by talking to them and asking them why they do what they do” (Penn & Schoen and Berland Associates, 2008, p. 29). In fact, scientific psychologists almost always rely on systematic research methods, of which talking to people is only one component. Another reason many people question psychology’s scientific status is that psychology is intimately familiar to all of us; memory, learning, love, sleep and dreams, personality, and the like are part and parcel of everyday lives. Because psychology is so familiar to all of us, we may assume that it’s easy (Lilienfeld, 2012). Indeed, children and adults alike tend to regard psychology as simpler and more self-evident than physics, chemistry, and biology (Keil, Lockhart, & Schlegel, 2010), which probably helps to explain why these other fields are often called the hard sciences. Yet as we’ll see in later chapters, there are many ways in which psychology is even “harder” than physics, because behavior—especially human behavior—is often challenging to predict (Meehl, 1978).

WHAT IS A SCIENTIFIC THEORY? Few terms in science have generated more confusion than the deceptively simple term *theory*. Some of this confusion has contributed to serious misunderstandings about how science works. We’ll first examine what a scientific theory is and then address two misconceptions about what a scientific theory *isn’t*.

A **scientific theory** is an explanation for a large number of findings in the natural world, including the psychological world. A scientific theory offers an account that ties multiple findings together into one pretty package.

But good scientific theories do more than account for existing data. They generate predictions regarding new data we haven’t yet observed. For a theory to be scientific, it must generate novel predictions that researchers can test. Scientists call a testable prediction a **hypothesis**. In other words, theories are general explanations, whereas hypotheses are specific predictions derived from those explanations (Bolles, 1962; Meehl, 1967). Based on their tests of hypotheses, scientists can provisionally accept the theory that generated these hypotheses, reject this theory outright, or revise it (Proctor & Capaldi, 2006).

Misconception 1: *A theory explains one specific event.* The first misunderstanding is that a theory is a specific explanation for an event. The popular media get this distinction wrong much of the time. We often hear television reporters say something like, “The most likely theory for the robbery at the downtown bank is that it was committed by two former bank employees who dressed up as armed guards.” But this isn’t a “theory” of the robbery. For one thing, it attempts to explain only one event rather than a variety of diverse observations. It also doesn’t generate testable predictions.

Misconception 2: *A theory is just an educated guess.* A second myth is that a scientific theory is merely a guess about how the world works. People often dismiss a theoretical explanation on these grounds, arguing that it’s “just a theory.”

In fact, *all* general scientific explanations about how the world works are theories. A few theories are extremely well supported by multiple lines of evidence; for example, the Big Bang theory, which proposes that the universe began in a gigantic explosion about 14 billion years ago, helps scientists to explain a diverse array of observations. They include the findings that (1) galaxies are rushing away from each other at remarkable speeds; (2) the universe exhibits a background radiation suggestive of the remnants of a tremendous explosion; and (3) powerful telescopes reveal that the oldest galaxies originated about 14 billion years ago, right around the time predicted by the Big Bang theory. Like all scientific theories, the Big Bang theory can never be “proved” because it’s always conceivable that a better explanation might come along one day. Nevertheless, because this theory is consistent with many differing lines of evidence, the overwhelming majority of scientists accept it as a good explanation. Darwinian evolution, the Big Bang, and other well-established theories aren’t guesses about how the world works, because they’ve been substantiated over and over again by independent investigators. In contrast, many other scientific theories are only moderately well supported, and still others are questionable or entirely discredited. Not all theories are created equal.

So when we hear that a scientific explanation is “just a theory,” we should remember that theories aren’t just guesses. Some theories have survived repeated efforts to refute them and are well-confirmed models of how the world works (Kitcher, 2009).

SCIENCE AS A SAFEGUARD AGAINST BIAS: PROTECTING US FROM OURSELVES. Some people assume that scientists are objective and free of biases. Yet scientists are human and have their biases, too (Mahoney & DeMonbreun, 1977). The best scientists are aware of their biases and try to find ways of compensating for them. This principle applies to all scientists, including psychological scientists—those who study mind, brain, and behavior. In particular, the best scientists realize that they *want* their pet theories to turn out to be correct. After all, they’ve invested months or even years in designing and running a study to test a theory, sometimes a theory they’ve developed. If the results of the study are negative, they’ll often be bitterly disappointed. They also know that because of this deep personal investment, they may bias the results unintentionally to make them turn out the way they want (Greenwald et al., 1986). Scientists are prone to self-deception, just like the rest of us. There are several traps into which scientists can fall unless they’re careful. We’ll discuss two of the most crucial next.

Confirmation Bias. To protect themselves against bias, good scientists adopt procedural safeguards against errors, especially errors that could work in their favor. In other words, scientific methods are tools for overcoming **confirmation bias**: the tendency to seek out evidence that supports our beliefs and deny, dismiss, or distort evidence that contradicts them (Nickerson, 1998; Risen & Gilovich, 2007). We can sum up confirmation bias in five words: *seek and ye shall find*.

Because of confirmation bias, our preconceptions often lead us to focus on evidence that supports our beliefs, resulting in psychological tunnel vision (Wagenmakers et al., 2012). One of the simplest demonstrations of confirmation bias comes from research on the *Wason selection task* (Wason, 1966), an example of which we can find in **FIGURE 1.3**. There, you’ll see four cards, each of which has a number on one side and a letter on the other side. Your task

Factoid

Academic psychologists are more skeptical of many controversial claims than their colleagues in more traditional sciences are, perhaps because psychologists are aware of how biases can influence the interpretation of data. For example, compared with physicists, chemists, and biologists, psychologists are considerably less likely to believe that extrasensory perception is an established scientific phenomenon (Wagner & Monnet, 1979).

This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered.

Approved by
Cobb County Board of Education
Thursday, March 28, 2002

Some creationists have argued that evolution is “just a theory.” Cobb County, Georgia, briefly required high school biology textbooks to carry this sticker (Pinker, 2002).

Here are four cards. Each of them has a letter on one side and a number on the other side. Two of these cards are shown with the letter side up, and two with the number side up.



Indicate which of these cards you have to turn over in order to determine whether the following claim is true:

If a card has a vowel on one side, then it has an odd number on the other side.

FIGURE 1.3 Diagram of Wason Selection Task. In the Wason selection task, you must pick two cards to test the hypothesis that all cards that have a vowel on one side have an odd number on the other. Which two will you select?

confirmation bias

tendency to seek out evidence that supports our hypotheses and deny, dismiss, or distort evidence that contradicts them