

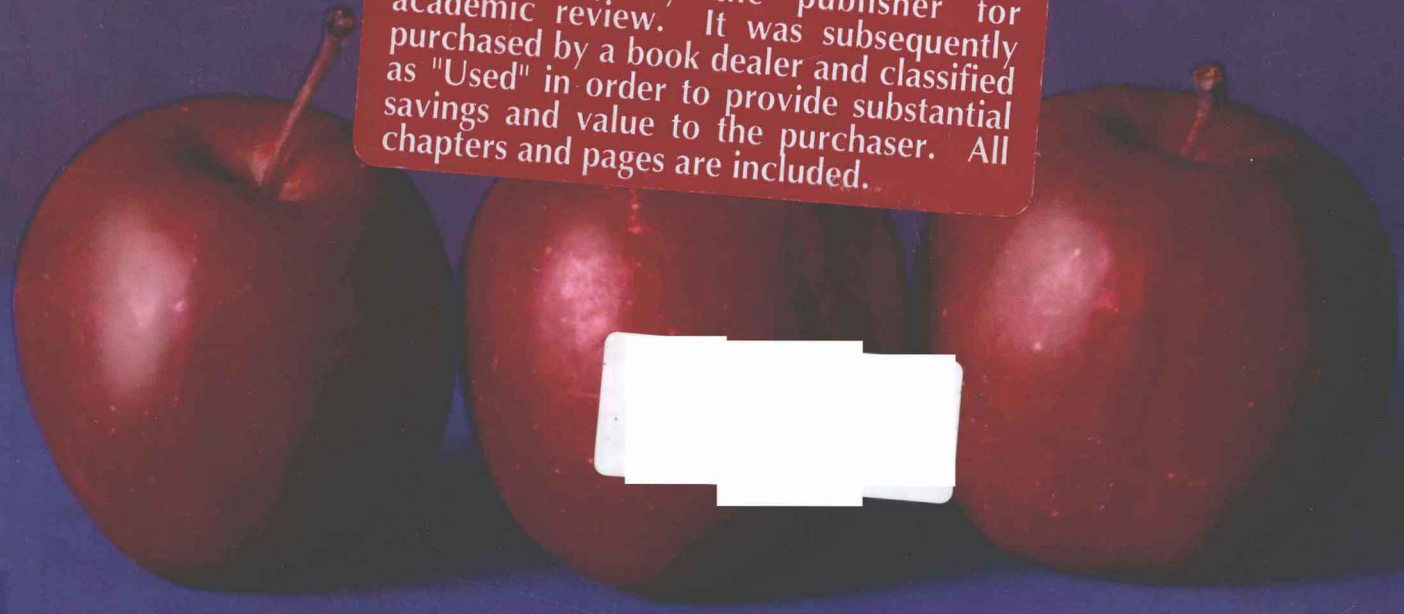
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# Psychology

CORE  
CONCEPTS

USED  
BOOK

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# PSYCHOLOGY

## Core Concepts

**Fifth Edition**

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*University of North Carolina at Asheville*



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*Credits continue on page C-1 following reference section.*

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# To the Student . . .

**T**here is one simple formula for academic success, and the following demonstration will show you what it is. Study this array of letters for a few seconds:

IBMUF0FBICIA

Now, without peeking, write down as many of the letters as you can (in the correct order).

Most people remember about five to seven letters correctly. A few people get them all. How do these exceptional few do it? They find a pattern. (You may have noticed some familiar initials in the array above: IBM, UFO, FBI, CIA.) Finding the pattern greatly eases the task because you can draw on material that is already stored in memory. In this case, all that needs to be remembered are four “chunks” of information instead of 12 unrelated letters.

The same principle applies to material you study for your psychology class. If you try to remember each piece of information as a separate item, you will have a difficult time. But if instead you look for patterns, you will find your task greatly simplified—and much more enjoyable. So, how can you identify the patterns? With a little help from your friendly authors, who have developed several learning features that will make meaningful patterns what you are reading in this text stand out clearly:

- **Core Concepts:** We have organized each major section of every chapter around a single, clear idea called a Core Concept. For example, one of the four Core Concepts in the “Memory” chapter says:



Human memory is an information processing system that works constructively to encode, store, and retrieve information.

The Core Concept, then, becomes the central idea around which about 10 pages of material—including several new terms—are organized. As you read the chapter, then, keeping the Core Concept in mind will help you encode the new terms and ideas related to that concept, store them in your memory, and later retrieve them when you are being tested.

■ **Key Questions:** Each Core Concept is introduced by a Key Question that also serves as a main heading in the chapter. Here, for example, is a Key Question from the Memory chapter:



## WHY DOES MEMORY SOMETIMES FAIL US?

Key Questions such as this will help you anticipate the most important point, or the Core Concept, in the section. In fact, the Core Concept always provides a brief answer to the Key Question. Think of the Key Question as the high beams on your car, helping you focus on what lies ahead. Our key questions should also serve as guides for you to be posing questions of your own about what you are reading.

In fact, Deane's memory works very much like your own. As you will learn in this chapter, everyone has a memory capable of distortion. You will also learn about memory's inner workings and some extraordinary memory abilities. Finally, we will end this chapter on a practical note by considering some steps you can take to improve your memory.

**WHAT IS MEMORY?**

The best defense against the tricks that memory can play comes from an understanding of how memory works. So, let's begin building that defense with a definition. Cognitive psychologists view memory as a system that encodes, stores, and retrieves information—a definition, by the way, that applies equally to an organism or a computer. Unlike a computer's memory, however, human memory is a cognitive system, in the sense of the term's Latin root, *cognoscere*, which means "knowing" or "understanding." That is, human memory works closely with the perceptual system, which takes information from the senses and selectively converts it into meaningful patterns that can be stored and accessed later when needed. These memory patterns, then, form the raw material for thought and behavior—allowing you to recognize a friend's face, ride a bicycle, recollect a trip to DisneyLand, and fit all goes well recall the concepts you need during a test. More generally, our Core Concept characterizes the memory system this way:

Human memory is an information processing system that works constructively to encode, store, and retrieve information.

And how is memory related to learning? You might think of human memory as the cognitive system that processes, records, and stores information as we learn and then allows us to retrieve that learned information later. Accordingly, this chapter is an extension of our discussion of cognitive learning in Chapter 4. The focus here, however, will be on more complex human learning and memory, as contrasted with the simpler forms of animal learning and conditioning that we studied earlier.

**Metaphors for Memory**

Human memory has been compared to a library or a storehouse (Haberlandt, 1996). These metaphors capture the ability of memory to hold large amounts of information. Some metaphors for memory, however, can be misleading. That's certainly the case with the "video recorder" metaphor for memory, which leads people to believe that human memory makes a complete and accurate record of everything we experience.

Cognitive psychologists have shown that this "video recorder" metaphor is wrong. In Deane Smith's case, it was dangerously wrong. Instead, cognitive psychologists see human memory as an interpretive system that takes in information and, much like an artist, selects details and organizes the rest in meaningful patterns.

Later, when remembering, what actually happens is that you retrieve fragments of memory—like pieces of a jigsaw puzzle. Then, using these fragments, you reconstruct the incident (or idea, emotion, or image) by filling in the blanks as you think it was, rather than the way it actually was. Most of the time, this



■ Both people and computers have memory.



■ Memory is like video—factual, stored, or broken—but recalls, alters, and organizes information.

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Haberlandt, 1996; Kandel, 2001; McGaugh, 2000; Trevis, 2006a). This explains why a blow to the head or an electric shock to the brain can cause loss of recent memories that have not yet consolidated. (The diagnosis in this case would be retrograde amnesia, or loss of prior memory traces.) Certain drugs, too, can interfere with the formation of long-term memories (Lynch & Staahl, 1991). The picture that emerges from such observations shows that memories form when activity in nerve circuits causes biochemical changes that make those circuits in the brain more likely to respond again in the future. We called this long-term potentiation in the previous chapter. Many thousands, if not millions, of neurons are probably involved in encoding and storing a single memory.

While memories are consolidating, they can also be strengthened by the person's emotional state—which accounts for our especially vivid memories of emotionally arousing experiences. From an evolutionary perspective, this is highly adaptive. If you survive a frightening encounter with a bear, for example, you are quite likely to remember to avoid bears in the future. The underlying biology involves emotion-related chemicals, such as epinephrine (adrenalin) and certain stress hormones, which act to enhance memory for emotion-laden experiences (Cahill et al., 1994; LeDoux, 1998; McGaugh, 2000).

**PSYCHOLOGY IN YOUR LIFE: "FLASHBULB" MEMORIES: WHERE WERE YOU WHEN . . . ?**

The closest most people will come to having a "photographic memory" is a flashbulb memory, an exceptionally clear recollection of an important emotion-laden event—a very vivid episodic memory (Brown & Kulik, 1977). You probably have a few such memories: a tragic accident, a death, a graduation, a victory. It's as though you had made a flash picture in your mind of the striking scene. (The term was coined in the days when flash photography required a new "flashbulb" for each picture.)

Many people have formed essentially the same flashbulb memories of certain events in the news, such as the December 2004 tsunami, the September 11 attacks, Princess Diana's death, or the shootings at Columbine high school. Researchers have also found that the attempted assassination of President Reagan (Pillemer, 1984) and the O. J. Simpson trial verdict (Schmuck et al., 2000) caused large numbers of people to develop flashbulb memories. Typically, these memories record precisely where the individuals were at the time they received the news, what they were doing, and the emotions they felt.

Despite their strong emotional involvement, flashbulb memories can be remarkably accurate (Schmuck et al., 2000). Yet studies have shown that flashbulb memories can become distorted over time (Neisser, 1991). For example, on the morning after the Challenger space shuttle explosion, psychology professors asked their students to describe the circumstances under which they had heard the news. Three years later the same students were again asked to recall the event. Of the latter accounts, about one-third gave substantially different stories, mostly about details on which they had previously not focused their attention at the time. It is also noteworthy that even those whose recollections were erroneous reported a high level of confidence in these memories (Winograd & Neisser, 1992). The general pattern appears to be that 10 to a year later, most flashbulb memories are nearly identical to reports given immediately after the event, while recollections gathered after two or three years show substantial distortions (Schmuck et al., 2000). What doesn't change, oddly enough, is people's confidence in their recollections.



■ Memories can be enhanced by emotion. In a study that Donald Berntson and colleagues conducted, they found that



■ The attack on the World Trade Center and the Pentagon were shocking events, and many Americans have "flashbulb" memories that include where they were and what they were doing when they learned of the attacks.

■ Retrograde amnesia The ability to remember information previously stored in memory (Compare with anterograde amnesia).

■ Flashbulb memory It is like and used long-term memories in its overall meaningful and emotional parts.

HOW DOES MEMORY WORK? 279

■ **Psychology in Your Life:** Psychology has many connections with events in the news and in everyday life, and we have explored one of these connections at the end of each major section in every chapter. What make psychology so fascinating to us and to our students are all the ways in which things learned in this course directly apply to events and experiences in the real world. To illustrate, here are some examples from the "Memory" chapter:

- Would You Want a "Photographic" Memory?
- "Flashbulb" Memories: Where Were You When . . . ?
- On the Tip of Your Tongue
- Improving Your Memory with Mnemonics

Such connections—practical, down to earth, and interesting—link your reading about psychology with your real-life experiences. They also help you critically evaluate many of the psychological ideas you encounter in the popular press. Also begin to notice how often you read stories about "research shows that . . ." By the end of this course, you will become a much wiser consumer of such information—some of which is often false or misleading.

### DO IT YOURSELF! The Eyes Have It

Can you tell if people are nervous when they smile at you? Smiles aren't made just with the lips. An smile is different from a fake one. It usually spreads to the eyes. Typically when you feel genuine joy or love, the individual's facial muscles wrinkle at the sides around the eyes.



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persuading the subject that the machine is highly accurate. A common ploy is to ask a series of loaded questions designed to provoke obvious emotional reactions. For example, "Did you ever, in your life, take anything that did not belong to you?" In another favorite technique, the examiner uses a deceptive stimulation procedure, or "stim test," in which the subject draws a card from a "stacked" deck. Then, the examiner pretends to identify the card from the subject's polygraph responses (Kleinmuntz & Stracko, 1984).



In the polygraph, often called a "lie detector," relies on the assumption that people display physical signs of emotional arousal.

When the actual investigation begins, it will consist of an artistic mix of critical questions, irrelevant questions, and control questions. The irrelevant questions ("Are you sitting down right now?") are designed to elicit truthful answers accompanied by a physical response consistent with truth-telling. The control questions ("Did you ever lie to your parents?") are designed to elicit an answer accompanied by an emotional response pattern. Then, the examiner can compare the subject's responses to these two types of questions with responses to the critical questions ("Did you steal the pocket?"). It is assumed that a guilty subject will give a stronger response to the critical questions than to the irrelevant and control questions.

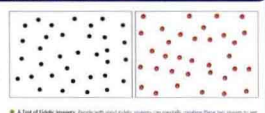
**Serious Concerns about Accuracy** Smiles, as this section, several issues call for polygraph procedure into question. Consider, for example, the problem of accuracy. Even if the examination were 95% accurate, the 5% error rate could lead to the misidentification of many innocent people as being guilty. Imagine that your company arranges for all 500 of your employees to take a "lie detector" test to find out who has been stealing office supplies. Imagine also that only about 1% (2) out of 500 people are really stealing, which is not an unreasonable estimate. If the lie detector test is 95% accurate, it will correctly spot 19 of these 20 thieves. But the company will still have a big problem. The test will also give 5% "false positives," falsely flagging 3% of the innocent people. Of the 498 innocent employees, the polygraph will inaccurately implicate 24 as liars. That is, you could end up with more people falsely accused of lying than people correctly accused of lying. This was based on an field study of suspected criminals, who were later either convicted or declared innocent. The polygraph results were no better than a random coin flip (Brett, et al., 1986).

An equally serious concern with polygraphy is that there are no generally accepted standards other than administering a polygraph examination or for

Whatever eidetic memory may be, it is clearly rare—so rare, in fact, that some psychologists have questioned its existence (Covinger, 1992). The few studies of "photographic memory" have portrayed it as different from everyday memory; as we have seen. But the fact is that we know relatively little about the phenomenon, and few psychologists are currently studying it. Eidetic imagery presents not only a practical problem for those rare individuals who possess it but also a theoretical problem for cognitive psychologists. If eidetic imagery exists, what component of memory is responsible? On the other hand, if it proves to be a unique form of memory, it doesn't fit well with the widely accepted three-stage model of memory—which we will discuss next.

### DO IT YOURSELF! A Test of Eidetic Imagery

Look at the dot pattern on the left in the figure for a few moments, and try to fix it in your memory. When that image is recalled, look at the dot pattern on the right. Try to put the two sets of dots together by studying the first image while looking at the second one. If you are the one who can recall the image from the first pattern, you will see something not apparent in either image alone. (Adapted from the program "You Have an Amazing Memory" by Robert O. G. If you want to see the combined image, but can't combine them in your memory, look at figure 2.)



A Test of Eidetic Imagery. People with good eidetic memory can normally combine these two images to see something that appears in neither one alone.

### CHECK YOUR UNDERSTANDING

- ANALYZE:** Which of the following is a major objection to the "false memory" theory of memory?
- Like perception, memory is an interpretation of experience.
  - Memories are never accurate.
  - Unlike a video recorder, memory takes in and stores an enormous quantity of information from the sensory world and organizes it.
  - Like a tape recorder, memory, human memory cannot be edited and changed as a video tape.
- RECALL:** Which of the following are the three essential tasks of memory?
- encoding, storage, and retrieval
  - sensory, working, and long-term
  - short-term, long-term, and permanent
  - recall, recognition, and rehearsal
- UNDERSTANDING THE CORE CONCEPT:** Which one of the following memory systems reconstructs material during retrieval?
- sensory memory
  - human memory
  - short-term memory
  - information recorded in a book

**Do It Yourself!** We have scattered active-learning demonstrations (such as the one at the beginning of this student preface) throughout the book. Besides being fun, these activities have the serious purpose of illustrating principles discussed in the text. In the "Memory" chapter, for example, one Do It Yourself! box helps you find the capacity of your short-term memory; another lets you test your "photographic memory" ability.

**Check Your Understanding and Review Tests:** Whether you're learning psychology, soccer, or the saxophone, you need feedback on your progress, and that's exactly what you will get from the Check Your Understanding quizzes and the Review Tests. These exercises will let you determine how well you have mastered the material.

**Using Psychology to Learn Psychology:** In a section near the end of every chapter, we explain how you can apply your new knowledge of psychology to make your studying more effective. For example, in Chapter 2, "Biopsychology," we tell you how to put your understanding of the brain to work for more efficient learning. Similarly, at the end of the chapter on "Emotion and Motivation," we explain how to use a new psychological concept of "flow" to boost your own academic motivation. Thus, Using Psychology to Learn Psychology not only reinforces points that you have studied, it brings the material home with immediate and practical applications to your life in college.

#### THEAPIES: THE STATE OF THE ART

Prompted initially by questions about the effectiveness of therapy and later by a shift to managed health care, the mental health professions have begun to identify specific psychological and biomedical treatments that are effective for specific disorders. The disorders for which such help now exists include depression, phobias and other anxiety disorders, certain schizophrenia, ADHD, and autism. We can expect to see more and more such treatments identified, especially in the realm of drug therapies.

On the negative side, some drug therapies are overprescribed, as physicians and patients seek quick fixes for mental problems. The reality is that most child or adolescent have no easy cures. For these, time is required for counseling or psychotherapy that may be necessary to sort through problems and evaluate alternative solutions.

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#### USING PSYCHOLOGY TO LEARN PSYCHOLOGY

##### How Is Education Like Therapy?

Consider the ways in which psychotherapy is like classroom experiences in college:

- Most therapists, like most professors, are professionals with special training in what they do.
- Most patients/clients are like students in that they are seeking professional help to change their lives in some way.
- Much of what happens in therapy and in the classroom involves learning: new ideas, new behaviors, new insights, new connections.

It also helps you learn psychology (and other subjects) as well to think of teaching and learning in therapeutic terms. As we have seen, therapy seems to work best when therapist and client have a good working relationship and when the client believes in the value of the experience—and the same is almost certainly true for the student-professor relationship. You can take the initiative in establishing a personal-but-professional relationship with your psychology professor by doing the following two things: (1) asking questions or otherwise participating in class (at appropriate times and without dominating or cornering) and (2) seeking your instructor's help on points you don't understand or on course-related topics you would like to pursue in more detail (during or during regular office hours). The result will be learning more about psychology, because you will be taking a more active part in the learning process. Incidentally, an active approach to the course will also help you stand out from the crowd in the professor's mind, which could be helpful if you later need a faculty recommendation.

Now consider a parallel between education and group therapy. In group therapy, patients learn from each other, as well as from the therapist. Much the same can occur in your psychology course. If you consider other students as learning resources, as we noted earlier in this book, the most successful students often spend part of their study time sharing information on groups.

One other tip for learning psychology we can borrow from the nature of behavior therapies: the importance of changing behavior, not just thinking. It is easy to "intellectualize" or feel or act like someone when you read about it or hear about it in class. But you are likely to find that the idea makes little impact on you ("I know, I read about it, but I can't remember it if you don't use it. The remedy is to do something with your new knowledge. Tell someone about it, come up with illustrations from your own experience, or try acting in a different way. In fact, for example, one reading about active listening in this chapter, try it the next time you talk to a friend. Educators sometimes speak of this as "active learning." And so should you!

**CONNECTION: CHAPTER 12**  
*Retrograde amnesia* involves loss of memory for information acquired in the past.

**Connection Arrows:** Important topics in other chapters are often cross-referenced with an arrow in the margin, as you can see in the sample here. The accompanying reference gives you either a preview or reminder of concepts covered in other chapters. This feature helps you see the inter-relatedness of ideas in psychology.

**Chapter Summaries:** We have made our summaries rather brief—intended to provide you with an overview of main points in each chapter. They remind you of the patterns instead of loading you with the details. One caution: They are not a substitute for reading the chapters! One helpful hint: Read

the summary before you read the rest of the chapter to get a flavor of what's ahead, then reread the summary after you finish the chapter. Reading the summary before will help you organize the material so that it can be more easily encoded and stored in your memory. And, naturally, reviewing the summary after reading the chapter will reinforce what you have just learned so that you can retrieve more of it in the future.

- **Our Recommended Books and Videos:** Your authors hope that your interest in psychology will give you new lenses with which to look at the world beyond this book. When you do, you will discover something related to behavior and mental processes nearly everywhere. To pique this interest, every chapter offers a list of relevant, stimulating books and videos that will extend the scope of your learning.

We have built into this text many other learning features, such as the marginal glossary, and the extensive references list (which can be a good resource for term papers). You will learn more about these as you use the book; but if you want a bit more information on our purposes for including these features, please read the Instructor's Preface.

We have one final suggestion to help you succeed in psychology: While this book is filled with examples to illustrate the most important ideas, you will remember these ideas longer if you generate your own examples as you study. This habit will make the information yours, as well as ours. And so, we wish you a memorable journey through the field we love.

Phil Zimbardo  
Bob Johnson  
Ann Weber

## SUPPLEMENTS FOR STUDENTS

- **Grade Aid Study Guide:** This robust study guide, written by Diane Finley of Prince George's Community College, is filled with guided activities and in-depth exercises to promote student learning. Each chapter includes "Before You Read," presenting a brief chapter summary and learning objectives; "As You Read," offering a collection of demonstrations, activities, and exercises; "After You Read," containing three short practice quizzes and one comprehensive chapter exam; "When You Have Finished," presenting web links for further information and a crossword puzzle using key terms from the text. An appendix includes answers to all practice tests and crossword puzzles.
- **Companion Website:** Connecting the textbook to the internet, this unique tool includes learning objectives, annotated web links, flashcard glossary terms, and online practice tests organized by chapter. Visit this site at [www.ablongman.com/zimbardo5e](http://www.ablongman.com/zimbardo5e).
- **MyPsychLab:** This interactive and instructive multimedia resource can be used to supplement a traditional lecture course or to administer a course entirely online. It is an all-inclusive tool, a text-specific e-book plus multimedia tutorials, audio, video, simulations, animations, and controlled assessments to completely engage students and reinforce learning. Fully customizable and easy to use, MyPsychLab meets the individual teaching



and learning needs of every instructor and every student. Visit the site at [www.mypsychlab.com](http://www.mypsychlab.com).

- ***Mind Matters II CD-ROM:*** A unique tool that combines major concepts with interactivity, this CD-ROM offers a wide range of learning opportunities, including activities with immediate feedback, video clips of historic experiments and current research, animations, simulations, and an interactive glossary of key terms. To see sample modules, visit [www.ablongman.com/mindmatters](http://www.ablongman.com/mindmatters).
- ***Evaluating Psychological Information:*** This workbook, *Sharpening Your Critical Thinking Skills*, 4th edition, developed by James Bell, focuses on helping students evaluate psychological research systematically and improving critical thinking skills.
- ***How to Write Psychology Papers*,** 2nd edition: Les Parrott provides a brief overview for writing APA-style psychology papers, including information on overcoming paper panic, using the Internet, preparing a working reference list, avoiding plagiarism, and using inclusive language.
- ***Discovering Psychology Telecourse Study Guide:*** In this *Telecourse Study Guide*, each chapter corresponds to one program, expands on the material covered in the program, specifies appropriate reading assignments, and reviews material covered in the text. In addition, the study guide includes learning objectives; reading assignments; key people and terms; video program summaries and test questions with answer key; textbook test questions with answer key; essay questions; student activities; additional book, article, and film resources; and annotated websites. All vocabulary and review questions are keyed to *Psychology: Core Concepts*.
- ***Study Card for Introduction to Psychology*,** © 2005: Colorful, affordable, and packed with useful information, Allyn & Bacon/Longman's Study Cards make studying easier, more efficient, and more enjoyable. Course information is distilled down to the basics, helping students quickly master the fundamentals, review a subject for understanding, or prepare for an exam.



# To the Instructor . . .

**W**e teachers of psychology have a little secret that we usually don't talk about, even among ourselves: Every introductory text contains more material than a student can possibly learn while taking the first course in psychology. Yet most texts try to cram ever more material into each new edition because the knowledge base in our field continues to grow at an exponential pace.

There is much that we want our students to know. Since the 4th edition of this text, neuroscience has revealed many more brain mechanisms underlying development, thinking, learning, perception, and every other subfield of psychology. At the same time, gender and culture issues have grown in prominence. Likewise, genetic variables have competed for the spotlight, as fallout from the human genome project has forced psychologists to consider anew the old questions about nature and nurture.

Cognitive psychologists, too, have been busy expanding the frontiers of knowledge about implicit memory, concept learning, and cognitive development. But they have been pressured by their colleagues working on "hot" cognition research to recognize the role of emotion in memory and thinking. Meanwhile, on the clinical front, psychologists have been accumulating evidence for psychological therapies of demonstrable effectiveness—some of which challenge the hegemony of Prozac and Valium.

And, of course, the terrorist attacks of September 11, 2001, have refocused our attention on the origins of aggression and violence. As we write this, the revelations of the horrendous abuses of Iraqi prisoners by American Army reservist MPs raise the fundamental questions of situational versus dispositional explanations for such pathological behavior. Are there just a few bad apples, or was that behavior the product of a systematic corruption of good soldiers in the bad barrel of a war prison?

Obviously, we, as writers of an introductory psychology text, must wrestle with several problems. How can we include the exciting new developments in the field and still acquaint students with all the classic studies, historical trends, and multiple perspectives in the field? How can we add what is new and clearly valuable to understanding the human condition without cutting out a lot of what has been traditional—and, at the same time, keep the book within manageable proportions? How can we make psychology meaningful to students without overwhelming them with information?

For this 5th edition of *Psychology: Core Concepts*, your authors have again had to make difficult choices, and we hope you will agree with most of them. The fact that each instructor has the opportunity to introduce additional materials in class eases the pressure somewhat. Accordingly, we hope you will feel free to let this book give students a broad overview of the field, while you emphasize your favorite topics and concepts. In fact, one of the things you, as a teacher, can do far better than any text is to model how a psychologist thinks and solves problems.<sup>1</sup>

But, as psychologists, we realize that the problem for students is not just one of sheer volume and information overload; it is also a problem of meaningfulness. With this in mind, we have again found inspiration in a classic study of chess players. As you may recall, Adrian de Groot (1965) and his colleagues (Chase & Simon, 1973) showed that experts did no better than novices at remembering the locations of pieces on a chess board when the pieces were placed at random. Only when the patterns made sense—because they represented positions that would be found in real games—did the experts show a big advantage of their experience. Clearly, meaningful patterns are easier to remember than random arrangements.

In applying this finding to *Psychology: Core Concepts*, 5th edition, our goal has been to help students take the first steps toward becoming more expert psychologists by revealing to them meaningful patterns that occur throughout the field of psychology. We have developed a number of special pedagogical features in our text that help us achieve this goal:

- **Core Concepts:** We have organized the major sections of every chapter around a single, clear idea that we call a Core Concept. Here is an example from the chapter on “Sensation and Perception”:

The brain senses the world indirectly because the sense organs convert stimulation into the language of the nervous system: neural impulses.

To borrow an old saying, the Core Concepts become the “forest,” while the details of the chapter become the “trees.”

- **Key Questions:** The main headings in each chapter appear in question form, as in this example, which introduces the Core Concept shown above:



## HOW DOES STIMULATION BECOME SENSATION?

Fundamental questions such as these help students anticipate and focus on the most important idea, the Core Concept, which serves as a brief answer to the Key Question. Both the Key Questions and the Core Concepts later reappear as organizing features of the Chapter Summary.

<sup>1</sup>In this vein, we commend to you a new book, *What the Best College Teachers Do* (Bain, 2004). It lays out the results of a 15-year study of college teachers who were nominated as “the best” by their students and colleagues. One of the factors that all of the best had in common was helping students learn how to think and solve problems like experts in their disciplines.

Beyond that fact, our ultimate destination in this chapter lies, far beyond mere sensation, in the amazing realm of perception. There we will uncover the psychological processes that attach meaning and personal significance to the sensory messages entering our brains. Perceptual psychology will help you understand how we assemble a series of tones into a familiar melody or a hierarchy of shapes and shadows into a familiar face. More generally, we will define perception as a mental process that elaborates and organizes meaning to the incoming sensory patterns. Thus, perception creates an interpretation of sensation. Perception answers questions such as: Is the tomato ripe? Is the sound a church bell or a doorbell? Does the face belong to someone you know?

In this chapter, you will also learn that many complex acts of sensing and perceiving occur behind the scenes, so effortlessly, continuously, and flawlessly that we pay them little conscious mind. Even more fundamentally, you will learn the sobering fact that our minds lack direct access to the outside world. No matter what we do, the information we get about external events must always be filtered through our sense organs and then combined with our unique mix of memories, emotions, motives, and expectations. So, the inner world of sensation and perception is the only world we can ever know.

As you can see, the boundary of sensation blurs into that of perception. Perception is essentially an interpretation and elaboration of sensation. Seen in these terms, sensation serves just to the initial steps in the processing of a stimulus. It is in these first sensory steps that we now turn our attention.

**HOW DOES STIMULATION BECOME SENSATION?**

A thunderstorm is approaching, and you feel the electric charge in the air make the hair stand up on your neck. Lightning flashes, and a split second later you hear the thunderclap. It was close by, and you smell the ozone left in the wake of the bolt, as it sizzled through the air. Your senses are warning you of danger.

Our senses have other adaptive functions, too. They aid our survival by directing us toward certain stimuli, such as tasty foods, which provide nourishment. Our senses also help us locate mates, seek shelter, and recognize our friends. Incidentally, our senses also give us the opportunity to find pleasure in music, art, athletics, food, and sex.

How do our senses accomplish all this? The complete answer is complex, but it involves one elegantly simple idea that applies across the sensory landscape: Our sensory impressions of the world involve neural representations of stimuli—and the actual stimuli themselves. The Core Concept puts it this way:

The brain senses the world indirectly because the sense organs convert stimulation into the language of the nervous system: neural impulses.

As we have noted, the brain never receives stimulation directly from the outside world. Its experience of a tomato is not the same as the tomato itself—although we usually assume that the two are identical. Neither can the brain receive light from a sunset, touch and stretch velvet, or inhale the fragrance of a rose. It must always rely on secondhand information from the gatekeepers of sensory systems, which delivers only a coded neural message, out of which the brain must create its own experience. (See Figure 5.1.) Just as you cannot receive phone messages without a telephone receiver to convert the electronic energy into sound you can hear, your brain also needs its sensory system to

**Perception** is a process that organizes sensory information into meaningful interpretations. It takes these raw sense messages, often they are a jumble of such patterns, and combines them with prior knowledge to create a unique perceptual experience.

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**CONNECTION: CHAPTER 8**

Expert knowledge is organized into elaborate *schemas*.

only reinforces points that students have learned, it brings the material home with immediate and practical applications to their college lives.

**Connection Arrows:** Uniquely in this book, important topics in other chapters are often cross-referenced with an arrow in the margin, as you saw in the previous paragraph. These icons are used in place of the phrase, "as we will see in Chapter X." A brief explanatory note accompanies these arrows, giving students a headline preview of the discussion to be found in the referenced chapter. We intend this feature to convey the sense of psychology as a web of interconnecting ideas.

**Our Recommended Books and Videos:** At the end of each chapter in the 5th edition, you'll find a short section in which we list our top picks of worthwhile books and rentable videos, both classics and more contemporary works. Each has been selected by our media guru, Ann Weber, as illustrative of some concept in the chapter.

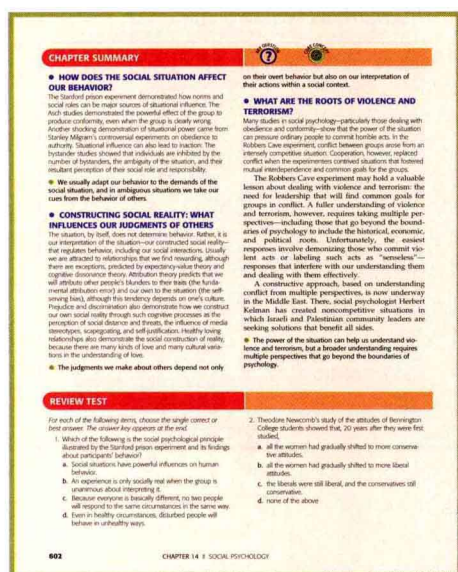
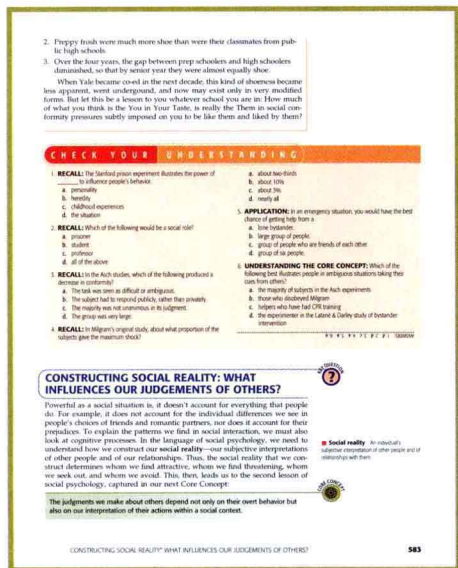
**Multiple Perspectives on Terrorism:** Finally, this edition of *Psychology: Core Concepts* again addresses the problem of terrorism. In the social psychology chapter we bring together the concepts developed in our discussions of aggression, violence, and conflict, applying them to build an understanding of terrorism. Doing this requires what may be psychology's greatest strength: the use of multiple perspectives, including biopsychology, social learning, and cognitive psychology, as well as perspectives drawn from sociology, history, political science, and other disciplines.

Along with these unique features, this new edition of *Psychology: Core Concepts* offers the breadth and depth of content plus the tried-and-true pedagogical devices that are standard for any modern introductory psychology text:

**Marginal glossaries:** In this 5th edition of *Psychology: Core Concepts*, the most important terms again appear in **boldface**, with their glossary definitions readily accessible in the margin. Then, at the end of the book, a comprehensive Glossary section gathers together all the terms and definitions from each chapter.

**Check Your Understanding and Chapter Review Tests:** Reviewers have told us that they want a book that promotes active reader involvement. The 5th edition of *Psychology: Core Concepts* does this in many ways. One of the most important for student learning is the Check Your Understanding feature, which offers a brief quiz at the end of each main chapter section. This is a quick checkup for the student to determine if she or he has gotten the main points from what was just read. We have written these quizzes so that they reinforce specific information from the chapters as well as some of the more abstract concepts. Accordingly, some questions call for simple recall, while others call for deeper analysis or application of material. In addition, at least one question in each Check Your Understanding quiz is aimed squarely at the Core Concept of the section. Similarly, the Review Test at the end of each chapter helps students assess their overall retention and understanding of the material in that chapter before going on to start the next one.

**Chapter Summaries:** The goal of each Chapter Summary is to provide students with a brief overview of the main points in that chapter, organized around the Key Questions and Core Concepts. We hope that you will advise your students to review these chapter summaries *before* reading the chapter, to get a preview of the



chapter content and organization, and then again *after* having read the chapter, to reinforce their learning.

- **Culture and gender:** Nearly every chapter brings in a culture- or gender-related concept. We have not trivialized this material by setting it aside in special boxes. Rather, culture and gender have been fully integrated with whatever psychological topic is being presented in the running text.

What is new to this edition? We think you and your students will like the following additions and modifications.

- **The Seven Modern Perspectives: Updated:** The Big Seven major modern perspectives have been updated to include trait psychology and the developmental viewpoint—both of which had long been ignored in the “perspectives” section of this and other texts. The modern perspectives we list in this edition are: *biological, developmental, cognitive, clinical, behavioral, trait, and social-cultural*. As you can surmise, evolution and neuroscience now fall under the biological perspective, while the clinical perspective includes both humanistic and psychodynamic psychologies.
- **State of the Art:** Each chapter ends in a “State of the Art” section, which briefly characterizes and reviews what’s known and also points to the unknowns that are ripe for research. One of the things we’re trying to do here is to get budding young researchers thinking about what the unsolved problems and big mysteries are in psychology.
- **Making the abstract concrete:** You will find a new emphasis on providing concrete examples of abstract concepts, along with an increased use of metaphors and similes, where appropriate—all designed to help students assimilate unfamiliar and abstract ideas. We think your students will find this especially helpful in mastering difficult concepts in biopsychology.
- **Fewer boldfaced terms:** In response to reviewers’ requests, we have been more selective about the terms we deem important enough to put in boldface and include in the marginal glossary. Again the goal is to avoid information overload, while calling students’ attention to the most important terms.
- **More judicious use of connection arrows in the margins:** While we have retained these icons as a tactic for conveying the vital connections of ideas and principles within our field, reviewers have advised us that less would be more—that fewer would be more useful to readers and, at the same time, provide a cleaner, less-cluttered look for the text.

This edition has also undergone a major developmental revision for content coverage and accuracy. While no book can be altogether free of slipups, we think you’ll agree that this edition does an extraordinarily good job of getting psychology right.

We think you will like the introduction to psychology presented in this book—both the content and the pedagogical features. After all, it’s a text that relies consistently on well-grounded principles of psychology to teach psychology.

## INSTRUCTOR SUPPLEMENTS

The following supplements will also enhance teaching and learning for you and your students:

- **Instructor’s Manual:** This helpful teaching companion features at-a-glance grids, handouts, lecture enhancements, detailed chapter outlines, activities

for the classroom, and other valuable course organization material for new and experienced instructors.

- **Test Bank:** Paul Wellman of Texas A&M University has provided an updated test bank containing over 2000 questions, including multiple choice, true/false, short answer, and essay (each with an answer justification). All questions are labeled with a page reference, difficulty ranking, and a type designation. This product is also available in TestGen computerized version for use in creating tests in the classroom.
- **PowerPoint Presentation:** David Lundberg-Kenrick has created a PowerPoint package with detailed outlines of key points for each chapter supported by charts, graphs, diagrams, and other visuals from the textbook. The presentation also contains links to the companion website for corresponding activities.
- **The Allyn & Bacon Introduction to Psychology Transparency Set:** This set of approximately 200 full-color transparencies is available upon adoption of the text from your local Allyn & Bacon sales representative.
- **Allyn & Bacon Digital Media Archive for Psychology, 4.0:** This comprehensive CD-ROM includes charts, graphs, maps, tables, and figures, with audio clips and video clips and links to relevant web sites.
- **Insights into Psychology, Volumes I–IV:** A new set of video resources prepared to accompany Allyn & Bacon’s texts in introductory psychology, each video consists of 15 to 16 topics, each supported by 2 to 3 video clips. Critical thinking questions accompany each clip. In addition, the video guide provides further critical thinking questions and Internet resources for more information.
- **Blockbuster Guide for Introduction to Psychology:** NEW! The *Blockbuster Guide* is a unique print resource for instructors who enjoy enhancing their classroom presentations with film. With heavy coverage of general, abnormal, social, and developmental psychology, this guide suggests a wide range of films to use in class and provides activities, questions for reflection, and other pedagogical tools to make the use of film more effective in the classroom.
- **MyPsychLab:** This interactive and instructive multimedia resource can be used to supplement a traditional lecture course or to administer a course entirely online. It is an all-inclusive tool, a text-specific e-book plus multimedia tutorials, audio, video, simulations, animations, and controlled assessments to completely engage students and reinforce learning. Fully customizable and easy to use, *MyPsychLab* meets the individual teaching and learning needs of every instructor and every student. Visit the site at [www.mypsychlab.com](http://www.mypsychlab.com).
- **CourseCompass:** Powered by Blackboard, this course management system uses a powerful suite of tools that allows instructors to create an online presence for any course.
- **Discovering Psychology Telecourse Videos:** Written, designed, and hosted by Phil Zimbardo, this set of 26 half-hour videos is available for class use from the Annenberg/CPB collection. The collection includes two completely new programs and more than 15 new sequences that bring students up-to-date in some of the latest developments in the field. A perfect complement to *Psychology: Core Concepts*, this course supplement is a landmark educational resource that reveals psychology’s contribution not only to understanding the puzzles of behavior but also to identifying solutions and

treatments to ease the problems of mental disorders. It has won numerous prizes and is widely used in the United States and internationally.

- **Discovering Psychology Telecourse Faculty Guide:** The *Telecourse Faculty Guide* provides guidelines for using *Discovering Psychology* as a resource within your course. Keyed directly to *Psychology: Core Concepts*, the faculty guide includes the complete Telecourse Study Guide plus suggested activities; suggested essays; cited studies; instructional resources, including books, articles, films, and websites; video program test questions with answer key; and a key term glossary.

## A NOTE OF THANKS

Nobody ever realizes the magnitude of the task when taking on a textbook-writing project. Susan Hartman and Kelly May, our Acquisitions Editors, deftly guided (and prodded) us through this process. The vision of the 5th edition confronted reality under the guidance of Pamela Barter, our tenacious Developmental Editor, who made us work harder than we had believed possible. We suspect that Pam may be able to leap tall buildings in a single bound, but we know with certainty that she has the X-ray eyes of an editor. Time and again she spotted glitches and potentially troublesome wording that had slipped passed the six less-penetrating eyes of your authors.

The job of making the manuscript into a book fell to Joe Sweeney, Production Supervisor, and Margaret Pinette, our puckish copyeditor, in whom we met a stickler for style with a great sense of humor. We think they did an outstanding job—as did our tireless photo researcher, the tenacious Sarah Evertson, who had the class and brass to get photos from even the most reluctant of sources.


We are sure that none of the above would be offended if we reserve our deepest thanks for our spouses and closest colleagues. Phil thanks his wonderful wife, Christina Maslach, for her endless inspiration and for modeling what is best in academic psychology.

Ann thanks her long-suffering spouse, John Quigley, for always and readily encouraging her efforts and assuring her that she's "the best." It will surprise no one who knows her that Ann also thanks her six cats and one perfect dog for their abiding, accepting love and for providing perspective and acceptance, no matter what. She also would like to thank her students and colleagues in the Department of Psychology, UNC at Asheville, for providing feedback, input, and inspiration of the teaching profession as well as the minutia of composing a book—lessons, examples, gimmicks, and especially ideas and images that don't work and so have to be deleted before the manuscript ever sees the light of publication!

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John Teske, Elizabethtown College  
Robert Wellman, Fitchburg State University

If you have any recommendations of your own that we should not overlook for the next edition, please write to us! Address your comments to:

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## ABOUT THE AUTHORS

### Phil Zimbardo

Philip Zimbardo, Ph.D., Stanford University professor, has been teaching the Introductory Psychology course for nearly 50 years and has been writing the basic text for this course, as well as the Faculty Guides and Student Workbooks, for the past 35 years. In addition, he has helped to develop and update the PBS-TV series, *Discovering Psychology*, that is used in many high school and university courses both nationally and internationally. He has been called the “Face and Voice of Psychology” because of this popular series and his other media presentations. Zimbardo also loves to conduct and publish research on a wide variety of subjects, as well as teaching and engaging in public and social service activities. He has published more than 300 professional and popular articles and chapters and 50 books of all kinds. He is currently engaged in writing a trade book on the psychology of evil that relates his classic Stanford Prison Experiment to the abuses at Iraq’s Abu Ghraib Prison. Please see these websites for more information: [www.zimbardo.com](http://www.zimbardo.com), [www.prisonexperiment.org](http://www.prisonexperiment.org), [www.psychologyMatters.org](http://www.psychologyMatters.org).

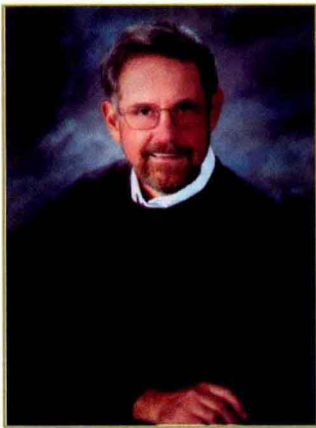


### Robert Johnson

Robert Johnson, Ph.D, taught introductory psychology for 28 years at Umpqua Community College. He is especially interested in applying psychological principles to the teaching of psychology and in encouraging linkages between psychology and other disciplines. In keeping with those interests, Bob founded the Pacific Northwest Great Teachers Seminar, of which he was the director for 20 years. He was also one of the founders of PT@CC (Psychology Teachers at Community Colleges), serving as its executive committee chair during 2004. That same year he also received the Two-Year College Teaching Award given by the Society for the Teaching of Psychology. Bob has long been active in APA, APS, the Western Psychological Association, and the Council of Teachers of Undergraduate Psychology.

Bob loves to write about psychology almost as much as he loves to teach. Aside from his contributions as a coauthor of *Psychology: Core Concepts*, he is particularly proud of his articles in *Teaching of Psychology*. Recently he began a term as the editor of *The General Psychologist*, the newsletter of the Society for General Psychology (Division 1 of APA). And, he is working on a book that brings to light what Shakespeare had to say about psychology.

Bob and his wife live on the North Umpqua River in southern Oregon, where they can go kayaking in their front yard or bicycling in the valleys of the Cascade Mountains. In his spare time he likes making pottery and Thai curries.



### Ann L. Weber

Ann L. Weber, Ph.D., is professor of psychology at the University of North Carolina at Asheville, where for almost three decades she has taught General Psychology, Social Psychology, and the Psychology of Close Relationships, among other courses. She came to UNCA after completing her undergraduate work at The Catholic University of America and graduate work at The Johns Hopkins University. *Psychology: Core Concepts* is one of her many student-oriented texts and study guides, in addition to scores of books and other writings on close relationships, loss, and grief. As a consultant, she conducts workshops on subjects from managing stress and surviving breakups to learning humor and perspective from relationships with pets. Her many recognitions for teaching include UNCA’s Distinguished Teacher Award and the Outstanding Teacher Award from the International Association for Relationship Research. Currently she is writing and developing courses on psychology in film and the relationships between people and animals. She and her husband live in the mountains of western North Carolina with five cats, two dogs, and a steady stream of fostered companion animals.

