

PSYCHOLOGY CONCEPTS AND APPLICATIONS



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Psychology

Concepts and Applications

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Dedication

To my wife, Judy, and my children, Michael and Daniella, with love always.

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Preface

Whew! The last period has been placed on the last sentence in the book you hold in your hands and now I have a chance to catch my breath. But as you know, the field of psychology stands still for no author! As you thumb through the pages of the text you'll find more than 800 references to research findings in psychology that have appeared just since the beginning of the twenty-first century. Psychology is a vibrant, dynamic discipline, and I have tried to approach the writing of this text with the same enthusiasm and vigor that psychologists bring to their research, teaching, and professional work every day.

Research-Based Text Development

Writing this text was the culmination of the many experiences I have had over the years studying, researching, and teaching psychology. The observations I have made in the classroom and in my own research helped form one of the most fundamental questions facing psychology instructors each day: How can students be helped to acquire and retain the information they will need to succeed in today's learning environment? By focusing on the challenges faced by both instructors and students, my students and I began conducting experimental studies to explore innovative ways of transforming the modern textbook into a more effective learning tool.¹ Basically, I wanted to see what I could discover about how to organize and present information most effectively to help students learn. **I wanted to see if I could use the research tools that define psychology as a scientific discipline to inform my work as a textbook author.**

I've taught research methods for more than twenty years, so it seemed natural to me to put my ideas in the form of hypotheses that could be tested under controlled conditions. Our first study focused on the development of a modular format for organizing text material. The modular format presents information in more digestible units. By breaking down a lengthy chapter into smaller instructional units, or modules, this format allows students to organize their study efforts by focusing on one module at a time rather than trying to tackle a whole chapter.

The participants in this study were introductory psychology students who were instructed to read each of two text passages in social psychology; one passage was arranged in

a modular format and the other, in a traditional format. The modules were organized around a set of basic concepts in each passage. After each reading, students completed a twenty-item multiple-choice quiz to assess their knowledge of the material. We used a randomized, counterbalanced design to control for order effects and differences between text passages.

What we found was that the majority of students preferred the modular format over the traditional format (57.3 percent versus 38.5 percent, with 4.2 percent expressing no preference). In addition, we discovered that students who preferred the modular format performed significantly better when material was presented in the modular format rather than the traditional format. It stands to reason that if students prefer a particular format, they will become more engaged in reading texts written in that format—an outcome that may translate into improved performance in actual classroom situations.

Our results also suggested that that too much modularization (i.e., use of very brief modules) may actually impair learning, perhaps by creating a stimulus-overload condition that makes it difficult for students to retain or integrate information.

In our second study we explored whether signaling concepts by extracting them and highlighting them in the margins of the text would help students learn these key points. Investigators researching various pedagogical tools have found that learning can indeed be enhanced when students are cued to material that is important for them to encode and retain. The signaling devices in question have included overviews, headings, and summaries. Yet despite this increased awareness of the effectiveness of such devices, textbooks have thus far lacked any direct means of signaling key concepts that need to be learned. In my view, the key concepts in a field of study are the basic building blocks of knowledge. **Some students can easily extract key concepts from text material. But others may be better able to learn the material when these concepts are signaled or cued in the text.**

To examine the learning effects of signaling concepts in text passages, we had students read two different text passages—one that highlighted key concepts in the margins and one that did not. Again, we used a randomized, counterbalanced research design. **Our results showed that signaling key concepts significantly improved quiz**

¹Nevid, J. S., & Carmony, T. M. (2000, April). *Emerging trends in format and style of introductory psychology texts*. Paper presented at the 14th Annual Conference on Undergraduate Teaching of Psychology, Ellenville, NY.

Nevid, J. S., & Carmony, T. M. (2002). Traditional versus modular format in presenting textual material in introductory psychology. *Teaching of Psychology*, 29, 237–238.

Nevid, J. S., & Lampmann, J. L. (2001, April). *Do pedagogical aids in textbooks enhance learning?* Paper presented at the 15th Annual Conference on Undergraduate Teaching of Psychology, Ellenville, NY.

Nevid, J. S., & Lampmann, J. L. (2002, August). *Concept boxes as pedagogical aids: Effects on content acquisition*. Poster presented at the meeting of the American Psychological Association, Div. 2, Society for the Teaching of Psychology, Chicago, IL.

performance overall as well as on the subset of items that directly assessed knowledge of these key concepts.

Not surprisingly, we found no significant differences in quiz performance between the signaled and nonsignaled conditions for items assessing text material *other* than key concepts. In other words, we found that signaling key concepts had no effects on learning material that was not signaled. This finding only reinforces what instructors have known for years—that students should not use pedagogical aids (whether they be summaries, interim quizzes, or cued concepts) as substitutes for reading the text in its entirety. Importantly, our results taught us that students are better able to learn key concepts when they are directly signaled or highlighted. Here, too, we polled students on which format they preferred—the one with signaled concepts or the one without. More than three-fourths (76.25 percent) preferred the format containing the signaled concepts, as well as finding it easier to understand and more clearly presented than the nonsignaled format. (This was interesting in light of the fact that the material was exactly the same in both formats; the only difference was that the signaled format extracted and highlighted the key concepts.)

Taken together, the results of these two studies gave me confidence that a modular approach with signaling of key concepts would be well received by students and would help them organize their study efforts more efficiently. But they also suggest that, to be effective as instructional units, modules should not be too choppy or fragmented. Therefore, rather than placing one or more modules on each two-page spread, I have organized modules around major sections in each chapter.

The text you are holding in your hands is literally the product of the research program undertaken in our laboratory. I have had opportunities to present these data at professional conferences and am encouraged by the responses I have received from course instructors. As one reviewer of the book put it, “Finally there is a text that uses psychology to teach psychology.”

Goals of the Text

Psychology: Concepts and Applications was written with four principal objectives or targets in mind: (1) to enhance learning, (2) to engage student interest, (3) to help students sharpen their critical thinking skills, and (4) to incorporate technology that serves as a tool for learning.

Targeting Learning

The text provides a broad perspective on psychology that covers the history, methods of research, major theories, and research findings of the discipline, as well as applications of the knowledge gained from contemporary research to the problems and challenges we face in today's world. Incorporating

recent developments in pedagogy, it also assists students in mastering basic concepts in the field and retaining information they have learned. At the core of this approach is the *concept-based module*, a comprehensive learning system that incorporates other well-established pedagogical devices, including the SQ3R study method, a marginal glossary, and question-and-answer formatted chapter summaries.

The Concept-Based Module As noted, this text is organized in a modular format that breaks down lengthy chapters into a smaller number of study units called modules. Each module corresponds to a topic of interest in particular areas of psychology and is a self-contained unit of instruction. This format is designed to assist students in organizing their study time. Instead of approaching each chapter as a whole, the modules present information in more manageable units of instruction. Students can chew on one module at a time rather than trying to digest the entire chapter at once. Set within a traditional chapter framework, the modules are structured in such a way as to help students make connections among and across the modular topics.

Each module is built, from the ground up, around a set of key concepts in a particular area of study. Why a concept-based approach? The reason is that I believe concepts are the basic building blocks of knowledge in a discipline. I would like students to take away from their first encounter with psychology a set of key concepts that gives them a good grounding in psychology and lays the foundation for further study. But as important as it is for students to glean key concepts, they also need to see how these concepts relate to the theoretical and research foundations of psychology.

More than 500 key concepts appear in the margins of the text, numbered consecutively throughout each chapter for easy reference. Here is a small sample:

Concept 2.8: When the neural impulse reaches the axon's terminal buttons, it triggers the release of chemicals that either increase or decrease the likelihood that neighboring cells will fire.

Concept 9.16: A more securely attached infant is likely to be better adjusted in childhood and adolescence than a less securely attached infant.

Concept 16.3: By filtering information through existing social schemas, first impressions become lasting impressions.

Two additional pedagogical devices are provided to help students acquire and retain key concepts:

- *Concept Charts* summarize and review key concepts in tabular form. They reinforce the student's knowledge of the concepts and help students make relational connections between concepts.
- *Review It* and *Recall It* are summaries appearing at the end of each module that help students review the material and test their knowledge by completing a short quiz.

SQ3R+ Study Method The survey, question, read, recite, review (SQ3R) study method is a widely used technique for enhancing learning and encouraging students to adopt a more active role in the learning process. This text incorporates not only the traditional elements of SQ3R but also *Think About It*, a feature that helps foster critical thinking skills.

- **Survey and Question** Survey methods are incorporated within both the chapter structure and the modular structure. Each chapter opens with a preview section showing the contents and organization of the chapter (including a numbered list of modules presented in the chapter), and the material covered in the modules is described in the introductory section preceding the first module. In addition, survey questions begin each module to highlight important learning objectives and encourage students to use questions as advance organizers for studying.
- **Read** The writing style has been carefully developed for reading level, content, and style. Students are often addressed directly to engage them in the material and encourage them to examine how the information may relate to their own personal experiences.
- **Recite and Review** Each module ends with a study break that consists of a *Review It* section and a *Recall It* section. These sections encourage recitation and review by allowing students to review the material covered in the module and to recite their knowledge by answering study questions (fill-ins, multiple choice, matching, and short answers). *Concept Charts* in each module provide further opportunities for students to review the knowledge they have acquired. And in the *Summing Up: Q & A* section at the end of each chapter, students can practice reciting answers to the study questions that introduced each module.
- **Think About It** The text goes beyond review and recitation by posing thought-provoking questions that encourage reflection, critical thought, and self-exploration. These questions foster critical thinking (e.g., Why is it incorrect to say that someone is right-brained or left-brained?) and encourage students to reflect on how the text material relates to their personal experiences (e.g., Have you ever taken an intelligence test? Did you think it was a fair appraisal of your intelligence?).

Application Modules The last module in each chapter is an application module that allows students to see how psychologists apply the knowledge they have gained from their research studies to real-life problems. Students will also see how they can apply the knowledge they gain from reading the chapter to their own lives. See the Features section on page xiv for a chapter-by-chapter listing of the application modules in the text.

Running Glossary Key terms are boldfaced and defined in the margins near their first mention. A full glossary is presented at the end of the book.

Integrating Diversity One primary objective of this text is to raise students' awareness of the importance of issues relating to diversity. Discussion of cultural and gender issues is therefore integrated within the main body of the text rather than relegated to boxed features. (A proliferation of boxes tends to break the flow of the text and to introduce unnecessary clutter that many students find distracting; it might even inadvertently convey the impression that material relating to diversity is less important than other material because it is boxed off.) For a reference guide to the integrated coverage of gender and sociocultural issues in the text, see the complete listings available in the Instructor's Manual to accompany *Psychology: Concepts and Applications*.

Summing Up: Q & A Chapter summaries are organized in a question-and-answer format that encourages active learning. The questions correspond to the survey questions that introduce each module. Students can recite their answers to these questions and then compare them to the sample answers presented in the text.

Targeting Student Interest

A textbook can be an effective learning tool only if it succeeds in engaging and retaining students' interest. *Psychology: Concepts and Applications* is designed not only to generate such interest but also to involve students directly in the material they read.

"Did You Know That..." Chapter-opening questions whet students' appetite for the material presented in the chapter and encourage them to read further. Some questions debunk common myths and misconceptions; others highlight interesting historical features or bring recent research developments into focus. Accompanying page numbers are provided for easy cross-referencing to the chapter sections in which the information is discussed. A small sample follows:

Did You Know That...

A student successfully completed all Ph.D. requirements at John Hopkins University but was refused a doctorate because she was a woman? (Ch. 1)

Men's and women's bodies produce both male and female sex hormones? (Ch. 2)

The "Big Five" is not the name of a new NCAA basketball conference but the label used to describe the leading trait theory of personality today? (Ch. 12)

"Try This Out" These activities and exercises provide opportunities for students to apply information presented in the text to their own experiences. Whether the topic involves using the principle of scaffolding to help a child acquire a particular skill, or performing a personal experiment on lucid dreaming, students can work through problems, generate solutions, and test out concepts and principles. They can

participate in active learning by applying the text concepts themselves to real-life situations, rather than simply reading about them.

Try This Out activities also offer suggestions for service learning through participation in research and volunteer experiences, while the self-scoring questionnaires in this feature allow students to evaluate their behavior and attitudes about specific issues. See the Features section on page xiv for a complete list of the *Try This Out* exercises and activities featured in the text.

“The Pioneers” Another way the text makes material more engaging is by providing glimpses into the personal lives of the pioneers who shaped the field. In these biographical snapshots, students learn how a view from a train inspired the founding of Gestalt psychology, how Pavlov discovered the conditioned response by accident, and how the beliefs that Albert Ellis first developed as a child would later inform his views on psychology. See the Features section on page xiv for a complete list of the pioneers featured in the text.

Targeting Critical Thinking Skills

Another major goal of the text is to encourage students to challenge their preconceived assumptions about human behavior and to think critically about information they receive from the media and other sources in the light of scientific evidence. *Thinking Critically About Psychology* is a section at the end of each chapter that gives students the opportunity to sharpen their critical thinking skills. Students can practice these skills by answering questions that require them to analyze problems and evaluate claims in relation to the information presented in the chapter. Students may then compare their answers to sample responses presented in the appendix.

Students can further reinforce their critical thinking skills by responding to the many thought-provoking questions posed throughout the text in the *Think About It* features and, more generally, by applying in their daily lives the critical thinking skills discussed in Chapter 1.

Targeting Technology as a Tool for Learning

The learning environment of today is much different from the one I experienced when I sat in my first undergraduate class in psychology. One important change has been the increased availability of computerized resources—specifically, the Internet and CD-ROMs. The text is supported by two key media resources: the *WebWorks website* and the *PsychStart CD-ROM*.

Integration of Text and Electronic Resources The knowledge base of psychology is constantly in flux, as research developments are reported daily in scientific and professional journals. But despite the fluid nature of our knowledge, the textbook remains a static learning tool. The best an author can do is to represent the knowledge in the field that exists

at a given point in time. By the time a textbook reaches the student's hands, some of the information it contains will be outdated and some may even have been brought into dispute by recent developments in the field.

This text contains a dynamic learning tool that allows instructors and students not only to keep abreast of rapidly changing developments in the field but also to further explore important and challenging concepts in an electronic environment. Icons embedded in the margins of the text indicate the availability of specific psychology-related destinations on the WebWorks website. Given the endless supply of Internet resources on psychology alone, the purpose of the integrated media icon strategy is to focus on four specific types of resources to support and expand the textual representation of key concepts and issues, as well as to provide clear identification of each icon entry's category and topic. The four categories are as follows: (1) *specific and general links* to psychology-related websites and information resources; (2) *quizzes* designed to enhance understanding of issues discussed in the modules; (3) *NetLab interactive exercises*, activities, and demonstrations; and (4) *research updates* for each chapter. Using the research update link, students can access the author's own updatable research library containing brief summaries of recent research studies in key areas of psychology. Students may find this material especially helpful if they are preparing reports and term papers or if they want to know the latest information about particular topics of interest. Instructors, too, may find it useful to access this material as a way of keeping abreast of the latest research developments in the field. In addition, a preview section at the end of each chapter provides the student with an overview of the additional media resources that can be found on both the WebWorks website and the PsychStart CD-ROM.

Ancillaries

Even the most comprehensive text is incomplete without ancillaries. The ones accompanying *Psychology: Concepts and Applications* help make it a complete teaching package.

Instructor Ancillaries

Instructor's Resource Manual The Instructor's Resource Manual (IRM) contains a variety of resources to aid instructors in preparing and presenting text material in a manner that meets their personal preferences and course needs. The IRM begins with a comprehensive preface, which covers preparation, pitfalls, planning, execution, resources, and best practices for both new and seasoned instructors. Each chapter provides a preview and a goals and activity planner to help organize classes. In addition, each chapter of the IRM contains a detailed outline, lecture suggestions, topics for discussion, classroom and individual activities with handouts, and writing assignment ideas. Also, CD-ROM resources as well as web materials are tied into individual chapter topics for easier class preparation and use.

Test Bank The test bank contains 2,400 items specifically developed for *Psychology: Concepts and Applications*. Multiple-choice questions as well as essay questions with answers are written at both the chapter and the module level to provide flexibility to the instructor. These questions are labeled by type (factual, conceptual, applied), learning objective, module reference number, and page reference for easier use in creating exams.

Computerized Test Bank A computerized test bank, containing all of the questions from the printed test bank, is available on the Instructor's Resource CD-ROM. Instructors can edit questions or add their own questions to generate printed or online exams.

Transparency package Transparencies comprise 100 four-color images, charts, and tables taken directly from the main text.

Instructor's Resource CD-ROM The Instructor's Resource CD-ROM contains electronic versions of instructors' resources so that they can easily be customized and inserted into teaching materials. The CD-ROM contains PowerPoint slides, learning objectives, chapter outlines, active learning and critical thinking materials, handouts, an overview of media resources available with the text, and the computerized test bank.

WebWorks Website The WebWorks website at <http://psychology.college.hmco.com/instructors> is a comprehensive gallery of online resources available to instructors using *Psychology: Concepts and Applications*.

PowerPoint Presentations The PowerPoint presentations consist of an extensive set of slides providing lecture sequences that include tables, figures, and charts from the main text. The slides are available on the WebWorks website as well as on the Instructors Resource CD-ROM.

eduSpace Web Tutorial The eduSpace web tutorial website contains approximately 80 multiple-choice, true/false, and fill-in questions per chapter, delivered in an environment that allows instructors to assign quizzes, track students' results, and add and modify questions.

Blackboard/WebCT Course Cartridges Blackboard/WebCT course cartridges offer a variety of student and instructor resources that can be incorporated into an instructor's online course.

Student Ancillaries

Study Guide The study guide focuses on providing students with resources aimed at improving study skills and comprehension of the text material. For each chapter, this guide provides a one-page detailed outline, a list of objectives, chapter overview, key terms and concepts, and self-

testing exercises and activities that highlight key concepts from the main text. In addition, students are provided an integrated set of media resources to further improve and expand their understanding of the main concepts of the course.

PsychStart CD-ROM PsychStart CD-ROM is an interactive study tool that provides a chapter walkthrough, hot-linked glossary terms, interactive activities, and quizzes to reinforce the most challenging concepts in each chapter of *Psychology: Concepts and Applications*.

WebWorks Website WebWorks website at <http://psychology.college.hmco.com/students> is also available to students using *Psychology: Concepts and Applications*. Web icons placed in the chapter margins relate chapter topics to online resources. Identified by category and topic, these resources are easily accessed by logging on to the text's website. Web categories include quizzing, links, NetLabs, and research updates, each specifically related to the chapter content.

Acknowledgments

First, I am indebted to the thousands of psychologists and other scientists whose work has informed the writing of this text. Thanks to their efforts, the field of psychology has had an enormous impact in broadening our understanding of ourselves and enhancing the quality of our lives. On a more personal level, I owe a debt of gratitude to the many colleagues and publishing professionals who helped shape this manuscript into its present form. Let me begin by thanking the professional colleagues who reviewed the manuscript and helped me refine it through several stages of development:

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A Message to Students

How to Use This Textbook

You are about to embark on a journey through the field of psychology. As with any journey, it is helpful to have markers or road signs to help you navigate your course. This text provides a number of convenient markers to help you know where you've been and where you're headed. Take a moment to familiarize yourself with the terrain you're going to encounter in your journey. It centers on the unique organizational framework represented in this text—the concept-based modular format.

Why a concept-based modular approach? There are three key reasons:

1. *To help you organize your study activities.* The modular approach breaks down large chapters into smaller units of instruction. Rather than try to digest an entire chapter at once, you can chew on one module at a time.
2. *To help you master the material.* Each module is a self-contained unit of instruction. At the end of each module you'll find a module review section designed to help you review the material in the module and test your knowledge before moving ahead.
3. *To help you learn key concepts that form the foundations of knowledge in each area of study.* As you make your way through each module, you will be learning a set of basic concepts and how they relate to the theoretical and research foundations of the field of psychology.

How to Use the SQ3R+ Study Method

This text includes a built-in study system called the SQ3R+ study method, a system designed to help students develop more effective study habits that expands upon the SQ3R method developed by psychologist Francis P. Robinson. SQ3R is an acronym that stands for five key features: *survey*, *question*, *read*, *recite*, and *review*. This text adds an additional feature—*Think About It*. Here's how you can best use the method to master the material:

1. *Survey* Preview each chapter before reading it. Scan the outline and the introductory section to get a sense of how the chapter is organized and what general topics are covered. Familiarizing yourself with the contents of a chap-

ter before reading it can activate related information that you already hold in memory, thereby assisting you in acquiring and retaining new information.

2. *Question* This text incorporates study questions at the start of each module that highlight key issues addressed in the module. Jot down these questions in a notebook or computer file so that you can answer them as you read along. You may also find it helpful to generate additional questions. Developing good questioning skills allows you to become a more active learner, which can enhance your ability to understand and retain information.
3. *Read* Read the material in the text in order to answer the study questions.
4. *Recite* Recite your answers to the study questions out loud. (Hearing yourself speak these answers will further enhance your retention and later retrieval of the information you have read.) For additional review as you get closer to exam time, jot down your answers in a notebook or computer file.
5. *Review* Establish a study schedule for reviewing the material on a regular basis. Test yourself each time you reread the material to further boost long-term retention. Use the *Review It* section that follows each module to review the material; then recite your knowledge by answering the questions posed in the accompanying *Recall It* quiz. Then reinforce your knowledge by comparing your answers to the study questions with the sample answers found in the Summing Up section at the end of the chapter.
6. *Think About It* This feature poses thought-provoking questions that encourage you to apply your critical thinking skills and to reflect on how the material may relate to your own experiences.

I hope you enjoy your journey through psychology. It began for me in my freshman year in college and has continued for me with a sense of wonder and joy ever since.

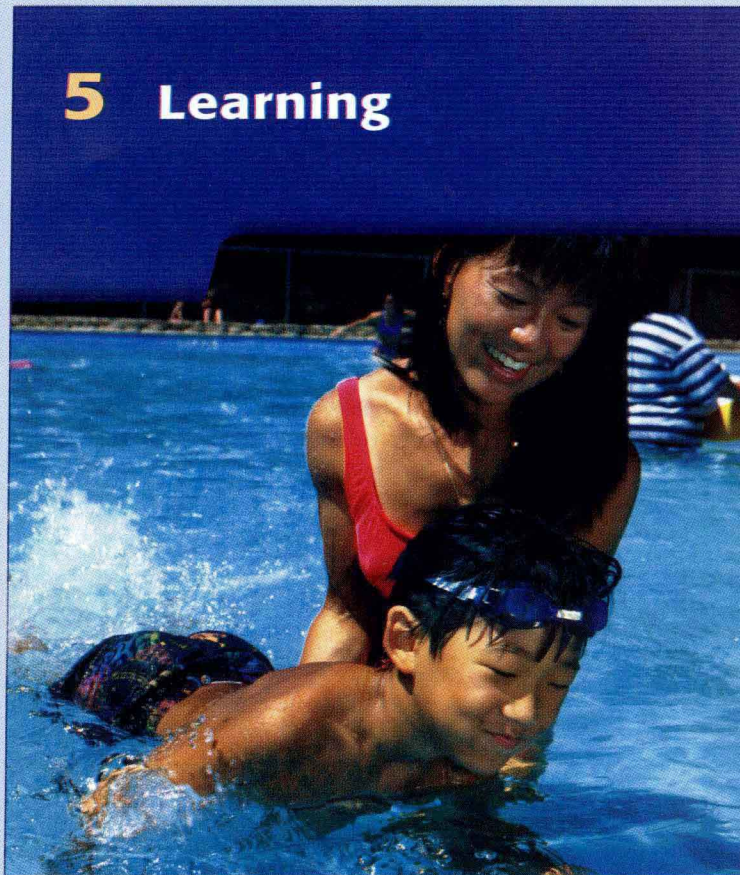
Please email your comments, questions, or suggestions to me at askauthor@aol.com.

Jeff Nevid
New York, NY

A Guide to *Psychology: Concepts and Applications*

Chapter Opening Features

Chapter Opener follows the Preview and provides an interesting vignette or overview that introduces the reader to the topics covered in the chapter.



5 Learning

PREVIEW

Did You Know That . . .

MODULE 5.1 Classical Conditioning:

Learning Through Association

MODULE 5.2 Operant Conditioning:

Learning Through Consequences

MODULE 5.3 Cognitive Learning

MODULE 5.4 Application: Putting

Reinforcement into Practice

Tying It Together • Summing Up: Q & A •

Key Terms • Thinking Critically About

Psychology • PsychStart CD-ROM •

WebWorks

DID YOU KNOW THAT . . .

- ▶ A major form of learning was discovered by accident? (p. 180)
- ▶ Déjà-vu may be a learned response? (p. 183)
- ▶ The founder of behaviorism made his mark on the world of advertising by applying a form of learning first observed in studies of digestion in dogs? (p. 185)
- ▶ In an early study, a young boy learned to fear a white rat after experimenters repeatedly made loud noises by banging steel bars behind his head while the rat was present? (p. 186)
- ▶ Salivating to the sound of a tone may not be harmful, but salivating at the sight of a Scotch bottle may well be dangerous to people battling alcoholism? (p. 188)
- ▶ Pigeons show forms of superstitious behavior that psychologists believe are learned in much the same way as humans learn superstitious behavior? (p. 194)
- ▶ Many people develop fears of various creatures even though they have had no direct negative experiences with them? (p. 210)

I hate eggs. It's not just the taste of eggs I can't stand. The smell, the feel, the very sight of eggs is enough to make me sick. Watching other people eat eggs can make me nauseous. It's not that I'm allergic to eggs. I like all kinds of baked goods that are made with eggs. I'm fine with eggs as long as they are cooked into other foods so they are no longer recognizable as, well, eggs. But eggs themselves, especially runny eggs, fill me with disgust.

I wasn't born with a disgust for eggs. Nor did I always dislike eggs. My parents tell me I was actually quite fond of eggs as a young child. But somewhere along the line, I acquired an aversion to eggs. Chances are I had an unpleasant experience with eggs. No, I don't think I was chased around a barn by a clutch of crazed chickens. Most likely, I had an experience in which eggs made me sick. Or perhaps I was forced to eat eggs when I wasn't feeling well. In any event, I have no memory of it. All I know is that I hate eggs and have hated them for as long as I can recall.

I have described my aversion to eggs to introduce you to the topic of learning. Some responses, such as pulling your hand away from a hot stove, are reflexive. We don't learn reflexes; we are biologically equipped to perform them automatically. Other behaviors develop naturally as the result of maturation. As a child's muscles mature, the child becomes capable of lifting heavier weights or throwing a ball a longer distance. But other responses, such as my aversion to eggs, are acquired through experience. Psychologists generally define learning as a relatively permanent change in behavior that results from experience. It is through experience that we learn about the world and develop new skills, such as riding a bicycle or cooking a soufflé. Acquired taste preferences or aversions, including my aversion to eggs, are also learned behaviors. Note the use of the term *relatively permanent* in the definition of learning. Psychologists believe that for learning to occur, changes in behavior must be enduring. But change need not be permanent. It is possible to unlearn behavior. For example, you would need to unlearn the behavior of driving on the right side of the road if you wanted to drive in a country where people drive on the left side of the road.

Psychologists recognize that learning is adaptive; it enables organisms to adapt their behavior to the demands of the environment. Through learning, organisms acquire behaviors that increase their chances of survival. Even taste aversions can be adaptive. They keep animals, including humans, from eating foods that have sickened or poisoned them in the past. But not all learned responses are adaptive. My own aversion to eggs limits the range of foods I might enjoy. By and large, however, learning helps prepare organisms to meet the demands that their environments impose on them.

Psychologists study many forms of learning, including three major types that are the focus of this chapter: classical conditioning, operant conditioning, and cognitive learning.

“Did You Know That . . .” consists of a chapter-opening bulleted list of questions meant to stimulate student thinking and preview many of the issues to be discussed in the chapter modules. At the end of each question, a page reference is given to allow students to follow-up on areas of interest.

Module Features

Survey Questions introduce each module and help students test their recall of the major concepts in the module. These study questions also serve as the end-of-chapter summary structure to reinforce learning and aid the study process.

Key Concepts are numbered concepts extracted from the text and placed in the margins next to key discussions within the modules. These concepts are interspersed throughout the text to help students identify and recall the major concepts covered in each module.

MODULE 5.1

Classical Conditioning: Learning Through Association

- What is learning?
- What is classical conditioning?
- What roles do extinction, spontaneous recovery, stimulus generalization, discrimination, and higher-order conditioning play in classical conditioning?
- What stimulus characteristics strengthen conditioned responses?
- What is the cognitive perspective on classical conditioning?
- What are some examples of classical conditioning in daily life?

Do your muscles tighten at the sound of a dentist's drill? Do you suddenly begin to salivate when passing your favorite bakery? You weren't born with these responses—you learned them. But how does **learning** occur?

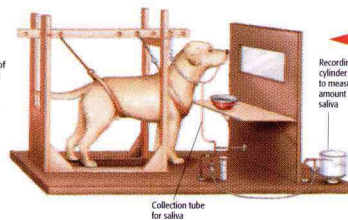
To understand how responses are learned, we need to consider the work of the Russian scientist Ivan Pavlov (1849–1936). Pavlov discovered the form of learning we call **classical conditioning**. Though Pavlov's discovery is among the most important in psychology, it actually occurred quite by accident (see the *Pioneers* box).

You might think of classical conditioning as **learning by association**. If you associate the sound of a dentist's drill with pain because of past experiences, the stimulus of that sound will probably cause you to respond with the muscle tension that is a natural reflex to pain. If you associate a certain bakery with a particularly tasty treat, you may find yourself salivating as you walk by that bakery. Responses are learned by experiences in which one stimulus is paired with another that elicits such natural reactions. Although classical conditioning is a relatively simple form of learning, it plays an important role in our lives—as you will see in this module.

Principles of Classical Conditioning

Pavlov performed many experiments in classical conditioning. In a typical experiment, he harnessed dogs in an apparatus similar to the one shown in Figure 5.1. When food is placed on a dog's tongue, the dog naturally salivates. This

Figure 5.1 Apparatus Similar to One Used in Pavlov's Experiments on Conditioning
In Pavlov's studies, a research assistant positioned behind a mirror sounded a tone as food was placed on the dog's tongue. After several pairings of the tone and food, the dog acquired a conditioned response of salivation. The amount of saliva dripping through a tube to a collection vial was taken as the measure of the strength of the conditioned response.



Art Program Both the text's illustrations and photos were carefully conceived, researched, and created with the goal of presenting a clear, concise, and pedagogically sound art program reflecting our diverse and changing student populations.

Concept 5.10
Feelings of nostalgia may be conditioned responses elicited by stimuli that were associated with pleasant experiences in the past.

of nostalgia may represent classically conditioned responses elicited by stimuli associated with pleasant experiences in the past—a whiff of perfume or perhaps even the mist in the air on a spring day.

Classical Conditioning of Drug Cravings People with chemical dependencies frequently encounter drug cravings, especially when they undergo drug withdrawal or go “cold turkey.” Though cravings may have a physiological basis (they constitute part of the withdrawal syndrome for addictive drugs), classical conditioning can also contribute to these strong desires. Cravings may be elicited by cues in the environment that were associated with previous drug use (O'Brien et al., 1992; Weiss & Mirin, 1987). A person battling alcoholism who goes “on the wagon” may experience strong cravings for a drink whenever he or she passes a familiar “watering hole” or socializes with former “drinking buddies.” Cravings may represent conditioned responses that continue to be elicited long after the physiological signs of withdrawal have passed.

The conditioning model of drug cravings is supported by research showing that people with alcoholism salivate more at the sight and odor of alcohol than do nonalcoholic subjects (Monti et al., 1987). Salivating to the sound of a tone may be harmless enough, but salivating when looking at a picture of a Scotch bottle in a magazine can be dangerous to a person struggling with alcoholism. Not surprisingly, drug counselors encourage recovering drug and alcohol abusers to avoid cues associated with their former drug-use patterns.

Drug Cravings as Conditioned Responses Drug cravings may be conditioned responses elicited by exposure to cues (conditioned stimuli) associated with drug-using behavior.

Concept 5.11
Drug cravings and taste aversions may be acquired through classical conditioning.

Classical Conditioning of Taste Aversions The principles of classical conditioning can also be used to explain **conditioned taste aversions**, such as my disgust for eggs (Limebeer and Parker, 2000). Psychologist John Garcia was the first to demonstrate experimentally the role of classical conditioning in the acquisition of taste aversions. Garcia and his colleague Bob Koelling noticed something unusual in the behavior of rats that had been exposed to nausea-inducing radiation. The rats refused to drink from the plastic water bottles in the radiation chambers, but they drank freely when returned to their own cages (Garcia & Koelling, 1966). Garcia reasoned that the water in the plastic bottles had a distinctive plastic taste that elicited a response of nausea because it had been paired with the sickening effects of the radiation. In classical conditioning terms, the radiation is the US, the nausea it produces is the UR, the plastic-tasting water is the CS, and the nausea the CS elicits on its own is the CR. When Garcia paired saccharin-flavored water with the nausea-inducing radiation, the rats reacted in the same way. By administering a nausea-inducing drug after the rats ate a certain food, Garcia and Koelling (1971) demonstrated that aversions to foods can also be classically conditioned.

In addition, Garcia and Koelling's work (1966) showed that taste aversions can be acquired even when the CS (the taste of the food) is presented a few hours before the US (the nausea-inducing stimulus). This discovery shocked their experimental colleagues, who believed that classical conditioning could occur only when the CS is followed almost immediately by the US. Moreover, Garcia and his colleagues were able to demonstrate that conditioned taste aversions can be acquired on the basis of a single pairing of the flavor of a food or drink with a nausea-inducing stimulus.

Like other forms of classical conditioning, conditioned taste aversions have clear survival benefits. Our ancestors lived without the benefit of refrigeration or preservatives. Acquiring an aversion to foods whose rancid smells and tastes

Integrated Media Resources

Descriptive icons throughout the chapter highlight available media resources that support key concepts in the text, including quizzes, links, NetLabs, and research updates.

“Think About It” features thought-provoking questions that help students sharpen their critical thinking skills and reflect on how the text material relates to their own experiences.

[Online Experiments on Learning/Link](#)

THINK About It
What Do You Fear?

Have you developed any fears you find troubling or that interfere with your daily life? Based on your reading of the chapter, what do you think might be the origin of these fears? How are you coping with them? Have you talked to anyone about them? Is there anyone you might contact to help you overcome them, such as a college health official or a health care provider or clinic in your area?

“Try This Out” features a service learning suggestion, self-assessment questionnaire, or a hands-on activity or exercise in which students can apply their knowledge of psychological concepts discussed in the chapter.

Concept Charts summarize and review major concepts and visually make relational connections for students.

Pioneer Boxes provide a glimpse into the lives of key researchers who helped shape the field of psychology.

TRY THIS OUT

The Fine Art of Observing Others

How might you use modeling to expand your social skills? Here's an example. If you're at a loss to know what to say to someone you meet at a party, observe how others interact with each other, especially people you believe are socially skillful. What do you notice about their body language, facial expressions, and topics of conversation that could be helpful to you? Begin practicing these behaviors yourself. Note how other people respond to you. Fine-tune your skills to produce a more favorable response. With some practice and fine-tuning, the behaviors are likely to become part of your regular behavioral repertoire.

Does the idea of holding a rat make you squirm? Does the sight of a crab on the beach make you want to run in the other direction? How about touching an insect? Many of us have fears of various creatures even though we have never had any negative experience with them. These fears may be acquired by modeling—by observing other people squirm or show fright when confronted with them (Merkelbach et al., 1996). In a study of forty-two people with a phobia about spiders, modeling experiences were found to be a greater contributor to the acquisition of the phobia than were direct conditioning experiences (Merkelbach et al., 1991).

Concept Chart 5.3 provides an overview of the three types of cognitive learning.



CONCEPT CHART 5.3
Types of Cognitive Learning

Type of Learning	Description	Example
Insight learning	The process of mentally dissecting a problem until the pieces suddenly fit together to form a workable solution	A person arrives at a solution to a problem after thinking about it from a different angle.
Latent learning	Learning that occurs but remains “hidden” until there is a reward for performing the learned behavior	A person learns the words of a song playing on the radio but doesn't sing them until friends at a party begin singing.
Observational learning	Learning by observing and imitating the behavior of others	Through observation, a child learns to imitate the gestures and habits of older siblings.

Review It and Recall It study sections appear at the end of each module and provide both a written summary and testing area for students to ensure comprehension before moving on in the text. Answers to the Recall It questions are provided at the end of the chapter.

THE PIONEERS

The Making of a Behaviorist



B. F. Skinner

Burrhus Frederic Skinner was raised in a small town in Pennsylvania. Something of a tinkerer as a boy, he was fond of building things—especially elaborate contraptions (Hunt, 1993). Later, as a psychologist, he used his mechanical aptitude to construct laboratory equipment for studying the behavior of animals (including the now-famous “Skinner box”). Skinner did not set out to become a psychologist. He majored in English in college and upon graduating tried his hand at writing. He gave up a writing career after a year because he realized he had nothing to say about human behavior. Instead, he turned to psychology, believing that the understanding of human behavior is best approached by scientific study.

Skinner worked mostly with rats and pigeons. He first focused his research on classically conditioned responses, but he soon began to explore the role of reinforcement—the environmental consequences that serve to strengthen behaviors. He charted the principles of reinforcement, a body of work that continues to inform our understanding of how behavior is shaped by its consequences. Ironically, in 1948, the would-be writer who turned to psychology produced one of the most widely read novels of its time: *Walden Two*, a fictional account of a utopian society in which principles of reinforcement help people lead happier and more productive, fulfilling lives. *Walden Two* gave millions of college students their first exposure to the principles of operant conditioning. In a self-deprecating way, Skinner later minimized his impact on the world, telling an interviewer that he had more of an effect on rats and pigeons than he had on people (cited in Hunt, 1993).

Skinner allowed that some responses occur reflexively, as Pavlov had demonstrated. But classical conditioning is limited to explaining how new stimuli can elicit existing behaviors, such as salivation. It cannot account for new behaviors, such as the behavior of the experimental animals in Thorndike's puzzle box. Skinner found in Thorndike's work a guiding principle that behavior is shaped by its consequences. However, he rejected Thorndike's mentalistic concept that consequences influence behavior because they produce “satisfying effects.” Skinner held that organisms learn responses that operate on the environment to produce consequences; he therefore called this learning process *operant conditioning*.

Through **operant conditioning** organisms learn responses that produce changes in the environment. In this form of learning, the consequences of a response determine the likelihood that the response will occur again. The response itself is called an **operant response**, or, simply, an “operant.” Behaviors that produce rewarding effects are strengthened—that is, they become more likely to occur again. For example, if your teacher responds to a question only if you first raise your hand, you will become more likely to raise your hand before asking a question. Operant conditioning is also called *instrumental learning* since the behavior is instrumental in bringing about rewarding consequences. The term **reinforcer** refers to a stimulus or event that increases the likelihood that the behavior it follows will be repeated. For example, the act of answering questions when students raise their hands is a reinforcer.

Skinner focused much of his experimental work on manipulating reinforcers to observe the effects on animal behavior (see the Pioneers box). He used a device we now call a **Skinner box**. The Skinner box is a cage that contains a food-release mechanism that the animal activates when it responds in a certain way—for example, by pressing a lever or pushing a button. In a typical experiment, a pigeon

Law of Effect Thorndike's principle that responses that have satisfying effects are more likely to recur, while those that have unpleasant effects are less likely to recur.

radical behaviorism The philosophical position that free will is an illusion or myth and that human and animal behavior is completely determined by environmental and genetic influences.

operant conditioning The process of learning in which the consequences of a response determine the probability that the response will be repeated.

operant response A response that operates on the environment to produce certain consequences.

reinforcer A stimulus or event that increases the probability that the response it follows will be repeated.

Skinner box An experimental apparatus developed by B. F. Skinner for studying relationships between reinforcement and behavior.

Key Terms appear bold-faced within the text proper and in the margin alongside the introduction of each key term discussion.

MODULE 5.3 REVIEW

Cognitive Learning

REVIEW IT

Cognitive learning involves mental processes, such as thinking, problem solving, and mental imaging, that cannot be directly observed. Psychologists who study cognitive learning maintain that people and other animals are capable of new behaviors without actually having had the chance to perform them or being reinforced for them. Cognitive learning includes insight

learning (mentally working through a problem until a solution suddenly occurs), latent learning (learning that occurs without direct reinforcement and that is not displayed until it is reinforced), and observational learning (learning by observing and imitating the behavior of others).

RECALL IT

- The type of learning that involves thinking, information processing, mental imaging, and problem solving is called _____.
- The chimp named Sultan learned to reach bananas by attaching two sticks together. This type of learning is called _____.
 - insight learning.
 - latent learning.
 - observational learning.
 - classical conditioning.
- The type of learning that occurs without any apparent reinforcement and that is not displayed at the time it is acquired is called _____.
 - insight learning.
 - latent learning.
 - observational learning.
 - classical conditioning.
- Observational learning _____.
 - is also known as latent learning.
 - involves imitating the behavior of others.
 - may lead to the acquisition of useful new skills but not to fear responses.
 - is based on the principles of operant conditioning.

APPLICATION

MODULE 5.4

Putting Reinforcement into Practice

What steps are involved in applying reinforcement principles?



Concept 5.29

To modify behavior through reinforcement, it is important to establish a clear connection, or contingency, between the desired behavior and the reinforcement.

When you smile at someone who compliments you or thank someone for doing you a favor, you are applying positive reinforcement, one of the principles of operant conditioning. Showing appreciation for desired behavior increases the likelihood that the behavior will be repeated.

To modify behavior through reinforcement, it is important to establish a clear contingency, or connection, between the desired behavior and the reinforcement. For example, making a child's weekly allowance of spending money contingent on certain behaviors (e.g., cleaning up after meals) will be far more effective than granting the allowance irrespective of behavior. *Contingency contracting*, which involves an exchange of desirable reinforcers, is a more formal way of establishing a contingency. In contingency contracting, two people in a relationship list the behaviors of the other that they would like changed. They then agree to reinforce each other for making the desired behavioral changes

Application Module Each chapter ends with a short applied module aimed at helping students see how psychological principles are used to deal with real-world problems and issues and provides tips on how to apply this knowledge in their own lives.

"Tying It Together" appears at the end of each chapter helping students see how the modules are integrated within the chapter structure as a whole.



- for the test." Praising the accomplishment, not the effort, may convey the message that the child will be prized only if he or she continues to get As.
- *Avoid repeating yourself.* Avoid using the same words each time you praise the child. If you tell Timmy he's terrific each time you praise him, the praise will soon lose its appeal.
 - *Don't end on a sour note.* Don't say, "I'm proud of how you cleaned your room by yourself, but next time I think you can do it faster."

TYING IT TOGETHER

Our capacity to learn, or change our behavior as the result of experience, helps us adapt to the demands of the environment. Whether we are learning to garner rewards and avert punishments or simply to dress warmly in cold weather, we are continually modifying and adjusting our behavior in light of environmental demands. The modules in this chapter focus on three major types of learning. Classical conditioning, or learning by association, is a form of learning in which the repeated pairing of two stimuli leads to a response to one stimulus that was previously elicited by the other stimulus (Module 5.1). Whereas classical conditioning explains the development of relatively simple, reflexive responses, operant conditioning, or learning by consequences, focuses on the development of more complex behaviors (Module 5.2). The third major form of learning is cognitive learning, which involves mental processes that cannot be directly observed (Module 5.3). Teachers and parents apply reinforcement, a principle of operant conditioning, to help children develop more appropriate behaviors (Module 5.4).

Chapter-Ending Features

Summing Up: Q & A provides an end-of-chapter summary in question-and-answer format, using the survey questions as a guide and bulleted summary points.

Key Terms A list of the chapter's key terms is provided with page references for easy location by the reader.

PsychStart CD-ROM provides an overview of the interactive study tools available to support each chapter, including activities, quizzes, a hot-linked glossary, and a chapter walkthrough.

SUMMING UP: Q & A

Foundations of Modern Psychology (Module 1.1)

What is psychology?

- Psychology is the science of behavior and mental processes.
- What are the origins of psychology?
- Systematic attempts to explain human behavior can be traced to philosophers in ancient times, including Confucius and the Greek philosophers Socrates, Plato, and Aristotle.
- What were the major early schools of psychology?
- Structuralism is the earliest school of psychology. It was identified with Wilhelm Wundt and Edward Titchener, and it attempted to break down mental experiences into their component parts—sensations, perceptions, and feelings.
- Functionalism is the school of psychology founded by William James. It attempts to explain our behavior in terms of the functions it serves in helping us adapt to the environment.
- Behaviorism is the school of psychology begun by James Watson. It holds that psychology should limit itself to observable phenomena—namely, behavior.
- Gestalt psychology is the school of psychology founded by Max Wertheimer. It is grounded in the belief that the brain structures our perceptions of the world in terms of organized patterns or wholes.
- Psychoanalysis, the school of thought originated by Sigmund Freud, emphasizes the role of unconscious motives and conflicts in determining human behavior.

What are the major contemporary perspectives in psychology?

- The behavioral perspective focuses on observable behavior and the influences of learning processes in behavior.
- The psychodynamic perspective represents the model of psychology developed by Freud and his followers. It holds that our behavior and personalities are shaped by unconscious motives and conflicts that lie outside the range of ordinary awareness.
- The humanistic perspective reflects the views of humanistic psychologists such as Carl Rogers and Abraham Maslow, who emphasized the importance of subjective conscious experience and personal freedom and responsibility.
- The physiological perspective examines the ways in which behavior and mental experience are influenced by biological processes such as heredity, hormones, and the workings of the brain and other parts of the nervous system.
- The cognitive perspective focuses on mental processes that allow us to gain knowledge about ourselves and the world.
- The sociocultural perspective examines how our behavior and attitudes are shaped by social and cultural influences.

Psychologists: Who They Are and What They Do (Module 1.2)

What are the various specialties in psychology?

- These include major subfields such as clinical and counseling psychology, school psychology, and experimental psy-

chology, as well as emerging specialty areas such as geropsychology, forensic psychology, and sport psychology.

What changes have occurred in the ethnic and gender characteristics of psychologists over time?

- Though psychology is now a more diverse discipline, African Americans and other minority groups remain underrepresented in the professional ranks of psychologists.
- Unlike the early days of the profession when women were actively excluded from pursuing professional careers, they now comprise about two-thirds of the new Ph.D.s in psychology.

Research Methods in Psychology (Module 1.3)

What are the major objectives of science?

- The major objectives are description, explanation, prediction, and control of events or variables.

What is the scientific method, and what are its four general steps?

- The scientific method is a set of guiding principles that directs the scientific process.
- The scientific method comprises four general steps that guide research: (1) developing a research question, (2) formulating a hypothesis, (3) gathering evidence, and (4) drawing conclusions.

What are the major research methods psychologists use?

- These include the case-study method, the survey method, the naturalistic observation method, the correlational method, and the experimental method.

What ethical guidelines must psychologists follow in their research?

- Psychologists are committed to following ethical guidelines that promote the dignity of the individual, human welfare, and scientific integrity.
- Psychologists are precluded from using methods that harm research participants or clients and must receive approval of their research protocols from institutional review committees before undertaking research with humans or animals.

Application: Becoming a Critical Thinker (Module 1.4)

What are the key features of critical thinking?

- The key features of critical thinking include adoption of a questioning attitude, clarifying what you mean, avoiding oversimplification and overgeneralization, distinguishing correlation from causation, considering the assumptions or premises upon which arguments are based, examining sources, questioning evidence upon which claims are made, and considering alternative explanations of a given set of findings.

Key Terms

- psychology (p. 4)
 psychophysics (p. 5)
 introspection (p. 6)
 structuralism (p. 6)
 developmental psychology (p. 6)
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 natural selection (p. 7)
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Thinking Critically About Psychology

Here is the first critical thinking exercise you will encounter in this text. Based on your reading of the chapter, answer the following questions. Then, evaluate your progress in developing critical thinking skills, compare your answers with the sample answers in Appendix A.

An experimenter claims that listening to a professor's lectures while you sleep can help improve your grades. The experimenter based this conclusion on the following data:

The experimenter invited students in a large introductory psychology class to participate in a study in which they would be given audiotapes of the professor's lectures and asked to play them back while they slept. Each of the thirty-six students who agreed to participate received a specially equipped audiotape player. Secured in the machine with tamper-proof sealing tape were recordings of each lecture given in the two weeks before the final examination. The tape player automatically played the tape two hours after the students went to bed. At other times, the play button was deactivated so that the students could not play the tape.

After the final examination, the experimenter compared the grades of the participating students with those of a group of students selected from the same class who had not participated in the study. The results showed that participating students achieved higher test grades.

1. Do you believe the experimenter's claims are justified? Why or why not?
2. What other factors might account for the observed differences in test scores between the two groups?
3. How might you design the study differently to strengthen the experimenter's conclusion?

Answers to the Recall It Questions For each Recall It section quiz, answers are provided at the end of the chapter.

PsychStart CD-ROM

Want to strengthen your understanding of the chapter material? PsychStart can help! PsychStart is an interactive study tool that provides a chapter walk-through, hot-linked glossary terms with pronunciation guide, interactive exercises, and quizzes to reinforce the most challenging concepts in each chapter.

WebWorks at

<http://psychology.college.hmco.com/students>

A comprehensive gallery of online resources is also available to users of *Psychology: Concepts and Applications*. Web icons placed in the chapter margins relate chapter topics to online resources. Identified by category and topic, these resources are easily accessible by logging on to the text's website. Web categories include quizzes, web links, NetLab, and research updates, each specifically related to the chapter content to help make your time spent online more efficient.

Answers to Recall It Questions

Module 1.1: 1. Know thyself; 2. Wilhelm Wundt; 3. c; 4. behaviorism; 5. b; 6. psychodynamic perspective; 7. a.
Module 1.2: 1. Basic; applied; 2. (a) iv; (b) i; (c) ii; (d) iii; 3. a; 4. b.
Module 1.3: 1. Inference; 2. a; 3. c; 4. d; 5. experimental method; 6. b.

"Thinking Critically About Psychology" provides an end-of-chapter opportunity for students to sharpen their analytical skills by answering a critical thinking question or questions. Sample answers/solutions are provided in an appendix.

WebWorks provides an overview of the online resources available as indicated by the margin icons throughout the chapter, including quizzes, exercises, web links, and research updates.

About the Author



Jeffrey S. Nevid is Professor of Psychology at St. John's University in New York. He earned his doctorate from the State University of New York at Albany and was a Postdoctoral Fellow in Evaluation Research at Northwestern University. He has published numerous research articles in such areas as health psychology, clinical and community psychology, social psychology, gender and human sexuality, adolescent development, and teaching of psychology. His research has appeared in such journals as *Health Psychology*, *Journal of Consulting and Clinical Psychology*, *Journal of Community Psychology*, *Journal of Youth and Adolescence*, *Behavior Therapy*, *Psychology and Marketing*, *Professional Psychology*, *Teaching of Psychology*, *Sex Roles*, and *Journal of Social Psychology*, among others. Dr. Nevid has coauthored several college texts, including *Abnormal Psychology in a Changing World*, *Human Sexuality in a World of Diversity*, *Adjustment and Growth: The Challenges of Life*, and *Health in the New Millennium*. He has also authored several books on AIDS and sexually transmitted diseases, including *A Student's Guide to AIDS and Other Sexually Transmitted Diseases* and *Choices: Sex in the Age of AIDS*. Dr. Nevid is actively involved in developing new pedagogical approaches and was a keynote speaker at the 16th Annual Conference on Undergraduate Teaching of Psychology in April 2002.

Photo by Daniella Nevid, age 5, who had a difficult time shooting this photograph because her uncooperative father refused to stand up straight.

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