

# Psychology

SIXTH EDITION

James W. Kalat

North Carolina State University

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## To My Family



## About the Author



James W. Kalat (rhymes with ballot) is Professor of Psychology at North Carolina State University, where he teaches courses in introduction to psychology and biological psychology. Born in 1946, he received an AB degree summa cum laude from Duke University in 1968 and a PhD in psychology from the University of Pennsylvania in 1971. He is also the author of *Biological Psychology* (7th ed.) (Belmont, CA: Wadsworth, 2001). In addition to textbooks, he has written journal articles on taste-aversion learning, the teaching of psychology, and other topics. A remarried widower, he has three children, two stepchildren, and two grandchildren.

## Preface to the Instructor

What can we expect students to remember from a course years after it ends? I am sure I have forgotten most of the facts I learned in college, and I suspect the same is true for you and for most of our students. Mastery of facts should not be the goal of education anyway. I hope the field of psychology will continue to progress so that many of the facts we now teach will be supplanted by new research in future decades.

Ideally, a course in psychology or a textbook about it should accomplish two goals. The first is to instill a love of learning, so that our graduates will keep up with new developments in the field, so that they continue to update their education. I fantasize that some of my former students occasionally pick up a copy of *Scientific American*, *American Scientist, Cerebrum*, or some other good magazine and read articles about psychological research. The second goal is to teach the skills of evaluating evidence and questioning assertions, so that if students do read or hear about a new discovery in psychology (or any related field), they will ask the right questions and draw the appropriate conclusions (or lack of them).

I do not believe that a textbook can instill the habit of questioning assertions merely through boxes labeled "Critical Thinking." In the past I have avoided even using that phrase, because I consider it overused and misused. In this edition I have yielded and you will see the phrase here and there. Regardless of terminology, I have tried to model the habit of critical thinking—evaluating the evidence—throughout the text. My goal is to help students learn to ask their own questions, distinguish between good and weak evidence and, ultimately, appreciate the excitement of psychological inquiry.

## What's New in the Sixth Edition

The Table of Contents for this edition is similar to the last edition, except that I have merged the first and second modules of Chapter 13, "Personality." The information in the text has been greatly updated, however. The sixth edition contains more than 500 references that are new since 1997, about half of them from 2000 or 2001. Every chapter has been reorganized, with new material added and old material clarified. Many figures and photographs have been revised or replaced. Throughout the text you can find many new Concept Checks, Try It Yourself ex-

ercises, and What's the Evidence sections. See, for example, page 299 for a new Try It Yourself exercise on overconfidence.

Here are a few examples of new content:

*Chapter 1:* A time line of major events in psychology and concurrent fields.

Chapter 2: A new example of a nonreplicable phenomenon: the much-ballyhooed "Mozart effect"; new examples of how the wording of a survey question influences the results; new discussion with example of why beforeand-after studies can be misleading.

Chapter 3: New research on changes in brain anatomy due to experience, including the growth of new neurons under some conditions; fascinating new study showing that people with left-hemisphere brain damage are better than other people at identifying when someone is lying.

Chapter 4: A new description of Dobelle's work that enables people with damaged eyes to see, using a camera that sends information directly to the brain; a discussion of phantom limb, noting recent research that has completely changed our understanding; brightness contrast, with wonderful new figure. (Don't take my word for it that it's wonderful; check it yourself on page 139.)

*Chapter 5:* New evidence that memories of something just learned become strengthened during sleep; expanded and reorganized treatment of dreaming; new research on narcolepsy.

*Chapter 6:* New material on classical conditioning as a timed response, further supporting the idea that a conditioned response prepares for the unconditioned stimulus.

Chapter 7: Much revised and expanded treatment of the role of attention in working memory; fascinating new example of implicit memory: Brain-damaged amnesic patients, after playing Tetris for 7 hours, don't remember playing the game, but nevertheless visualize little falling blocks as they fall asleep.

*Chapter 8* is the most interactive chapter in the book. It has 22 Try It Yourself exercises, 17 Concept Checks, and 4 A Step Further exercises. For example, note the new demonstration of a different version of the Stroop effect: When you see the name of a color written in an incongruent color, such as the word RED written in blue, it's easier to *say* "red," but it's easier to *point* to a blue patch.

New section noting that the evolution of language ability is not just a consequence of overall intelligence: People with Williams syndrome have normal or good language development despite mental retardation in most other areas.

Comment on the fact that deaf children who don't learn sign language while young learn it only with difficulty later. This observation is our best evidence for a critical period of human language learning.

Chapter 9: Expanded treatment of the Flynn effect, the tendency for raw performance on IQ tests to improve with each generation; new evidence that IQ and school achievement have increased in African Americans since about 1970, cutting by ½ the gap between African Americans and European Americans.

Chapter 10: New explanation of fetal alcohol syndrome; new example showing that even three-year-olds sometimes distinguish between appearance and reality, depending on how they are tested; completely rewritten section on death and dying, introducing terror-management theory; rewritten material on family influences, strengthening the emphasis on evaluation of evidence; expanded and clarified criticism of most birth order studies (another example of critical evaluation of the evidence); new section on gender and self-esteem, noting problems of measurement.

Chapter 11: Compared to other countries, Americans eat a more healthful diet but worry more that it's unhealthful.

Chapter 12: Major expansion of the section on happiness, including the hot new research topic "positive psychology" which is used to pursue the theme of evaluating evidence.

Chapter 13: Revised and clarified criticisms of the Big Five personality traits; interesting new finding that scores on anxiety tests have gradually increased over the decades, for uncertain reasons; expanded and updated criticisms of projective techniques.

Chapter 14: Updated and expanded discussion of the relationship between attractiveness and good genes; revised, updated, and expanded discussion of men's and women's preferences in their partners; brief new section about marriage counseling; revised and updated account of the Prisoner's dilemma.

*Chapter 15:* Clarified criticisms of *DSM-IV*; new examples of the difficulty of preventing mental disorders.

Chapter 16: New research on panic disorder leads to a revised interpretation of its causes and treatment; discussion of St. John's wort as an antidepressant, including the fascinating side effect that it activates a liver enzyme that breaks down other medications; note that prevalence of schizophrenia has declined worldwide since the mid-1900s for no known reason.

## Teaching and Learning Supplements

A number of important supplements accompany the text. Nancy Melucci of Santa Monica College prepared a very thorough and creative Instructor's Resource Guide that includes suggestions for class demonstrations and lecture material; it also contains possible answers to the "Step Further" questions. The Study Guide, by Pamela Brouillard of Texas A & M, Corpus Christi, provides various study aids, including practice test items and an ESL component. A bank of test items has been prepared by Pamela Brouillard and Mark Hartlaub, both from Texas A & M, Corpus Christi. That bank is also available on computer disc. Note that many of the items have already been class tested and the display indicates the percent correct and point biserial for students at N. C. State University. Note also that the test item bank includes a special file of items that cut across chapters, intended for a comprehensive final exam.

Other supplements for the text include transparencies (0-534-53995-5), PsychLink (0-534-58025-4), CNN videos, WebTutor Advantage, the PsychLink CD, and PsychNow! online.

In addition, you and your students will also have access to the *Kalat Sixth Edition* section of the Wadsworth Psychology Study Center at http://psychology.wadsworth.com. This is a convenient place to communicate with students and other instructors, pick up pedagogical tips, lecture ideas, and other instruction aids, and find pertinent resources among annotated lists of Internet links, organized by the subject areas covered in the book. Students can use the *Kalat Sixth Edition* site to test and enhance their understanding of the text through chapter-by-chapter interactive tutorial quizzes and practice tests.

### Acknowledgments

An author needs self-confidence bordering on arrogance just to begin the job of writing a textbook and, to complete it, the humility to accept criticism of favorite ideas and carefully written prose. A great many people provided helpful suggestions that made this a far better text than it would have been without them.

In preparing this edition, I was fortunate to work with very skilled and dedicated people. Vicki Knight, my acquisitions editor, provided consistent encouragement, friendship, support, and wise advice. Penelope Sky, my developmental editor, was the guiding force behind the illustrations, from identifying what needed to be depicted to selecting photos and revising drawings. She also provided detailed comments on certain content points, especially in the final two chapters. Jennifer Wilkinson did a

tireless job of supervising all the supplements. Kirk Bomont was meticulous in shepherding the book into production. Frank Hubert was one of the quickest and most cooperative copy editors I have dealt with in my two decades of textbook writing. Nancy Shammas did a marvelous job of supervising the production and keeping everyone on schedule, a most complicated task with a book such as this. Precision Graphics, which managed the art development, and Ellen Pettengell, who designed the interior, and Roy Neuhaus who created the cover, had the patience and artistic judgment to counterbalance their very nonartistic author. Mary Kay Polsemen accomplished the nearly impossible task of managing all the permissions requests. Marc Linsenman planned and executed the marketing strategies. Joan Murie, the photo researcher, found an amazing variety of images. To each of these, my thanks and congratulations.

My wife, Jo Ellen Kalat, not only provided support and encouragement, but also listened to my attempts to explain concepts and offered many helpful suggestions and questions. My colleagues at North Carolina State University provided me with encouragement, ideas, and free advice. I thank Larry Upton particularly for his extensive and insightful comments. I also received helpful advice from Lynne Baker-Ward, Amy Halberstadt, and Bob Pond.

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James Kalat

## Preface to the Student

Welcome to introductory psychology! I hope you will enjoy reading this text as much as I enjoyed writing it. When you finish, I hope you will fill out the comments page at the back of the book, cut the page out, and mail it to the publisher, who will pass it along to me. Please include a return address.

The first time I taught introductory psychology, several students complained that the book we were using was interesting to read but impossible to study. What they meant was that they had trouble finding and remembering the main points. I have tried to make this book interesting, clear, and as easy to study as possible.

Each chapter is divided into two or more modules, so that you can study one section at a time. Each chapter begins with a table of contents, to alert you to the topics ahead. At the end of each module is a summary of important points, with page references. If a point is unfamiliar you should reread the appropriate text. At the end of each chapter you will find suggestions for further reading, a list of Internet sites to explore, and a list of important terms.

When an important term first appears in the text, it is highlighted in **boldface** and defined in *italics*. All these terms reappear in alphabetic order (with definitions) at the end of the chapter and in the Glossary/Subject Index (with definitions) at the end of the book. You might want to find the Glossary/Subject Index right now and familiarize yourself with it. Note that for each term there is both a definition and a page reference.

I sometimes meet students who think they have mastered the course because they have memorized all the definitions. They are mistaken. You do need to understand the words, but don't waste time memorizing definitions. It is better to use each word in a sentence or list some examples for each term.

At various points in the text are Concept Checks, questions that ask you to use or apply the information you just read. Try to answer each of them, and then turn to the indicated page to check your answer. If your answer is incorrect, you might want to reread the section.

You will also find an occasional passage marked A Step Further. Here you are required to go beyond the text discussion. In many cases there are several reasonable answers. I hope you will think about these questions, perhaps talk about them with fellow students, and maybe ask your instructor's opinion.

I have included in the text a number of items marked Try It Yourself. Some of these require a fair amount of time, but most can be done with little or no equipment in just a minute or two. You will understand and remember the text far better if you do try these exercises. In some cases you will understand the text *only* if you try them. I recall test questions I asked my own students that were answered correctly by almost everyone who tried a particular Try It Yourself exercise, and missed by almost everyone else. A word to the wise . . .

On the inside covers, note the Theme Index, which directs you to pages where Critical Thinking exercises appear in the text, as well as the influences of gender and culture on behavior. In the back of the book you will also find a list of all the references cited in the text, in case you want to check something for more details.

You can enhance your knowledge with the optional Study Guide that accompanies this text. If your book store does not stock it, you can ask them to order a copy. The ISBN is 0-534-53990-4. You can also go to http://psychology.wadsworth.com where example test items (not as many as the Study Guide) and other helpful resources are available.

Now I'll answer a few of the questions often asked by students.

Do you have any useful suggestions for improving study habits? Whenever students ask me why they did badly on the latest test, I ask, "When did you read the assignment?" Some answer, "Well, I didn't exactly read all of the assignment," or "I read it the night before the test." If you want to learn the material well, I recommend reading the text before the lecture, reviewing it again within a day after the lecture, and quickly going over it again a few days later. Then reread the textbook assignments and your lecture notes before any test. Memory researchers have clearly established that you will understand and remember something better by studying it several times over several days than by spending the same amount of time all at once. Also, of course, the more total time you spend studying, the better.

When you study, don't just read the text: Stop and think about it. The more actively you use the material, the better you will remember it. One way to improve your studying is to read by the SPAR method: **S**urvey, **P**rocess meaningfully, **A**sk questions, **R**eview.

*Survey:* Know what to expect so that you can focus on the main points. When you start a chapter, first look over the outline to get a preview of the contents. Before starting a new module, turn to the end and read the summary.

*Process meaningfully:* Read the chapter carefully, stopping to think from time to time. Tell your roommate something you learned. Think about how you might

apply a concept to a real-life situation. Pause when you come to the Concept Checks and try to answer them. Do the Try It Yourself exercises. Try to monitor how well you understand the text and adjust your reading accordingly. Good readers read quickly through easy, familiar content but slowly through difficult material.

Ask questions: When you finish the chapter, try to anticipate what you might be asked later. You can use questions in the Study Guide or compose your own. Write out the questions and think about them, but do not answer them yet.

Review: Pause for a few hours or more. Now return to your questions and try to answer them. Check your answers against the text or the answers in the Study Guide. Reinforcing your memory a day or two after you first read the chapter will help you retain the material longer and deepen your understanding. If you study the same material several times at lengthy intervals, you increase your chance of remembering it long after the course is over.

### Is it worthwhile to buy and use the Study Guide?

The Study Guide is designed for students who would like help studying, remembering the material, or answering multiple-choice questions. It is most useful to freshmen and students who have had trouble with similar courses in the past. The correct answers to multiple-choice questions are included, as well as explanations of why they are correct. You can work through each chapter of the Study Guide in one or two hours. The Study Guide can help if you are willing to spend enough time with it in addition to reading the text.

What do those parentheses mean, as in "(Newstead & Makinen, 1997)"? Am I supposed to remember the names and dates? Psychologists generally cite references not in footnotes but in parentheses. "(Newstead & Makinen, 1997)" refers to an article written by Newstead and Makinen, published in 1997. All the references cited in the text are listed in alphabetical order (by the authors' last names) in the References section at the back of the book.

You will also notice a few citations that include two dates separated by a slash, such as "(Wundt, 1862/1961)." This means that Wundt's document was originally published in 1862 and was republished in 1961. (In this case, Wundt's original work was in German and the 1961 version was an English translation.)

No one expects you to memorize the parenthetical source citations. They are provided so you can look up the source of a statement and check it for further information. A few names *are* worth remembering, however. For instance, you will read about such famous people as B. F. Skinner, Jean Piaget, and Sigmund Freud. Names that are important to remember are emphasized in the discussion, not enclosed in parentheses.

Can you help me read and understand graphs? The graphs in this book are easy to follow. Just take a minute

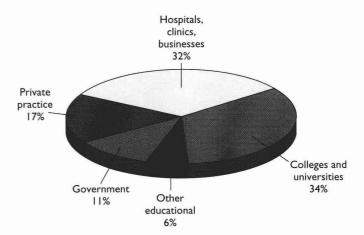


FIGURE | Pie graph

or so to study them carefully. You will encounter four kinds: pie graphs, bar graphs, line graphs, and scatter plots. Let's look at each kind.

*Pie graphs* show how a whole is divided into parts. Figure 1 shows that more than one-third of all psychologists take a starting job with a college or some other educational institution. Another one-fifth to one-fourth of psychologists work in independent practice. The total circle represents 100% of all psychologists.

Line graphs show how one variable is related to another variable. In Figure 2, you see that 80% of people correctly remembered a set of letters—such as HOZDF—after a 3-second delay. As the delay time increased, the percentage of people remembering the letters declined sharply.

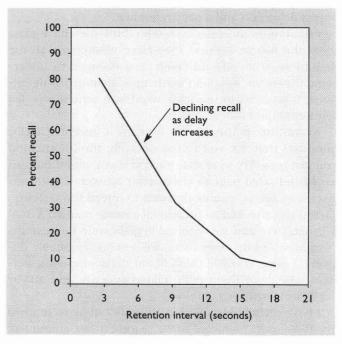


FIGURE 2 Line graph

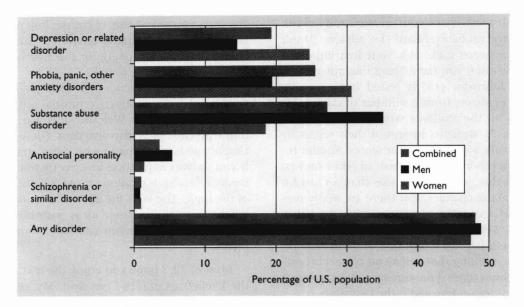


FIGURE 3 Bar graph

*Bar graphs* show how often events fall into one category or another. Figure 3 shows how many adults in the United States suffer from certain psychological disorders. The length of the bars indicates the frequency of particular disorders.

Scatter plots are similar to line graphs, with this difference: A line graph shows averages, whereas a scatter plot shows individual data points. By looking at a scatter plot, we can see how much variation occurs among individuals.

To prepare a scatter plot, we make two observations about each individual. In Figure 4, each student is represented by one point. If you take that point and scan down to the *x*-axis, you find that student's SAT score. If you then scan across to the *y*-axis, you find that student's grade average for the freshman year. A scatter plot shows whether two variables are closely or only loosely related.

### We may have to take multiple-choice tests on this material. How can I do better on those tests?

- 1. Read each statement carefully. Do not choose the first answer that looks correct; first make sure that the other answers are wrong. If two answers seem reasonable, decide which of the two is better.
- 2. If you don't know the correct answer, make an educated guess. Start by eliminating any answer that you know cannot be right. An answer that includes absolute words such as *always* or *never* is probably wrong. (Psychologists occasionally make an absolute statement. For example, "People *never* see anything in complete darkness." However, such absolutes are rare.) Also eliminate any answer that includes unfamiliar terms. If you don't remember ever hearing of something, it probably is not the right answer.

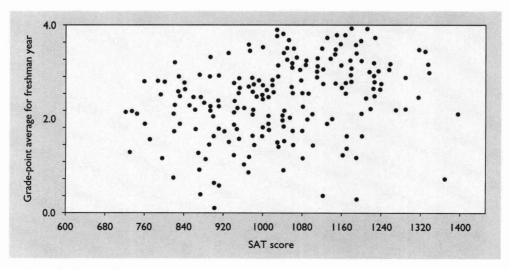


FIGURE 4 Scatter plot

3. After you finish a test, check your answers and rethink them. You have probably heard the advice, "Don't change your answers; stick with your first impulse." No matter how often you have heard that advice, it is wrong. J. J. Johnston (1975) tested it by looking through answer sheets from a number of classes. He found that of all the students who changed one or more answers, 71 students improved their scores by doing so and only 31 lowered their scores. Similar results have been reported in a number of other studies. I do not mean that you should make changes just for the sake of making changes. But there are many reasons why your reconsidered answer might be better than the first. Sometimes when you read the questions that appear later in a test, one of them may remind you of something that helps you correct an earlier answer. Sometimes you reread a question and realize that you misunderstood it the first time.

Why, then, do so many students (and professors) believe that it is a mistake to change an answer? Think of what happens when you get a test paper back. When you look it over, which items do you examine most carefully?

The ones you got wrong, of course. You may notice three items that you originally answered correctly and then changed. You may overlook the five other items you changed from wrong to right.

If you want to practice your multiple-choice skills, try your hand at the interactive tutorial quizzes available at the *Kalat Sixth Edition* Web site; once again, the address is http://psychology.wadsworth.com. These quizzes, one per chapter, go hand-in-hand with the material in this book. If you answer a question incorrectly online, you get immediate feedback guiding you to a better understanding of the topic. The Web site also includes discussion boards where you can exchange ideas with other readers, and Internet links where you can learn more about certain topics.

Most of all, I hope you enjoy the text. I have included the liveliest examples I can find. My goal is not just to teach you some facts, but to encourage a love of learning so that you will read more and educate yourself about psychology long after your course is over.

James Kalat

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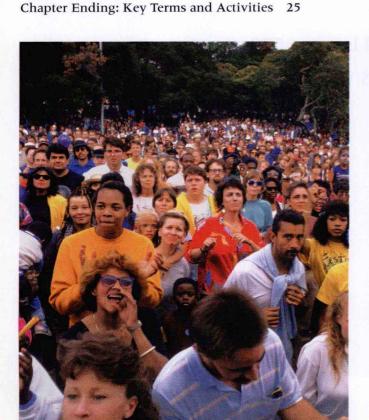
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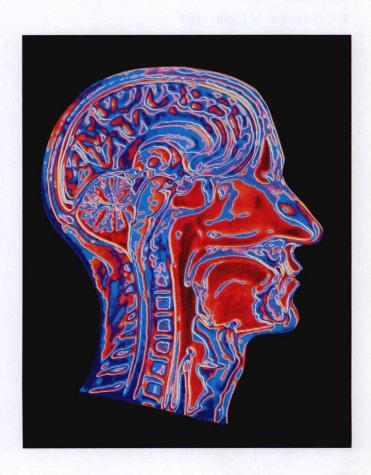
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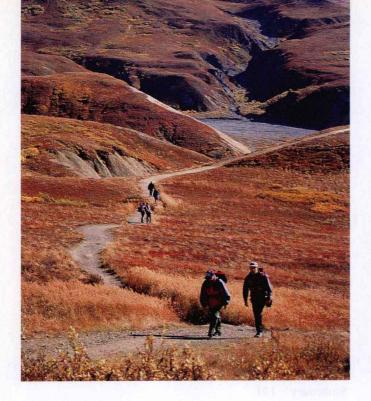
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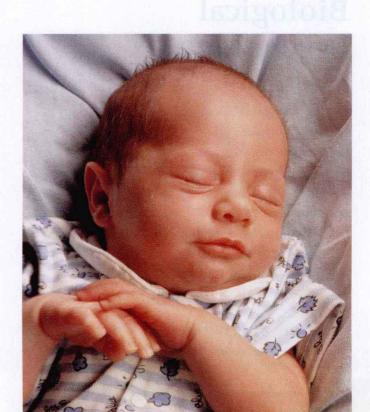
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