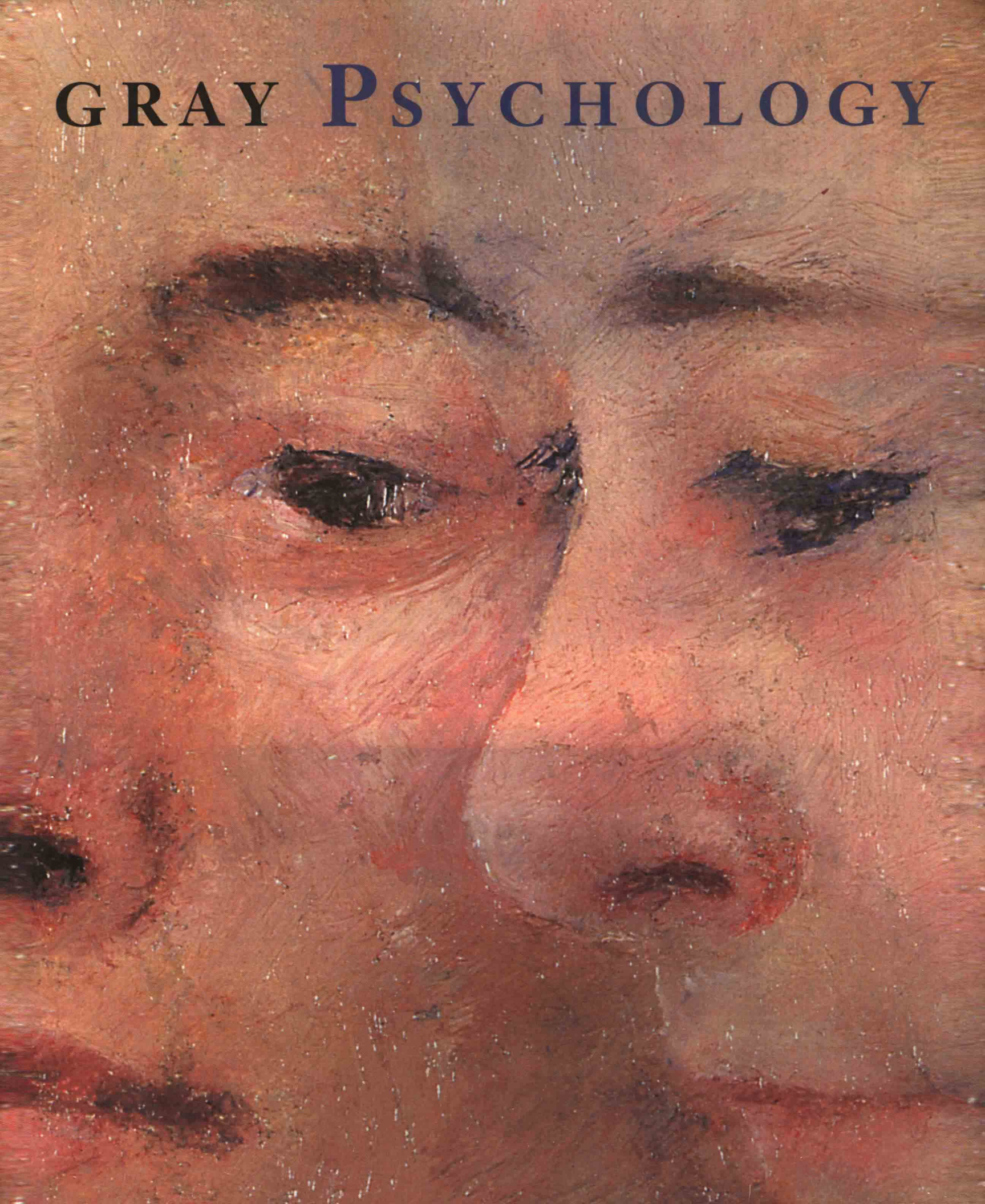


# GRAY PSYCHOLOGY



# PSYCHOLOGY

PETER GRAY

Boston College

Worth Publishers, Inc.

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*To Anita and Scott*

**PSYCHOLOGY**

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# PREFACE

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My immodest goal has been to write an introduction to psychology that describes the main ideas of the field, and the evidence behind them, in as logically coherent and intellectually stimulating a manner as possible—one that will excite students' interest through appealing to their intelligence. As cognitive psychologists have shown repeatedly, the human mind is not particularly good at absorbing and remembering miscellaneous pieces of information. It is designed for thinking, figuring out, understanding; and it remembers what it understands. I want students to join you and me in *thinking about* behavior—its functions, causes, and mechanisms.

Toward achieving this goal, I have approached each domain of psychology with the aim of identifying its main questions, its main approaches to answering questions, and its most important and interesting theories and findings. I have striven to describe these as clearly as possible and have provided concrete, real-life examples to help readers see their relevance. The book is organized in a way that brings together similar questions and ways of thinking about behavior, so as to maximize the opportunities to present extended arguments while still covering the traditional ground of the introductory course. Margin notes continuously call attention to the main ideas and lines of evidence. Throughout the book I have aimed to depict the science of psychology as a human endeavor in which progress comes through the work of thoughtful, if fallible, people who make observations, conduct experiments, reason, and argue about behavior.

One of my dearest aims has been to achieve some small measure of the personal touch that William James accomplished so masterfully in *The Principles of Psychology*—the book that still stands, in my mind, as far and away the best introduction to psychology ever written. (I keep reminding myself that James had it easier—psychology was only a few years old at the time.) I hope students will read this text—as anyone must read James's—not as Truth with a capital *T*, nor as an unbiased distillate of all of psychology, but rather as one person's honest attempt to understand the field and to convey that understanding as best he could. Toward that end, in writing the book I constantly imagined myself carrying on a dialogue with an inquiring, thinking, appropriately skeptical student.

I must also confess (as you will find it out anyway in reading the text) to sharing two of James's biases—rationalism and functionalism. As a rationalist, I am uncomfortable presenting findings and facts without trying to make sense of them. Sometimes in our teaching of psychology we overplay the methods for gathering and analyzing data and underplay the value of logical thought. I want students always to think about findings in relation to larger ideas and not to gain the impression that the discipline is simply a piling of fact upon fact. As a functionalist, I want to know why, in terms of survival or other benefit, people (or animals) behave as they do. This latter bias does not dominate the book, but it certainly seeps through in many places. It is part of the reason why the first major unit (following the brief *Background to the Study of Psychology* unit) is entitled *Nature, Nurture, and Behavioral*

*Adaptation* and deals with behavioral evolution and learning in back-to-back chapters. Natural selection and learning are the two reasons why behavior is functional, and I want students to know something about those processes, and their interaction, right from the start. This functionalist orientation also leads me, in the second half of the book, to pay more than the usual amount of attention to cross-cultural research and to behavioral processes as they operate in the contexts of people's everyday lives.

An important issue faced by any textbook author is that of deciding how much attention to pay to current as opposed to classic work. Clearly, a prime task of any introductory psychology text published today is to represent the field as it is in the 1990s, but, in my view, that task cannot be achieved without a historical perspective. One cannot adequately depict psychology for the future by providing a snapshot of the present. Ideas and approaches in psychology or any scholarly field emerge and evolve over time, and a reasoned presentation must portray something of that evolution. This book contains plenty of current research, but it sets that research in the context of ideas that have been around for a long time and are associated with such names as Darwin, Pavlov, Piaget, Lewin, and Freud.

## Organization

---

Over the decades, a relatively uniform way of dividing up and arranging topics has emerged and taken hold in introductory psychology. For the most part, I have followed that standard organization: It is comfortable; it fits reasonably well with the ways that research psychologists divide up the discipline; and it makes considerable logical sense. My slight departures reflect three important developments in contemporary psychology: (1) Knowledge of heredity and evolution is increasingly recognized to be important as a background for thinking about basic psychological processes. (2) Developments in the study of basic learning processes (which has always been conducted largely with nonhuman animals) link that field more closely than ever to an evolutionary perspective. (3) Developments in cognitive psychology link its attempts to understand the components of the mind more meaningfully than in the past to the more traditional psychometric approach to the human intellect.

The book is divided into seven units, or parts, each of which consists of two or three chapters.

Part 1, *Background to the Study of Psychology*, has two relatively brief chapters. The first, on the history and scope of psychology, shows how some of psychology's most basic ideas and ways of conducting research have developed over time; and the second, on methods, lays out some general elements of psychological research that will be useful to students in later chapters. (If you prefer a more thorough discussion of statistics than Chapter 2 contains, you may wish to supplement it with the first three sections of the Statistical Appendix.)

Part 2, *Nature, Nurture, and Behavioral Adaptation*, is devoted explicitly to two fundamental themes that reappear frequently in the book: (1) Behavioral mechanisms are formed through an interplay between genetic inheritance (nature) and environmental experience (nurture); and (2) behavior can be understood as adaptation to the environment, which occurs at two levels—the phylogenetic level (through natural selection) and the individual level (through learning). These themes are developed in three chapters. The first is on behavioral genetics; after laying out the fundamentals of the nature-nurture issue and the behavioral genetic approach, this chapter explores research on the heritability of intelligence and schizophrenia as well as various single-gene traits. The second chapter, on the evolution of behavior, includes the idea that even behaviors that are most highly prepared by evolution must develop, in the individual, through interaction with the

environment. The third chapter, on basic processes of learning, includes the idea that learning mechanisms themselves are products of evolution.

Part 3, *Physiological Mechanisms of Behavior*, is a three-chapter discussion of the attempt to explain behavior in terms of the neural and hormonal mechanisms that produce it. The first chapter is a functional introduction to the nervous system and to the actions of hormones and drugs. The second is about basic mechanisms of motivation and arousal; here the ideas about the nervous system and hormones developed in the previous chapter are applied to the topics of hunger, sex, reward mechanisms, sleep, and emotionality. The third chapter is on sensory mechanisms, focusing mainly on hearing, vision, and pain. Although this unit emphasizes physiological mechanisms, it is not exclusively physiological. For example, the discussions of motives and emotions pay ample attention to the role of environmental influences, and the discussion of sensation includes psychophysical methods and findings.

The sensation chapter at the end of Part 3 flows logically into the perception chapter at the beginning of Part 4, *Cognitive Mechanisms of Behavior*. Like the physiological approach, the cognitive approach attempts to explain behavior in terms of inner mechanisms; but it is concerned with mechanisms that are too complex to understand physiologically, and are therefore discussed in the metaphorical terms of information-processing models. The second chapter of this unit is on memory, the core topic of cognitive psychology, and the third is entitled *The Human Intellect*. This somewhat unusual chapter deals with three topics that are becoming ever more closely associated in contemporary psychology: (1) the structure of human intelligence, (2) the cognitive components of problem solving, and (3) the cognitive components of language ability and the relation of language to thought. Throughout these chapters, the information-processing approach is highlighted but is tempered by ecological discussions that draw attention to the functions of each mental process and the environmental contexts within which they occur.

In sum, Parts 2, 3, and 4 are all concerned with basic psychological processes, and each part deals with those processes from a different explanatory perspective. Part 2 takes a functionalist, or adaptationist, perspective; Part 3 takes a physiological perspective; and Part 4 takes an information-processing perspective. This arrangement allows me to develop coherent arguments and to avoid the confusion that often comes when very different modes of explanation are mixed together. The remaining three parts are concerned with understanding the whole person and the person's relationships to the social environment.

Part 5, *Growth of the Mind and Person*, is a two-chapter unit on developmental psychology. The first chapter, on cognitive development, deals with the same large processes—thought and language—as did the last chapter of Part 4, but now from a developmental perspective. A major goal here is to show how the adult mind can be understood by identifying and describing the steps through which it is built in the developing child. The second chapter, on social development, is concerned with the changes in social relationships and life tasks that occur through the life span. This chapter also sets the stage for the next pair of chapters.

Part 6, *The Person in a World of People*, is a two-chapter unit on social psychology. The first chapter, on social cognition, is concerned with the mental processes involved in forming judgments of other people, perceiving and presenting the self in the social environment, and forming and modifying attitudes. The second chapter, on social influence, deals with compliance, obedience, conformity, group decision-making, and intergroup conflict. A theme running through this chapter is that of contrasting the normative and informational influences that stem from observing other people's behavior. The unit on social psychology is placed before the one on personality and mental disorders because the insights of social psychology—especially those pertaining to social cognition—are increasingly becoming incorporated into personality theories and approaches to understanding and treating mental disorders.

Part 7, *Personality and Disorders*, consists of three chapters on topics that students most strongly identify as “psychology” before they enter the course. The first chapter, on personality theories, focuses on the main explanatory concepts and lines of evidence underlying (a) Freud’s theory, (b) post-Freudian psychodynamic theories, (c) humanistic theories, (d) social learning theories, and (e) trait theories of the person. The second chapter, on mental disorders, begins by discussing the problems involved in categorizing and diagnosing disorders, and then, through the discussion of specific disorders, emphasizes the notion of multiple causation and the theme that the symptoms characterizing disorders are different in degree, not in kind, from normal psychological experiences and processes. The final chapter, on treatment, offers an opportunity to recapitulate many of the main ideas of earlier chapters—now in the context of their application to therapy. Ideas from Parts 2, 3, 4, and 6 reappear in the discussions of biological, behavioral, and cognitive therapies, and ideas from the personality chapter reappear in the discussions of psychodynamic and humanistic therapies.

Although this ordering of topics makes the most sense to me, I recognize that other sensible arrangements exist and that time limits may prevent you from using the entire book. Therefore, each chapter is written so that it can be read as a separate entity, independent of others. Links are often made to material presented in another chapter, but most of these are spelled out in enough detail to be understood by students who have not read the other chapter. The only major exception falls in the physiological unit: Chapters 7 and 8, on motivation and sensation, assume that the student has learned some of the basic information presented in Chapter 6, on the nervous system.

## Features

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The main pedagogical feature of this or any other textbook is, of course, the narrative itself, which should be clear, logical, and interesting. Everything else is secondary. I have avoided the boxes and inserts that are often found in introductory psychology texts, because such digressions add to the impression that psychology is a jumble of things that don’t fit together very well. I have aimed, to the degree that the field allows it, to produce a logical flow of ideas.

One nondisruptive feature I have included is *margin notes*, each of which calls attention to the main idea, line of argument, or evidence addressed in the adjacent paragraphs of text. Each note contains an implicit question; to make the question clear, most of the notes begin with the words *How*, *Why*, *The difference between*, or *Evidence that*. As described in the *To the Student* section, these notes are designed both to promote active, focused reading and to provide a guide for review. To review, the students need only re-read the margin notes and study again the accompanying text in those places where he or she cannot answer a note’s implied question. I owe the idea to my son, Scott, who found that his understanding of a book of philosophical dialogues was enhanced by similar notes that helped him to keep track of the developing arguments.

Because the margin notes make a traditional end-of-chapter review unnecessary, I am able to conclude each chapter with a section called *Concluding Thoughts*. This section expands on the broad themes of the chapter, points out relationships to ideas discussed in other chapters, and sometimes even offers a new idea or two for students to consider as they reflect on the chapter. *Concluding Thoughts* is followed by a brief section called *Further Reading*, which contains thumbnail reviews of several relevant and interesting books that are sufficiently nontechnical to be read by the first-year student. At the very end of each chapter, a tiny section called *Looking Ahead* is designed to entice the reader into the next chapter and to show its relationship to the chapter just read.

## Supplements

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An excellent study guide called *Focus on Psychology* has been prepared to accompany this text. Its author, Mary Trahan, is a cognitive psychologist at Randolph-Macon College who has a special interest in applying the insights of her field to the teaching of psychology. Trahan's guide is designed to be used in parallel with the reading of each textbook chapter, helping students to focus their attention on and think about its main ideas. Students who have pretested the guide have praised it highly.

For instructors, a very useful *Instructor's Resource Manual* has been prepared by Timothy M. Osberg, a specialist in developmental and clinical psychology, and Burt Thompson, a specialist in perception and learning, both at Niagara University. For each chapter, Osberg and Thompson describe interesting class demonstrations and activities, with handouts, for class participation; provide writing exercises to test students' mastery of concepts; suggest ways to elaborate on some of the textbook's key ideas; and recommend relevant films and videos, including modules from *The Brain* and *The Mind* series. They also suggest appropriate programs from *PsychSim II: Computer Simulations in Psychology*, the award-winning software with accompanying student worksheets, developed by Thomas Ludwig at Hope College. I have also contributed an introductory chapter to the manual, offering some general thoughts about teaching introductory psychology and using this text. An extensive set of transparencies, available on request, has been made from charts, graphs, and illustrations from the textbook and other sources. Also available is a carefully developed *Test Bank* of multiple-choice and essay questions, prepared by Mary Trahan and Norman Simonson, a clinical psychologist at the University of Massachusetts, Amherst.

## Acknowledgments

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Nobody writes a textbook alone. Hundreds of people have contributed to the development of this one, of whom I can list only a few here.

Herbert Terrace's inspiring introductory psychology course at Columbia University enticed me, at age 18, to turn away from a planned career in physics toward one in psychology. In graduate school at Rockefeller University, I was inspired and taught by Neal Miller, Jay Weiss, Bruce McEwen, William Estes, Peter Marler, and many others. My outlook has also been strongly influenced by my colleagues at Boston College, some of whom have contributed in very direct ways to the development of this book. They include (in alphabetical order) Greg Ball, Ali Banuazizi, Norm Berkowitz, Hiram Brownell, Donnan Canavan, Randy Easton, Marc Fried, Murray Horwitz, Marianne LaFrance, Ramsay Liem, Michael Moore, Gilda Morelli, Michael Numan, Bill Ryan, Karen Schneider-Rosen, Jeanne Sholl, Joe Tecce, and Ellen Winner. Of these, I owe special thanks to my friend Michael Moore, who worked closely with me on early drafts of the cognitive and developmental units, and who carefully read and brilliantly critiqued early drafts of the other units.

Another group who deserve special thanks, but are too numerous to name, are the hundreds of students in my sections of Introductory Psychology, who read chapter drafts as part of their course assignments, and whose feedback was invaluable in my writing of final drafts. I also thank Jane Manwaring, Dawn Derienzo, and Bianca Dinapoli for their help in the preparation of materials. I thank, too, my friends Daniel and Hanna Greenberg, educational innovators and philosophers who have contributed greatly to my own thinking in both psychology and education. And, more than anyone else, I thank my wife, Anita, and my son, Scott, who have put up with me through all this and have contributed immeasurably to my growth and to the development of the ideas in this book. It is dedicated to them.



How can I appropriately thank Phyllis Fisher, my wonderfully demanding and intellectually inspiring developmental editor? Our working arrangement has been one of continuous dialogue and debate. In the process, Phyllis has taught me not only to be a better writer, but also a better thinker and psychologist than I was before we met. She shared all of my initial goals and insisted that I stick with them, but she also led me to adopt some new goals. For example, she made me far more sensitive than I had previously been to issues pertaining to gender and culture, and this sensitivity has become an important part of the book.

As part of her task, Phyllis coordinated the process by which experts in each area of psychology and notably successful teachers of the introductory course reviewed each draft of the text. I was greatly impressed by the seriousness with which the reviewers approached this task; they taught me a great deal, and each one influenced the final outcome. A reviewer whose wise, gentle suasions were especially valuable is Peter Platenius, of Queen's University, Ontario. For their thoughtful, sometimes challenging, and always helpful reviews, I thank:

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*Framingham, Massachusetts*  
*January 1991*

# TO THE STUDENT

Welcome to your psychology textbook. I hope you will enjoy it. It is about a question that, to me, is one of the most fascinating anyone can ask: What makes people feel, think, and behave the way they do? That, really, is what psychology is about. In this book you will read, in different units, about different approaches to answering that big question; and you will discover dozens of specific findings and ideas that help to answer it.

I hope that as you read this book you will allow yourself to become intrigued by psychology; that you will not focus too narrowly on getting a good grade; that you will think about, challenge, and discuss with others the book's ideas; and that you will keep constantly in mind that ideas in psychology come from people who are basically no different from you—so your own insights, questions, and thoughts are legitimate. Psychology is a science, and the essence of science is this: We do not accept anything on authority. It doesn't matter *who* says that something is or isn't true; what matters is the *evidence*—the facts and logic upon which the ideas are based, which are open for evaluation by any thinking person. In this book I have tried to present both the main ideas in psychology and some of the evidence. Each page is offered for your consideration, not for your unquestioning acceptance.

You may find it useful to know about some of this book's special features before you begin your study. Perhaps the most useful of these is the *margin notes*, which occur at a rate of about one per page of text. Each note points out the main issue or argument in the paragraph or paragraphs that follow it. For example, if you turn to page 3, you will find that the book's first margin note reads as follows:

■ *A succinct definition of psychology and three ways of expanding on it.* That note tells you exactly what the following paragraphs are about. If you read it first, before reading the paragraphs, it will help you to focus your attention; you will read with the goal of discovering how psychology is defined and three ways in which that definition can be expanded. As you continue on through the book, you will find that these notes serve not only to help you to read actively—for the explicit purpose of answering their implied questions—but also to review. When you have completed a section of the chapter, go back and re-read the margin notes. If you can answer the implied question in each note, you have understood what you have read; if you cannot, you should probably read the relevant paragraphs again.

I would also like to draw your attention to the *numbered figures* in each chapter. In some cases a figure will help you understand a point that would be difficult from the text alone, and in other cases it will provide you with information that supplements or complements what is in the text. Whenever the text says, "see Figure \_\_\_\_\_," take a few moments to study that figure and read the caption. Many of the figures are graphs, with data that back up an idea described in the text. If you have not had much experience reading graphs, please do not feel embarrassed

about mentioning that to your instructor. He or she might then present some sample graphs in class and explain how to read them.

Another feature is the use of ***bold italics*** to highlight important terms. I suggest that you *not* devote much effort, on your first reading, to learning term definitions. Rather, read with the aim of understanding and thinking about the main *ideas* and the lines of evidence supporting or refuting them. In that process you will learn many of the terms, in the context of the ideas, without explicitly trying to learn them. The bold italics may be useful, however, in your later review. As you are reviewing the margin notes, look also for each of the bold italics terms and check your knowledge of its meaning. These terms are also defined in the *glossary* at the back of the book. If an important term has been defined in an earlier chapter, it is sometimes, but not always, defined again when it reappears. If it is not defined, you can use the glossary to find both the term's definition and the number of the page on which it was first used.

A feature that this book shares with other books and articles in psychology is the use of *reference citations*, which can be found in the narrative on nearly every page. Each citation consists of the name of one or more researchers followed by a year. Sometimes both the name (or names) and the year are in parentheses, such as (*Jones & Smith, 1984*), and other times, when the name or names are part of the sentence, only the year is in parentheses, such as *According to Alice Jones (1987). . .* In either case, the year refers to the year of publication of an article or book, by the person or persons named, which describes more fully the idea or the research study being mentioned or discussed. The full reference to that article or book can be found in the *References* section at the back of the textbook. At first you may find these citations disruptive to the flow of your reading, but you will soon learn to read right through them. Their purpose is to give credit to the people whose work or ideas are being described and to give you the opportunity to look up, and read more about, any ideas or research findings that intrigue you. In addition, at the end of each chapter, in a section called *Further Reading*, you will find brief reviews of several interesting books that you might use to supplement your study of specific areas of psychology.

An excellent study guide, called *Focus on Psychology*, has been written by Mary Trahan to accompany this textbook. The study guide will help you learn and remember the main ideas as you read each chapter of the textbook. It also contains practice tests you can use to determine your mastery of the material.

Finally, I suggest that you turn to page 336, where, in the context of a general discussion of research on memory, you will find some ideas about reading any textbook that will help you to remember its contents.

And now—let's discuss psychology.

# CONTENTS IN BRIEF

---

## PART 1

### BACKGROUND TO THE STUDY OF PSYCHOLOGY 1

#### CHAPTER 1

##### THE HISTORY AND SCOPE OF PSYCHOLOGY 3

#### CHAPTER 2

##### METHODS OF PSYCHOLOGY 25

---

## PART 2

### NATURE, NURTURE, AND BEHAVIORAL ADAPTATION 45

#### CHAPTER 3

##### GENETICS OF BEHAVIOR 47

#### CHAPTER 4

##### THE ADAPTIVENESS OF BEHAVIOR I: EVOLUTION 81

#### CHAPTER 5

##### THE ADAPTIVENESS OF BEHAVIOR II: LEARNING 121

---

## PART 3

### PHYSIOLOGICAL MECHANISMS OF BEHAVIOR 163

#### CHAPTER 6

##### THE NERVOUS SYSTEM 165

#### CHAPTER 7

##### MECHANISMS OF MOTIVATION, SLEEP, AND EMOTION 197

#### CHAPTER 8

##### SENSATION 239

---

## PART 4

### COGNITIVE MECHANISMS OF BEHAVIOR 281

#### CHAPTER 9

##### PERCEPTION 283

#### CHAPTER 10

##### MEMORY 323

#### CHAPTER 11

##### THE HUMAN INTELLECT 365

---

## PART 5

### GROWTH OF THE MIND AND PERSON 409

#### CHAPTER 12

##### COGNITIVE DEVELOPMENT 411

#### CHAPTER 13

##### SOCIAL DEVELOPMENT 449

---

## PART 6

### THE PERSON IN A WORLD OF PEOPLE 489

#### CHAPTER 14

##### SOCIAL COGNITION 491

#### CHAPTER 15

##### SOCIAL INFLUENCES ON BEHAVIOR 527

---

## PART 7

### PERSONALITY AND DISORDERS 561

#### CHAPTER 16

##### THEORIES OF PERSONALITY 563

#### CHAPTER 17

##### MENTAL DISORDERS 605

#### CHAPTER 18

##### TREATMENT 643

---

### STATISTICAL APPENDIX A-1

### GLOSSARY G-1

### REFERENCES R-1

### ILLUSTRATION CREDITS IC-1

### NAME INDEX NI-1

### SUBJECT INDEX SI-1

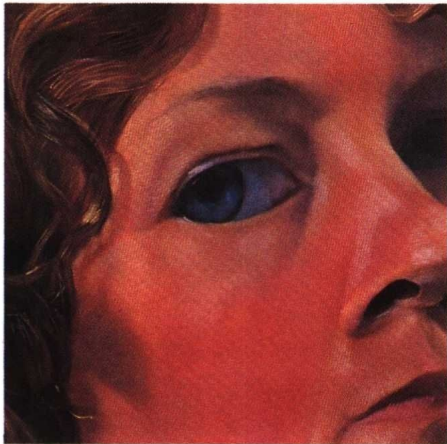
# CONTENTS

---

---

## PART 1

### BACKGROUND TO THE STUDY OF PSYCHOLOGY 1



---

## CHAPTER 1

### THE HISTORY AND SCOPE OF PSYCHOLOGY 3

#### Before Psychology:

#### Preparing the Intellectual Ground 4

*Philosophical Developments: From Spirit to Machine* 4

*Nineteenth-Century Physiology:*

*Learning About the Machine* 6

*Darwin and Evolution:*

*A New Unity of Person and Nature* 7

#### The Evolution of Psychology:

#### A History of Alternative Perspectives 8

*The Origin of Experimental Psychology* 8

*Early Structuralism* 9

*Early Functionalism* 9

*Gestalt Psychology* 10

*Psychoanalysis* 12

*Behaviorism* 13

*Ethology* 14

*Physiological Psychology* 16

*Cognitive Psychology* 16

### The Scope of Psychology Today 19

*The Connections of Psychology  
to Other Scholarly Fields* 19

*The Questions of Psychology as  
Arranged in This Book* 20

*Psychology as a Profession* 21

### Concluding Thoughts 22

### Further Reading 23

### Looking Ahead 23

---

## CHAPTER 2

### METHODS OF PSYCHOLOGY 25

#### Lessons from Clever Hans 25

#### A Taxonomy of Research Strategies 28

*Research Designs* 28

*Data-Collection Methods* 31

*Research Settings* 32

#### Statistical Methods in Psychology 33

*Describing the Central Tendency  
and Variability of a Set of Data* 33

*Describing a Correlation* 34

*Inferential Statistics* 35

#### Sources of Error and Bias

#### in Psychological Research 36

*Problems with the Measurement Procedure* 36

*Observer-Expectancy Effects* 38

*Subject-Expectancy Effects (Placebo Effects)* 38

*Problems in Generalizing from  
a Sample to a Larger Population* 39

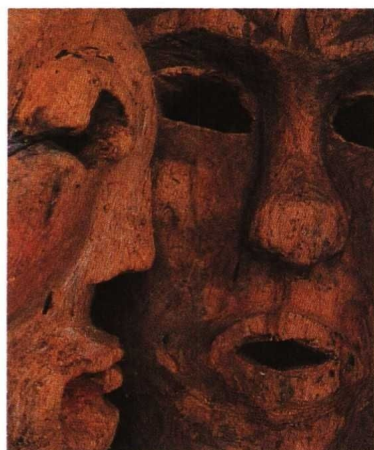
#### Ethical Issues in Psychological Research 40

### Concluding Thoughts 42

### Further Reading 43

### Looking Ahead 43



**PART 2****NATURE, NURTURE, AND BEHAVIORAL ADAPTATION 45****CHAPTER 3****GENETICS OF BEHAVIOR 47****Principles of Gene Action and Heredity 48***How Genes Affect Physical**Development and Behavior 48**Sexual Reproduction and Patterns of Heredity 49***Single-Gene and Chromosomal Effects on Behavior 53***Mendelian Inheritance of Behavioral**Traits in Dogs: Scott and Fuller's Study 54**Mendelian Disorders in Humans 56**Chromosomal Disorders in Humans 58***Polygenic Effects on Behavior 61***The Concept of Heritability 62**Selective Breeding for Behavioral**Characteristics in Animals 64**The Heritability and Environmentalty of IQ 67**Genetic Influence on Risk for Schizophrenia 73***Concluding Thoughts 77****Further Reading 79****Looking Ahead 79****CHAPTER 4****THE ADAPTIVENESS OF BEHAVIOR I: EVOLUTION 81****Basic Concepts: Natural Selection and Evolutionary Adaptation 81***The Process of Evolution by Natural Selection 81**Evolutionary Adaptation 85**Some Precautions Concerning**Adaptational Thinking 87***Ethology: The Study of Species-Specific Behavior Patterns 89***Describing Species-Specific Behaviors 89**Development of Species-Specific Behaviors:**The Role of the Environment 91**Tracing the Evolution of Species-Specific Behaviors 93**Human Emotional Expressions as**Species-Specific Behaviors 97***Sociobiology: The Comparative Study of Animals' Social Systems 104***Patterns of Mating 105**Patterns of Aggression 110**Patterns of Helping 112**Sociobiological Thought About Human Behavior 113***Concluding Thoughts 118****Further Reading 119****Looking Ahead 119****CHAPTER 5****THE ADAPTIVENESS OF BEHAVIOR II: LEARNING 121****The Behavioral Perspective:****Acquiring New Responses to Stimuli 121***Classical Conditioning 122**Operant Conditioning 130***The Cognitive Perspective:****Acquiring Information About the World 143***Cognitive Views of Conditioning 143*

<i>Place Learning</i>	150
<i>Observational Learning</i>	151
<b>The Ecological Perspective: Filling the Blanks in Species-Specific Behavior Patterns</b>	153
<i>Learning What to Eat</i>	153
<i>Other Examples of Selective Learning Abilities</i>	157
<b>Concluding Thoughts</b>	159
<b>Further Reading</b>	160
<b>Looking Ahead</b>	161

---

### PART 3

#### PHYSIOLOGICAL MECHANISMS OF BEHAVIOR 163




---

### CHAPTER 6

#### THE NERVOUS SYSTEM 165

<b>Neurons: The Units of the Nervous System</b>	165
<b>Functional Organization of the Nervous System</b>	172
<i>The Peripheral Nervous System</i>	173
<i>Functional Approach to the Central Nervous System</i>	175
<i>The Spinal Cord and Reflex Mechanisms</i>	175
<i>Subcortical Structures of the Brain</i>	177
<i>The Cerebral Cortex</i>	180
<i>Hierarchical Organization in the Control of Movement: A Summary</i>	185
<b>Hormones, Drugs, and Their Interactions with Neurotransmission</b>	187
<i>Hormones</i>	187
<i>Drugs</i>	190
<b>Concluding Thoughts</b>	194
<b>Further Reading</b>	195
<b>Looking Ahead</b>	195

---

### CHAPTER 7

#### MECHANISMS OF MOTIVATION, SLEEP, AND EMOTION 197

<b>Motivation and Reward</b>	197
<i>The Physiological Approach to the Study of Drives</i>	199
<i>Hunger</i>	202
<i>The Sex Drive</i>	208
<i>Reward Mechanisms and Their Relationship to Drives</i>	214
<b>Sleep</b>	216
<b>Arousal and Emotionality</b>	226
<i>High Arousal and Stress</i>	226
<i>The Relationship Between Physiological Arousal and Emotion</i>	229
<b>Concluding Thoughts</b>	236
<b>Further Reading</b>	236
<b>Looking Ahead</b>	237

---

### CHAPTER 8

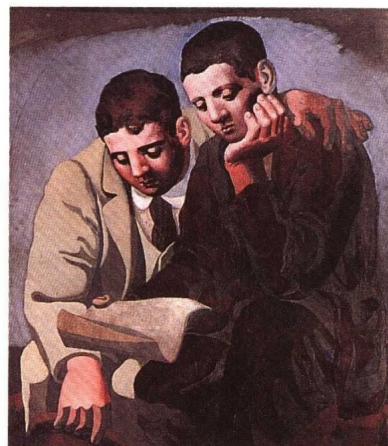
#### SENSATION 239

<b>Overview</b>	240
<b>Hearing</b>	244
<b>Vision</b>	251
<b>Pain</b>	266
<b>Psychophysics</b>	270
<b>Concluding Thoughts</b>	277
<b>Further Reading</b>	278
<b>Looking Ahead</b>	279

---

### PART 4

#### COGNITIVE MECHANISMS OF BEHAVIOR 281





---

**CHAPTER 9****PERCEPTION 283****Perceiving Patterns and Recognizing Objects 284***Holistic Perception and Top-Down**Analysis of Stimulus Input 285**Feature Detection and Bottom-Up**Analysis of Stimulus Input 290***Attention: The Selectivity of Perception 295****Perceiving Objects in Relation to Space:****Depth, Size, and Motion Perception 303***Perceiving Depth 304**Perceiving Size 306**Perceiving Motion 311**Two Perspectives on the Use of Relational Information:**Unconscious Inference and Direct Perception 313***Concluding Thoughts 319      Further Reading 321****Looking Ahead 321**

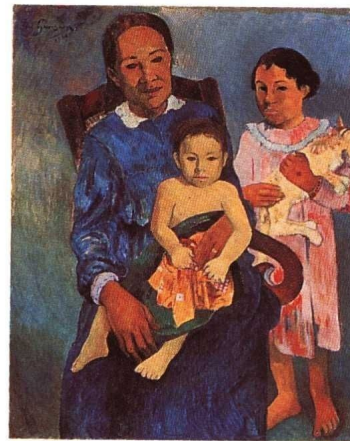
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**CHAPTER 10****MEMORY 323****An Information-Processing Model of Memory 323****Sensory Memory: The Preattentive Store 328****Short-term Memory and****Encoding into Long-term Memory 331***Rote Rehearsal 331**Beyond Rote Rehearsal 334***Representation and Organization****in Long-term Memory 340***The Problem of Representation 340**Organization of Knowledge 345***Problems of Retrieval from Long-term Memory 349***Why Do We Forget? 349**Memory Construction as a Source of Distortion 354**Effects of Hypnosis on Memory 356***Neuropsychological Evidence for Multiple Memory Systems 357****Concluding Thoughts 361      Further Reading 362****Looking Ahead 363**

---

**CHAPTER 11****THE HUMAN INTELLECT 365****Conceptions of Intelligence 365***The Psychometric Approach to Intelligence 366**The Information-Processing**Approach to Intelligence 373**The Neuropsychological Approach to Intelligence 377**The Ecological Approach to Intelligence 383***Logical Reasoning and Problem Solving 385***Elements of Logic 386**Some Strategies for Solving Problems 390***Language and Its Relationship to Thought 394***Language as a Cognitive System 394**The Relation of Language to Thought 401***Concluding Thoughts 406      Further Reading 407****Looking Ahead 407**

---

**PART 5****GROWTH OF THE MIND AND PERSON 409**

---

**CHAPTER 12****COGNITIVE DEVELOPMENT 411****Some Basic Issues in the Study of Development 411****Development of Perception and Knowledge in Infancy 414***Perceptual Development 414**Early Knowledge 417***Development of Language 420***The Course of Language Development 420**Internal and External Supports  
for Language Development 425**Teaching Language to Chimpanzees 428***Development of Logical Thought 431***Piaget's Studies of Reasoning in Children 431**Piaget's Theory of Mental Development 435**The Information-Processing Perspective 440**The Sociocultural Perspective 443***Concluding Thoughts 446****Further Reading 447****Looking Ahead 447**

---

**CHAPTER 13****SOCIAL DEVELOPMENT 449****Perspectives on Social Development 449***Theories Emphasizing Drives and Mental Conflicts 449**Theories Emphasizing Cognitive Growth 451**Theories Emphasizing the Social Environment 451***Infancy: Attachment to Caregivers 454****Childhood: Becoming Socialized 460***Parenting Styles 460**Theories About the**Developmental Functions of Play 463**School as a Socializing Force 464**Gender as a Factor in Socialization 466***Adolescence: Finding Oneself 470***Relationships in Adolescence 470**Sexuality 472**Self-Concept and Identity 473**Moral Reasoning 475***Adulthood: Caring and Working 479***Family 479**Employment 481**Growing Old 483***Concluding Thoughts 486****Further Reading 487****Looking Ahead 487**

---

**PART 6****THE PERSON IN A WORLD OF PEOPLE 489**

---

**CHAPTER 14****SOCIAL COGNITION 491****Perceiving Others 491***Basic Processes of Person Perception 492**Biases in Person Perception 494***Perceiving and Presenting the Self 501***The Self as a Social Product 501**The Social Presentation of the Self 506***Meanings of Friendship and Love 510****Attitudes 513***Functions and Origins of Attitudes 513**Cognitive Dissonance as a Force**for Attitude Consistency and Change 516**Why Don't People Always Behave**According to Their Attitudes? 519***Concluding Thoughts 523****Further Reading 525****Looking Ahead 525**

---

**CHAPTER 15****SOCIAL INFLUENCES ON BEHAVIOR 527****A Perspective: The Person in a Field of Social Forces 527****Influence of Others' Requests 530***Some Principles of Compliance 530**Obedience: Milgram's Experiments and Beyond 535***Influence of Others' Presence or Examples 540***Audience and Coparticipant Effects 540**Conformity 545**Group Discussion and Decision Making 548**Group Versus Group 552***Concluding Thoughts 558****Further Reading 559****Looking Ahead 559**

---

**PART 7****PERSONALITY AND DISORDERS 561**

---

**CHAPTER 16****THEORIES OF PERSONALITY 563****Freud's Psychodynamic Theory 564***Freud's Model of the Mind 564**Freud's View of Personality Development 570**Personality Research Based on Freud's Theory 572**Critique of Freud's Theory 574***Post-Freudian Psychodynamic Theories 576****Humanistic Theories 578***Basic Tenets of Humanistic Psychology 579**Rogers's Theory 581**Maslow's Theory 582**Critique of Humanistic Theories 584*