



THIRD EDITION

Psychology

GLEITMAN

Psychology

Third Edition

HENRY GLEITMAN

UNIVERSITY OF PENNSYLVANIA

W • W • NORTON & COMPANY • NEW YORK • LONDON



Copyright © 1991, 1986, 1981 by W. W. Norton & Company, Inc.

Printed in the United States of America
All Rights Reserved
Third Edition

Library of Congress Cataloging-in-Publication Data

Gleitman, Henry.

Psychology/Henry Gleitman.—3rd ed.

p. cm.

Includes index.

I. Psychology. I. Title.

BF121.G58 1991

150—dc20

90-41937

ISBN 0-393-95955-4

The text of this book is composed in Times Roman, with the display type set in Times Roman Bold.

Composition by New England Typographic Service, Inc.

Manufacturing by R. R. Donnelley & Sons Company.

Book design by Antonina Krass.

Illustrations by Delores Bego.

Cover illustration: *David*, by Michelangelo (Photograph by A. Moldvay/Art Resource, New York)

Acknowledgments and copyrights appear on pages A93–A99, which constitute a continuation of the copyright page.

W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, N.Y. 10110

W. W. Norton & Company, Ltd., 10 Coptic Street, London WC1A 1PU

1 2 3 4 5 6 7 8 9 0

Preface

This is the third edition of my book *Psychology*. One reason for this revision is the obvious fact that like any other discipline, psychology advances and develops. Until a few decades ago, many psychologists tended to be somewhat defensive about the status of the field and were probably a bit too loud in proclaiming that “Psychology is a science!” Today there is no need for such defensive proclamations, for by now that assertion has become a simple statement of fact. In the decades that have passed psychology has assuredly become a “real” and vigorously progressive science.

As a field advances, so must the books that try to describe it. These advances, together with suggestions by students and colleagues who have used the text, prompted a number of changes that I describe below.

THE OVERALL AIM: COHESION IN A DIVERSE FIELD

Before describing these changes, let me briefly review what has not changed: my original aims. In writing *Psychology*, I sought to present the field in all its diversity while yet conveying the sense in which it is a coherent intellectual enterprise. In pursuit of this goal, I did the following:

1. To present the different sub-areas of psychology, I organized the book around five main questions: How do humans (and where relevant, animals) act, how do they know, how do they interact, how do they develop, and how do they differ from each other?
2. To provide some intellectual cohesion, I considered each topic against the backdrop of one or two major ideas that could serve as an organizing and unifying framework. Thus the chapter on the biological bases of behavior opens with

Descartes's conception of the organism as a machine, and the next chapter treats various aspects of motivated behavior as manifestations of negative feedback. To relate the material across chapters, I used several overarching themes. For example, the various chapters that deal with cognition (Sensory Processes, Perception, Memory, Thinking, and Language) all involve variations on the two controversies of nature versus nurture and psychological atomism versus organization.

3. In many cases, the attempt at integration required taking a step backward to look at psychology's intellectual history, for a number of the field's endeavors are hard to explain unless one points to the paths that led up to them. Why did Thorndike study cats in puzzle boxes? Why did his conclusions have such an important effect on American psychology? Why were they challenged by Köhler and Tolman? It still pays to take a serious look at the work of such pioneers before turning to the present. Much as a river's water is clearer when it is taken from its source, so issues that have become more and more complex as detail has piled upon detail become more plain and evident when traced back to their origin.

GENERAL ORGANIZATION

The most obvious difference between this and the previous editions is the expansion of the coverage of the topics of social psychology and personality, which are now treated in two chapters each. Further changes represent updatings (in some cases, major updatings) of the subject matter that are best described within an outline of the overall structure of the book. After an introductory chapter, the book is divided into five parts that reflect the perspectives from which most psychological phenomena can be regarded: Action, Cognition, Social Behavior, Development, and Individual Differences. In brief outline, they cover the following topics:

Part I: Action

This part focuses on overt behavior and its physiological basis. It begins by considering the biological underpinnings of human and animal action, leading to a discussion of the nervous system and its operation (Chapter 2) and some phenomena of motivation (Chapter 3). It then asks how organisms can modify their behavior to adapt to new circumstances, a topic which leads to a discussion of classical and instrumental conditioning and modern behavior theory (Chapter 4).

In Chapter 2 (*Biological Bases of Behavior*) there is an increased emphasis on neurotransmitter processes at the synapse and on modern work on recovery of nervous function. Chapter 3 (*Motivation*) now includes sections on feeding disorders, drug addiction, and a discussion of the biological basis of reward. Chapter 4 (*Learning*) stresses recent developments in animal learning, including work on contingency and modern cognitive approaches to classical and instrumental conditioning.

Part II: Cognition

This part deals with knowledge and how it is gained and used. It begins by asking how the senses provide us with information about the world outside (Chapter 5), and how this information is organized and interpreted to lead to the perception of objects and events (Chapter 6). Further questions concern the way this knowledge is stored in memory and retrieved when needed (Chapter 7), the way it is organized through thinking (Chapter 8), and the way knowledge is communicated to others through the medium of language (Chapter 9).

Many of the changes in this part reflect a greater concern with recent information-processing approaches. In Chapter 5 (*Sensory Processes*) the organization has been simplified by incorporating an appendix on some aspects of signal detection within the chapter. In Chapter 6 (*Perception*), the organization has been changed to give more prominence to some modern approaches to pattern recognition. Chapter 7 (*Memory*) highlights the changes in outlook from the stage theories of the sixties to the modern emphasis on encoding and retrieval and such current concerns as the role of schemas in memory and the difference between explicit and implicit memory. Chapter 8 (*Thinking*) includes new material on artificial intelligence, on reasoning, and on the role of framing in decision making. Chapter 9 (*Language and Language Development*), written by Lila Gleitman and myself, merged what were formerly two chapters into one that deals with language structure and processing as well as with language acquisition.

Part III: Social Behavior

This part concerns our interactions with others. It begins with a discussion of built-in social tendencies in humans and animals, a topic to which ethology and evolutionary theory have made major contributions (Chapter 10). It proceeds by taking up the first influential attempt to understand how childhood affects human socialization by considering Freud and psychoanalytic concepts (Chapter 11), thus paving the way for the discussion of modern approaches to social development taken up later in the section on development. It then turns to modern social psychology, considering how people try to understand the social situation in which they find themselves, how they interpret their own internal states and emotions, and how they interact with others (Chapters 12 and 13).

There have been several changes in this section. Chapter 10 (*The Biological Bases of Social Behavior*) includes an expanded section on primate social behavior, as well as an expanded discussion of the relevance of sociobiological theories to human concerns. Like its counterpart in the previous edition, Chapter 11 (*The Individual and Society: The Contributions of Sigmund Freud*) discusses the contributions of psychoanalytic and related views to our conceptions of socialization. Two chapters are now devoted to issues in modern social psychology. Chapter 12 (*Social Cognition and Emotion*) focuses on the way individuals interpret social events, and includes discussions of attitudes and attitude change, attribution, impressions of others, and the interpretation of one's own internal states. Chapter 13 (*Social Interaction*) deals with the way individuals deal with others, and includes discussions of social exchange, attraction and love, conformity, obedience, and crowd behavior.

Part IV: Development

This section contains two chapters on development. Chapter 14 (*Physical and Cognitive Development*) now merges what were formerly two chapters into one with a greater focus on recent, post-Piagetian approaches to mental growth, and includes a section on cultural differences in cognitive development. Chapter 15 (*Social Development*) updates its counterpart in the previous edition with expanded discussions of such topics as moral development, empathy, sex and gender. As previously noted, the subject matter of a former chapter on language development is now incorporated into one single chapter on language (Chapter 9).

Part IV: Individual Differences

This part begins with a chapter on mental testing in general and intelligence testing in particular (Chapter 16), and then continues with two new chapters on personality assessment and theory (Chapters 17 and 18). It continues by looking at several varieties of psychopathology and asking how they arise (Chapter 19), and concludes by examining various methods of treatment and therapy (Chapter 20).

Chapter 17 (*Intelligence*) is updated in various ways, including more recent attempts to understand intelligence in information-processing terms. Two new chapters take up personality differences. Chapter 18 (*Personality I*) considers methods of personality assessment and discusses trait theory as one of four theoretical approaches to personality, with particular attention to the trait-situation controversy and to recent attempts to look for biological and genetic bases of personality differences. Chapter 19 (*Personality II*) takes up three other theoretical approaches to personality—the psychodynamic, behavioral, and humanistic. Both Chapter 19 (*Psychopathology*) and Chapter 20 (*Treatment of Psychopathology*) have been updated to include modern developments, such as the two-syndrome hypothesis of schizophrenia, new work on panic disorder, and new approaches to the evaluation of treatment outcome.

THE READER AND THE BOOK

It is sometimes said that students in the introductory course want to learn about things that are relevant to themselves and to their own lives. But why should this be a problem? When you come right down to it, there is something odd about the idea that psychology is *not* relevant to anyone's particular life history—specialist and nonspecialist alike. Psychology deals with the nature of human experience and behavior, about the hows and whys of what we do, think, and feel. Everyone has perceived, learned, remembered and forgotten, has been angry and afraid and been in love, has given in to group pressure and been independent. In short, everyone has experienced most of the phenomena that psychology tries to explain. This being so, psychology cannot fail to be relevant.

It surely is relevant, but its relevance has to be pointed out. I've tried to do so by a liberal use of examples from ordinary experience and a frequent resort to

metaphors of one kind or another, in the hope that in so doing I would show the direct relation of many psychological phenomena to the reader's own life.

In these attempts, the most important guide has been my own experience as a classroom teacher. There is little doubt that one of the best ways of learning something is to teach it, for in trying to explain to others, you first have to clarify it to yourself. This holds for the subject matter of every course I have ever taught, but most especially for the introductory course. Students in an advanced course will come at you with tough and searching questions; they want to know about the evidence that bears on a theory of, say, color vision or language acquisition, and about how that evidence was obtained. But students in an introductory course ask the toughest questions of all. They ask why anyone would ever want to know about color vision (or language acquisition or whatever) in the first place. And they also ask what any one topic has to do with any other. They ask such questions because they—unlike the advanced students—have not as yet accepted the premises of the field. They wonder whether the emperor is really wearing clothes. As a result, they made me ask myself afresh what the field of psychology is all about—what the emperor's clothes are really like when you look at them more closely.

This book as well as its predecessor grew out of my attempts to answer such questions over the years in which I taught the introductory course, to answer them not only to satisfy the students but also to satisfy myself.

SUPPLEMENTARY MATERIALS

To help serve the needs of students, instructors, and teaching assistants, several supplementary materials are available with this text.

1. *For the student:*

There is a complete *Study Guide* for students, prepared by two of my colleagues and collaborators, John Jonides of the University of Michigan and Paul Rozin of the University of Pennsylvania. This *Study Guide*, a revised version of the guide the same authors wrote for the first and second editions of *Psychology*, should prove very useful to students who want some help and guidance in mastering the material in the text. Moreover, for every chapter, it provides experiments and observational studies that students can carry out on their own to get some first-hand experience with psychology's subject matter.

2. *For the instructor:*

There is an *Instructor's Manual*, prepared by Christine Massey of Swarthmore College, Hilary Schmidt of New Jersey Medical School and the Monell Institute, Alan Silberberg of American University, and myself, which offers specific suggestions for every textbook chapter, including discussion topics, demonstrations, and a bibliography. The manual also includes an annotated film and media guide prepared by James B. Maas of Cornell University.

John Jonides of the University of Michigan and Paul Cornwell of Pennsylvania State University, with the help of Tibor Palfai of Syracuse University, have pre-

pared a *Test Item File*, which includes questions for all chapters and the statistical appendix. A proportion of these questions have been statistically analyzed at Syracuse and Pennsylvania State Universities; the resulting data are included in the printed *Test Item File*. Of course, this *Test Item File* is available on diskette in MS-DOS, Apple II, and Macintosh formats.

I have prepared a set of *Classroom Demonstrations* with the collaboration of Paul Rozin and Lila Gleitman, both of the University of Pennsylvania. Included are materials necessary to perform about thirty in-class experiments covering a range of phenomena, from the speed of the nervous impulse, through the Stroop effect, to a demonstration of sex stereotypes. Slides, transparencies, student worksheets, data summaries, and detailed instructions for the instructor are included. These demonstrations are adapted from those that I and my collaborators have used in our own teaching.

ACKNOWLEDGMENTS

There remains the pleasant task of thanking the many friends and colleagues who helped so greatly in the various phases of writing this book and its predecessors. Some read parts of the manuscript and gave valuable advice and criticism. Others talked to me at length about various issues in the field which I then saw more clearly. I am very grateful to them all. These many helpers, and the main areas in which they advised me, are as follows:

Biological Foundations

Elizabeth Adkins-Regan, *Cornell University*; Norman T. Adler, *University of Pennsylvania*; Robert C. Bolles, *University of Washington*; Brooks Carder, *Dorothy Cheney, University of Pennsylvania*; John D. Corbit, *Brown University*; Alan N. Epstein, *University of Pennsylvania*; Steven Fluharty, *University of Pennsylvania*; Charles R. Gallistel, *University of California, Los Angeles*; Harvey J. Grill, *University of Pennsylvania*; Jerre Levy, *University of Chicago*; Martha McClintock, *University of Chicago*; Peter M. Milner, *McGill University*; Douglas G. Mook, *University of Virginia*; Allen Parducci, *University of California, Los Angeles*; Judith Rodin, *Yale University*; Paul Rozin, *University of Pennsylvania*; Jonathan I. Schull, *Haverford College*; Robert Seyfarth, *University of Pennsylvania*; W. John Smith, *University of Pennsylvania*; Paul G. Shinkman, *University of North Carolina*; Peter Shizgall, *Concordia University*; Edward M. Stricker, *University of Pittsburgh*.

Learning

Ruth Colwill, *Brown University*; Frank Costin, *University of Illinois*; Richard B. Day, *McMaster University*; Paula Durlach, *McMaster University*; Richard C. Gonzales, *Bryn Mawr College*; Robert Henderson, *University of Illinois*; Werner Honig, *Dalhousie University*; Francis W. Irwin, *late of University of Pennsylvania*.

nia; Nicholas Mackintosh, *Cambridge University*; Robert Rescorla, *University of Pennsylvania*; Barry Schwartz, *Swarthmore College*; Richard L. Solomon, *University of Pennsylvania*; John Staddon, *Duke University*.

Sensation and Perception

Linda Bartoshuk, *Yale University*; Julian E. Hochberg, *Columbia University*; Leo M. Hurvich, *University of Pennsylvania*; Dorothea Jameson, *University of Pennsylvania*; R. Duncan Luce, *University of California, Irvine*; Neil A. MacMillan, *Brooklyn College*; James L. McClelland, *Carnegie-Mellon*; Jacob Nachmias, *University of Pennsylvania*; Edward Pugh, *University of Pennsylvania*; Irwin Rock, *University of California, Berkeley*; Burton S. Rosner, *Oxford University*; Robert Steinman, *University of Maryland*; Denise Varner, *University of Washington*; Brian Wandell, *Stanford University*; James L. Zacks, *Michigan State University*.

Cognition

Lynn A. Cooper, *Columbia University*; Robert G. Crowder, *Yale University*; Lila R. Gleitman, *University of Pennsylvania*; Francis C. Keil, *Cornell University*; Deborah Kemler, *Swarthmore College*; Stephen M. Kosslyn, *Harvard University*; John Jonides, *University of Michigan*; Michael McCloskey, *Johns Hopkins University*; Douglas Medin, *University of Illinois*; Morris Moscovitch, *University of Toronto*; Ulric Neisser, *Emory University*; Daniel N. Osherson, *Massachusetts Institute of Technology*; David Premack, *University of Pennsylvania*; Daniel Reisberg, *Reed College*; Miriam W. Schustack, *University of California, San Diego*; Myrna Schwartz, *University of Pennsylvania*; Michael Turvey, *University of Connecticut*; Rose T. Zacks, *Michigan State University*.

Language

Sharon L. Armstrong, *Drake University*; Anne Fowler, *Bryn Mawr College*; John Gilbert, *University of British Columbia*; Roberta Golinkoff, *University of Delaware*; Barbara Landau, *Columbia University*; Anne Lederer, *University of Pennsylvania*; Elissa Newport, *University of Rochester*; Ruth Ostrin, *Medical Research Council, Cambridge, England*; Ted Suppala, *University of Rochester*; Kenneth Wexler, *Massachusetts Institute of Technology*.

Social Psychology

Solomon E. Asch, *University of Pennsylvania*; Joel Cooper, *Princeton University*; Phoebe C. Ellsworth, *University of Michigan*; Frederick J. Evans, *Carrier Foundation, Bellemead, N.J.*; Alan Fridlund, *University of California, Santa Barbara*; Larry Gross, *University of Pennsylvania*; Michael Lessac; Clark R. McCauley, Jr., *Bryn Mawr College*; Stanley Milgram, *late of City College of New York*; Martin T. Orne, *University of Pennsylvania*; Albert Pepitone, *University of Pennsylvania*;

Dennis Regan, *Cornell University*; Lee Ross, *Stanford University*; John Sabini, *University of Pennsylvania*; Philip R. Shaver, *University of Denver*; R. Lance Shotland, *Pennsylvania State University*.

Development

Thomas Ayres, *Clarkson College of Technology*; Renée Baillargeon, *University of Illinois*; Anne L. Brown, *University of Illinois*; Justin Aronfreed, *University of Pennsylvania*; Edwin Boswell, *Ardmore, Pennsylvania*; Adele Diamond, *University of Pennsylvania*; Carol S. Dweck, *Columbia University*; Margery B. Franklin, *Sarah Lawrence College*; Rochel Gelman, *University of California, Los Angeles*; Frederick Gibbons, *Iowa State University*; Ellen Gleitman, *Devon, Pennsylvania*; Susan Scanlon Jones, *Indiana University*; Philip J. Kellman, *Swarthmore College*; Ellen Markman, *Stanford University*; Elizabeth Spelke, *Cornell University*; Douglas Wallen, *Mankato State University*; Sheldon White, *Harvard University*.

Intelligence

Jonathan Baron, *University of Pennsylvania*; James F. Crow, *University of Wisconsin*; Daniel B. Keating, *University of Minnesota*; Robert Sternberg, *Yale University*.

Personality

Hal Bertilson, *Saint Joseph's University*; Jack Block, *Massachusetts Institute of Technology*; Nathan Brody, *Wesleyan University*; Peter Gay, *Yale University*; Lewis R. Goldberg, *University of Oregon, Eugene*; Ruben Gur, *University of Pennsylvania*; Judith Harackiewicz, *Columbia University*; John Kihlstrom, *University of Arizona*; Lester B. Luborsky, *University of Pennsylvania*; Carl Malmquist, *University of Minnesota*; Jerry S. Wiggins, *University of British Columbia*.

Psychopathology

Lyn Y. Abramson, *University of Wisconsin*; Lauren Alloy, *Temple University*; Kayla F. Bernheim, *Livingston County Counseling Services*; John B. Brady, *University of Pennsylvania*; Gerald C. Davison, *University of Southern California*; Leonard M. Horowitz, *Stanford University*; Steven Mathysse, *McLean Hospital*; Sue Mineka, *Northwestern University*; Ann James Premack, *University of Pennsylvania*; Rena Repetta, *New York University*; Martin E.P. Seligman, *University of Pennsylvania*; Larry Stein, *University of California, Irvine*; Hans H. Strupp, *Vanderbilt University*; Paul L. Wachtel, *College of the City University of New York*; Ingrid I. Waldron, *University of Pennsylvania*; Richard Warner, *University of Southern California*; David R. Williams, *University of Pennsylvania*; Julius Wishner, *University of Pennsylvania*.

Intellectual History

Mark B. Adams, *University of Pennsylvania*; David DeVries, *New York University*; Claire E. Gleitman, *New York University*; Alan C. Kors, *University of Pennsylvania*; Elisabeth Rozin, *Upper Darby, Pennsylvania*; Harris B. Savin, *Philadelphia, Pennsylvania*.

To state in detail how each of these persons helped me is impossible. But I do want to express special thanks to a few whose comments helped me to see whole topics in a new light for this edition. I owe special thanks to Ruth Colwill, Paula Durlach, Werner Honig, and Robert Rescorla, whose wise counsel and comments helped me understand how recent developments in the field of animal learning have given new life to many issues of its past; to Dorothy Cheney and Robert Seyfarth, who gave me valuable insights into empirical and theoretical issues in modern ethology; to Michael McCloskey and Douglas Medin, who provided unfailingly good advice in the areas of perception and cognition; to Robert Crowder, whose incisive comments on several drafts of the chapter on memory were invaluable; to Daniel Reisberg, who gave me important insights into new developments in the fields of memory and thinking and whose help went far beyond the bounds of collegial duty; to Jonathan Baron, Phoebe Ellsworth, and Rick McCauley, whose discussions of thinking, social processes, and intelligence helped me consider many aspects of these areas from a new perspective; to Adele Diamond, Susan Scanlon Jones, and Philip Kellman, who helped me to see the developmental forest as well as its trees; to Nathan Brody, whose many discussions and insightful comments on two chapters on personality I found invaluable; and to Lauren Alloy, whose comments and advice on facts and theories in the field of psychopathology were indispensable.

Yet another kind of thanks goes to Neil Macmillan who wrote "Statistics: The Collection, Organization, and Interpretation of Data," an appendix for *Psychology*, with a fine sense of balance between the demands of the subject matter and the demands of expository clarity.

Four persons contributed in a special way: Lyn Abramson, John Jonides, Paul Rozin, and John Sabini. All four are distinguished scientists as well as dedicated teachers with considerable experience in the introductory course. They served as an editorial advisory group who counseled me on all aspects of this edition, sharing their knowledge of the subject matter as well as their experience in communicating it to beginning students. Lyn Abramson was particularly helpful in discussions of individual differences and psychopathology. John Jonides provided sharp criticisms and new perspectives, especially in the area of cognition. As always, Paul Rozin helped me see many facets of the field in a new way, especially its biological aspects. John Sabini shared his wide-ranging scholarly perspective, which was of particular help in the areas related to social processes.

In thanking all these persons I take particular pleasure from the fact that about half of them were once undergraduate and/or graduate students of mine. I find something reassuring in the reflection that those I once taught are now teaching me, though it's almost certain that I learned much more from them now than they ever learned from me.

To one person I owe a special debt: my wife, friend, and collaborator, Lila R. Gleitman. She read virtually all chapters of this manuscript and did what she

PREFACE

always does to the things I do and think and write about—she makes them better. Much better. I can't thank her enough.

Several persons helped on this edition in still other ways. Kathy Hirsh-Pasek took photographs of her children to add to those illustrating previous developmental chapters. Further thanks go to my publisher, W. W. Norton, specifically to Roy Tedoff who managed the production of the book; to Antonina Krass who designed it; to Dolores Bego who executed the drawings and illustrations; to Amy Cherry who supervised the photo and art research, and to Jane Carter, Claire Gleitman, and Libby Miles who participated in that endeavor; to Ruth Mandel who lent us her sharp artistic eye; to Hank Smith who provided helpful and generous editorial advice and encouragement; and to Cathy Wick who served as a valuable adviser as well as editor of various ancillaries. I owe special thanks to Roberta Flechner for her untiring and admirable efforts in arranging the layouts, which somehow managed to fit the many pieces of the puzzle into a seamless whole.

My final thanks go to two other persons at Norton. One is its president, Donald Lamm. I met him over twenty-five years ago when he first gave me the idea to write this book. We have both aged (somewhat) in the interim, but he is still the same sharp-eyed critic that he was twenty-five years ago—his ideas are as brilliant (and often as outrageous) as ever, his puns as bad as ever, and my esteem and affection for him are as great as ever.

The other person at Norton I want to thank is my editor, Sandy Lifland. She is a person of exquisite taste and enormous personal tact and sensitivity, of extraordinary judgment and competence, and of an amazing ability to keep track of a multitude of details while never losing sight of the overall whole. It was a real pleasure to work with her.

H.G.

Merion, Pennsylvania
October 1990

The Contents in Brief

1. Introduction

PART I

Action

2. Biological Bases of Behavior
3. Motivation
4. Learning

PART II

Cognition

5. Sensory Processes
6. Perception
7. Memory
8. Thinking
9. Language

PART III

Social Behavior

10. The Biological Basis of Social Behavior
11. The Individual and Society: The Contributions of Sigmund Freud
12. Social Cognition and Emotion
13. Social Interaction

PART IV

Development

14. Physical and Cognitive Development
15. Social Development

PART V

Individual Differences

16. Intelligence: Its Nature and Measurement
17. Personality I: Assessment and the Trait Approach
18. Personality II: Psychodynamic, Behavioral, and Humanistic Approaches
19. Psychopathology
20. Treatment of Psychopathology

APPENDIX

Statistics: The Collection, Organization, and Interpretation of Data

Contents

Preface xxi

CHAPTER 1 Introduction 1

The Scope of Psychology 1 ELECTRICALLY TRIGGERED IMAGES
AMBIGUOUS SIGHTS AND SOUNDS THE PERCEPTUAL WORLD OF IN-
FANTS DISPLAYS COMPLEX SOCIAL BEHAVIOR IN HUMANS

A Science of Many Faces 5 DREAMS AS MENTAL EXPERIENCES
DREAMS AS BEHAVIOR DREAMS AS COGNITION DREAMS AND SOCIAL
BEHAVIOR DREAMS AND HUMAN DEVELOPMENT DREAMS AND INDI-
VIDUAL DIFFERENCES PERSPECTIVES ON PSYCHOLOGY

The Task of Psychology 13

PART I

Action

CHAPTER 2 Biological Bases of Behavior 17

The Organism as Machine 17 DESCARTES AND THE REFLEX CONCEPT
THE BASIC NERVOUS FUNCTIONS: RECEPTION, INTEGRATION, REACTION

Nerve Cell and Nerve Impulse 20 THE NEURON THE ELECTRICAL
ACTIVITY OF THE NEURON

Interaction among Nerve Cells 25 THE REFLEX INFERRING THE
SYNAPSE THE SYNAPTIC MECHANISM

Interaction through the Bloodstream: The Endocrine System 35

The Main Structures of the Nervous System 36 THE EVOLUTION OF
CENTRAL CONTROL THE PERIPHERAL AND CENTRAL NERVOUS SYSTEMS
HIERARCHICAL FUNCTION IN THE NERVOUS SYSTEM

The Cerebral Cortex 42 PROJECTION AREAS ASSOCIATION AREAS
ONE BRAIN OR TWO? RECOVERY FROM BRAIN INJURY

Some Problems in Localizing Brain Function 58 WHAT IS THE PSYCHO-
LOGICAL FUNCTION? WHO'S IN CHARGE?

Summary 60

CHAPTER 3 Motivation 62

Motivation as Direction 62 CONTROL SYSTEMS

Self-Regulation 64 HOMEOSTASIS TEMPERATURE REGULATION

Thirst 68 VOLUME RECEPTORS OSMORECEPTORS

Hunger 69 THE SIGNALS FOR FEEDING HYPOTHALAMIC CONTROL
CENTERS FOOD SELECTION OBESITY ANOREXIA AND BULIMIA

Fear and Rage 81 THREAT AND THE AUTONOMIC NERVOUS SYSTEM
DISRUPTIVE EFFECTS OF AUTONOMIC AROUSAL

Sleep and Waking 85 WAKING SLEEP

What Different Motives Have in Common 92 LEVEL OF STIMULATION
DRUGS AND ADDICTION THE OPPONENT-PROCESS THEORY OF MOTIVA-
TION THE BIOLOGY OF REWARD THE NATURE OF MOTIVES

Summary 100

CHAPTER 4 Learning 102

Habituation 103

Classical Conditioning 104 PAVLOV AND THE CONDITIONED REFLEX
THE MAJOR PHENOMENA OF CLASSICAL CONDITIONING EXTENSIONS OF
CLASSICAL CONDITIONING

Instrumental Conditioning 112 THORNDIKE AND THE LAW OF EFFECT
SKINNER AND OPERANT BEHAVIOR THE MAJOR PHENOMENA OF INSTRU-
MENTAL CONDITIONING

Cognitive Learning 123 A COGNITIVE VIEW OF CLASSICAL CONDITIONING A COGNITIVE VIEW OF INSTRUMENTAL CONDITIONING BIOLOGICAL CONSTRAINTS ON LEARNING

Complex Cognition in Animals 140 COGNITIVE MAPS INSIGHTFUL BEHAVIOR

Taking Stock 146

Summary 146

PART II

Cognition

CHAPTER 5 Sensory Processes 151

The Orgins of Knowledge 151 THE EMPIRICIST VIEW THE NATIVIST REJOINDER

Psychophysics 155 MEASURING SENSORY INTENSITY DETECTION AND DECISION

Sensory Coding 163

An Overview of the Senses 164 KINESTHESIS AND THE VESTIBULAR SENSES THE SKIN SENSES THE SENSE OF TASTE THE SENSE OF SMELL HEARING THE SENSES: SOME COMMON PRINCIPLES

Vision 176 THE STIMULUS: LIGHT GATHERING THE STIMULUS: THE EYE THE VISUAL RECEPTORS INTERACTION IN TIME: ADAPTATION INTERACTION IN SPACE: CONTRAST COLOR THE PHYSIOLOGICAL BASIS OF COLOR VISION

Summary 195

CHAPTER 6 Perception 199

The Problem of Peception 199

The Perception of Depth: Where Is It? 200 BINOCULAR CUES MONOCULAR CUES THE PERCEPTION OF DEPTH THROUGH MOTION INNATE FACTORS IN DEPTH PERCEPTION

The Perception of Movement: What Is It Doing? 205 ILLUSIONS OF MOVEMENT PERCEIVED STABILITY

Form Perception: What Is It? 207 RECOGNIZING THE ELEMENTS OF FORM PERCEPTUAL SEGREGATION PATTERN RECOGNITION