PRINCIPLES OF PSYCHOLOGY

SECOND EDITION



Price

Glickstein

Horton

Sherman

Fazio

PRINCIPLES OF PSYCHOLOGY

SECOND EDITION

Richard H. Price University of Michigan, Ann Arbor

> Mitchell Glickstein University College, London

David L. Horton
University of Maryland, College Park

Steven J. Sherman Indiana University, Bloomington

Russell H. Fazio Indiana University, Bloomington

Scott, Koresman and Company Gienview, Illinois London, England Cover: Robert Drea for Scott, Foresman.

Copyright © 1987, 1982 Scott, Foresman and Company. All Rights Reserved.

Printed in the United States of America.

123456 VHJ 919089888786

Library of Congress Cataloging in Publication Data Principles of psychology. Bibliography: p. Includes index. 1. Psychology. I. Price, Richard H. BF121.P7 1987 150 86-29714 ISBN 0-673-18743-8

PREFACE

One of the reasons psychology is exciting to teach and to learn is that it is a series of stories of discovery. In telling these stories to our students, we are presenting the science of psychology at its best. Seen this way, psychology can be enjoyed for its logic, its rigor, and its use of the scientific method. To be sure, the story of discovery in psychology is also a story of false starts and blind alleys that have tested the persistence and insight of those men and women who have contributed to the field through their research. We believe that psychology can be taught in all its complexity without sacrificing accuracy or understanding if we teach it by telling the story of discovery. It is this idea that has inspired us as we prepared the second edition of *Principles of Psychology*.

Our Goals in Preparing the Second Edition

As we reflected on what we had accomplished in the first edition of *Principles* and what we hoped to accomplish in the second, several major themes emerged. First, as with the first edition, we wanted to emphasize psychological research. In order to do this, we believed it crucial to draw on the expertise of active researchers to provide sound scholarship across the broad expanse of psychology. In addition, we wanted to add depth to several chapters while maintaining our orientation to comprehensive content. Third, we planned the format design and illustration for this edition to be even more inviting and engaging. Finally, we felt that this edition of *Principles* should have a special set of learning aids designed especially for it.

Research: The Story of Discovery

Psychology is a method of inquiry as well as a body of knowledge. In addition to describing what we know about behavior and mental processes, *Principles* explains precisely *how we know it*. For example, one of the most exciting new areas of psychological research focuses on the chemistry of the brain. *Principles* describes not only the newest findings about the ways in which these chemicals influence behavior, but also tells the fascinating story of how they were discovered in the first place. Such stories, interesting in their own right, demonstrate the fascinating processes of psychological research. By understanding these processes, students are more likely to retain important information and to achieve insight into psychology as a dynamic evolving science.

Both in the text and in special features, *Principles* tells the story of how important scientific discoveries in psychology have been made and shows their significance for current theory and research. For example, in the introductory chapter, we discuss the discovery of "opiate receptors" by Candace Pert and Solomon Snyder and consider its meaning for contemporary understanding of brain and behavior relationships. At the same time, we tell classical stories of discovery such as Paul Broca's discovery of the area of the brain that controls speech and Otto Lowi's dream that inspired the experiment uncovering evidence of neurotransmitters in 1921. Still other stories of discovery relate to the intense competition between contrasting learning and biological perspectives to explain phenomena such as learned helplessness.

The Author Team

Such is the breadth of modern psychology that no single author can hope to encompass all of its variety with the accuracy and authority that comes from sound scholarship and firsthand research. The principal authors represent a wide range of authority and expertise. They are: Richard H. Price of the University of Michigan (personality, intelligence, abnormal psychology, behavior change); Mitchell Glickstein of University College, London, England (physiological psychology, sensation, and perception); David L. Horton of the University of Maryland (learning, memory and cognition, language, statistics); Steven J. Sherman and Russell H. Fazio, both of Indiana University (social psychology, motivation and emotion); Julian M. Davidson of Stanford University (consciousness, sexual behavior); and David M. Brodzinsky of Rutgers University (development). Each of our authors is an active researcher who has also made contributions to psychology's story of discovery.

Coverage in the Second Edition

Our goal in the second edition was to provide as thorough a text as possible, a book with both breadth and depth, within the constraints of the introductory course. This means a sophisticated, straightforward text appropriate for psychology majors and comprehensive enough even for a two-semester course. Chapter 1 presents the story of discovery theme and describes the science and the scientists in psychology's history who have shaped modern day psychology. From that beginning, the entire range of topics traditional in the mainstream courses of psychology is then surveyed in this text.

In addition, *Principles* presents in unusual detail, several areas of investigation that reflect the widening scope of psychological research. An entire chapter, for example, is devoted to sexual behavior. We also paid particular attention to the rapid growth of psychobiological research in the past two decades. While Chapter 2 describes the basic structures of the nervous system, including the substrates of behavior at the cellular level, other chapters—for example, Sensation, Perception, Consciousness, and Abnormal Behavior—expand the discussion of the role of the brain.

Chapter 6 on Development has been extensively revised. The foundations of our understanding of development is provided covering physical, cognitive, social, and moral development through the entire life span. Considerable additional coverage has been given to adult development and development in aging to provide a life-span orientation to human development.

Format and Special Features

In thinking about presenting *Principles* to the student in the second edition, we wanted to discuss psychology in prose that is clear, interesting, and lucid without sacrificing depth or accuracy. The concepts and methods of psychology are often complex, and we do not pretend that they are always easily grasped. Yet the most rigorous of experiments and studies typically possess an essence of elegant simplicity. We illustrate this work not only with relevant examples taken from everyday life, but also from stories drawn from the human framework in which research is carried on.

To aid the student, we have begun each chapter with a brief outline of the main topics to be covered and ended it with a concisely detailed summary. Each chapter also contains two brief essays set off from the main text. One, labeled "Research," makes the methodology of psychology explicit and provides an up-close look at how psychologists work and think. It takes the reader step-by-step through an important experiment or study from the original hypothesis and how it was formulated to the results and the implications of the findings. Our discussion centers on studies and experiments that expand on chapter topics. For example, the "Research" essay in Chapter 5 (Conciousness) discusses the surprising recent study of the "near-death experience."

,

Chapter 13 (Intelligence) recalls in careful detail a classic study of environmental influence. In Chapter 16 (Environmental Influence) the reader is taken to the race track for a novel experiment on dissonance and the two dollar bettor.

The second essay, entitled "Focus," highlights a topic of special interest intended to supplement or amplify material in the main text. The focus may be on an important new finding as in Chapter 2 (The Nervous System)—"The Brain's Own Opiates"; an intriguing insight from animal research as in Chapter 4 (Sensation)—"Senses We Do Not Have"; a controversial issue as in Chapter 10 (Motivation and Emotion)—"The Effects of TV Violence"; or an unconventional approach to treatment as in Chapter 15 (Behavior Change)—"Therapy Through Folk Healing."

In addition, the illustration and design program for the second edition of *Principles* has been carefully structured to invite the reader into the content of each chapter, using illustrations and drawings to amplify and explain fundamental concepts discussed in the text.

Supplementary Materials

The needs of today's instructors and students demand not only a text with a solid base in scientific research, but also a full and broad array of ancillary materials to make teaching and learning more effective.

Coursepack is a combination study guide/anthology designed to assist students in learning the subject matter of psychology and to excite them about the subtleties of psyshological research. Written by William Buskist (Auburn University), Part I contains chapter outlines, learning objectives, identification exercises, suggested readings, and short-essay and multiple-choice drill questions; in addition, for each chapter a 20-item practice quiz (with the answer key in the Instructor's Manual only) can be assigned by the instructor for extra drill or as a pop quiz. Part II of Coursepack is the anthology; it includes a selection of brief essays on important issues in psychological research. These essays are not meant to be exhaustive but rather to stimulate students' interest and broaden their awareness of the role of research in psychology. Multiple-choice items follow each essay to check student learning. Most important, Coursepack is shrinkwrapped with each copy of the text—that means every student will have a copy of this innovative study aid.

In addition to Coursepack, there are available excellent resources specifically designed for the instructor. The Instructor's Manual, also prepared by William Buskist, is written especially for first-time instructors. It includes over 2000 multiple-choice items; annotated lecture outlines for each chapter, referenced to the text and to Coursepack; suggestions for teaching and organizing the course; and suggested readings. Available, too, are the following: two- and four-color transparencies/35mm slides; a videotape library consisting of short videotaped experiments, demonstrations, and high-interest features covering the broad spectrum of psychology; computerized test items; DIPLOMA, a computerized classroom management system; and SIMLABS, a set of computer-simulated laboratory experiments.

Acknowledgments

The writing and preparation of the second edition has required the effort and support of many individuals. Our appreciation is extended to those psychologists who have reviewed the manuscript in its several drafts and who have contributed to its improvement, coherence, and overall refinement. They were:

Richard Burns Georgia Southwestern College
Peter Crane University of Pittsburgh, Johnstown

Joseph Eubanks San Antonio College

Phillip Freedman University of Illinois, Chicago

Bruce Fretz University of Maryland, College Park

Josh Gerow Indiana University - Purdue University at Fort Wayne

Daniel Kaye UCLA

Donald Kline University of Notre Dame

John Kulig Carthage College

Joan Lockhart University of Washington, Seattle
Jane Ellen Maddy University of Minnesota, Duluth

Gerald Miller University of Texas, El Paso

Richard Sanders University of North Carolina, Wilmington

David Schroeder University of Arkansas

Joseph Stokes University of Illinois, Chicago

A. Bond Woodruff Northern Illinois University

A special note of appreciation is due to Alfred Kellam of the University of Michigan, a dedicated teacher of introductory psychology who aided substantially in the final revisions of many of the chapters in this edition. We also wish to thank our friends and colleagues, the competent and supportive people at Scott, Foresman whose aid and resourcefulness were so instrumental in completing the second edition. They are: Scott Hardy, Acquisitions Editor who engineered the entire process; Joanne Tinsley, Developmental Editor, and Elizabeth Fresen, Project Editor whose patience and commitment to detail and accuracy were so remarkable. In addition, we wish to thank Heidi Fieschko, who designed the text, and Sandy Schneider, Senior Picture Researcher. Each of these people at Scott, Foresman contributed their high standards of professionalism to this second edition of *Principles of Psychology*.

Richard H. Price
University of Michigan, Ann Arbor

OVERVIEW

PART 1

Psychology: The Science and the Scientists

1 The Science and the Scientists

PART 2

Perception and Consciousness

- 2 The Nervous System
 - 3 Sensation
 - 4 Perception
 - 5 Consciousness

PART 3

Growth, Learning, and Language

- 6 Development
- 7 The Varieties of Learning
 - 8 Memory and Cognition
 - 9 Language

PART 4

Motives and Emotions

- 10 Motivation and Emotion
 - 11 Sexual Behavior

PART 5

Personality and Intelligence

- 12 Personality and Its Assessment
 - 13 Intelligence

PART 6

Abnormal Behavior: Patterns and Treatment

- 14 Abnormal Behavior
 - 15 Behavior Change

PART 7

Social Influence and Interaction

- 16 Social Influence
- 17 Social Interaction

APPENDIX

Statistical Methods

CONTENTS

PART 1

Psychology: The Science and the Scientists 1

Chapter 1 The Science and the Scientists 3
Richard H. Price

Approaches in Psychology 5

The Behavioral Approach • The Cognitive Approach • The Psychodynamic Approach • The Humanistic Approach • The Biological Approach • Contemporary Approaches and Psychological Science

Methods in Psychology 16

Correlational Research • Experimental Research • Comparing the Correlational and Experimental Methods

Summary 26

FOCUS: On the Frontiers of Research 25

PART 2

Perception and Consciousness 29

Chapter 2 The Nervous System 31

Mitchell Glickstein

Structures and Functions of the Nervous System 33

The Central Nervous System • The Peripheral Nervous System

Structures and Functions of the Brain 35

The Brain Stem • The Cerebellum • The Midbrain • The Cerebrum • The Cerebral Cortex • The Connecting Pathways • Symmetry of the Brain

Structures and Functions of the Neuron 47

The Neuron • Electrical Activity in the Neuron • Transmission of Impulses Between Neurons

A "Wiring Diagram" 56

Summary 59

RESEARCH: Studying Behavior at the Cellular Level 57

FOCUS: The Brain's Own Opiates 54

Chapter 3 Sensation 61

Mitchell Glickstein

Characteristics of the Senses 62

Stimulation • Detection • Neural Coding

Psychophysics 64

Sensory Thresholds • Psychophysical Scales • Signal Detection Theory

Vision 68

Visual Stimulation: The Nature of Light • Structure of the Eye • Dark and Light Adaptation • Color Vision • Neural Coding of Light • The Brain and Vision

Audition 81

Auditory Stimulation: The Nature of Sound • Structure of the Ear • Neural Coding of Sound • The Brain and Audition: Binaural Hearing • Deafness

The Chemical Senses 87
Smell • Taste

Somesthesis 90

Senses of Position and Movement 91

Kinesthesis • Vestibular System

Summary 94

RESEARCH: How Much Light Do We Need for Seeing? 72

FOCUS: Senses We Do Not Have 92

Chapter 4 Perception 97

Mitchell Glickstein

Visual Perception: An Introduction 99

Perceptual Adaptation • Visual Capture • Perceptual Constancy

Perception of Shape and Form 102

Figure-Ground Differentiation • Feature Detectors • Pattern Recognition

Perception of Depth 106

Monocular Cues • Binocular Cues

Perception of Motion 111

Real Motion • Apparent Motion

Development of Visual Perception 114

Visual Perception in Infants • Learning and Visual Perception

Auditory Perception 119

Neural Processing of Sound • Auditory Masking • Selective Attention

Summary 122

RESEARCH: Perceiving Motion in Depth 112

FOCUS: The Study of ESP 120

Chapter 5 Consciousness 125

Julian M. Davidson

Normal Versus Altered States of Consciousness 126

Neural Approaches to Consciousness 127

The Mind-Body Problem • Neurophysiology • Localization • Electroencephalographs: Recording Brain Waves • The Split Brain • State-Dependent Learning

Sleep and Dreams 133

Our Biological Clock: The Circadian Rhythm • The Structures of Sleep • REM Sleep and Dreams • Uses of the Dream

Biofeedback 139

Brain-Wave Control • Visceral Control • Clinical Applications

Meditation and Peak Experiences 141

Types of Meditation • Physiological Responses • Peak Experiences

Hypnosis 144

Characteristics of the Hypnotic State

Chemistry and Consciousness 147

Alcohol • Classification of Psychoactive Drugs • Psychedelics • Drugs and the Brain

Summary 158

RESEARCH: The Near-Death Experience 145

FOCUS: Anomalous Experiences 158

PART 3

Growth, Learning, and Language 163

Chapter 6 Development 165

David M. Brodzinsky

Determinants of Development 166

The Nature-Nurture Controversy • Genetics • A Model of Development

Physical Development 171

Prenatal Period • Infancy • Childhood • Adolescence: Ages 12 to 18 • Early and Middle Adulthood: Ages 20 to 65 • Late Adulthood: After 65

Cognitive Development 179

Piaget: The Growth of Logic • Infancy and Toddlerhood • Childhood • Adolescence • Early and Middle Adulthood • Late Adulthood • Information Processing Theory

Social Development 189

Erikson's Theory of Psychosocial Development • Infancy and Toddlerhood • Childhood • Adolescence • Early and Middle Adulthood • Late Adulthood

Moral Development 205

The Learning Approach • The Cognitive Approach

Summary 208

RESEARCH: From Identity to Intimacy 202

FOCUS: Styles of Parenting 196

Chapter 7 The Varieties of Learning 211

David L. Horton

Programmed Learning 213

Classical Conditioning 215

Acquisition: Stimulus and Response • Essential Features and Measurement • Time Factors • Extinction and Spontaneous Recovery • Generalization and Discrimination • Special Types of Conditioning • Limitations of Classical Conditioning

Instrumental and Operant Conditioning 221

Instrumental Conditioning • Operant Conditioning • Similarities Between Operant and Classical Conditioning

Reinforcement 224
Schedules of Reinforcement

Constraints on Conditioning 227

Behavior Shaping • Superstitious Behavior • Autoshaping • Escape and Avoidance Learning • Partial Reinforcement and Extinction • Summary of Conditioning

Cognition and Learning 234

Insight Experiments • Learning Abstract Concepts • Motor Learning

Summary 240

RESEARCH: Song Learning in the Swamp Sparrow 214

FOCUS: Observational Learning 236

Chapter 8 Memory and Cognition 243

David L. Horton

Stages of Memory 244

Sensory Memory • Short-Term Memory • Long-Term Memory

Encoding, Storage, and Retrieval 254

Encoding • Storage • Retrieval

Remembering and Forgetting 269

Mnemonics • Forgetting

Memory and Thinking 273

Summary 276

RESEARCH: Posthypnotic Amnesia and the Episodic-Semantic Distinction 260

FOCUS: In Search of the Engram 274

Chapter 9 Language 279
David L. Horton

Speech Production and Perception 281

The Sounds of Speech • Lateralization in Speech Perception • The Speech Code

Grammar and Syntax 285

Grammars as Theories • Phrase Structure and Transformational Rules

Semantics and Syntax 289

Language Acquisition 291

Acquisition of Language Production • Acquisition of Grammatical Structure • Acquisition of Semantic Structure • Biological Basis for Language

Language Use in Adults 298

Language Comprehension 299

Inference • General Knowledge and Prior Context • Schemata and Comprehension

The Relationship Between Language and Thought 303

Summary 306

RESEARCH: Underextension in Child Language 296

FOCUS: Language in Chimps 304

PART 4 Motives and Emotions 309

Chapter 10 Motivation and Emotion 311
Russell H. Fazio, Mitchell Glickstein, Steven J. Sherman

Motivation and Evolution 313

Adaptive Behavior: Survival • Optimization of Adaptive Behavior

Physiological Bases of Motivated Behavior 315

Neural Control Mechanisms • Thirst • Hunger

Social Bases of Motivated Behavior 324

The Adaptive Behavior of Social Behavior: Sociobiology • Sociobiology, Motivation, and the Human Species

Human Social Motives 327

The Need for Affiliation • The Need for Achievement

Emotions 330

The James-Lange Theory • Physiological Bases of Emotion • Cognitive Aspects of Emotion

Aggression 334

The Sociobiological Approach • Physiological Mechanisms and Aggression • Psychosocial Approaches to Aggression

Summary 343

RESEARCH: The Cost of Pleasure, the Benefits of Pain 338

FOCUS: Effects of TV Violence 340

Chapter 11 Sexual Behavior 345 Julian M. Davidson

Pioneers in Human Sex Research 347

Freud: Psychosexual Development • Kinsey: Asking About Sex • Masters and Johnson: Into the Laboratory

Variations in Sexual Behavior 351

Interspecies Variance • Intercultural Variance • Cross-Cultural Variance and Similarities • Intracultural Variance • Individual Variance: The Life Cycle

The Role of Hormones in Sexual Behavior 362

Mechanisms of Hormonal Production • Effects of Hormones in Females • Effects of Hormones in Males • Effects of Hormones Within the Brain

Sexual Differentiation 367

The "Reversed Adam" Principle • The Influence of Learning in Sexual Differentiation • Androgen and Environment • Sex Difference and Similarities in Humans • Homosexuality • Transsexualism

Sex Differences and Sex Stereotypes 373
Sex Differences • Sex Stereotypes

The Biosocial Complex 377

Summary 378

RESEARCH: Female Sexuality and the Menstrual Cycle 356

FOCUS: The Nature of Orgasm 352

PART 5

Personality and Intelligence 381

Chapter 12 Personality and Its Assessment 383
Richard H. Price

Psychodynamic Theories 385

Stages of Personality Development • The Ego Psychologists • Jung's Analytical Approach • Psychodynamic Approachs to Assessment • Evaluation of the Psychodynamic Approach

Dispositional Theories 393

Typological Theories • Trait Theories • Need Approaches • Issues in the Dispositional Approach to Personality

Learning Theories 404

Skinner: Operant Approaches • Bandura: Social Learning Through Observation • Issues in the Learning Approach to Personality

Phenomenological Theories 410

Rogers: The Concept of Self-Actualization • Maslow: The Hierarchy of Needs • Kelly: The Personal Construct Theory of Personality • Issues in the Phenomenological Approach to Personality

Metatheories of Personality 414

Summary 416

RESEARCH: The Problems with "Common Sense" in Assessing Personality 390

FOCUS: Sex Stereotypes in Psychological Assessment 415

Chapter 13 Intelligence 419 Richard H. Price

Theories of Intelligence 421

Structural Theories • Information Processing Theory

Artificial Intelligence 425

Measurement of Intelligence 426

The Binet Scales • The Stanford-Binet • The Wechsler Scales • Evaluating the Tests • Criticisms of Tests

Determinants of Intelligence 433

Hereditary Influences on Intelligence • The Evolution of Intelligence • Environmental Influences on Intelligence • The Heredity Versus Environment Controversy • Changes in Intellectual Ability over the Life Span

Extremes of Intelligence 445

Mental Retardation • The Intellectually Gifted

Intelligence in Perspective 450

Summary 450

RESEARCH: A Classic Study of Environmental Influence 442

FOCUS: Identical Twins as "Living Laboratories" 436

PART 6

Abnormal Behavior: Patterns and Treatment 453

Chapter 14 Abnormal Behavior 455 Richard H. Price

Theoretical Approaches to Abnormal Behavior 457

Environmental Approaches to Abnormal Behavior • Psychological Approaches to Abnormal Behavior • Biological Approaches to Abnormal Behavior

Diagnosis and Classification of Abnormal Behavior 463

Phobias • Obsessive-Compulsive Disorders

Adjustment Reactions: Responses to Traumatic Events 468

Posttraumatic Stress Disorders • Dissociative Disorders

Affective Disorders: Depression and Mania 470
Clinical Descriptions • Explanations for Affective Disorders

Schizophrenia: A Major Disorder of Perception and Thought 475

Clinical Descriptions • Determinants of Schizophrenia • The Vulnerability Model of Schizophrenia

Personality Disorders 484
Antisocial Personality

Substance Abuse and Dependence 487

Major Drug Classes and Patterns of Abuse and Dependence • Alcohol Abuse and Dependence

Summary 491

RESEARCH: "Helplessness"—learned or Biochemical? 478

FOCUS: The Model Psychosis Hypothesis 483

Chapter 15 Behavior Change 493 Richard H. Price

Psychotherapies 495

Psychodynamic Therapy • Humanistic Therapy • Behavior Therapy • Group Therapy • Evaluating Psychotherapy

Biological Therapies 513

Electroconvulsive Therapy • Psychosurgery • Drug Treatment

Community Mental Health 518

Community Living • Crisis Intervention • Prevention • The Rights of Patients • The Role of the Nonprofessional • Mutual Support Groups

Summary 526

RESEARCH: A Way to Find Out Whether Psychotherapy Works 510

FOCUS: Therapy Through Folk Healing 524

PART 7
Social Influence and Interaction 529

Chapter 16 Social Influence 531 Russell H. Fazio, Steven J. Sherman

Social Psychology Focuses on People 532

Behavior and Stimuli 533

Arousal: The Mere Presence of Others • Social Reinforcement • Social Punishment • Information: Social Comparison

Conformity 547

Public Compliance Versus Private Acceptance • Information Versus Reinforcement: Two Different Processes • Factors Affecting Conformity

Learning About Ourselves 551

How Others Treat Us • Self-Perception

Intentional Social Influence 554

Obedience to Authority • Persuasion: Changing Attitudes by Changing Perceptions • Dissonance: Changing Attitudes by Changing Behavior • Brainwashing: Extreme Social Influence

Summary 564

RESEARCH: Dissonance and the \$2 Bettor 559

FOCUS: The Process of Religious Conversion 563

Chapter 17 Social Interaction 567 Russell H. Fazio, Steven J. Sherman

Social Relationships: Thibaut and Kelley's Theory of Social Interaction 568

Rewards and Costs • The Comparison Level • Considering the Alternatives • Limitations of the Theory

Social Perception 570

Impression Formation • Major Determinants in Impression Formation • The Attribution Process
• Links Between Social Perception and Social Interaction

Group Interactions 583
Intragroup Behavior • Intergroup Relations

Interaction with the Environment 591

Crowding • Noise • Aftereffects of Crowding

Summary 598

RESEARCH: The Effects of Sex-Role Stereotypes 584

FOCUS: Proxemics: The Space We Call Our Own 596

APPENDIX Statistical Methods 601 David L. Horton

Some Uses of Numbers 602

Measurement Categories 603

Descriptive Statistics 603

Measures of Central Tendency • Frequency Distributions and Central Tendency • Measures of Variability • Variability and the Normal Distribution

Correlation and Regression 608

Inferential Statistics 611

Glossary 613

References 635

Credits 661

Name Index 667

Subject Index 675

