HUMAN LEARNING

SEVENTH EDITION GLOBAL EDITION

Jeanne Ellis Ormrod University of Northern Colorado (Emerita)

PEARSON

Boston Columbus Indianapolis New York San Francisco Amsterdam Cape Town Dubai London Madrid Milan Munich Paris Montréal Toronto Delhi Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo

Brief Contents

Preface 5

PART ONE

INTRODUCTION TO HUMAN LEARNING

CHAPTER 1 Learning: Definition, Principles, and Theories 17

CHAPTER 2 The Nervous System and Learning 30

PART TWO

BEHAVIORIST VIEWS OF LEARNING

CHAPTER 3 Behaviorism 51

CHAPTER 4 Applications of Behaviorist Principles 92

PART THREE

SOCIAL COGNITIVE THEORY

CHAPTER 5 Social Cognitive Theory 129

PART FOUR

COGNITIVE VIEWS OF LEARNING

CHAPTER 6 Cognitivism 160

CHAPTER 7 Memory and Its Components 178

CHAPTER 8 Long-Term Memory Storage and Retrieval Processes 206 CHAPTER 9 Knowledge 249

PART FIVE

DEVELOPMENTAL AND CONTEXTUAL PERSPECTIVES

CHAPTER 10 Cognitive-Developmental Perspectives 293

CHAPTER 11 Sociocultural Theory and Other Contextual Perspectives 318

PART SIX

COMPLEX LEARNING AND COGNITION CHAPTER 12 Learning and Studying Effectively 362

CHAPTER 13 Transfer, Problem Solving, and Critical Thinking 399

PART SEVEN

MOTIVATION

CHAPTER 14 Motivation, Affect, and Their Effects 439

CHAPTER 15 Cognitive Factors in Motivation 476

REFERENCES 519 NAME INDEX 589 SUBJECT INDEX 609

Contents

Preface 5

PART ONE

INTRODUCTION TO HUMAN LEARNING

CHAPTER 1

Learning: Definition, Principles, and Theories 17 The Importance of Learning 18 Defining Learning 20 Determining When Learning Has Occurred 20 Types of Learning Research 21 Learning Principles and Theories 21 How Theories of Learning Have Evolved over Time 22 Advantages of Theories 24 Potential Drawbacks of Theories 26 A Perspective on Theories and Principles 27 Applying Knowledge about Learning to Instructional Practices 27 Overview of the Book 28 SUMMARY 29

CHAPTER 2

The Nervous System and Learning 30 Basic Building Blocks of the Human Nervous 31 System 32 Neurons 32 Synapses 34 Glial Cells Brain Structures and Functions 34 Methods in Brain Research 34 Parts of the Brain 35 The Left and Right Hemispheres 38 Interconnectedness of Brain Structures 39 Development of the Brain 39 Prenatal Development 39 Development in Infancy and Early Childhood 40 Development in Middle Childhood, Adolescence, and Adulthood 41 Factors Influencing Brain Development 42 To What Extent Are There Critical or Sensitive Periods in Brain Development? 43 To What Extent Is the Brain "Prewired" to Know or Learn Things? 45

The Neurological Basis of Learning46Educational Implications of Brain Research47SUMMARY50

PARTTWO

BEHAVIORIST VIEWS OF LEARNING

CHAPTER 3

Behaviorism 51

Basic Assumptions in Behaviorism52Classical Conditioning54Classical Conditioning in Human Learning56Common Phenomena in Classical56
Conditioning 58 Eliminating Unproductive Classically Conditioned Responses 61
Operant Conditioning 63 Important Conditions for Operant Conditioning to Occur 65
Contrasting Operant Conditioning with Classical Conditioning 66
Forms That Reinforcement Might Take 67 Common Phenomena in Operant Conditioning 71 Effects of Antecedent Stimuli and Responses in Operant Conditioning 79
Avoidance Learning 81 Punishment 83 Potentially Effective Forms of Punishment 85 Ineffective Forms of Punishment 86 Cognition and Motivation in Behaviorist Theories 88 SUMMARY 90

CHAPTER 4

Applications of Behaviorist Principles 92	
Applying Behaviorist Principles to Classroo Management 93	m
Creating a Productive Classroom Climate	93
Concerns about Using Reinforcement and Punishment in Classroom Settings	94

Using Reinforcement to Increase Productive Behaviors 97 Strategies for Decreasing Undesirable **Behaviors** 101 Applied Behavior Analysis (ABA) 107 Frequently Used ABA Strategies 107 Using ABA with Large Groups 111 Adding a Cognitive Component to ABA 114 Implications of Behaviorism for Classroom Instruction and Assessment 114 Importance of Making Active Responses 115 Identifying Instructional Goals and Objectives 115 Programmed Instruction and Computer-Assisted Instruction 119 Mastery Learning 121 School Assessment Practices 123 When Behaviorist Approaches Are Most 127 Useful SUMMARY 127

PARTTHREE

SOCIAL COGNITIVE THEORY

CHAPTER 5

Social Cognitive Theory 129 General Principles of Social Cognitive Theory 131 Environmental Factors in Social Cognitive Theory: Revisiting Reinforcement and Punishment 131 Cognitive Factors in Social Cognitive Theory 134 Reciprocal Causation 136 Modeling 138 How Modeling Affects Behavior 138 Characteristics of Effective Models 139 Behaviors That Can Be Learned through Modeling 141 Conditions Necessary for Effective Modeling to Occur 143 Self-Efficacy 146 How Self-Efficacy Affects Behavior and Cognition 146 Factors in the Development of Self-Efficacy 147

Self-Regulation150Elements of Self-Regulation150Promoting Self-Regulated Behavior151The Cognitive Side of Self-Regulation155Educational Implications of Social CognitiveTheory155SUMMARY159

PART FOUR

COGNITIVE VIEWS OF LEARNING

CHAPTER 6

Cognitivism	160	
Basic Assumptions	in Cognitive	
Perspectives	161	
Edward Tolman's Pu	urposive Behaviorism	163
Gestalt Psychology	165	
Verbal Learning Res	search 169	
Contemporary Cogn	nitive Perspectives	173
Information Proces	ssing Theory 173	
Constructivism	174	
Contextual Theorie	es 175	
Integrating Cogniti	ively Oriented	
Perspectives	176	
General Educationa	l Implications of Cogni	tivist
Approaches 1	176	
SUMMARY 177	,	

CHAPTER 7

Memory and Its Components	178
A Dual-Store Model of Memory	180
Sensory Register 181	
Moving Information to Working Mem	ory:
The Role of Attention 183	
Working Memory 188	
Moving Information to Long-Term Memory:	
Connecting New Information with	Prior
Knowledge 193	
Long-Term Memory 194	
Challenges to the Dual-Store Model	195
Are Working Memory and Long-Term	1 Memory
Really Different? 196	-

Is Conscious Thought Necessary for Long-Term Memory Storage? 197 Alternative Views of Human Memory 198 Levels of Processing 198 Activation 200 Remembering That The Map Is Not the Territory 201 Generalizations about Memory and Their Educational Implications 201 SUMMARY 204

CHAPTER 8

Long-Term Memory Storage and Retrieval Processes 206
Storage as a Constructive Process 207
Examples of Construction in Action 208
Long-Term Memory Storage Processes 210
Rehearsal 212
Meaningful Learning 212
Internal Organization 214
Elaboration 215
Visual Imagery 216
How Procedural Knowledge Is Acquired 218
Factors Affecting Long-Term Memory
Storage 219
Working Memory 219
Prior Knowledge 220
Prior Misconceptions 222
Expectations 223
Verbalization 224
Enactment 225
Repetition and Review 225
Long-Term Memory Retrieval Processes 227
Importance of Context for Retrieval 230
Construction in Retrieval 231
The Power of Suggestion: Effects of Subsequently
Presented Information 232
Constructing Entirely New "Memories"
during Retrieval 233
Remembering Prior Recollections 233
Forgetting 234
Decay 234
Interference and Inhibition 235
Repression 235

Failure to Retrieve236Construction Error237Insufficient Self-Monitoringduring Retrieval237Failure to Store or Consolidate237Promoting Effective Long-Term Memory Storageand Retrieval Processes238SUMMARY247

CHAPTER 9

Knowledge 249

The Various Kinds of Knowledge 250 Declarative and Procedural Knowledge 250 Explicit and Implicit Knowledge 251 How Knowledge Is Encoded in Long-Term Memory 252 Encoding in Terms of Physical Characteristics 252 Encoding in Terms of Actions 253 Encoding in Terms of Symbols 254 Encoding in Terms of Meanings 255 Different Forms of Encoding Are Not Mutually Exclusive 256 The Organization of Long-Term Memory 257 Long-Term Memory as a Hierarchy 257 Long-Term Memory as a Network 259 Parallel Distributed Processing 262 Concepts 263 Theories of Concept Learning 264 Factors Facilitating Concept Learning 268 Schemas and Scripts 271 Personal Theories 273 Personal Theories versus Reality 275 Fostering Theory Development 277 Worldviews 278 The Challenge of Conceptual Change 279 Promoting Conceptual Change 281 Development of Expertise 287 Generalizations about the Nature of Knowledge 288 SUMMARY 291

PART FIVE

DEVELOPMENTAL AND CONTEXTUAL PERSPECTIVES

CHAPTER 10

Cognitive-Developmental Perspectives 293	
Piaget's Theory of Cognitive Development	294
Key Ideas in Piaget's Theory 295	
Piaget's Stages of Cognitive Development	298
Current Perspectives on Piaget's Theory	304
Capabilities of Different Age-Groups 305	5
Effects of Experience and Prior Knowledge	306
Effects of Culture 306	
Views on Piaget's Stages 307	
Neo-Piagetian Theories of Cognitive	
Development 307	
Case's Theory 309	
Implications of Piagetian and Neo-Piagetian	
Theories 312	
SUMMARY 317	

CHAPTER 11

Sociocultural Theory and Other Contextual Perspectives 318
Vygotsky's Theory of Cognitive
Development 319
Key Ideas in Vygotsky's Theory 320
Comparing Piaget's and Vygotsky's
Theories 324
Current Perspectives on Vygotsky's
Theory 326
Social Construction of Meaning 327
Scaffolding 328
Participation in Adult Activities 330
Apprenticeships 3.31
Acquisition of Teaching Skills 332
Dynamic Assessment 333
Adding a Sociocultural Element to Information
Processing Theory 333
Intersubjectivity 334
Social Construction of Memories 334
Collaborative Use of Cognitive Strategies 335

Expanding the Contextualist Framework 337 Embodiment 337 Situated and Distributed Learning and Cognition 337 Ecological Systems Theory 339 General Implications of Sociocultural and Other Contextualist Theories 341 Peer-Interactive Instructional Strategies 343 Class Discussions 345 Reciprocal Teaching 347 Cooperative Learning 350 Peer Tutoring 353 Communities of Learners 355 Technology-Based Collaborative Learning 358 SUMMARY 360

PART SIX

COMPLEX LEARNING AND COGNITION

CHAPTER 12

Learning and Studying Effectively 362 Metacognitive Knowledge and Skills 364 Self-Regulated Learning 367 Roots of Self-Regulated Learning 368 Effective Learning and Study Strategies 369 Meaningful Learning, Organization, and Elaboration 369 Note Taking 371 Identifying Important Information 372 Summarizing 372 Comprehension Monitoring 373 Mnemonics 375 Development of Metacognitive Knowledge and Skills 381 Epistemic Beliefs 383 Developmental and Cultural Differences in Epistemic Beliefs 385 Effects of Epistemic Beliefs 386 The Intentional Learner 389 Why Students Don't Always Use Effective Strategies 390

Promoting Effective Learning and Study Strategies 391 SUMMARY 397

CHAPTER 13

Transfer, Problem Solving, and Critical Thinking 399 Transfer 400 Types of Transfer 400 Theories of Transfer 403 Factors Affecting Transfer 407 Problem Solving 409 Theories of Problem Solving 410 Cognitive Factors Affecting Successful Problem Solving 412 Problem-Solving Strategies 420 Meaningless versus Meaningful Problem Solving 424 Facilitating Transfer and Problem Solving in Instructional Settings 424 Critical Thinking 432 Developmental, Individual, and Cultural Differences in Critical Thinking 434 Fostering Critical Thinking in the Classroom 435 SUMMARY 437

PART SEVEN

MOTIVATION

CHAPTER 14

Motivation, Affect, and Their Effects	439
General Effects of Motivation 441	
Extrinsic versus Intrinsic Motivation 441	
Basic Human Needs 442	
Drive Reduction 442	
Arousal 444	
Maslow's Hierarchy of Needs 446	
Competence and Self-Worth 448	
Autonomy 451	
Relatedness and Belonging 455	

Individual Differences in Motivation	457
Need for Approval 457	
Need for Achievement 457	
Sense of Identity 458	
Dispositions 459	
Affect and Its Effects 461	
How Affect Is Related to Motivation	461
How Affect Is Related to Cognition	
and Learning 462	
Anxiety 464	
Creating a Motivating and Affect-Friend	lly
Classroom Environment 469	
SUMMARY 475	

CHAPTER 15

Cognitive Factors in Motivation	476
Interests 477	
Effects of Interest 477	
Factors Promoting Interest 478	
Expectancies and Values 479	
Effects of Expectancies and Values	480
Factors Influencing Expectancies	
and Values 480	

481 Goals Achievement Goals 482 Work-Avoidance and Doing-Just-Enough Goals 488 Social Goals 489 Career Goals 489 Coordinating Multiple Goals 490 Attributions 491 Effects of Attributions 493 Factors Influencing the Nature of Attributions 496 Explanatory Style: Mastery Orientation versus Learned Helplessness 500 Motivation, Affect, and Self-Regulation 503 How Motivation and Affect Are Intertwined with Self-Regulation 503 Internalized Motivation 504 **Encouraging Motivating Cognitions** 506 A TARGETS Mnemonic for Motivational 514 Strategies SUMMARY 516 REFERENCES 519 NAME INDEX 589 SUBJECT INDEX 609