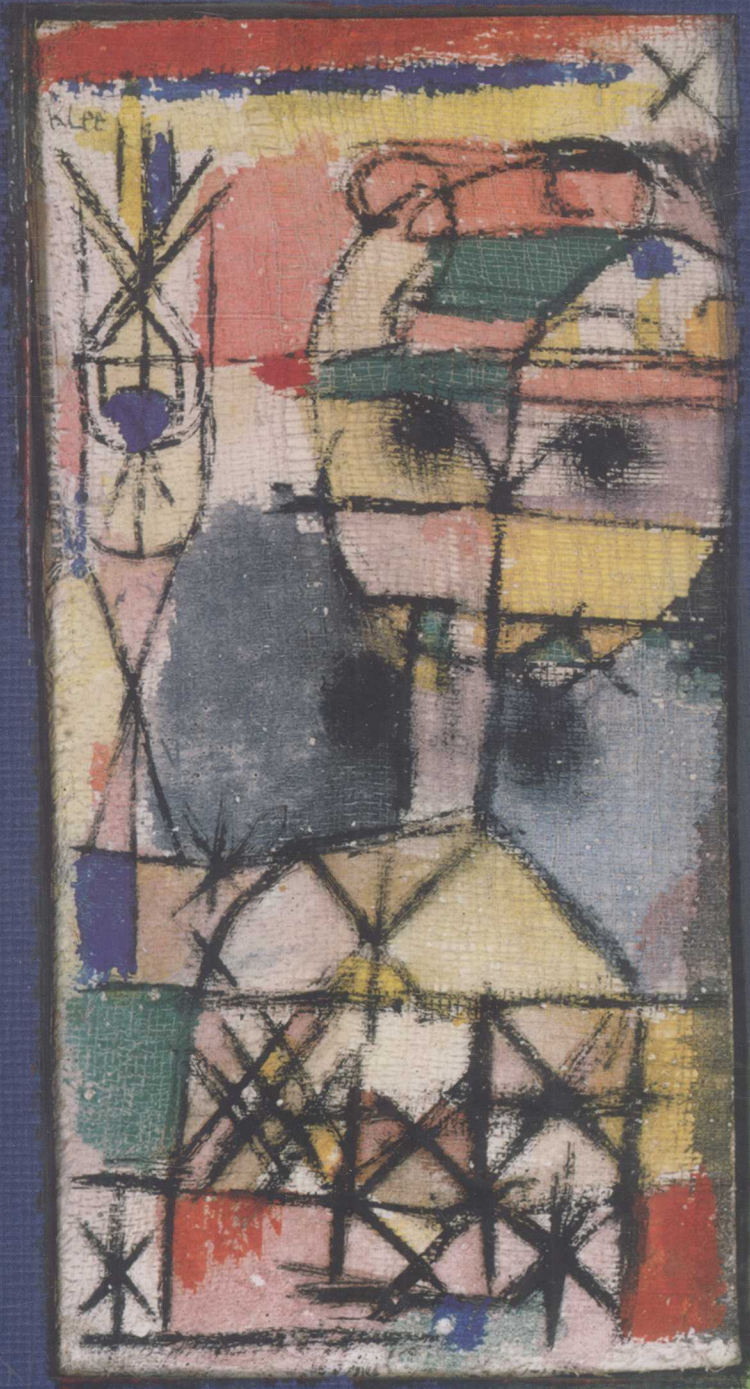


FOURTH
EDITION



HUMAN LEARNING

JEANNE ELLIS ORMROD

HUMAN LEARNING

FOURTH EDITION

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Preface

Human learning is a fascinating process, and psychologists discover more about it every year. Yet I am saddened and frustrated by how little nonpsychologists seem to know about how they themselves learn and about how they can best help others learn in instructional settings. Research is clear on this point: How something is taught, studied, and thought about definitely *does* make a difference in what people learn, how well they understand it, how long they remember it, and how readily they apply it to new situations and problems.

I have written this textbook with particular students in mind: students who would like to learn about learning but often do not have much background in psychology. Such students may benefit from studying the historical roots of learning theories but prefer to focus their energies on studying contemporary perspectives and ideas. These students might find learning theories fascinating but lose patience when they cannot see the relevance of those theories to everyday practice. These students are capable of reading a dry, terse textbook but probably learn more effectively from a book that shows how different concepts relate to one another, provides numerous examples, and, especially, emphasizes meaningful learning—true *understanding*—of the material it presents.

In This Edition

This fourth edition of *Human Learning* is different in many ways from the third edition of 1998. A new Chapter 2 introduces readers to the anatomy and physiology of the brain, speculates about the physiological bases of learning and memory, and dispels common myths about brain functioning and development. Behaviorist views of learning have been condensed from four chapters into three, with closer attention to how early behaviorists built on one another's ideas. The contents of the "old" Chapter 13 (expository instruction, teaching concepts, mnemonics, etc.) have been integrated into other chapters, where various instructional strategies can be more closely tied to the principles and theories on which they are based. And the virtual explosion of research on human motivation in recent years has made it necessary to expand my discussion of motivation to three chapters.

In addition to the discussion of the brain in chapter 2, many new topics appear throughout the book. Examples include measures of learning (Chapter 1); noncontingent reinforcement as a means of reducing undesirable behaviors (Chapter 4); effects of high-stakes testing (Chapter 5); functional analysis (Chapter 5); collective self-efficacy (Chapter 7); phonological loop and visuospatial sketchpad (Chapter 9); the generation effect (Chapter 10); acquisition of procedural knowledge (Chapter 10); confirmation bias (Chapter 11); false memories (Chapter 12); theory of mind, intentional learning, and epistemic doubt (Chapter 13); near versus far transfer (Chapter 14); visual imagery in problem solving (Chapter 14); the social nature of learning (Chapter 15); technology-based discussions (Chapter 15); arousal and relatedness as basic human needs (Chapter 16); performance-approach, performance-avoidance, work-avoidance, social, and career goals (Chapter 17); dispositions (Chapter 17); interrelationships among motivation, affect, and self-regulation (Chapter 17) process versus product goals (Chapter 17); entity versus incremental views of intelligence (Chapter 18); intrapersonal versus interpersonal attributions, and cultural differences in attributions (Chapter 18). And, more generally, I have rewritten every chapter to reflect the latest developments in learning theory and research.

Acknowledgments

Although I am listed as the sole author, I have certainly not written this book alone. Many people have helped me along the way:

- Frank Di Vesta, my adviser and mentor at Penn State, who taught me a great deal about learning and who absolutely refused to let me graduate until I also learned a great deal about writing.
- Kevin Davis, my editor at Merrill Education, who continues to guide, support, and inspire me in my efforts to shed light on the many ways in which psychology can inform practice in educational and therapeutic settings.
- The editorial staff at Carlisle Publishers Services—especially Holly Henjum, who skillfully transformed my rough manuscript into a polished publication, and Katherine Evancie, who carefully scrutinized every line for grammatical errors, awkward prose, and missing references.
- My colleagues across the nation who read early drafts or editions most thoroughly and conscientiously and whose suggestions have greatly improved the final product: Livingston Alexander, Western Kentucky University; Martha B. Bronson, Boston College; Margaret W. Cohen, University of Missouri at St. Louis; Ralph F. Darr, Jr., The University of Akron; Jean C. Faieta, Edinboro University of Pennsylvania; Sarah Huyvaert, Eastern Michigan University; Jaina Jolley, Clarion University of Pennsylvania; Joseph Kersting, Western Illinois University; Mary Lou Koran, University of Florida; Gerald Larson, Kent State University; Mark Lewis, University of Texas at Tyler; Michael S. Meloth, University of Colorado; John Newel, University of Florida at Gainesville; Jim O'Connor, California State University at Bakersfield; Sarah Peterson, Northern Illinois University; Steven Pulos, University of Northern Colorado; and Karen Zabrucky, Georgia State University.
- Colleagues who recently reviewed the third edition and offered many helpful suggestions for adding to and in other ways enhancing my discussions in the fourth edition: P. Karen Murphy, The Pennsylvania State University; Jonathan A. Plucker, In-

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- My husband, Richard, and my children, Christina, Alex, and Jeffrey, who have been eternally supportive of my writing endeavors and who have provided me with numerous examples of human learning in action.
- My parents, James and Nancy Ellis, who long ago taught me the value of higher education.
- My students, who urged me to write the book in the first place and continue to give me feedback about how I can make it better.

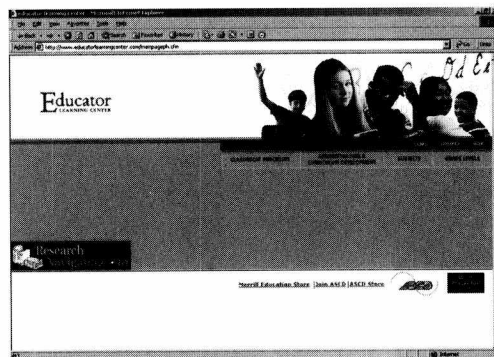
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Importance of Learning

Defining Learning

Determining When Learning Has Occurred

Nature of Principles and Theories

Advantages of Theories

Disadvantages of Theories

*A Perspective on Theories
and Principles*

*Applying Principles and Theories to Instructional
Practice*

Overview of the Book

Summary

When my son Alex was in kindergarten, his teacher asked me *please* to do something about his shoes. I had been sending Alex off to school every morning with his shoelaces carefully and lovingly tied, yet by the time he arrived at his classroom door, the laces were untied and flopping every which way—a state to which they invariably returned within 10 minutes of his teacher's retying them. Alex and I tried a series of shoe-tying lessons but with little success. As an alternative, I proposed that we double-knot the laces when we tied them each morning, but Alex rejected my suggestion as being too babyish. I purchased a couple of pairs of shoes that had Velcro straps instead of laces, but Alex gave the shoes such a workout that the Velcro quickly separated itself from the leather. By March, the teacher, justifiably irritated that she had to retie my son's shoes so many times each day, insisted that Alex learn to tie them himself. So I sat down with him and demonstrated, for the umpteenth time, how to put two laces together to make a presentable bow. This time, however, I accompanied my explanation with a magical statement: "Alex, when you learn to tie your shoes, I will give you a quarter." Alex had shoe-tying perfected in five minutes, and after that we didn't have a single complaint from school—well, not about his shoes anyway.

When my daughter Tina was in fourth grade, she experienced considerable difficulty with a series of homework assignments in subtraction. She had never learned the basic subtraction facts, despite my continually nagging her to practice them, the result being that she could not solve many two- and three-digit subtraction problems successfully. One night, after her typical half-hour tantrum about "these stupid problems," my husband explained to Tina that subtraction was nothing more than reversed addition and that her knowledge of addition facts could help her with subtraction. Something must have clicked in Tina's head, because we weren't subjected to any more tantrums about subtraction. Multiplication, yes, but not subtraction.

Human learning takes many forms. Some instances of learning are readily observable, such as when a child learns to tie shoes. Other instances of learning are fairly subtle, such as when a child gains a better understanding of mathematical principles. And people learn for many different reasons. Some learn for the external rewards their achievements bring—for example, for good grades, recognition, or money (consider my mercenary son). But others learn for less obvious, more internal reasons—perhaps to gain a sense of accomplishment, or perhaps simply to make life easier.

In this book, I describe human learning from the various perspectives that have evolved in psychological theory throughout the twentieth century and are continuing to evolve in the twenty-first century. As you will soon discover, learning is a complicated process, and psychologists disagree even about such basic issues as what learning is, how it occurs, and which factors are necessary for it to occur at all.

IMPORTANCE OF LEARNING

Many species have things easy compared to humans, or at least so it would seem. Birds, for example, are born with a wealth of knowledge that we humans must learn. Birds instinctively know how to build their houses; we either have to be taught something about framing, roofing, and drywalling or else have to hire someone to do these things for us. Birds know, without being taught, exactly when to fly south and how to get there; we have to look at our calendars and road maps. Birds instinctively know how to care for their young, meanwhile, we attend prenatal classes, read child-care books, and watch others demonstrate how to change diapers.

However, it is the humans, not the birds, who are getting ahead in this world. Human beings have learned to make increasingly stronger and more comfortable homes for themselves, while birds are still making the same flimsy, drafty nests they have been living in for thousands of years. Humans have developed fast, dependable modes of transportation for themselves and their possessions, while birds are still winging it. And humans are learning how better to feed and care for themselves and their young, so that each generation grows taller, stronger, and healthier than the previous one. Birds, meanwhile, are still eating worms.

The learning process allows the human race a greater degree of flexibility and adaptability than is true for any other species on the planet. Because so little of our behavior is instinctive and so much of it is learned, we are able to benefit from our experiences. We know which actions are likely to lead to successful outcomes and which are not, and we modify our behavior accordingly. And as adults pass on to children the wisdom gleaned from their ancestors and from their own experiences, each generation is just that much more capable of behaving intelligently. Let's face it: We can get from New York to Miami in three hours, but how long does it take the birds?

DEFINING LEARNING

My son Alex's learning to tie his shoes and my daughter Tina's learning how subtraction relates to addition are both examples of learning. Consider these instances of learning as well:

- The mother of a 10-year-old boy insists that her son assume some household chores, for which he earns a small weekly allowance. The allowance, when saved for two or three

weeks, enables the boy to purchase small toys of his own choosing. As a result, he develops an appreciation for the value of money.

- A college student from a small town is, for the first time, exposed to political viewpoints different from her own. After engaging in heated political debates with classmates, she evaluates and modifies her own political philosophy.
- A toddler is overly affectionate with a neighborhood dog, and the dog responds by biting the toddler's hand. After that, the child cries and runs quickly to his mother every time he sees a dog.

As you can see, learning is the means through which we acquire not only skills and knowledge, but values, attitudes, and emotional reactions as well.

Just what do we mean by the term **learning**? Different psychologists conceptualize and define learning differently. Here are two definitions that reflect two common, yet quite different, conceptions of what learning is:

1. Learning is a relatively permanent change in behavior as a result of experience.
2. Learning is a relatively permanent change in mental representations or associations as a result of experience.

What do these definitions have in common? Both describe learning as involving a relatively permanent *change*—a change that will last for some time, although not necessarily forever. And both definitions attribute this change to *experience*; in other words, learning takes place as a result of one or more events in the learner's life. Other changes, such as those caused by maturational changes in the body, organic damage, or temporary body states (e.g., fatigue, drugs), are not attributable to experience and so do not reflect learning.

The two definitions I have presented differ primarily in terms of *what* changes when learning occurs. The first definition refers to a change in *behavior*—an external change that we can observe—and reflects the perspective of a group of theories collectively known as **behaviorism**. Behaviorist theories focus on the learning of tangible, observable behaviors or *responses*, such as tying shoes, solving a subtraction problem correctly, or complaining about a stomachache in order to stay home from school.

In contrast, the second definition focuses on a change in *mental representations or associations*—an internal change that we *cannot* see—reflecting the perspective of a group of theories collectively known as **cognitivism**. Cognitive theories focus not on behavioral outcomes but on the *thought processes* (sometimes called *mental events*) involved in human learning. Examples of such processes include finding relationships between addition and subtraction facts, using memory gimmicks to remember French vocabulary words, or constructing idiosyncratic and highly personalized interpretations of classic works of literature.

In this book, I will describe both the behaviorist and cognitive views of learning; I will also describe perspectives that lie somewhere between the two extremes. Most psychologists tend to align themselves with one perspective or the other, and I, whose graduate training and research program have been rooted in cognitive traditions, am no exception. Yet I firmly believe that both the behaviorist and cognitive perspectives have something important to say about human learning and that both provide useful suggestions for helping people learn more effectively.