Adaptive Learning and the Human Condition

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To my mother, Hilda, who first taught me to love learning

To my wife, Fran, for lovingly enriching my human condition

CONTENTS

PREFACE

The systematic study of adaptive learning has a long and storied history dating back to the beginning of the 20th century. At that time, Ivan Pavlov and Edward Thorndike introduced the two major experimental paradigms of classical and instrumental conditioning that have since defined this research area and stood the test of time. In the 1930s, B. F. Skinner made significant contributions to the study of instrumental conditioning. The methods and technical vocabularies he and Pavlov developed still serve as the basis of organizing the content covered in chapters and textbooks of learning.

Historically, there have been two major categories of learning textbooks: those emphasizing theories, exemplified by Hilgard and Bauer's *Theories of Learning* (1975), and those emphasizing principles, exemplified by Kimble's revision of Hilgard and Marquis's *Conditioning and Learning* (1961). The present book is in the tradition of the latter and similar in coverage to recent texts in learning and behavior (e.g., Domjan, 2009; Mazur, 2006; Powell, Symbaluk, & Macdonald, 2009; Schwartz, Wasserman, & Robbins, 2002).

Similar to other learning textbooks, *Adaptive Learning and the Human Condition* emphasizes the experimental research literatures related to classical and instrumental conditioning. Defining learning as an adaptive process through which individuals acquire the ability to predict and control the environment enables the student to appreciate why these two research paradigms, and only these two, are addressed. Adaptation requires acquiring the ability to predict, and when possible, control environmental events. Pavlov studied animals under circumstances that made it possible to predict, but not control, events. Thorndike and Skinner studied animals under circumstances in which their behavior reliably impacted (i.e., controlled) the environment. Observational learning and language are treated as indirect processes for acquiring the same abilities. This enables students to appreciate the relevance of the animal learning literature to human beings as well as the ubiquity and importance of learning principles in our everyday lives.

The first and last chapters of *Adaptive Learning and the Human Condition* begin with the same sentence. A recurring message of this book is that learning principles constitute very powerful explanations for human behavior and help us understand the way we live and why we, more than any other animal, dominate this planet. The two most fundamental ways in which this book differs from other learning textbooks are reflected in the title and this sentence. Learning is defined as an adaptive process that when combined with the human capacities for speech and creation of tools has enabled us to transform the world and thus the human condition. In addition to the usual extension of learning principles to clinical applications, they are related to such nontraditional topics as parenting, moral development, schooling, the effects of technology, and human self-actualization.

THE "BIG MAP"

A textbook, like a course, may be described as a long journey (Levy, 1991). When writing a textbook or teaching a course, it is essential to be an effective guide and to provide useful maps. Before starting, it is often helpful to look at the "big map" portraying the

entire length of the journey. This provides a sense of the scope, as well as an appreciation for where separate trips fit within the overall travel plan. Here and there we may find it necessary and/or enjoyable to take a short side trip. I hope you enjoy the ride!

The textbook (journey) is divided into four major sections (trips): Introduction to the Science of Adaptive Learning (Chapters 1–2), Predictive Learning (Chapters 3–5), Control Learning (Chapters 6–9), and The Human Condition (Chapters 10–14).

Chapter 1 considers how the assumptions, strengths, and limitations of the scientific method apply to the discipline of psychology. The goals and methods of the early schools are described as we examine how current approaches to the discipline evolved. Psychology studies how hereditary (nature) and environmental (nurture) variables affect the thoughts, feelings, and actions of individuals. Learning is seen as a ubiquitous process throughout the animal kingdom, whereby individuals change as the result of experience. It is adaptive, enabling individuals to predict and control their circumstances. The traditional classical and instrumental (or operant) conditioning paradigms, introduced by Pavlov, Thorndike, and Skinner, relate to these two components of adaptation. Classical conditioning procedures study individuals under conditions that enable them to predict, but not control, their environment. Instrumental conditioning procedures study individuals under conditions that enable them to affect the environment. Observational learning and symbolic communication (i.e., language) are treated as indirect procedures for acquiring the ability to predict and control.

The title of the book implies that a science of adaptive learning can result in principles helpful to understanding and influencing the human condition. Chapter 2 addresses the needs of a science to determine cause and effect (internal validity) under naturalistic conditions (external validity). Issues concerning the implementation of these strategies to the study of psychology are considered. The strengths of large-*N* and small-*N* experimental designs in addressing internal validity concerns are described. Issues related to the extension of findings obtained with other animals studied in specialized apparatuses to the human condition are considered.

Chapters 3 through 5 consider the scientific research findings related to predictive learning. Basic principles, phenomena, theoretical issues, and applications are reviewed. Chapters 6 through 8 cover the same topics for control learning. Chapter 9 describes issues related to the maintenance of learned behavior. Alternatives to punishment as a procedure to reduce problematic behaviors are considered. A unifying schema for adaptive learning is presented, consisting of the ability to predict and control the occurrence or nonoccurrence of appetitive and aversive events. In subsequent chapters, this schema is used to describe and explain the changing human condition and to generate solutions to individual and social problems.

Chapter 10 describes how adaptive learning principles may be applied to understand human personality and culture. Chapter 11 extends adaptive learning principles to concept learning, problem solving, and tool making. The abilities to learn, communicate symbolically, and use the precision grip have enabled humans to create transformational technologies. Chapter 12 describes how reading and writing enable the permanent recording of human advancement, further accelerating the transformational process. In Chapter 13, Maslow's hierarchy of human needs is used to compare the human conditions for contemporary Stone Age hunter/gatherers and technology-enhanced cultures. Chapter 14 addresses the implications of a science of adaptive learning to issues of freedom and

determinism. Self-control strategies are described as alternatives to relying upon willpower to achieve personal goals and to self-actualize.

The topic of learning poses many challenges for a textbook author. The material is difficult to "chunk" into meaningful units telling a story. One must define what constitutes "the forest and the trees" in selecting articles to cite from the extensive classic and current research literature. The title of the book implies the strategies used to address each of these challenges.

The four book sections constitute the major chunks:

1. The study of learning is placed within the context of the scientific revolution originating around the time of Galileo; learning is defined as an adaptive process through which individuals acquire the ability to predict and control the environment.
2. Predictive learning (classical conditioning) methods, principles, theoretical issues, and applications are treated in depth.
3. Control learning (instrumental conditioning) methods, principles, theoretical issues, and applications are treated in depth.
4. Adaptive learning principles are applied to the understanding of the human condition.

Throughout the book, research is selected from the voluminous nonhuman literature with an eye toward application to understanding and addressing human concerns. Often, the lives of members of a Stone Age nomadic tribe (the Nukak) are contrasted with those of humans in technologically enhanced societies so that the student can appreciate the remarkable transformation that has taken place over the eons, centuries, and even within their lifetimes. Toward the end of the book, the principles are applied to help us understand the accelerating transformation of our planet and the human condition. In the final chapter, the student is asked to consider the implications and applications of learning principles to governing their own lives. The topics of freedom and self-control are considered in both theoretical and practical terms.

LITTLE MAPS AND STUDENT LEARNING AIDS

I have tried to write *Adaptive Learning and the Human Condition* in a clear, engaging style for the undergraduate student. A few learning aids have been integrated into the text in order to help students acquire an often unfamiliar and technical vocabulary and to understand the material in a more cohesive and integrative way than is assessed through objective examination questions (i.e., multiple choice and true-false).

The four major sections constitute the big map, charting the entire journey. Chapter outlines at the beginning constitute small maps, providing the detail necessary to consider and negotiate current journeys. Even though summaries occur at the end of chapters, it would be an effective strategy to read them and consider how they relate to the outlines before actually beginning the content. The summaries are partially written in a cumulative manner. Rereading them after completing the chapters should enable the student to integrate the current material with that covered previously as the story line progresses.

Key terms are highlighted and defined in the margins near where they first appear as well as in a comprehensive glossary at the end of the book. Students often believe that studying simply consists of reading and rereading the material. I encourage

a more active approach in which students ask themselves and try to answer questions requiring mastery of the factual and conceptual material. I try to assist them in becoming objective and accurate assessors of their own learning. Comprehensive essay questions are provided at the end of major sections. I suggest that students assess their mastery of the material by either standing in front of a mirror and stating the answers out loud or writing them down. The questions are difficult, and it is unlikely that the student will be able to adequately answer them by attempting to memorize the material. A thorough understanding of the rationale and details regarding the procedures, findings, and implications of the research literature is required.

I have attempted to present the material in a sufficiently interesting way so that the student recognizes its relevance and importance and becomes willing to dedicate the time and effort required to achieve a high level of mastery. From the time I was an undergraduate and fell in love with psychology, I have believed and hoped that application of the scientific method to the study of behavior could help us frame human existential issues as testable questions and develop effective technologies to address individual and social concerns. By writing this book, I have attempted to share this belief and hope with others.

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ABOUT THE AUTHOR

Jeffrey C. Levy's professional career at Seton Hall University may be divided into three stages, BC, DC, and AC (before, during, and after his 24-year term as chair of the Department of Psychology). Frequently recognized for teaching excellence, he received the Deans Advisory Council's Outstanding Teacher Award for the College of Arts & Sciences and the Sears-Roebuck Award for College Teaching and Campus Leadership, and he was twice nominated by Seton Hall for National CASE Professor of the Year recognition. Trained as an experimental psychologist with interests in behavior modification, Levy regularly taught the undergraduate Learning course with and without a related animal laboratory and a graduate course in Behavior Modification. A sabbatical opportunity subsequent to his service as chair enabled him to dedicate a year to elaborating upon this teaching experience and drafting *Adaptive Learning and the Human Condition*.