

Preface

Now is an exciting time to be participating in the field of animal behavior—whether as a researcher, an instructor, or a student. In particular, students taking courses in animal behavior today are getting their first glimpses of the field at a dynamic point in its history. The third edition of *Principles of Animal Behavior* aims to show why—by building on the work in the first two editions of this book and adding the latest, best, cutting-edge research being done in animal behavior. Much has happened in the field of animal behavior since the last edition of this book was published in 2009. Recent research findings have given me ample opportunity not only to update and expand on the studies presented in the book but also to reinforce the previous editions' focus on ultimate and proximate causation, as well as the book's unique emphasis on natural selection, learning, and cultural transmission. But there is more to this new edition of *Principles of Animal Behavior* than that.

The third edition greatly expands the discussion of proximate causation, so much so that I have added a new second “primer” chapter on this subject. Chapter 3 is now devoted to hormones, neurobiology, and behavior, while Chapter 4 focuses on molecular genetics, development, and behavior. This discussion of proximate causation introduces a line of inquiry that is sustained throughout the book, alongside ultimate causation. My goal is to weave together the most current knowledge on proximate and ultimate factors and present an integrated approach to animal behavior.

The process of natural selection produces the vast diversity of behavior we see within and across animal species. As such, I delve deeply into the adaptationist approach to animal behavior. In this edition of *Principles of Animal Behavior*, I have also added a great deal of new material on another way to study behavior in an evolutionary context—the phylogenetic approach to the study of behavior. Again, the aim is to produce an integrative overview of animal behavior: The tapestry of animal behavior is created from weaving all of its components into a beautiful whole.

A completely new feature in this edition is the Conservation Connection boxes in Chapters 2–17. Many students taking a course in animal behavior are interested in the course, in part, because they care about the natural world and the creatures that inhabit it. They want to make a difference, and some may even pursue careers in conservation biology. But most animal behavior textbooks barely touch on the subject of conservation biology, or they discuss it only in passing. The Conservation Connection boxes that run throughout the third edition of *Principles of Animal Behavior* give the topic of conservation and animal behavior the space it deserves. Each box focuses on a specific conservation issue related to the chapter topic—such as migration or foraging—and shows how ethology and conservation biology can inform each other in addressing that issue.

From the first edition of this book, my aim has been to explain underlying concepts in a way that is scientifically rigorous but, at the same time, accessible to students. Each chapter in the book provides a sound theoretical and conceptual basis upon which the empirical studies rest. The presentation of theory, sometimes in the form of mathematical models, is not meant to intimidate students but rather to illuminate the wonderful examples of animal behavior in that chapter. My goal has been to produce a book that students will actually enjoy and will recommend to their friends as a “keeper.” I also hope that instructors will find this book useful in their research programs, as well as in their courses.

MAJOR FEATURES

The book is written for both biology and psychology students. Its core strengths are:

► **A BALANCED TREATMENT OF PROXIMATE AND ULTIMATE FACTORS.**

A comprehensive understanding of animal behavior requires a balanced and integrated approach to proximate and ultimate causation. Each of these perspectives informs the other, and both are necessary for an understanding of animal behavior. This book weaves together these two perspectives in ways that other books do not. In the third edition, coverage of proximate factors has been expanded from one chapter to two, allowing for greater depth of material in neurobiology, endocrinology, genetics, and development. Once these topics are thoroughly introduced, examples of proximate and ultimate factors are then integrated into every chapter that follows, reinforcing how modern ethologists study behavior.

► **LEARNING AND CULTURAL TRANSMISSION PRESENTED ALONGSIDE NATURAL SELECTION AND PHYLOGENY.**

This book has always been distinctive in that it integrates learning, cultural transmission, natural selection, and phylogeny throughout the book, bringing together perspectives and research from various subdisciplines in biology, psychology, and anthropology. In recent years, these topics have only become more important to the study of animal behavior. The third edition's coverage of them has been expanded to reflect this.

- **AN EXTENSIVE DISCUSSION OF PHYLOGENY.** Darwin spoke of two “great laws”: one centered on natural selection and the other on phylogeny. An emphasis on phylogeny has become more evident in animal behavior research in the last few years, so this edition delves more deeply into the role that phylogeny plays in understanding fundamental issues in animal behavior. Chapter 2 provides an overview of phylogenetic approaches to ethology, including a detailed description of how to build a phylogenetic tree, and later chapters include comprehensive discussions of the phylogeny of specific animal behaviors, including learning, parental care, cooperation, foraging, migratory behavior, and play.
- **A THOROUGHLY UPDATED ART PROGRAM.** The art program in this book has always included extensive data graphics, as well as photographs that convey the beauty of the natural world. But students often struggle to interpret the graphical representations of data that are so widely used for reporting results across the sciences. The third edition’s art program therefore has been updated to include a new element—extensive bubble captions that help students identify and interpret information conveyed in the figure.
- **NEW CONSERVATION CONNECTION BOXES.** Increasingly, conservation biologists and environmental scientists are using animal behavior research to maintain and improve ecosystems around the world. Chapters 2–17 in this book now each include a Conservation Connection box that describes both a current research inquiry and an application of that inquiry in nature.
- **EXTENSIVE VIDEO CLIPS OF ANIMAL BEHAVIOR.** To illustrate animal behavior in its entirety and to show students the behaviors about which they are learning, the text includes hundreds of beautiful photos and line drawings. But students in the twenty-first century have the opportunity to *see* animal behavior in action through video, as well as print. That is why, in addition to the photos and line art in the text, we provide a collection of over 200 wonderful videos—from the BBC, the Cornell Lab of Ornithology, and researchers cited in the book—that capture the beauty of studying animal behavior.

These clips are offered through two resources, the Norton Animal Behavior DVD, which includes descriptions of each clip and references to the book, and 60 new video clips, which are on the Web at wnnorton.com/college/biology/animalbehavior. Each of these clips is accompanied by assignable quizzes that test students’ grasp of core concepts, as well as their ability to analyze examples of animal behavior.