

Preface

This is my tenth attempt at writing a comprehensive but manageable textbook on animal behavior for undergraduates. Over the years, I have come to believe that there are three really big ideas worth my students' attention. First, the logic of science is powerful, understandable, and beautiful. Students should know how the logic is used to produce hypotheses, predictions, and tests of scientific explanations. Second, my readers ought to learn why evolutionary scientists who study behavioral traits are so dependent on the work of a nineteenth century biologist, Charles Darwin. The Darwinian or adaptationist approach is the foundation for my book for a simple reason—it works and I think students should know why. Third, I am keen to have students understand the distinction between proximate (immediate) and ultimate (evolutionary) causes in biology. I believe that all three goals can be achieved without requiring students to become deeply involved in the formal mathematical and graphical elaborations of modern behavioral biology. Instead, the three big ideas can be discussed in English in ways I hope will make some students want to build on what they have learned.

The recognition that I really had only three primary goals led me to reorganize the text substantially this time around. My textbook has always been largely about one of my main interests, namely, behavioral adaptation and the explanatory beauty of Darwinian theory. An understanding of natural selection theory directs us to puzzles worth solving; in many ways the premier puzzle of this sort is the evolution of altruism. Therefore, instead of tackling the topic of altruism toward the end of the book, I have placed it at the beginning as an introduction to the concept of a Darwinian puzzle and to the kind of scientific research that can help solve such a puzzle.

The chapters that follow continue to direct the reader's attention primarily to the question, what adaptive value, if any, is served by behaviors under examination? After looking at social behavior, anti-predator behavior, mating behavior, and parental behavior, I then present examples of how the developmental and physiological (proximate) mechanisms underlying animal behavior work and why they can also be studied in terms of their adaptive value. I think this sequence puts the proximate details of genes, neurons, and hormones in a more accessible context for students who, initially at least, are likely to be largely interested in whole animals and what they do.

Although the book has been restructured, I have continued to place discussion questions throughout the text in the hope that instructors will use these items or ones of their own making to reinforce the main points outlined above. My questions deal with the logic of science, the meaning of natural selection theory, and the distinction between proximate and ultimate causes in biology. Instructors can also use classroom discussion and out-of-class assignments to emphasize the unfinished nature of behavioral research, which, like all other scientific areas, is constantly expanding and sometimes coming to new conclusions that differ from original ones. I have flagged a few of the many controversies that exist in the discipline; instructors will know of others. These can be exploited to encourage the evaluation of competing ideas, contrary results, and changing conclusions in the discipline.

A full range of classroom activities could be used to encourage students to turn off the academic autopilot and really grapple with the major concepts of the course, and to stop thinking that attractive Powerpoint presentations will teach them all they need to know about the field of animal behavior. Indeed, there is abundant evidence that the old-fashioned 50-minute lecture is exactly that—old-fashioned and relatively ineffective as an educational tool, no matter how entertaining and beautifully delivered. Most instructors know this from personal experience; when we hear others lecturing at departmental seminars and the like, we often stop paying attention within 10 minutes (or at least I do), and instead do some serious daydreaming or doze intermittently, depending on the time of day and our degree of sleep deprivation, even if we are genuinely interested in what the speaker has to say. Our students are no different.

So I suggest that you try breaking your lectures into a series of mini-lectures that lead to student discussions or team problem-solving challenges that require your listeners to engage directly with the major concepts you wish them to absorb. Discussion questions of the sort I have written could be used to this end, and I certainly hope that instructors will take advantage of them or others of their own construction rather than soldiering on in a futile and ultimately counterproductive attempt to “cover the material.” We all know that the many details of the courses we ourselves took from lecture-happy college and university instructors have faded into oblivion. The hours I spent memorizing the difference between things like alkanes and alkenes were neither happy nor useful. I do not remember what the difference is nor do I care. So let’s not ask our students to memorize for memorization’s sake. I would like to think that our students are more likely to learn something important if they have a hand in tackling a key idea that requires them to personally solve a puzzle or to convince a classmate about their view of the answer to a discussion question. I imagine that many instructors in animal behavior are already doing these things and more; if my textbook can help out, great!

I have also had much help from the team at Sinauer Associates, my publisher, with whom I have partnered now for over 37 years. During this time I have always had good editors who have deftly handled all the details that have to be dealt with, and there are many Syd Carroll is my current editor. I have also had much help from the team at Sinauer Associates, my publisher, with whom I have partnered now for over 37 years. During this time I have always had good editors who have deftly handled all the details that have to be dealt with, and there are many Syd Carroll is my current editor.

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