

TEXTBOOK REVIEW

Discovering Biological Psychology

by Laura A. Freberg

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There are many excellent textbooks for biological psychology. When I first saw a preview of Laura Freberg's *Discovering Biological Psychology*, I did not expect it would replace the text I had used for years, *Foundations of Physiological Psychology* by Neil R. Carlson (Allyn & Bacon, 2005). I still believe that Carlson's text is excellent in that it is extremely detailed and well-written, but Freberg has written a text that meets a need that many instructors have -- a text that covers the appropriate material without leaving out important information and yet is extremely accessible to students. Instructors who teach in extremely selective institutions, where most students have very high SAT scores and strong verbal abilities, may not have felt a need for such a text. However, faculty at institutions, where some of our students are less well prepared, will likely share my need. Over the years I have examined many of the available biological and physiological psychology texts. I found many exciting texts that were unfortunately written beyond the abilities of many of my students. In contrast I find that Freberg's text is accessible to almost any student; and yet it is thorough enough to offer the challenge that well-prepared students need.

I use the Freberg text in my 300-level physiological psychology class, the only such class offered at Slippery Rock University. I believe this text would also be appropriate for an introductory-level course, at a 200 level, for instance, at an institution where there are two levels of biological psychology courses taught. *Discovering Biological Psychology* is comprehensive in that it covers everything that one would wish to cover, without adding a level of detail more appropriate to an upper-level course, and at what I feel is an appropriate depth for institutions that offer a single biological psychology course.

Several things make the Freberg text stand out from the many other texts on this topic. The first, as mentioned, is the accessibility of the material. Freberg states (personal communication) that she keeps a quote from Einstein in front of her as she writes, "Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius – and a lot of courage – to move in the opposite direction." She knows that some faculty members balk at the word accessible, assuming that accessibility means that the material has been diluted. She respectfully disagrees and believes that an expert should be able to present the material to a novice without sacrificing rigor or accuracy. She has done exactly that; the results I received the first semester I used the textbook indicate that the students found it so. The mean grade in my class was higher than normal with only one failure, an unusual circumstance for this class of nearly all psychology majors.

I recognize this is anecdotal data from a single class, but it certainly seems to speak well to the text's accessibility.

Further, although the text does make the material accessible to students, it is presented in a scholarly manner. Some texts I have seen use a "folksy" and very informal writing style. I am uncomfortable with this style because I assign formal APA style papers so a text that uses a casual tone and/or talks down to them does not provide an appropriate example of professional writing.

Freberg takes a "how things work" approach. Not only is the material accessible to the students, it is made salient. Rather than just tell students that action potentials propagate down the axon, she tells them why. For example, she explains that the reason it travels down the axon (instead of going both ways) is that each prior segment of the axon will be in the refractory period and won't be able to fire. Her goal is understanding, not rote memorization. Every chapter includes some reference to the "real life" application of the material they are learning. She answers the question "why do I have to learn this stuff?" before students ask it! One example is the inclusion of a section on thirst and sports drinks in the chapter on motivation. This gives students information to which they can relate. Many of these real life examples are included in the illustrations in the text.

The illustrations, graphs, and artwork in the text are excellent. They are not only helpful in clarifying the material being presented, but in addition, they make the information meaningful. For instance, in the chapter on motivation, which includes hunger, thirst, and body temperature, there is a photo of Korey Stringer, the Minnesota Vikings football player whose life was taken by heat stroke, and an accompanying caption explaining what happened. The chapter on psychological disorders includes John Nash, the Nobel Prize winning mathematician who was the subject of the 2001 film *A Beautiful Mind*. The chapter on sexual development includes a wonderful set of photos illustrating 5-alpha reductase deficiency males before and after puberty. Such illustrations and examples make the material meaningful to students and emphasize understanding over memorization, a learning strategy that most instructors favor.

Freberg comments that she was creative with the standard table of contents to reflect the current state of biological psychology. While presenting similar material as other texts, she has "rearranged" it in some cases, putting topics together in logical ways. Examples of this are given below. Another difference between Freberg's text and the introductory Carlson text is that she has included a chapter on movement. I had regretted the

elimination of that chapter from Carlson's *Foundations of Physiological Psychology* text.

The first chapter of the Freberg text introduces biological psychology and briefly covers various research methods and research ethics. It does not go into detail about the history of the field as do some other texts, but within each chapter the history of that particular topic is included where appropriate. Including historical information within the topic where it applies may make it more salient to the student. Chapter two covers the anatomy of the nervous system, and chapter three introduces the cells of the nervous system and includes the action potential and synapses. This order is the opposite of the order of Carlson's introductory book and seems to work well for the students. They seemed to grasp the concepts in the chapter on the cells of the nervous system more easily after having an overview of the anatomy. The explanation of the action potential is particularly understandable, something that I feel is extremely important for this foundational information.

Chapter four covers pharmacology and does a very good job of explaining both drug actions at the synapse and the basic principles of drug effects. In chapter five Freberg fits together the topics of genetics, evolution, and the development of the human brain. The genetics of behavior and the development of the human brain in such adaptive ways create a coherent presentation. This is an example of one of the ways Freberg has been creative with her table of contents to reflect the state of the discipline.

The next two chapters are the usual vision, non visual sensation and perception. These are followed by an excellent chapter on movement. There is enough information given to be challenging in each of these chapters, and it is presented in a clear and understandable manner. Chapter nine addresses motivation, and includes temperature, thirst, and hunger. I was pleased with the fact that this text is much more up to date on the research on hunger than many I have read. Sexual behavior has a chapter to itself and it includes topics I have not seen in other biopsychology texts, including attraction and parental behavior. Chapter 11 covers sleep and waking and chapter 12 covers learning and memory. The topics of learning and memory may contain some of the most rapidly changing material in the field. I found that when I read this chapter it gave me a better understanding than I previously had of some of the latest research.

Chapter 13 covers lateralization, language, and intelligence, three topics that I think fit together wonderfully well. Others have put language in a chapter by itself and many do not even cover intelligence. Chapter 14 covers emotion, aggression, reward and stress, another creative linking of topics that seems to work well. Chapter 15 covers neurological disorders, with sections on assessment of brain damage, recovery from brain damage, and another on various therapies for brain injury. Chapter 16 covers psychological disorders. It always disturbs me that we have to label disorders "psychological," because as biological psychologists we know that for every psychological event there is a biological event. Thus, there is no such thing as a purely "psychological" disorder.

However I suspect we will have to continue to make the distinction for some time between illnesses that have clearly organic origins and those that are less clearly physiological. That said, the chapter is as up to date as a text book can be on the most recent work on many of the most important illnesses, including schizophrenia, mood disorders, anxiety disorders, autism, ADHD, and antisocial personality disorder.

Sixteen chapters seem about right for a one-semester course for psychology majors. I did skip over some of the material in order to make it through the first semester I used the book, but I expect that with proper planning one could cover all the chapters in a semester.

The ancillaries for the text include two CD-ROMs. The *ClassPresent* CD contains animations (the same ones that are on the student web site). The *ClassPrep* CD contains a very complete PowerPoint® presentation for each chapter that can be used as is or modified. I especially appreciate these because they allow me to teach from the PowerPoint without having to make separate lecture notes. Some instructors may find the PowerPoint presentations too complete but slides that are not needed can be deleted.

The test bank is also on this CD. In the interest of full disclosure, I contributed application questions to the test bank. I noted that when the final version of the test bank arrived, not only are the questions I wrote included, but others were added. A good, fair test bank is very important because nothing is more frustrating to a student than ambiguous or tricky questions on an exam. I think that for the most part the questions on the test bank are very clear. This CD also includes sample lecture outlines, ideas for classroom demonstrations and handouts, and ideas about outside resources one could use in the classroom.

The pedagogical aspects of the book include vocabulary words in bold in the text with definitions in the margins. There are learning objectives at the beginning of each chapter and a chapter outline on one of the first two pages of each chapter. Interim summaries are included throughout each chapter where appropriate to help students organize the material. Further, each chapter ends with a "new directions" section where students are introduced to the newest material. For instance, chapter one's "new direction" introduces new ethical challenges concerning stem cell research. Each chapter also ends with thought questions, recommended reading, key terms, and recommended web sites. A study guide and comprehensive student web site are also available for students.

Instructors looking for a student-friendly text that is accurate, has very complete coverage, and that is as current as a text can be, will be very satisfied with Freberg's *Discovering Biological Psychology*.