BOOK REVIEW

Anxious: Using the Brain to Understand and Treat Fear and Anxiety

By Joseph LeDoux
2015 Viking (Penguin Random House) 466 pages

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"So, first of all, let me assert my firm belief that the only thing we have to fear is fear itself—nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance." – Franklin Delano Roosevelt

There are very few students of history who have not read or heard these words from Franklin Delano Roosevelt's 1933 inaugural speech. They were spoken at a time when millions of Americans that had lost their savings and/or jobs and were looking for reasons to be hopeful. Within a decade after uttering these famous words FDR found himself sending young men to war against Germany, Italy, and Japan, many of whom would come back with "shell shock," what medicine now refers to as post-traumatic stress disorder (PTSD). Over the course of the next seventy years the United States would enter several armed conflicts and thousands more men and women would return home paralyzed by fear and anxiety triggered by any number of common environmental stimuli or the retrieval of their memories. While PTSD is not the focus of *Anxious* and its stunningly detailed and interdisciplinary discussion of fear, I believe we can all agree that fear and anxiety have been popular topics of discussion in the media and on college campuses as of late. Furthermore, these are emotions that most of us would say we have felt at some point in our lives. I have felt fear while standing on the top of the Hoover Dam and peering over its edge to see the Colorado River. My students commonly report that they have felt anxiety prior to exams. But what is fear? Is the feeling I get whilst at the top of the Hoover Dam the same as the feeling my students have when they are sitting down to take the Medical College Admissions Test? Is it the same phenomenological experience as that of the person who has agoraphobia or the veteran that suffers from PTSD? Is the rodent in a conditioned place aversion paradigm having the same experience? Dr. LeDoux grapples with these questions at various points in *Anxious* by drawing upon over a century of clinical, scientific, and philosophical literature. At various points he sheds light on what may have been the misattribution of scientific results by popular media and scientists themselves, yet in the end he provides an optimistic view of the future of fear research; one that anyone would be anxious to see come to fruition.

The first chapter of *Anxious* begins with a discussion of the etymology of fear and moves very quickly to the modern DSM-5 definitions of fear and anxiety disorders. During this rapid journey from ancient Greece to the 20th century we see the evolution of the colloquial and clinical definitions of fear. At the end of this chapter, LeDoux shares his own scientific/philosophical view that fear "result[s] when we become consciously aware that our brain has nonconsciously detected danger" (pg. 20). He uses the remainder of the book to flesh this subtle, yet crucial splitting of philosophical hairs. The arguments supporting this view of fear allow for a crucial lesson to be taught to young students of our profession. As LeDoux notes, the word fear and the phrase "fear processing circuitry" have been used differently by writers over the last century which has caused a great deal of confusion about what neuroscience has actually been studying in regards to fear. Since the concept of fear has morphed and been inconsistent over this time, students (undergraduates, graduates, and professors alike) can pick up a publication and not know whether the authors were referring to "fear" (the conscious emotion) or "fear" (the subconscious awareness of danger or some other related process). While this might seem to be a scary conversation to approach with undergraduate students, I think that the reader of this text will be pleasantly surprised at how well each chapter presents anatomical, physiological, and clinical data alongside philosophical concepts. This tractable text will challenge your students (and you) to be more thoughtful about designing experiments and interpreting the data they collect.

Each chapter has diagrams that are at times complex, but not overwhelming, and there are elements of "planned redundancy" where LeDoux builds upon broad concepts introduced in previous figures. Students will tour the "fear circuitry" through the discussion of anatomical and physiological data collected from the neocortex, amygdala, hypothalamus, and periaqueductal gray using a variety of techniques used by many laboratories. The reader also gets a necessary tour of the philosophy of consciousness literature so that they can formulate their own opinions on whether or not the empirical data on fear actually speaks to conscious feelings of fear or the unconscious detection of danger. Lastly, and perhaps most importantly for undergraduate students interested in pursuing medicine or applied scientific work, LeDoux ends *Anxious* by discussing the history, breakthroughs and limitations of the pharmacological and cognitive therapy treatments of fear and anxiety that have their roots in the experimental data discussed in previous chapters. The reader leaves with a sense of just how much more the field has to learn in order to help those who suffer from these often debilitating symptoms.

In summary, I believe this book would be of pedagogical use in a number of different courses in an undergraduate curriculum. For example, I have found that while

undergraduate textbooks might adequately describe the methodology and empirical results of cognitive neuroscience experiments they often lack in-depth conversations regarding the functional definitions given to the cognitive processes (attention, decision making, emotions, etc.). How is a student supposed to gage the legitimacy of the results if s/he doesn't have a firm grasp on the definition (the concept)? *Anxious* presents a very clear introduction to not only the neuroscience of fear, but also the process and the pitfalls of creating these pragmatic definitions of cognitive processes. While LeDoux acknowledges that these definitions (including his own) might ultimately be incorrect, the student will walk away from *Anxious* with an example of how to think deeply about their research topic. Because of this, I think that it would be a fine addition to the cognitive processes section of an introductory neuroscience course, an upper level psychology course focused on emotions, or perhaps the basis for a first-year seminar focused on introducing students to the philosophy of (neuro)science. Regardless, students will walk away with a better understanding of an emotion that they will unfortunately encounter way too often in life and hopefully will leave the text less fearful of the big questions regarding the cognitive processes of the brain.

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