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Book Review: Why We Do What We Do

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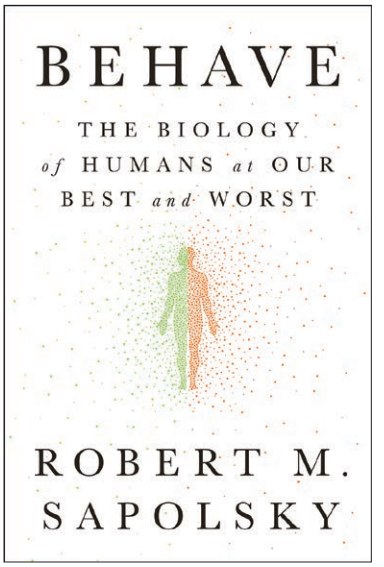
Robert M. Sapolsky, *Behave: The Biology of Humans at Our Best and Worst* (New York: Penguin Random House, 2017).

I was 74 pages into Robert Sapolsky's new book, *Behave*, when its section on gambling and the dopamine reward system became personally relevant. I was at the Orient Point Ferry Terminal at the eastern tip of Long Island, cruelly misdirected by my GPS and without a reservation. Backtracking towards New York City, my originally intended route, would have lengthened my trip substantially. But if I could get on a ferry, it would be a shorter and more enjoyable journey. Fortunately, my decision to wait paid off and I felt extremely happy when, as a standby passenger, I was finally directed onto the boat. Having read Sapolsky, I understood this burst of happiness at various levels, including brain anatomy, the physiology of neurotransmitters, the connections between various parts of the brain, and, in my case, the dopamine reward system. I even understood *why* I felt much happier than if I had had a ferry reservation in the first place.

In *Behave*, Sapolsky provides a multifaceted and detailed understanding of how and why different human behaviors occur. He achieves this for a non-specialist audience using a clever organizational approach. In the first chapter, "The Behavior," Sapolsky posits that a behavior has *just* occurred then takes the reader on a journey back in time through all of that behavior's precipitating events. He leads readers from "prior second," to "prior seconds to minutes," to "prior hours to days," and, ultimately, to evolutionary forces in the "prior millions of years." This approach helps readers achieve a sophisticated and comprehensive understanding of behavioral causation.

In the chapter, "One Second Before," the reader looks at human behavior through the lens of sensory stimulation and the neural circuitry that affects communication between various parts of the brain. Although the behavior itself may be *described* in very simple terms, the real challenge is in the question: *why* did that behavior occur? This chapter explores the *why* at the level of neural communication between areas of the brain involved in automatic responses, emotion and cognition.



The *why* is also strongly influenced by the brain's intrinsic reward system. Studying behaviors such as pathological gambling, addiction, or even catching a ferry on standby, show that "dopamine is more about the anticipation of reward, than about reward itself" (73).

"Why did that behavior occur?" remains the central question for the next eight chapters as Sapolsky guides the reader progressively back in time from when the behavior occurred. In the chapters "Seconds to Minutes Before" and "Hours to Days Before," the author examines the sensory stimulation that prompts or cues a behavior and the effects of hormones, such as testosterone, on the brain and on behaviors. Sapolsky explores the areas of the brain that are targeted by outside stimuli, including subliminal stimuli. Of special interest is the brain's very quick response (less than a tenth of a second) to the face of a person from a different "race," along with activation of the amygdala, an area of the brain associated with "fear conditioning." By clarifying popular perceptions, Sapolsky provides a nuanced view of the effects of stimuli and hormones on behavior while emphasizing their importance. As an example, he writes that testosterone "increases whatever is needed to maintain status. In a

world in which status is awarded for the best of behaviors, testosterone would be the most prosocial hormone in existence" (135).

In the chapter titled "Adolescence; or Dude, Where's My Frontal Cortex?," we learn that the adolescent brain really does work differently. Specifically, the "limbic, autonomic and endocrine systems are going full blast while the frontal cortex is still working out the assembly instructions" (155). Sapolsky's argument is that the frontal cortex is the brain region "least constrained by genes and most sculpted by experience" (173). This is the most monumental idea in the book, for it helps explain how humans function in remarkably complex social environments, environments that are extremely variable even over recent time periods and among different societies living today. The chapter "Back to the Crib, Back to the Womb" seeks the roots of adult behavior in childhood. Brain development, development of morality, the ability to regulate emotions and behavior as shown by the very interesting "marshmallow test," childhood adversity, and the effects of male and female hormones on development are some of the more interesting topics covered.

The remainder of the first part of the book considers the roles of genes, culture and evolutionary factors in shaping behaviors. Sapolsky's chapter on genetics is comprehensive and accurate. He recognizes the complexities of gene and environment interaction and refutes the idea of genetic determinism in the case of human behaviors. However, genes are clearly important for brain development; genetic variation in neurotransmitters, hormone responses, and other aspects of brain biology does occur. The role of culture on behavior is similarly nuanced. A comprehensive chapter on evolution of behavior provides the basic science of evolutionary processes, recognizing that variation in genes that influence behavior *could* be acted upon by evolutionary forces. It remains uncertain, however, whether any recent human behavioral adaptations are the result of evolutionary, as opposed to cultural, factors. The end of this chapter introduces the "sociobiology debate" over the evolutionary underpinnings of human behaviors, including violence and war-mongering.

The final part of the book explores some of these most important human behaviors, including "human clannishness and xenophobia," hierarchy, obedience to authority, and morality. Sapolsky also examines free will and the criminal justice system, ending the book with a chapter on "War and Peace." Sapolsky's wonderful synthesis of neuroscience, built progressively through the book, provides a strong foundation from which to examine these influential forms of behavior. Although human behavior is complicated, "hellishingly" so, and includes the most horrendous acts, ultimately, Sapolsky gives us hope. As he puts it, when recognizing people such as Nelson Mandela or even far less well-known individuals whose behavior has made an enormous difference in this world: "Individuals no more exceptional than the rest of us provide stunning examples of our finest moments as humans." (674).

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