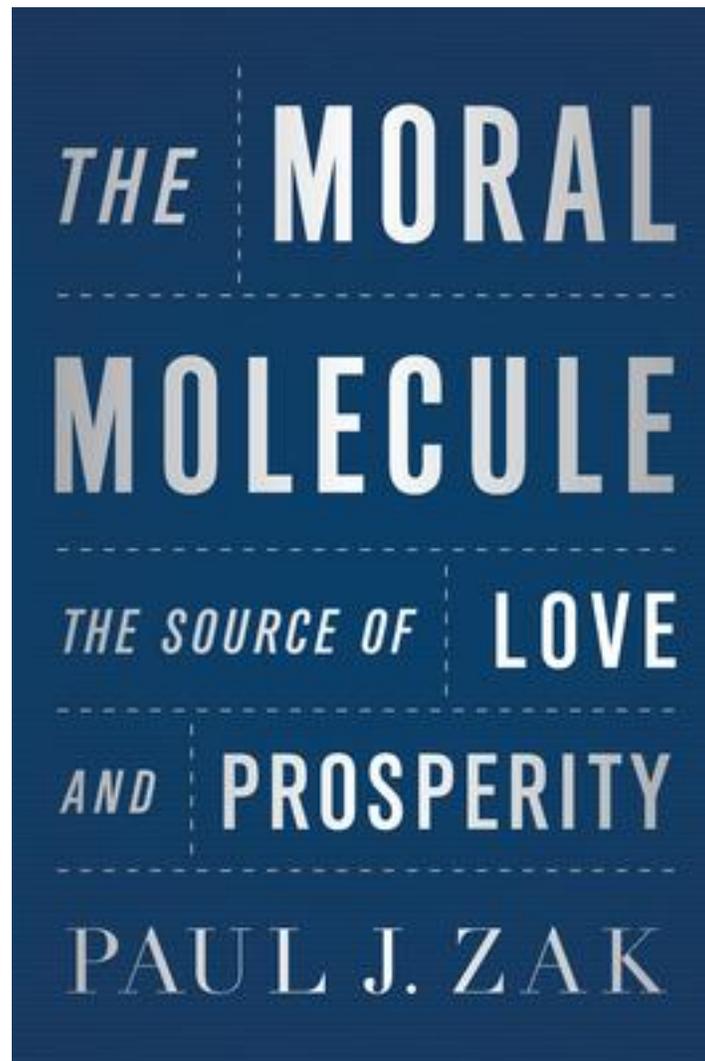


Are You Responsible for Your Hormones?

Review: *The Moral Molecule: The Source of Love and Prosperity*

by Paul J. Zak, Ph.D.

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Courtesy of Dutton

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In *The Moral Molecule*, neuroeconomist Paul J. Zak describes a fascinating intersection of neuroscience, cultural anthropology, economics, philosophy, and politics. Given that many scientists specialize in only one, or maybe two, of these domains, taking the time to synthesize developments across fields can spark broad new frameworks and even paradigm shifts. Such synthesis can also capture the attention of the general public, especially given a topic that reflects our most personal experiences: moral behavior.

This book presents an often autobiographical account of the author's research on the biological basis of ethical behavior, with a focus on the pituitary peptide hormone oxytocin, the so-called moral molecule. The book's scope is wide-ranging, including an evolutionary and a religious perspective and vignettes ripped from the headlines, all laced with personal anecdotes. The casual tone will likely make the material accessible to a broad audience. But at times, Dr. Zak oversimplifies his arguments, leaving me with some questions and concerns.

Dr. Zak begins by sharing some of the initial experiments that led him to study the connection between oxytocin and trust. In 2005 he reported the intriguing finding that when individuals engaged in the pro-social behavior of being trustworthy in a monetary transaction, they had higher levels of oxytocin in their blood. He summarizes the rich literature on this evolutionarily favored peptide, which demonstrates that it promotes maternal behavior and even social monogamy in a variety of species. He then presents testosterone as a counterpart to oxytocin, as though a yin-yang relationship exists. Many social behaviors that cannot be explained by oxytocin are associated with variations in testosterone, such as sex differences in behavior, philandering, rule enforcing, and outgroup-directed aggression.

Having described the role of oxytocin on social behavior, the author suggests that various behavioral problems may relate to oxytocin dysfunction, acquired either due to developmental maltreatment or congenital issues, such as in autism or psychopathy. Although these specific mental health problems are strikingly different, affected individuals and society would benefit substantially if research on oxytocin provided clues to treat and prevent these serious behavioral problems. Furthermore, Dr. Zak proposes that community activities, such as dancing and spiritual quests, promote natural oxytocin release, thereby providing a sense of wellbeing. Thus, argues Dr. Zak, in addition to clinical applications, oxytocin research may translate into positive psychology approaches. One may imagine emotional hygiene regimens, with appropriate doses of social contact and prayer, devised to enhance our oxytocin secretion.

The final section of the book returns to trust and its importance in trade and commerce. This section includes the message that a few highly testosterone-laden individuals warp our oxytocin-mediated biological tendency to engage in fair interactions. In a marketplace without reciprocity, the inevitable withdrawal of participation erodes the synergistic benefits we normally enjoy from specialization and trade. Likewise, society needs trust for effective governing. Dr. Zak prescribes authentic communication, diversity exposure, policies that reinforce fairness, and improved education as policies that would promote societal prosperity via enhanced oxytocin activity. As he presents oxytocin as a mediator of morality in the marketplace and in politics, it takes on a divine aura. The take-home message is reminiscent of an uplifting new-age sermon: hug often.

Although (or because) the topics of the book are engaging, I had a number of concerns. Dr. Zak presents the thesis of the book, that moral behavior is mediated by oxytocin, without a working definition of morality. The behavioral effects of oxytocin in humans, as described in the book, seem better described more narrowly as pro-social. The ethical virtue of humanity, defined by positive psychologists Christopher Peterson and Martin Seligman, includes love, kindness, and social intelligence,¹ and these qualities match well with oxytocin actions, as indicated by the research presented here. However, ethical behavior is often construed as manifestations of character traits, such as wisdom, courage, and temperance. Dr. Zak does not consider the possible roles of oxytocin in these aspects of moral behavior, which often require higher cognitive processing than a pro-social impulse. Thus, although “moral molecule” is a catchy nickname, it is imprecise.

In addition, the function of oxytocin may not be to specifically promote social behavior. Researchers have proposed that the underlying effect of oxytocin simply may be to reduce anxiety² or to promote the salience of social cues.³ In some cases, by making social cues more conspicuous, individuals may behave in a hostile manner.⁴ It would be hard to interpret such behavior as moral. Such considerations may give behaviorists pause.

Dr. Zak’s references to preliminary or extrapolated evidence undermine the force of his argument. For example, Dr. Zak explains that oxytocin’s effects on pro-social behavior are mediated by serotonin and dopamine, creating the impression that researchers have completely uncovered the neural circuitry. But given that experimental evidence for this proposed mechanism is not documented, the reader may be left wondering how to separate fact from

speculation elsewhere in the book. Likewise, when the author makes the bold statement that “if the oxytocin receptors are not stimulated by love and attention early on, they fail to develop,” I suspect he was not describing the extant data literally.

The Moral Molecule will leave the reductionist reader hungry for details about the mechanisms that control oxytocin and testosterone secretion. Although these hormones may affect our social brain circuits, what in turn controls them? A neural circuit must have evolved to detect the specific circumstances that demand pro-social behaviors. Should not this neural network be considered the ethical (or humanist) prime mover, instead of oxytocin?

Overall, *The Moral Molecule* exposes some very fertile ground for future research, and the author is to be commended for presenting a coherent and engaging discussion of oxytocin function, spanning biopsychology and philosophy. Although some may prefer a more scientifically rigorous discussion, this book is likely to engage a broad audience interested in the new frontiers of social neuroscience.

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References

1. Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Oxford: Oxford University Press.
2. Churchland, P. S., & Winkielman, P. (2012). Modulating social behavior with oxytocin: how does it work? What does it mean? *Hormones and Behavior*, 61(3), 392-399.
3. Wacker, D. W., & Ludwig, M. (2012). Vasopressin, oxytocin, and social odor recognition. *Hormones and Behavior*, 61(3), 259-265.
4. Bartz, J. A., Zaki, J., Bolger, N., & Ochsner, K. N. (2011). Social effects of oxytocin in humans: Context and person matter. *Trends in Cognitive Sciences*, 15(7), 301-309.