
BOOK REVIEWS

Nature Versus Nurture: A New Spin on an Old Debate

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Brain and Culture: Neurobiology, Ideology, and Social Change, by Bruce E. Wexler. 2006.
Cambridge, Massachusetts: The MIT Press, 307 pp., \$34.00 (HB).

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In *Brain and Culture: Neurobiology, Ideology, and Social Change*, Bruce Wexler takes on the age old debate of “nature versus nurture.” His premise is that neurological and psychological functions are intrinsically tied to one another, that each one drives the development of the other, making it impossible to differentiate the two. In order to make his case, Dr. Wexler adeptly covers an impressive breadth of research from a diverse array of disciplines. He includes seminal works from cognitive psychology, developmental psychology, psychoanalysis, experimental psychology, sociology, anthropology, and of course, neuropsychology. Although Dr. Wexler does not present any new research in this book, by juxtaposing information from many disciplines, a new spin on the old debate clearly emerges.

Brain and Culture summarizes previous findings to show that exposure to sensory stimulation directly shapes both the structure and the ultimate function of the brain. Dr. Wexler then argues that young humans innately seek out stimulation that is needed for sociological *and* neurological development. Furthermore, a person’s openness to novelty and change is directly related to their degree of neuronal plasticity. Once a person has reached sexual maturity, their brain is fully developed, and he/she has less ability to incorporate new information. Thus, a baby will actively seek out new sensory information in order to learn about their environment, but an adult will strive to control their environment in order to match information to their “increasingly inflexible inner world.” This “neurologically-based” inflexibility in turn impacts one’s ability to deal with life altering experiences such as immigration or the death of a spouse. Finally, Dr. Wexler suggests that it affects a society’s ability to understand and accept foreign cultures.

As a whole, this book is an organized and well-structured text. The introduction lays out Dr. Wexler’s entire premise with hints as to the supporting evidence he provides later. Each chapter in the book also provides frequent summaries

of content and previews upcoming topics. Given the diverse literature that is included in the book, this format allows the reader to better absorb the premise and its supporting evidence. Research findings are summarized in an entirely approachable manner, and one need not be familiar with the science in order to follow and understand the findings and their implications.

The foundation for Dr. Wexler’s theory is laid out in the first three chapters. In short, he argues that the brain develops in response to sensory stimulation, and that social interactions are critical stimuli for the development of the frontal lobes, parietal lobes, and limbic structures. The fact that the human brain is not fully developed until the third decade is presented as evidence for the impact of social interactions on structural neurological development. In particular, Dr. Wexler argues that this prolonged plasticity, provides “an unprecedented opportunity for environmental shaping of uniquely human aspects of brain function.” Nearly every premise in this half of the book is supported extensively with scientific research and/or observations. For example, in the first chapter, the book reviews the structural and functional organization of the brain. It begins with a basic review of the neuron itself and goes on to incorporate Hebb’s work on memory and learning. The latter half of the chapter emphasizes the neocortex, and in particular the parietal and frontal lobes.

In the second chapter, Dr. Wexler builds his theory that the environment directly shapes the brain’s neuronal connections, which in turn affects our understanding of society and culture. He approaches this argument by highlighting the role of sensory deprivation in the developing brain, especially during critical periods. He then proceeds to argue that we are subsequently better able to see familiar features due to a neurological predisposition to do so. This chapter also provides a succinct review on the effects of enriched rearing environments, including the impact of such stimulation

on the *size* and *function* of the brain. While similar research in humans is limited, there is still some literature presented on imaging data as well as the role of birth order and family size on subsequent intellectual development.

Chapter 3 leads to the real platform of the book. In particular, Dr. Wexler begins to emphasize the impact of social interaction on brain development. More specifically, he suggests that social interactions are essentially an extension of the more easily parsed sensory stimulation discussed previously. This chapter suggests that humans have such a prolonged childhood in order to specifically allow increased social influence on the development of brain structure and function. It relies upon the broadest range of supporting evidence, including the work of Harlow, Luria, Vygotsky, and Freud, and does an impressive job of distilling this research to support his premise.

In the second half of the book, Dr. Wexler discusses the impact of reduced plasticity on human behavior. In particular, he argues that since an adult no longer has the neuroplasticity necessary to absorb new and/or conflicting information, he/she will make every effort possible to change their world to conform to their “increasingly inflexible inner world.” Literature regarding priming is provided as support regarding a predisposed way of perceiving one’s world, and research supporting cognitive differences amongst cultures is further provided as evidence regarding one’s approach to understanding their environment. Dr. Wexler then uses immigration and bereavement as examples of what happens when one’s world changes so much that it no longer matches an internal neurological structure and cognitive expectations. This is perhaps the most interesting concept within the book. Unfortunately, while the text does an elegant job of incorporating an incredibly diverse amount of literature, it does not entirely make the link between brain maturation (and loss of plasticity) with adult “rigidity.” Furthermore, evidence ostensibly supporting this premise is occasionally conflicting. For example, Dr. Wexler provides some compelling examples of immigrants detailing their own struggles as they encounter a new culture. However, these portrayals are written by adolescents, who presumably are still neurologically plastic.

Finally, in the last chapter of the book, Dr. Wexler discusses the difficulties that will arise when two cultures collide. He argues conflict is unavoidable because exposure to diametrically different cultures will “create an uncomfortable dissonance between internal and external realities.” Therefore, while individuals will be fascinated with another culture, they will also attempt to fit it into their own personal belief system. When this cannot be done, conflict will ensue. The book suggests that this conflict parallels that of an individual’s approach to contradictory information. That is, a country will first attempt to ignore the differences. When this is not possible it will then devalue and distort the offending culture. Ultimately, it will attempt to either coerce the other culture into assimilation or employ military forces in order to eventually dominate the new culture. As supporting evidence, Dr. Wexler uses the Crusades and other political examples of attempts to dominate other cultures and subsume them into their own. He presents a fascinating argument that is well supported by historical documents. However, it seems to discount mankind’s drive for power and a desire to dominate others regardless of their similarities or differences. It would have been interesting to know how Dr. Wexler would account for these tendencies within his proposed model.

Although there is room to expand on the theories presented, overall this is a thought-provoking and thoroughly educational text. In the end one is reasonably convinced that the question is not really one of nature versus nurture. Rather the reader is able to appreciate Dr. Wexler’s thesis that the neurological, psychological, and social development of each person represents a mechanism of nature *via* nurture. In short, this is a fascinating book that will make the reader reconsider some of their own assumptions about the role of society on the structural development of the brain. Because it covers such a diverse range of research it would make an excellent textbook for graduate level students. However, all neuropsychologists, regardless of how plastic their brain may be, may want to challenge their preconceived notions and consider integrating this book’s theories into their own internal neurological structure and cognitive expectations.

Estrogen: Protective or destructive to neurons?

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The Effects of Estrogen on Brain Function. Natalie L. Rasgon (Ed.). 2006. Baltimore, MD: The Johns Hopkins University Press, 167 pp., \$49.95 (HB).

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The Effects of Estrogen on Brain Function, edited by Natalie L. Rasgon, is a collection of chapters about estrogen written by experts from different scientific disciplines. The

research and controversies surrounding cognitive and neurophysiological changes related to hormone replacement therapy, especially within the context of Alzheimer’s disease,