

## BOOK REVIEW

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### Review of: *Neurodevelopmental Mechanisms in Psychopathology*

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**REFERENCE:** Cicchetti D, Walker E. *Neurodevelopmental mechanisms in psychopathology*. Cambridge University Press, Cambridge, U.K., 2003, 558 pp.

This fascinating book represents an exciting perspective on the origins of psychopathology by focusing on the development of the brain. The assumption of such a neurodevelopmental perspective is that mental disorders arise from factors that alter the normal course of brain development. It is based on an understanding from research in these areas that neurodevelopment is a complex process that can be altered by a number of factors, from inherited constitutional liabilities to psychosocial stressors. The theoretical underpinnings of the neurodevelopmental perspective emerged in the 1970s, when clinical researchers proposed shifting the focus of understanding psychopathology from trying to identify a single initial cause of mental disorders to emphasizing the importance of bi-directional relationships among brain and experience in producing behavior.

This book developed out of a conference at Emory University in 1999. The editors organized the conference with the goal of assembling a diverse group of researchers who shared an interest in the field. Participants ranged from basic science researchers who used animal models to examine neurodevelopment to clinical researchers who studied developmental factors in human psychopathology. The main goals of the meeting were to examine cutting-edge findings in the field and to chart future directions for research. More than 20 investigators presented their most recent work, hypothesized about underlying mechanisms, and speculated on future directions for research. This book represents a collection of 21 chapters that evolved from the presentations at the conference.

The book is divided into four sections. The first section is made up of six chapters that address basic mechanisms in prenatal, perinatal, and postnatal neurodevelopmental processes and their associations with high-risk conditions and adult mental disorders. The authors of the first three chapters describe our current understanding of the process involved in fetal, neonatal, and postpubertal adolescent brain development, and demonstrate how multiple factors can disrupt early development of brain structures that are known to play a role in human emotion and cognition. Explicating more fully the developmental aspects of the prefrontal cortex in adolescents,

would help forensic scientists to better understand developmental competency issues with the acquisition of progressive executive functioning. The final chapters of this first section represent empirical findings on the associations of prenatal and perinatal events and schizophrenia. Through careful longitudinal research, the authors have demonstrated relationships between early insults to the developing brain and mental health in adulthood. They have been able to show how latent congenital vulnerabilities can lay dormant until later developmental events trigger their expression.

The second section consists of three chapters that shift the focus to animal models. The authors present findings from primate research focused on elucidating the mechanisms involved in the development of psychopathology. The first two chapters offer intriguing findings that may interest forensic scientists. Schneider et al.'s chapter presents compelling evidence from experiments on rhesus monkeys of the importance of prenatal stress in the subsequent development of psychopathology. Maestripieri and Wallen similarly present evidence of how manipulating early environmental exposures is related to the development of psychopathology. The authors have looked at the neurobehavioral effects of mother-infant separation, food deprivation, and infant abuse on primates, and have demonstrated the importance of such adverse experiences on later psychological functioning. The thought-provoking research in this chapter has implications for youth and adult offenders seen in forensic settings, as similar adverse early experiences have been associated with individuals in these populations. Understanding the mechanisms of how such adverse experiences affect the developing brain will undoubtedly contribute to forensic scientists' ability to identify individuals at risk and intervene more effectively with them in conjunction with clinicians and the criminal justice system.

The third group of chapters focuses on models of the nature of genetic and environmental influences on the developmental course of psychopathology. Two specific chapters might be of particular interest to those working with and examining children and adolescents in a forensic setting. McBurnett, King, and Scarpa describe exciting research on neuroendocrine functioning and the emergence of conduct disorder and substance abuse disorders. This research is potentially highly relevant to forensic scientists attempting to identify individuals at risk for aggression, antisocial and psychopathic behavior, and substance abuse. Identification of such individuals

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through assessments of neuroendocrine functioning offers the tantalizing possibility of earlier detection and interventions to address emerging criminal behavior. Cicchetti reports in his chapter on how child maltreatment from abuse and neglect affects neuroendocrine functioning and the emergence of psychopathology. He presents evidence that children exposed to such maltreatment have higher rates of disruptive behavioral problems. He notes that much work needs to be done to tease out the relationship between neuroendocrine functioning and such psychopathology. Understanding this relationship is relevant to addressing the consequences of such behavioral problems, including involvement with the criminal justice system.

The final fourth section of chapters addresses the developmental course of some specific mental disorders: personality disorders, depression, bipolar disorder, post-traumatic stress disorder, and schizophrenia. Siever et al.'s chapter on neurobiology of personality is fascinating and intriguing. The interplay of genetics, brain structure, information processing and capacity with the neurochemical measures present a complex and at times somewhat daunting task. The chapter does a wonderful job of delineating the interplay and creating a credible plausibility. The last four chapters in this section astutely examine how different syndromes of psychopathology can arise from the bi-directional interactions between specific biological liabilities and environmental factors that an individual faces. Each chapter offers critical, comprehensive ways of understanding the nature of these complex disorders. Post et al.'s chapter is a tour de force that comprehensively looks at psychosocial stressors as predisposing factors to bipolar disorder and post-traumatic stress disorder. It is a delight to see the authors move so seamlessly between the intricacies of gene expression and stressful life events.

This is not a practical, clinically-oriented book, *per se*. It is dense with empirical findings and theoretical models. Because the book grew from a conference in which many different individuals presented disparate work, it does not flow easily from one chapter to the next. The editors have nonetheless done a good job of weaving a coherent picture from the different research methods and subjects by organizing the chapters into four sections that more or less contain related subjects. This holds truest in the first two sections of the book, but breaks down to a degree in the final two sections. Within each chapter, the authors and editors have done a good job in making the material digestible, by clearly stating the purpose and outline of each chapter and summarizing the findings at the end. Generally, the chapters are well written, though the reader is expected to be able to follow a high level presentation of research findings.

This book is by researchers, for researchers. It will also be of interest to graduate students, clinicians-in-training, and academic clinicians and forensic scientists. The book has limited utility for practicing clinicians, and less for practicing forensic examiners. While there is much sound research presented here, the authors and editors acknowledge that much more needs to be known and understood before we can make definitive statements about the developing brain and the origins of psychopathology. The book presents cutting-edge thinking, hypotheses, and speculations, little of which would be considered part of the accepted standards of medical knowledge and certainty at the present time. The book is thus an important step towards a broader understanding of the origins of psychopathology that will have ramifications clinically in the future. For the forensic scientist or psychiatrist, this book would be a most useful ready reference to explicate the limits of knowledge and the extent of medical certainty.