ENCYCLOPEDIA
on Early Childhood
Development

Temperament and Its Impact on Child Development: Comments on Rothbart, Kagan, Eisenberg, and Schermerhorn and Bates

Susan D. Calkins, PhD

University of North Carolina, USA

April 2012, Éd. rév.

Introduction

As noted by Rothbart, Kagan, Eisenberg, and Schermerhorn and Bates, the construct of temperament has been the focus of considerable developmental and clinical psychology research because it has the potential to capture the child's contribution to early developmental processes. Temperament refers to individual characteristics that are assumed to have a biological or genetic basis, that determine the individual's affective, attentional and motor responses cross-situationally, and that play a role in subsequent social interactions and social functioning. Early temperament research focused on establishing taxonomies of temperament dimensions, addressing measurement issues and examining stability of temperament across time. The five authors have conducted important longitudinal research that examines the extent to which

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temperament affects normative development, positive adjustment and the development of psychopathology. This work has considerable translational potential, as it may facilitate the development of appropriate interventions targeted toward children with different temperamental tendencies who may be vulnerable to learning and social difficulties. This research also reveals which dimensions of parenting, or socialization more broadly, may interact with which child tendencies to influence behavioural trajectories and outcomes.

Research and Conclusions

Current theory and research on infant and child temperament and its role in emotional functioning and behavioural adjustment has its roots in the work of Thomas and Chess.[1,2,3] Their work stimulated a number of researchers interested in early socio-emotional development to explore the notion that inborn characteristics of the child contributed substantively to later behaviour, and to attempt to develop measurement strategies to capture these characteristics. Subsequent theories of temperament have varied in the numbers of temperament dimensions proposed, the emphasis on emotion versus behaviour and the extent to which the environment influences these initial tendencies.[4,5,6]

Rothbart and colleagues[6,7,8,9] articulated one of the most influential and comprehensive theories of early temperament, one that has generated a great deal of research on infant development over the last 20 years.[10,11,12,13,14] This theory defines temperament along two broad dimensions of reactivity and self-regulation, which then subsume multiple subscales that place a greater emphasis on basic emotion, attention and motor processes.

With respect to the reactive dimension of temperament, Rothbart notes that researchers may characterize an infant's initial responses by his physiological and behavioural reactions to sensory stimuli of different qualities and intensities. This reactivity is believed to be present at birth and reflects a relatively stable characteristic of the infant.[9] The second dimension proposed by Rothbart, self-regulation, has been described largely in terms of attentional and motor control mechanisms that emerge across early development. For example, the development of attention and its use in the control of emotional reactivity begin to emerge in the first year of life and continue throughout the preschool and school years.[6,15,16] Individual differences in the ability to voluntarily sustain focus or shift attention are critical components of self-control of attention. Attentional orienting skills, in particular, have been identified as a critical component of the regulatory process, since orienting has the direct effect of amplifying, at a neural level, the

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stimuli toward which attention is directed, changing the affective experience of the individual.[17] Thus, orienting skills assist in the management of both negative and positive emotions, and consequently in the development of adaptive control of emotion and behaviour. Rothbart views the very young infant as a highly reactive organism whose behaviour becomes, with development, increasingly controlled by regulatory processes. It is these regulatory processes that may ultimately determine the young child's degree of success at mastering developmental achievements.[18,19]

Eisenberg notes the importance of studying individual differences as well as normative development of one key dimension of temperament, effortful control. This term refers to a special class of self-regulatory processes that develop with the maturation of attentional mechanisms, particularly the anterior attention system.[16] Although it is believed that effortful control begins to emerge at the end of the first year of life, its development continues at least through the preschool years, and again, is a likely candidate process in the development of childhood psychopathology. Eisenberg argues for the value of studying these effortful control processes across the first several years of life, since they likely play an important role in adaptive behaviour, and factors that affect the development of effortful control, including caregiving, may exert their effect prior to the emergence of the actual skills.

Kagan[20,21] focuses his temperament theory on two extreme types of children — inhibited and uninhibited — that he argues represent distinct bio-behavioural profiles leading to patterns of approach versus withdrawal tendencies across childhood. In his view, the biological disposition toward inhibition functions as a foundation, rather than a constraint. Not all inhibited children, he notes, become shy, anxious adults. Presumably, some children who display inhibited tendencies early in development because of their biological disposition may develop strategies for coping with this early bias so that, over time, they engage in adaptive and appropriate behaviour.

Schermerhorn and Bates address the complex transactions that occur between children and parents as a function of both children's temperament and parenting behaviour. The most consistent findings suggest that both child negative reactivity and self-regulation are predictive of, and predicted by, specific dimensions of parenting behaviour. These findings support the notion that child temperament is part of a dynamic system of dyadic interactions that modifies both caregivers and offspring over time. Not surprisingly, child temperament and parenting behaviour also interact to predict subsequent behaviour and functioning. Again, the research

findings identify specific dimensions of temperament, notably fearfulness and self-regulation, that are implicated in these interactional pathways, suggesting that some temperament dimensions are more modifiable, or predictive of particular outcomes, than others.

The four perspectives on temperament and temperament research presented here highlight a number of areas of agreement that are critical to ongoing research and application of temperament theory. Temperament is manifest early in development, modifies and is modified by the environment, and is influential in behavioural adaptation. The notion that it is biologically-based, an early tenet of temperament theory, continues to generate much empirical work, particularly, and as several of the authors note, as the fields of genetics and neuroscience have become integrated into mainstream developmental psychology.

The field of temperament has further come to recognize that co-action, transaction, and interaction characterize development in any biologically informed model of child functioning.[22] By incorporating biological indicators of temperament and functioning, temperament researchers are able to shift the focus of the research from the observation that an interaction between parent and child has occurred and leads to a specific behavioural outcome, to how and why that interaction leads to behavioural change. In fact, recent temperament work has adopted an empirical approach that measures functioning across multiple biological levels of analysis, and that examines how the environment may modify these biological processes. So, for example, in one recent study that assessed the genetic and physiological basis for self-regulation, the researchers found that children at genetic risk for behavioural difficulties characterized by poor physiological regulation were less vulnerable to such difficulties when exposed to sensitive caregiving early in development. Thus, the presumed mechanism for successful behavioural adaptation is a physiological system that supports the regulation of behaviour. [23] Importantly, that physiological system is highly responsive to sensitive caregiving early in development. Understanding the genetic, neural, physiological and behavioural mechanisms responsible for developmental adaptation will be the focus of much future temperament research.

Implications for the Policy and Service Perspectives

Rothbart, Kagan, Eisenberg, and Schermerhorn and Bates all highlight various ways in which early temperament may influence child development. One hypothesis that follows directly from Rothbart's theory of temperament is that temperamental reactivity exerts its effects on child behaviour via the developing self-regulatory system. Recent developmental neuroscience work

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suggests that because of its dependence on the maturation of prefrontal-limbic connections, the development of self-regulatory processes is relatively protracted,[24] from the development of basic and automatic regulation of physiology in infancy and toddlerhood to the more self-conscious and intentional regulation of cognition emerging in middle childhood.[25] From a developmental perspective, then, opportunities for success and failure of self-regulation are numerous over the course of childhood, particularly given the potential of environmental factors such as parenting to facilitate or disrupt development in these domains.[26] The next generation of temperament research will focus a great deal on the complex biological processes involved in these developmental pathways and the way these processes may be modified by the environment.

Normative achievements in self-regulation are the hallmark of positive adjustment, and failures of self-regulation characterize adjustment problems of childhood. Indeed, many consider the development of emotional self-regulation in particular to be one of the key processes in childhood behaviour problems.[27,28,29,30] For example, in characterizing the behaviour of children with early externalizing behaviour problems, there is often reference to a lack of control, under-control, or poor regulation.[29,30] In characterizing the behaviour of children with internalizing disorders, there is often a discussion of over-control.[12] Understanding the role of temperament in child development may be facilitated by examining the possible mediational effects of emerging self and emotion regulation, and may provide a more proximal mechanism for the development of different forms of behavioural adjustment difficulties characteristic of childhood.

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