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REVIEW

- 133 Biobehavioral assessment of the anxiety disorders: Current progress and future directions
Abbott D, Shirali Y, Haws JK, Lack CW

MINIREVIEWS

- 148 Tattoos as a window to the psyche: How talking about skin art can inform psychiatric practice
Roggenkamp H, Nicholls A, Pierre JM
- 159 Developmental psychopathology: A primer for clinical pediatrics
Eme R
- 163 Taking care of suicidal patients with new technologies and reaching-out means in the post-discharge period
Falcone G, Nardella A, Lamis DA, Erbuto D, Girardi P, Pompili M
- 177 Catatonia as a putative nosological entity: A historical sketch
Gazdag G, Takács R, Ungvari GS

SYSTEMATIC REVIEWS

- 184 Transition to school for children with autism spectrum disorder: A systematic review
Marsh A, Spagnol V, Grove R, Eapen V

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Developmental psychopathology: A primer for clinical pediatrics

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Abstract

Developmental psychopathology (DP), broadly defined as the scientific discipline that has as its primary goal the integration of developmental science and psychopathology into a coherent approach to explanatory models for psychopathological development, has become the dominant approach in the past decade for understanding

the origins of mental disorders among children and adolescents. Hence, it is incumbent upon those working in the field of clinical pediatrics to have at least a basic understanding of its core principles of DP. This article provided such an understanding (*i.e.*, a primer) in an exposition of the four principles that are generally considered be core elements of with examples illustrative of each of the principles.

Key words: Developmental psychopathology; Developmental cascades; Developmental pathways

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Core tip: Developmental psychopathology is an expansive approach to understanding the processes and pathways to normal and abnormal development. The minireview articulated the four central principles upon which approach is based. Perhaps the most important tip which these principles point to is an expansion on the notion of developmental cascades as a way of advancing the sophistication and comprehensiveness of the understanding of developmental pathways. Namely the notion of developmental cascades proposes that early appearing problems can have effects that spread across multiple levels of functioning in a multiplicity of ways over time and thus provides a promising direction for the constructing developmental models for pathways of cascading effects.

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INTRODUCTION

Developmental psychopathology (DP), broadly

defined as the scientific discipline that has as its primary goal the integration of developmental science and psychopathology into a coherent approach to explanatory models for psychopathological development, has become the dominant approach in the past decade for understanding the origins of mental disorders among children and adolescents^[1-3]. This approach emphasizes psychobiological vulnerabilities in interplay with environmental risk factors that shape developmental processes involved in psychopathology. The importance of understanding these processes is anchored in the robust consensus among clinicians and researchers that most adult manifestations of mental disorder have their origins, if not outright symptoms presentations, prior to age 18^[3]. Hence, it is incumbent upon those working in the field of clinical pediatrics to have at least a basic understanding of the core principles of DP. The purpose of this article is to provide such an understanding (*i.e.*, a primer) on this discipline by focusing on four principles that are generally considered be core elements of DP^[3]. Readers who may be interested in a much more comprehensive exposition of DP should consult the current, authoritative multi-volume work edited by Cicchetti^[4].

The article will begin with a presentation of a more expanded definition of DP and then proceed to discuss four principles that are central to the DP model with examples illustrative of each of the principles.

DEFINITION OF DP

To reiterate, DP has as its primary goal the infusion of development into the study of psychopathology and its diagnosis and treatment. It has as its primary objective, the scientific understanding how and why, and for whom and when, processes related to psychopathology develop. In so doing it emphasizes the role of developmental and contextual processes in the origins and course of various juvenile mental disorders. This emphasis has historically distinguished DP from the disciplines of clinical and abnormal child psychology which focused on the classification of childhood mental disorders rather than the complex interplay of factors affecting the dynamic processes of abnormal development. Thus, in the DP approach, psychopathology is viewed not "as a static set of diagnostic entities but rather as the product of the failure to obtain core developmental competences, leading to a progressive veering from normal developmental trajectories and an accumulation of behavior patterns considered maladaptive in most contexts, even though at least some of these behaviors may have been adaptive in the context of deprived or harsh early environments"^[3]. Lastly, since the predominant focus is on understanding the complex interplay among biological, psychological, and contextual aspects of development, DP is by definition interdisciplinary, as it draws on findings from multiple disciplines involving the medical, biological, psychological, and sociological

sciences.

CORE PRINCIPLES OF DP

DP thus has a very broad approach and can be considered a "macroparadigm that acts as a type of framework for understanding developmental processes from multiple perspectives"^[1]. Next, we discuss four of the core principles that undergird this framework. Note that although these principles are separately discussed, they are inherently interrelated.

CONSIDERING THE NORMAL AND ABNORMAL DEVELOPMENTAL PROCESSES TOGETHER

In a nutshell, this principle posits that normal and abnormal developmental processes are mutually informative and thus should be considered together. Thus, as previously mentioned, since phenomena defined as abnormal from the DP perspective represent aberrations in normal developmental processes, knowledge of pathways and processes of normal development are essential for understanding pathology. A crucial corollary of this concept is that nearly all forms of psychopathology are best understood from a quantitative/dimensional, not a qualitative/categorical perspective. Namely, since almost no mental disorder constitutes a clearly demarcated, qualitatively distinct category (*i.e.*, a disorder is either present or absent) but rather is an extreme expression on a dimension/continuum, then processes applying to individuals near the center of the continuum are likely to apply to those at the extreme end of the continuum. Thus, psychological problems are "diagnosed" when there is evidence of deviations from the normal healthy course of development with a key issue being the determination of when and how the normal processes become disrupted and channeled into maladaptive functioning. An example of how the knowledge of normal development can inform an understanding of abnormal development such as chronic physical aggression comes from the study of the developmental origins of physical aggression^[5]. Research has shown that humans, rather than having to learn how to use physical aggression, spontaneously start such usage towards the end of the first year after birth when they have acquired the physical coordination to push, pull, hit, kick, *etc.*. This usage peaks in frequency somewhere between 2 and 4 years of age and then begins to decline. Therefore, this finding from normal development clearly indicates that in order to properly understand the small group of children (almost all male) who become chronically physically aggressive the focus needs to be on the reasons why they fail to learn alternatives to physical aggression with age rather than why physical aggression has become part of their behavioral repertoire.

Conversely, knowledge of abnormal development can also inform an understanding of normal develop-

ment for the same reason that an knowledge of normal development can inform and understanding of abnormal development. Namely, in the continuum model of abnormal development, processes that apply to individuals at the extreme end of the continuum (abnormal behavior) are likely to be applicable to those near the center of the continuum (normal behavior).

An example comes from the studies of infants and toddlers that were subject to brutal deprivation in Romanian orphanages in the 1980s of varying duration (e.g., 6 mo to 3.5 years) and subsequently adopted into high quality homes in England^[6]. Perhaps the most striking finding in these studies was an apparent 6-mo threshold in that when the deprivation lasted for 6 mo or less there was no detectable impairments in functioning across 7 domains at various follow-ups to age 11 when these children were compared to adopted children who had not experienced such savage deprivation. However, pervasive impairment was found in most children if the duration of deprivation extended beyond the 6-mo cut-off. In addition, there was also the unexpected finding of no significant dose-response effect of deprivation of ranging from 6 mo to 3.5 years. Thus, findings from the extremely abnormal circumstance of brutal deprivation uncovered what appears to be threshold relevant to normal development in that infants are relatively invulnerable during the first 6 mo of life to long-lasting impairments if their subsequent care-taking is of high quality.

In sum, DP's ultimate goal is the weaving studies of normal and abnormal development into a comprehensive synthesis.

DEVELOPMENTAL PROCESSES ARE RECIPROCAL AND TRANSACTIONAL

In contrast to a linear model of developmental processes in child factors respond to environmental factors in a static invariant manner, the DP model posits that developmental processes are almost always reciprocal and transactional in nature in that: (1) Child level factors influence environmental factors and vice versa; and (2) Such mutually reciprocating influences cause changes in both child and environmental factors. For example, in a child with Attention-Deficit/Hyperactivity Disorder, impulsivity greatly increases the risk for eliciting coercive, oppositional interchanges with significant others in the child's life. Indeed, it is estimated that a typical child with ADHD has an astonishing half a million of these negative interchanges each year. This change in the environment in turn has a reciprocal influence on the child's behavior in that there is an acceleration of the use by the child of aversive behaviors to attain access to rewarding resources and to reduce unpleasant experiences. These reciprocal and transactional processes can result in a developmental cascade which refers to the cumulative consequences for development of the many reciprocal and transactional processes that result in spreading effects across many child level and

environmental level factors. Developmental cascades can explain why some problems in children (particularly conduct problems) can cause widespread difficulties in adulthood^[7].

DEVELOPMENTAL PATHWAYS

Since psychopathology is conceptualized as resulting over time from reciprocal and transactional processes that result in successive and changing pattern of maladaptation of the juvenile in relationship to their environment, the articulation of developmental pathways is "at the heart of the DP perspective"^[1]. A developmental pathway refers to a sequence and timing of behavioral continuities and transformations across development with individuals differing in their propensity to progress along the successive behavior represented by the pathway. Progress along the pathway is probabilistic, not deterministic^[8]. Although change is seen as always possible because of the dynamic nature of developmental processes, there is likely to be continuity and stability in maladaptive behavior because past structures and organizations in the individual and the transactional processes surrounding constrain change. The resultant stability in highly similar overt behaviors over time is referred to as homotypic continuity. An example of such continuity would be the depressed, withdrawn, fearful behavior of a maltreated child who continues to be reared in an abusive environment. However, in many cases the specific behavioral manifestations will change but there is continuity and stability at the level of an underlying trait. This process is termed heterotypic continuity. For example, in a case of youth on an early onset pathway for antisocial behavior, the initial manifestations are likely to be tantrums and non-compliance in preschool, followed by impulsivity and aggression during childhood; a variety of covert (e.g., theft) and overt (violence) antisocial behaviors including substance abuse problems and delinquency; and criminality in adulthood. Thus, seemingly disparate behaviors are different manifestations on a continuous antisocial pathway.

Lastly, a corollary of the developmental pathway principle is the concept of multiple pathways and outcomes. That is, multiple pathways can lead to the same development outcome (equifinality); and a given risk factor can cause multiple different outcomes (multifinality). An example of equifinality would be aggressive behavior which can have multiple different causes such as maltreatment, traumatic brain injury, a heritable tendency to impulsive, disinhibited behavior, and prenatal and perinatal risk factors^[9]. An example of multifinality would ADHD which poses a significant risk for multiple adverse outcomes such as criminality, substance abuse, academic and occupational failure^[10].

MULTIPLE LEVELS OF ANALYSIS

Following directly from the preceding principles, the last principle to be considered posits that a comprehensive

understanding of the developmental processes and pathway involved in the origins and maintenance of psychopathology requires a simultaneous analysis on multiple levels ranging from the neurobiological (e.g., neural systems) to the individual (e.g., temperament) and to all the contexts in which the individual is embedded (e.g., family, school, social). Needless to say, the implementation of this principle for any particular pathology is in its infancy, with perhaps the best example of this principle being the ontogenic process model of antisocial behavior articulated by Beauchaine and colleagues^[11-13]. In this model the biologically based temperamental trait of impulsivity, expressed early in life as the hyperactive/impulsive and combined presentations of ADHD, is conceptualized as a vulnerability to the development of antisocial behavior. The neurobiological substrate of this trait is a hyporesponsive mesolimbic dopamine (DA) system caused by chronically low levels of dopamine and diminished DA reactivity to rewards. In turn, this dysfunction provokes psychological states (irritability, discontentment) that motivate excessive impulsive reward-seeking behaviors that temporarily upregulate DA hyporesponsivity. This vulnerability elicits and interacts with various environment risk factors (e.g., aversive family and social interactions, school failure) leading to a developmental pathway of increasingly more severe antisocial behaviors.

CONCLUSION AND FUTURE DIRECTIONS

DP is an expansive approach to understanding the processes and pathways to normal and abnormal development. The preceding discussion, which articulated the four central principles upon which approach is based, also provides the basis for future directions of DP. Perhaps the most important direction which these principles point to is an expansion on the notion of developmental cascades as a way of advancing the sophistication and comprehensiveness of the understanding of developmental pathways^[1]. As previously discussed, the notion of developmental cascades proposes that early appearing problems can have effects that spread across multiple levels of

functioning in a multiplicity of ways over time and thus provides a promising direction for the constructing developmental models for pathways of cascading effects.

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