The Historical Origins and Developmental Pathways of the Discipline of Developmental Psychopathology

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ABSTRACT

The historical origins of the field of developmental psychopathology are discussed and the meaning of a developmental psychopathology perspective is described. The definitional principles and tenets of the discipline of developmental psychopathology are delineated and they are utilized to highlight diversity in process and outcome. The definitional principles that are discussed include: 1) the mutual interplay between the study of normality and psychopathology; 2) the importance of a multiple-levels of analysis and multidisciplinary approach; 3) the processes that contribute to resilient adaptation in the face of significant adversity; 4) translational research; and 5) implications for prevention and intervention. Examples derived from research and clinical contexts are provided to illustrate these principles. Advances in our knowledge base in developmental psychopathology not only have benefitted the scientific understanding of the relation between normal and abnormal development, but also have contributed to reducing the individual and societal burden of mental illness.

In this article, the historical origins and scientific advances in the field of developmental psychopathology are described and the principles that have guided its evolution are explicated. The definitional parameters of the discipline are then discussed. Examples of research derived from academic settings and from clinical research contexts are included to illustrate these principles. Finally, important directions for prevention and intervention are proffered that possess implications for enhancing our understanding of normal and abnormal development and for reducing suffering in persons with mental disorders.

HISTORICAL ORIGINS OF DEVELOPMENTAL PSYCHOPATHOLOGY

The field of developmental psychopathology owes its emergence and coalescence to a number of historically based endeavors in a variety of disciplines, including embryology, genetics, the neurosciences, psychoanalysis, and clinical, developmental, and experimental psychology (1). Many of the great theorists in these influential disciplines have reasoned that we can learn more about the normal functioning of an organism by studying its pathology, and likewise, more about its pathology by investigating its normal condition (2). A number of these integrative thinkers conceived of psychopathology as a magnifying mirror in which normal biological and psychological processes could better be observed. Because these systematizers conceptualized psychopathology as a distortion or exaggeration of the normal condition, the study of pathological phenomena was thought to throw into sharper relief one's understanding of normal processes.

A basic theme that appears in the writings of these earlier thinkers is that because all psychopathology can be conceived as a distortion, disturbance or degeneration of normal functioning, it thus follows that, if one wishes to understand pathology more fully, then one must understand the normal functioning against which psychopathology is compared (2). Not only is knowledge of normal biological, psychological and social pro-

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cesses extremely helpful for understanding, preventing and treating psychopathology, but also the deviations from normal development that are seen in pathological processes indicate in exciting ways how normal ontogenesis may be better investigated and understood. Indeed, for many thinkers the very essence and uniqueness of a developmental psychopathology approach lies in its focus on both normal and abnormal, adaptive and maladaptive, ontogenetic processes (2-6).

The field of developmental psychopathology first came into ascendance during the 1970s, predominantly through being highlighted as an important perspective by researchers conducting prospective longitudinal studies of children at risk for developing schizophrenia (7). Also instrumental in the field's emergence were epidemiological investigations of families exhibiting discord, disharmony, and disruption but where there was no parental mental disorder (8) and studies of the links between cumulative risk factors and developmental outcome (9). Likewise, research on the causes, correlates and consequences of secure and insecure attachment (10, 11), investigations of children with a variety of handicapping conditions (12-16), and studies in life span developmental psychology (17) were influential in furthering interest in developmental psychopathology. These investigations generated important knowledge about basic developmental processes in a variety of biological and psychological systems that provided a solid empirical basis against which developmental psychopathologists could discover new truths about the processes underlying adaptation and maladaptation, as well as the best means of preventing and treating psychopathology.

Over the course of the past four decades, developmental psychopathology has emerged as an integrative discipline that is the product of the confluence of various efforts that had been previously distinct and separate (1, 2, 18, 19). Rather than competing with existing theories and facts, the developmental psychopathology perspective represents a broad, integrative framework within which the contributions of separate disciplines can be realized in the larger context of understanding individual development and functioning. The principles of developmental psychopathology can provide the conceptual scaffolding for facilitating this multidisciplinary integration. Through the organizing principles of the concept of development and of systems theory, the discipline of developmental psychopathology has brought together fields of study and investigators that were once disparate in order to examine complex questions of the etiology, course, and sequelae of psychopathology and resilience (19).

WHAT IS DEVELOPMENTAL PSYCHOPATHOLOGY?

Although definitional divergence exists (19), developmental psychopathology is a scientific discipline whose predominant focus is elucidating the interplay among the biological, psychological and social-contextual aspects of normal and abnormal development across the lifespan (20). In recent years, developmental psychopathology has become increasingly contextual, multi-level, dynamic and multidisciplinary (21-23).

In one of the initial statements concerning the goals of developmental psychopathology, Cicchetti (1, p. 20) remarked, "Developmental psychopathology should bridge fields of study, span the life cycle, and aid in the discovery of important new truths about the processes underlying adaptation and maladaptation, as well as the best means of preventing or ameliorating psychopathology." Cicchetti further commented, "This discipline should contribute greatly to reducing the dualisms that exist between the clinical study of and research into childhood and adult disorders, between the behavioral and biological sciences, between developmental psychology and psychopathology, and between basic and applied science" (p. 20).

Theorists and researchers in the field of developmental psychopathology strive to bring together, within a life span framework, the many contributions to the understanding of individuals at high risk for developing mental disorders as well as those who have already manifested such disorders. Developmental psychopathologists do not espouse or adhere to one particular theory that could account for all developmental phenomena (24, 25). Rather, they seek to integrate knowledge across scientific disciplines at multiple levels of analysis and within and between developmental domains (21, 22, 26, 27).

Developmental psychopathologists also engage in a comprehensive evaluation of biological, psychological, social and cultural processes and strive to ascertain how the interaction among these multiple levels of analysis may influence individual differences, the continuity or discontinuity of adaptive or maladaptive behavioral patterns, and the pathways by which normal and pathological developmental outcomes may be achieved. In practice, this entails comprehension of and appreciation for the developmental transformations and

reorganizations that occur over time; an analysis of the risk and protective factors and mechanisms operating within and outside the individual and his or her environment over the course of lifespan development; the investigation of how emergent functions, competencies and developmental tasks modify the expression of a disorder or lead to new symptoms and difficulties; and the recognition that a particular stressor or set of stressful circumstances may eventuate in different biological and psychological difficulties, depending on when in the developmental period the stress occurs (28).

Moreover, various difficulties will constitute different meanings for an individual depending on cultural considerations (29), as well as an individual's experiential history and current level of psychological and biological organization and functioning. Importantly, the increasing diversity among populations within and outside of the United States demands that developmental psychopathology must similarly evolve to adequately examine and intervene with racially and ethnically diverse groups (30). In an investigation of the role of cultural context in moderating associations between early risk and children's adaptation in Israeli and Palestinian couples, culture-specific effects of risk and protective factors were found (31). Studies such as this highlight the importance of incorporating cultural considerations into diagnostic and treatment decisions. For example, because individuals in Puerto Rican and Hispanic cultures operate in the context of familism, which is defined as a strong identification to the family group, it may be more adaptive for adolescents in these cultures to remain dependent on parents for longer periods and to be less autonomy striving than adolescents from Eurocentric cultures (32). Therefore, considerations of cultural context must be prominent when determining whether an individual has diverted onto a maladaptive pathway and when deciding whether, or how best, to intervene.

The dynamic interplay between risk and protective factors is conceived as influencing the developmental course through the impact it has on the quality of the organization of biological and psychological systems as the individual develops (28, 33). Developmental psychopathology research emphasizes probabilistic, rather than deterministic, models of dysfunction (25, 34). However, various risk factors have been shown to be especially harmful to competent functioning, thereby promoting the development of psychopathology (24, 35). In addition, as risk factors become multiplicative, their influence on development becomes increasingly pernicious (36). Thus, for example, being a teen parent in and of itself may not significantly increase the risk of developmental maladaptation in offspring; however, if the young mother resides within an impoverished community with frequent intra- and extra-familial violence present, then the likelihood of negative offspring adaptation increases exponentially. It is important to note that the establishment of a process or condition as a risk factor is not a simple matter and that, even when the predictive status of a risk factor has been confirmed, this represents the starting point of a developmental psychopathology analysis. For example, although negative attributional biases that are associated with depression have been established for both children and adults (e.g., 37, 38), a developmental psychopathology perspective requires an understanding of how these biases originate and develop (24).

Furthermore, attention to the protective factors that individuals possess and experience throughout development is critical, especially since these intra- and extra-organismic sources of protection may promote adaptation and resilience in their own right (39, 40). In addition, some protective factors may be influential in preserving competent functioning in the context of specific risk factors (24). Research on biological, as well as psychological protective factors is vitally important for identifying processes that contribute to the development of either the recovery of function or resilient adaptation in the face of significant adversity (41). Moreover, understanding the dynamic transactions between risk and protective factors plays a central role in building developmentally informed models of prevention (42). If a given capacity, such as the failure to develop a secure attachment relationship with the primary caregiver, is identified as being a risk factor for maladaptation, and if it can be modified as a function of intervention, then the probability of successful adaptation is enhanced. Through increasing the relative balance of protective processes over risk factors, the potential for righting the developmental course, attaining adaptive developmental pathways, and reducing the emergence of psychopathology may be achieved (43).

Developmental psychopathologists stress that disordered individuals may move between pathological and nonpathological forms of functioning. In addition, even in the midst of psychopathology, individuals may display adaptive and maladaptive processes so that it becomes possible to delimit the presence, nature, and boundaries of the underlying psychopathology.

Furthermore, developmental psychopathology is a perspective that is especially applicable to the investigation of transitional points in development across the life span (20, 44, 45). Development extends throughout the entire course of life, and adaptive and maladaptive processes emerge over the life span. It is only by examining a range of conditions and populations from infancy through adulthood and into old age that developmental continuities and discontinuities can be elucidated fully. Studies on the emergence of conduct disorders serve to illustrate this point. For example, Moffitt (46, 47) has distinguished between childhood-onset ("life-course-persistent") and adolescent-onset ("adolescence-limited") conduct disorders and has found that individuals with adolescent-onset behavior problems are less likely to engage in adult criminality than are those with life-course-persistent conduct disorders. In a similar developmental analysis of the continuity/discontinuity of early externalizing behavior problems, Campbell and her colleagues (48) have found that a number of intra- and extra-organismic factors affect continuity of behavior problems. For example, multiple risk factors, including high levels of early hyperactivity and aggression, in combination with high levels of negative parenting and family stress, have been associated with problems at school entry for boys.

The above examples highlight the fact that all periods of life usher in new biological and psychological challenges, strengths and vulnerabilities. From infancy through senescence, each period of life has its own developmental agenda and contributes in a unique manner to the past, present, and future organization of individual development. Rutter has conjectured that key life turning points may be times when the presence of protective mechanisms could help individuals redirect themselves from a risk trajectory onto a more adaptive developmental pathway (49, 50). Likewise, Toth and Cicchetti (51) have suggested that these periods of developmental transition may also afford opportunities when individuals are most amenable to profiting from therapeutic interventions.

Whereas change in functioning remains possible at each transitional turning point in development, prior adaptation does place constraints on subsequent adaptation. In particular, the longer an individual continues along a maladaptive ontogenic pathway, the more difficult it is to reclaim a normal developmental trajectory (5). Furthermore, recovery of function to an adaptive level of developmental organization is more likely to occur following a period of pathology if the level of organization prior to the breakdown was a competent and adaptive one (52, 53).

With respect to the emergence of psychopathology, all stages of life are consequential in that the developmental process may undergo a pernicious turn toward mental disorder at any phase (46, 53-57). Many mental disorders have several distinct phases (25). The factors that are associated with the onset of a disorder may be very different from those that are associated with the cessation of a disorder or with its repeated occurrence (58, 59). For example, although genetic factors frequently are associated with the onset of a major depressive disorder, relapse has been linked with aspects of the family climate, such as negative expressed emotion (60). In contrast to the dichotomous world of mental disorder/nondisorder held by many mental health providers, a developmental psychopathology perspective recognizes that normality often fades into abnormality, that adaptive and maladaptive may take on differing definitions depending on whether one's time referent is immediate circumstances or long-term development, and that processes within the individual can be characterized as having shades or degrees of psychopathology (57).

DEFINITIONAL PARAMETERS OF DEVELOPMENTAL PSYCHOPATHOLOGY

THE MUTUAL INTERPLAY BETWEEN NORMAL AND PSYCHOPATHOLOGICAL FUNCTIONING

Although the field of developmental psychopathology focuses predominantly on the investigation of high-risk and disordered populations, a commitment to the importance of applying knowledge of normal development to the study of atypical populations also is inherent in this approach. Thus, even before the emergence of a psychopathological disorder, certain pathways signify adaptational failures in normal development that probabilistically forebode subsequent pathology (5). Similarly, a developmental psychopathology perspective recognizes the value in examining abnormality in order to enhance our understanding of normal processes. Accordingly, individuals who are at risk for the development of pathology but who do not manifest it and individuals who develop an actual mental disorder are of equal interest (61, 62). As such, developmental psychopathologists also are committed to understanding pathways to resilience – i.e., the attainment of competent adaptation despite exposure to conditions of adversity (40, 63).

Despite the fact that the mutual interplay between normal and atypical development are emphasized within this discipline, most contemporary theory and research have focused on the contributions that normal development can make to advancing our knowledge of psychopathological processes. There has been significantly less recognition that the investigation of high-risk conditions and mental disorders can augment our comprehension of normal developmental processes; however, this is beginning to change (see, e.g., 64-66).

The examination of individuals with high-risk conditions and mental disorders can provide a natural entrée into the study of system organization, disorganization and reorganization that is otherwise not possible due to the constraints associated with research involving human participants. Through investigating a variety of high-risk and mentally disordered conditions, it is possible to gain significant insight into processes of development not generally achieved through sole reliance on investigations of relatively homogeneous nondisordered populations. Research conducted with atypical populations also can elucidate the behavioral and biological consequences of alternative pathways of development, provide important information about the range and variability of individual response to challenge and adversity, and help to specify the limits of behavioral and biological plasticity (67-70). Finally, findings revealed by experiments of nature also hold considerable promise for informing prevention and intervention strategies (71-73). For example, although it is ethically impossible to experimentally manipulate the quality of caregiving that is provided, investigations of children in maltreating families or of children reared by a depressed parent provide insights into the effects of non-optimal care on children's development.

Developmental psychopathologists have articulated the expectation that there are multiple contributors to adaptive and maladaptive outcomes in any individual, that these factors and their relative contributions vary among individuals, and that there are myriad pathways to any particular manifestation of adaptive and disordered behavior. Accordingly, the principles of equifinality and multifinality, derived from general systems theory, are germane. Within the discipline of developmental psychopathology, equifinality has been invoked to explain why a variety of developmental pathways may eventuate in a given outcome, rather than expecting a singular primary pathway to the adaptive or maladaptive outcome. In this regard, for example, childhood depression may emanate from the experience of being maltreated, the death of a parent, and/or genetic factors. Likewise, multifinality is used to explain why individuals may begin on the same major pathway and, as a function of their subsequent "choices," exhibit very different patterns of adaptation or maladaptation (5, 52, 74-76). For example, although child maltreatment typically leads to maladaptation, subsequent psychopathology may involve outcomes such as depression, conduct disorder, substance abuse, and/or a combination of such problems. Moreover, some children exhibit resilient functioning even in the context of severely impaired parenting.

MULTIPLE LEVELS OF ANALYSIS AND MULTI-DISCIPLINARY EFFORTS

The discipline of developmental psychopathology provides a framework for integrating knowledge within and across disciplines, contexts and domains of inquiry. In this regard, developmental psychopathology as a field will be enriched by increased interactions with geneticists, neuroscientists, molecular biologists, anthropologists, sociologists and epidemiologists. Research conducted within a developmental psychopathology framework has challenged assumptions about what constitutes health or psychopathology and has begun to redefine the manner in which the mental health community operationalizes, assesses, classifies, communicates about, and treats the adjustment problems and functioning impairments of infants, children, adolescents and adults (18, 77). Through its principles and tenets, developmental psychopathology transcends disciplinary boundaries and provides fertile ground for moving beyond mere symptom description to a process level understanding of normal and atypical developmental trajectories. Moreover, multi-level analyses of psychopathology often require a range of expertise that necessitates synergistic interdisciplinary, collaborative research (78). Successful interdisciplinary scientific research has the potential to transform the field of developmental psychopathology given the increased likelihood that such investigations will uncover innovative scientific discoveries and generate findings that will influence multiple disciplines (78).

Nonetheless, most of what is known about the correlates, causes, pathways and sequelae of mental disorders has been gleaned from investigations that focused on relatively narrow domains of variables. It is apparent from the questions addressed by developmental

psychopathologists that progress toward a process-level understanding of mental disorders will require research designs and strategies that call for the simultaneous assessment of multiple domains of variables both within and outside of the developing person (26). In some instances, reference to variables measured in other domains is essential to clarify the role(s) of variables of interest for other questions; it is necessary to consider variables from other domains as competing explanations for postulated causal paths. To understand psychopathology fully, all levels of analysis must be examined and integrated. Each level both informs and constrains all other levels of analysis. Moreover, the influence of levels on one another is almost always bidirectional (53, 75).

An interesting approach to a multiple levels of analysis perspective on psychopathology has emanated from investigations of gene-environment (G x E) interactions. The majority of G x E studies have focused on depression and antisocial behavior, although a smaller number of investigations have examined schizophrenia and attention deficit hyperactivity disorder. In a seminal longitudinal investigation, Caspi and his colleagues (79) sought to explain why stress resulted in depression for some, but not all, adults. These investigators found that the 5-HTTLPR polymorphism moderated the effect of stressful life events on adult depression. Specifically, Caspi et al. (79) discovered that adult depression was predicted by the interaction between individuals carrying the s/s or the s/l genotype in the 5-HTTLPR gene-linked promoter region and child maltreatment that occurred during the first decade of life. Results such as these have converged to demonstrate that early adverse environments interact with genetic make-up to exert a greater negative impact on genetically at risk children (80).

RESILIENCE

As the developmental perspective has assumed a more prominent role in psychopathology research, there has been a growing interest in the study of resilience (81). Specifically, research has been directed toward identifying the biological and psychological factors that stem the trajectory from risk to psychopathology, thereby resulting in adaptive outcomes even in the presence of adversity. A developmental psychopathology perspective on resilience highlights the importance of examining multiple biological and psychological systems concurrently (21, 67, 82). Along these lines, the investigation of multiple aspects of the developmental process concurrently can shed light on the nature of the interrelation among various ontogenetic domains. For example, how do cognition, affect and neurobiological growth relate with one another at various developmental periods? When an advance or a lag occurs in one system, what are the consequences for other systems? Pursuing answers to questions such as these will enable researchers to formulate more precise definitions of resilience.

As is true for all developmental phenomena, resilience is a dynamic process, not a static phenomenon (83). We believe that the concept of resilience as "invulnerability" must be avoided. Resilient individuals, although giving the impression of being somewhat herculean in their resistance to stress, must also undergo struggles associated with this process (cf. 84). Thus, these resilient individuals also may need support to deal with the emotional difficulties that often accompany the experience of adversity.

Another vital aspect of the scientific study of resilience is that it affords an additional avenue for examining biological and social constraints that may operate on aspects of the developmental process throughout the life course (61, 85). Moreover, through investigating the determinants of resilient adaptation, we are in a position to discover the range and variability in individuals' attempts to respond adaptively to challenge and ill fortune (86). For example, in an investigation of the multilevel determinants of resilient functioning, Cicchetti and Rogosch (87) found that the personality variables of ego-resiliency and ego-control and the regulation of the adrenal steroid hormones dehydroepiandrosterone (DHEA) and cortisol each made independent contributions in predicting resilience among maltreated children. In addition, Curtis and Cicchetti (88) discovered that emotional regulation predicted resilient functioning in both maltreated and nonmaltreated comparison children; however, Curtis and Cicchetti (88) found that electroencephalogram (EEG) asymmetry in central cortical regions independently predicted resilience only in maltreated children.

Finally, the ability to function resiliently in the presence of biological and/or environmental disadvantage may be achieved through the use of developmental pathways that are less typical than those negotiated in the course of usual circumstances. For example, Cicchetti and Rogosch (89) found that whereas relationship factors were related to resilience in low-income nonmaltreated

children, self-strivings were associated with resilience in children with histories of maltreatment. Thus, an important question for researchers to pursue is whether the use of alternative pathways to attaining competence renders individuals more vulnerable to manifesting subsequent delays or deviations in development. Only longitudinal investigations can fully address this issue, but it will be critical to ascertain whether these individuals are more prone to developing psychopathology later in life. Research on resilience is an excellent example of translational research as it also lends itself to informing prevention and intervention initiatives.

TRANSLATIONAL RESEARCH

Translational research has been defined as examining how basic behavioral and biological processes inform the diagnosis, prevention, treatment and delivery of services for mental disorder, and, conversely, how knowledge of mental illness enhances our comprehension of basic behavioral and biological processes (90). The new era of translational research is not only exerting impacts on developmental psychopathology, but also is affecting all fields of research in the medical, physical, social and clinical sciences (91). The impetus to conduct translational research in the behavioral sciences has emanated largely from the National Institute of Mental Health (92, 93) and was spurred by the recognition of the tremendous individual, social and economic burden associated with mental illness (90). Hence, the emphasis on translational research by funding agencies is quickly translating itself into increased priorities within the academic arena.

This formulation of translational research is in direct accord with two of the key tenets of a developmental psychopathology perspective, namely, the reciprocal interplay between basic and applied research and between normal and atypical development (94). Thus, the parameters of developmental psychopathology lend themselves to fostering translational research that has implications for society, policymakers and individuals with mental disorders and their families.

PREVENTION AND INTERVENTION: A MULTI-LEVEL PERSPECTIVE

The preeminent objective of the field of prevention science is to intervene in the course of development in order to reduce or eliminate the emergence of maladaptation and mental disorder, as well as to promote resilient adaptation in individuals at high-risk for psychopathology (71, 95). To fulfill this laudable goal, it is important that prevention scientists possess a complex, multilevel understanding of the course of normality to formulate an in-depth portrayal of how deviations in normal developmental processes can eventuate in maladaptation and psychopathology (96). Because of its focus on the interplay between normal and abnormal development, the discipline of developmental psychopathology is uniquely poised to provide the theoretical foundation for prevention and intervention initiatives (42, 72, 97).

From the integrative developmental psychopathology framework, randomized controlled trials may be conceptualized as veridical experiments in modifying the course of development. Therefore, these randomized preventive trials may be conceived as tests of theory and causal mechanisms, thereby proffering insights into the etiology and pathogenesis of maladaptation and disordered outcomes (98, 99). The incorporation of biological measures into the design and evaluation of these RCT preventive interventions will enable prevention scientists to grasp the development of maladaptation, psychopathology, and resilience in their full complexity (100, 101). For example, in the evaluation of an attachment-based intervention on cortisol production of infants and toddlers in foster care, Dozier and her colleagues (102) found that their relational intervention was effective in helping children to regulate their biology. Methodologically sound prevention science that incorporates a theoretically informed and guided multiple levels of analysis perspective will provide a unique lens through which the processes responsible for the development, maintenance and modification of both typical and atypical functional outcomes can be discerned (72, 100, 101, 103).

Collaborative interdisciplinary preventive interventions between researchers and clinicians that take into account multiple levels of influence also will help to reduce the schisms that have long existed between science and practice (104). The incorporation of an interdisciplinary, multiple level perspective will enable prevention scientists to derive a more precise and comprehensive understanding of the mediators and moderators underlying successful and unsuccessful intervention outcomes. For example, although efficacious treatments are increasingly being identified, the field has been slower to uncover the processes and mechanisms that contribute to positive outcomes. As Kazdin (105) states "…we really do not understand very much about therapy, why

and how it achieves change and for who it is and is not effective and why…" (p. 533). This becomes even more problematic when efforts to translate research-derived efficacious treatments into the broader clinical world occur. In fact, therapies that are evaluated scientifically in randomized control trials continue to far outperform those involving the usual clinical care provided in real world clinical settings (106). The field of developmental psychopathology holds great promise for increasing the theoretical bases of interventions, for elucidating the contributors to positive outcome, and for fostering increased availability of these treatments.

Clearly, the results of randomized prevention trials will be informative to practitioners. Equally essential, however, is the need for prevention scientists to conceptualize, design and evaluate prevention trials in such a way that also enables their results to enhance our understanding of development and the pathways contributing to intervention efficacy at multiple levels of influence. Determining the multiple levels at which change is engendered through the conduct of randomized prevention trials will provide more insights into the mechanisms of change, the extent to which neural plasticity may be promoted, and the interrelations between biological and psychological processes in maladaptation, psychopathology and resilience (67, 100, 101, 107). Furthermore, preventive interventions with the most in-depth empirical support, based on integrative multilevel theories of psychopathology and resilience, can be implemented in effectiveness trials in community or real-world settings to reach the broadest number of people and to prevent, or alleviate, suffering from mental disorders (104, 108).

CONCLUSION

These are exciting times for the discipline of developmental psychopathology and the field has grown considerably as it has traversed its own developmental pathway. Advances in genomics, gene x environment interactions and epigenetics, growth in our understanding of neurobiology and neural plasticity, and progress in the development of methodological and technological tools, including brain imaging, hormone assays, and statistical analysis of change set the stage for integrating disciplines and multiple levels of analysis that will greatly enhance the knowledge base of the development and course of mental disorders (77). Moreover, prevention and intervention trials are being increasingly based on theoretical models and efforts to elucidate the mechanisms and processes contributing to change are being initiated. The information that is emanating from the field of developmental psychopathology can be integrated into the armamentariums of professionals from diverse disciplies, even when they do not consider themselves to be developmental psychopathologists. These knowledge gains will not only benefit the scientific study of psychopathology and resilence, but also permit translation to informing developmentally-based preventive interventions that will contribute to reducing the individual and societal burden of mental illess.

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