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This article highlights the defining principles, progress and future directions in developmental psychopathology in relation to this special section. Six fundamental principles of developmental psychopathology are identified and the pervasive impact of this integrative framework on research, theory, and practice in behavioral health fields over the past three decades is described. This special section reflects the increasing influence of developmental systems theory, the growing focus on *change*, intensifying interest in translational research, and the increasingly complex and differentiated nature of research on pathways toward and away from psychopathology. A new era in developmental psychopathology is dawning, with exciting frontiers in brain development and plasticity, gene-environment interaction, resilience and recovery, multilevel dynamics, interdisciplinary research and training, and methodologies for assessing and analyzing change over time within and across individual systems and their contexts.

Developmental psychopathology (DP) emerged in the 1970s, though it has much earlier roots in the history of science (Cicchetti, 1984, 1990a; Cummings, Davies, & Campbell, 2000; Masten, 1989; Masten, Burt, & Coatsworth, in press; Sameroff, 2000a; Sroufe & Rutter, 1984). The DP perspective represented a merger of two great traditions of thinking and research on adaptive behavior, one focused on psychopathology and the other on development (Masten et al., in press). The search for etiologies and interventions for serious mental health problems and disorders spurred this merger, as investigators began to identify and study children forward in time, often individuals who showed signs of risk for later psychopathology due to problem behaviors of their own or because family members had disorders known to aggregate in families (Masten, 1989). Longitudinal studies of children at risk for psychopathology required the expertise of both developmental and clinical scientists, as well as attention to measures of adaptive behavior and individual differences. A group of influential scholars and their students charted the course for the integration of developmental and clinical science perspectives and provided much of the initial momentum for this new approach. Norman Garmezy, Irving Gottesman, Michael Rutter, Arnold Sameroff, Alan Sroufe, and Ed Zigler not only collaborated and shared ideas with each other, but also trained influential students, including Thomas Achenbach and Dante Cicchetti, among many others. Momentum grew with the publication of a text called *Developmental Psychopathology* (Achenbach, 1974), a special issue on DP in *Child Development* (Cicchetti, 1984), the initiation of the Rochester Symposia on Developmental Psychopathology in 1987 by Cicchetti, the founding of *Development and Psychopathology*, also by Cicchetti, first published in 1989, and the publication of the two-volume compendium on *Developmental Psychopathology* (edited by Cicchetti & Cohen, 1995).

Developmental psychopathology has been defined in various ways, as a "macroparadigm" (Achenbach, 1990) or simply as a developmental approach to understanding and treating psychopathology: "characterized by attempts to understand psychopathology from within the framework of normative developmental psychology" (Luthar, Burack, Cicchetti, & Weisz, 1997, p. xv); "a joining of developmental psychology and child and adult psychopathology" (Zigler, 1989, p. ix). Table 1 presents a sample of other defining statements about DP from an array of scholars. While definitions have varied, common themes appear across the writings of leading DP proponents, and these are delineated in the next section. As evident in Table 1, most developmental psychopathologists do not define DP as a singular theory but rather as an integrative framework. It is also not viewed as a classification system or as a medical model. DP reflects an integrative, multidisciplinary perspective and set of continually evolving research strategies that are centrally concerned with adaptation in development. Moreover, developmental psychopathology is grounded in a practical mission, to prevent or ameliorate behavioral problems and disorders and to promote positive development. Perhaps the simplest definition would be as follows: *Developmental psychopathology is the study of behavioral health and adaptation in a developmental context*.

The purpose of this article is to highlight the principles, progress and future of developmental psychopathology as reflected in this special section. The first section outlines the core features of developmental psychopathology, the second section provides a concise commentary on articles included in this section, and the concluding remarks focus on the future.

Fundamental principles of developmental psychopathology

Definitions of DP vary in emphasis, yet there is a consistent set of core tenets that have come to characterize this perspective on behavioral health (Cummings et al., 2000; Masten, 2004; Masten & Braswell, 1991). Many of these tenets have

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Table 1
The meaning of developmental psychopathology

The title of this book, *Developmental Psychopathology*, is intended to emphasize that psychopathology in children is best understood in relation to the changes – progressions, regressions, deviations, successes, and failures – that occur in the course of children's attempts to master the developmental tasks they face. (Achenbach, 1974, p. iii)

. . . *the study of the origins of and course of individual patterns of behavioral maladaptation*, whatever the age of onset, whatever the causes, whatever the transformations in behavioral manifestations, and however complex the course of the developmental pattern may be. (Sroufe & Rutter, 1984, p. 18)

Developmental psychopathology is concerned with the origins and course of maladaptive patterns of behavior. . . . Disorder is viewed as *developmental deviation*. . . . Developmental psychopathologists are interested in those individuals who consistently follow a pathway leading to disorder. But they are just as interested in those individuals who, having deviated from normal developmental pathways, ultimately resume normal development and achieve adequate adaptation and those who resist stresses that usually lead to developmental deviation. . . . When developmental psychopathology is defined in this way, understanding the nature of developmental pathways becomes critical. (Sroufe, 1989, p. 13)

Developmental psychopathology is an evolving interdisciplinary scientific field that seeks to elucidate the interplay among the biological, psychological, and social-contextual aspects of normal and abnormal development across the life course. (Cicchetti, 2000, p. ix)

. . . an integrative approach to understanding behavior problems in the full context of human development, with a focus on variations in adaptation, the processes that account for that variation, and how patterns of maladaptation may be prevented or ameliorated. (Masten, 2004, p. 311)

Table 2
Core principles of developmental psychopathology

The Developmental Principle
Psychopathology occurs in a developing organism and therefore a developmental perspective is essential for understanding, preventing, and treating the causes, problems, and consequences associated with it.

The Normative Principle
Psychopathology is defined in relation to normative development in cultural and historical context.

The Systems Principle
Human individuals are living systems and therefore psychopathology arises from complex interactions among systems within an individual and also between the individual and the multiple systems in which the life of the individual is embedded.

The Multilevel Principle
Processes involved in psychopathology occur within and across multiple levels of functioning, from the molecular or genetic to cultural or societal systems, and therefore multiple disciplines and multiple levels of analysis are often required for a complete understanding of causes and consequences.

The Agency Principle
The human organism is an active agent in development.

The Mutually Informative Principle
Variations in adaptation, including successful as well as unsuccessful development, normal as well as deviant behavior, resilience as well as maladaptation, are important for understanding pathological and normal development; the study of deviant development and the study of normal development are mutually informative.

The Longitudinal Principle
Prospective, longitudinal studies are essential for understanding the interplay of the systems that influence development and the many possible pathways toward and away from psychopathology.

been highlighted in publications by leading proponents of a developmental approach to psychopathology, including the following developmental psychopathologists: Achenbach (1974, 1990); Cicchetti (1984, 1990a, 1990b, 1993, 2000; Cicchetti & Cohen, 1995, in press); Egeland (Egeland, Carlson, & Sroufe, 1993); Garmezy (1993; Garmezy & Rutter, 1983); Gottesman (1974; Gottesman & Shields, 1982); Sroufe (1989, 1990, 1997; Sroufe & Rutter, 1984; Sroufe & Waters, 1976), Rutter (1981, 1986; Rutter & Garmezy, 1983; Rutter & Sroufe, 2000), Sameroff (1989, 2000a, 2000b; Sameroff & Chandler, 1975; Sameroff & Emde, 1989); and Zigler (Zigler & Glick, 1986). These developmental psychopathologists drew extensively from the ideas of earlier developmental scientists and clinicians, across multiple disciplines, including Darwin, Anna and Sigmund Freud, Spencer, Werner, Waddington, Bowlby, von Bertalanffy, Bronfenbrenner, White, and many others, as documented by Cicchetti (1990a), Garmezy (1993), and others (Cummings et al., 2000; Masten, 1989; Masten & Coatsworth, 1995; Masten & Curtis, 2000; Sameroff, 2000a, 2000b). Core tenets of DP are listed in Table 2.

The developmental principle

The core tenets of developmental psychopathology derive in large part from common features of contemporary developmental theories (Baltes, Reese, & Lipsitt, 1980; Cicchetti, 1990b; Cicchetti & Rogosch, 1996; Gottlieb, 1998; Lerner, 1998; Rutter & Sroufe, 2000; Sameroff, 2000a, 2000b; Sroufe, 1997; Thelen & Smith, 1998). Developmental models typically assume that individual development arises from complex interactions and co-actions among genes, internal systems, contexts, and people at multiple levels. As a consequence, the course of individual development can take many directions, and there are multiple pathways toward and away from psychopathology. Individuals who begin with similar behavior or circumstances can end up heading in very different directions, a phenomenon referred to as *multifinality*, while individuals who begin at very different places, behaviorally or circumstantially, can end up on the same final common pathways, or with the same diagnosis, often termed *equifinality*. Moreover, as a result of biological and cultural evolution, development in childhood and adolescence generally proceeds in a direction of increasing adaptability, often characterized by differentiation, increasing complexity, higher-order organization, and with a positive bias toward survival, reproduction, or the desired achievements of a given culture. Also, development is characterized by *coherence* or orderly patterns of change, which can result in behaviors that appear dramatically different from one point to the next, but have a predictable course. There are periods of rapid or concentrated

transformation when changes in the organism or context or their interaction create periods of marked growth, vulnerability, or opportunity, during which dramatic inflections can occur in the course of behavior for good or ill. As a result, for example, transitions into adolescence or into adulthood, two periods of dramatic change in organism and context, are associated with onset and offset, acceleration and deceleration of psychopathology or problem behavior, and turning points in the direction of adaptive development. Further, psychopathology can arise in a biologically normal individual who pursues goals or behaves in ways viewed as deviant in the society, or from deviations in development itself, when the development of the organism is not proceeding normally for some reason. It is also conceivable that an individual who starts off life with normal genetic potential and normal early development begins to develop abnormally due to experiences, toxic exposures, illnesses or injuries of some kind.

The normative principle

This principle acknowledges that psychopathology is judged in relation to expectations about what is "normal" in a given time and society for a person of a particular gender or age. Some individuals are judged to have psychopathology because their functioning is well below average on bell-curve distributions of important aspects of adaptive functioning: maladaptive behavior itself is the key symptom. Other individuals fail to meet societal expectations for developmentally appropriate behavior due to interference from symptoms of a mental disorder. *Developmental tasks* are the standards for behavior and achievement in a particular society or cultural group that form the basis for judging whether development is proceeding well; in effect, developmental tasks and related issues are the psychosocial milestones for behavior across the lifespan, and serve as broad indicators of how well adaptation and adjustment in the societal context are proceeding (Masten et al., in press). Developmental tasks wax and wane in salience as a function of development, culture and context. School achievement, for example, is not important in infancy but is very salient throughout the school years in many societies, and then wanes in importance later in adulthood as young people move on to the tasks of work, raising families, and other business of adulthood. Yet the impact of achievement in the academic domain can have lifelong consequences because formal education is a gateway to adult opportunities and because the knowledge and skills acquired in school are important for adaptive success in many societies. Some developmental tasks are universal and characteristic of the species (e.g., learning a language) while others are unique to a cultural group or context (e.g., learning to hunt). Significant failures in age-salient developmental tasks can have repercussions for the evaluation by the self as well as family and community members, contributing to symptoms of distress or declines in well-being as well as consequences for opportunities and status (Masten et al., in press).

The systems principle

Developmental systems theory (Bronfenbrenner, 1979; Cicchetti, 1990b; Ford & Lerner, 1992; Granic & Hollenstein, 2003; Lerner, 1998; Sameroff, 2000a, 2000b; Thelen & Smith, 1998) is the prevailing conceptual framework in developmental psychopathology. This perspective begins with the idea that human individuals are living systems continually interacting with the contexts in which their lives are unfolding, including family, peer groups, schools, and larger systems. Living systems are assumed to have self-organizing, self-regulatory, and self-righting properties, and they have the dual adaptive tasks of maintaining their own functioning while adapting to the context in which they are embedded (Masten & Coatsworth, 1995). Human individuals are living systems, interacting with other individuals and also with groups of people in the larger systems of their contexts, such as families and peer groups. As a social species, human individuals often regulate the behavior of other people and are regulated by relationships; in other words, humans often co-regulate each other. The functional course and behavior of a living system are continually influenced by internal and external interactions, and this dynamic nature reflects multicausality and multiple pathways at the core of the developmental principle. Other properties of systems include the tendency to settle into stable patterns or *attractor states*, as well as the capacity for sudden transformation or reorganization, due to internal or external perturbations. Systems often reciprocally influence each other within and across levels of context, effects described as *transactional* influences (Sameroff & Chandler, 1975). Thus, an individual can influence a parent or peers in a classroom and then subsequently be influenced in turn by the reactive behavior of these people. Adolescents can choose friends or which chat rooms to join, and then be influenced by those individuals over the course of time and interactions.

The multilevel principle

Multilevel dynamics are integral to developmental psychopathology because of the prevailing overarching framework of developmental systems theory and also because of salience of gene-environment interaction models as causal for psychopathology. DP spans levels of analysis and therefore multiple disciplines of expertise are required to capture the dynamic nature of systems interaction at the heart of developmental processes. Some of the most influential developmental theorists in the history of DP underscored how multiple levels of interaction and analysis would be required to fully understand human development, both normal and pathological. DP has been strongly shaped by some of the key developmental-interactional models that span levels of analysis. These include: the models from embryology, illustrating interactions from gene to cytoplasm to organism to environment (e.g., Weiss, 1959); the models and concepts from behavior genetics and epigenetics (Gottesman, 1974; Gottesman & Hanson, 2005); Bronfenbrenner's (1979) ecological model of embedded systems, from the micro to the macro; Sameroff's (1989, 2000a, 2000b) transactional model of interacting environtype, phenotype and genotype; and Gottlieb's (1992, 1998) model of bidirectional influences across four levels, from the environment (physical, social, cultural) to behavior, to neural activity, to genetic activity. Exciting new techniques in brain imaging and genomics, as well as ground-breaking research on gene by environment interactions, the dynamics of gene expression, endophenotypes, and the like are leading to intensified interest in multilevel processes in DP (Gottesman & Hanson, 2005; Masten et al., in press).

The agency principle

It is also emphasized in developmental psychopathology, as well as in most contemporary theories of development, that the individual is an active agent in development. During childhood and adolescence, agency generally increases, due to brain development, physical development, learning, and opportunity structure afforded by the context. Thus, children and adolescents increasingly can exercise choice over their own experiences, their own behavior, and the contexts in which they spend their time. These choices can play a substantial role in the course of development, including the course of psychopathology. Young people make choices about friends and activities that subsequently influence their behavior, with positive or negative consequences. The growing agency of youth can cause great concern by adolescence, when young people in many modern societies have the capacity and opportunity for engaging in many risky behaviors that can have life-altering consequences (Steinberg, Dahl, Keating, Kupfer, Masten, & Pine, in press).

The mutually informative principle

Developmental psychopathologists have long emphasized the importance of understanding all variations in adaptive behavior and development, both positive and negative; they have argued that knowledge of the processes accounting for normative development, competence, resilience, and recovery informs the understanding of psychopathology and that the study of deviant behavior and pathways illuminates the study of normal development. Thus, developmental psychopathology encompasses the study of competence and disorders, good and poor adaptation, and all the pathways toward and away from positive or negative development. Understanding processes of positive and negative change, along with normative and non-normative development, is viewed as essential for informed prevention and intervention. In developmental psychopathology, research on mental illness, which traditionally focused on undesirable behavior, has been integrated with research on competence and developmental tasks, which focused on desirable behavior (Masten & Curtis, 2000; Masten et al., in press).

The longitudinal principle

Given the other fundamental principles that characterize developmental psychopathology, it follows that this approach would emphasize the importance of longitudinal perspectives and research to understand development or psychopathology. Capturing variations in the timing and tempo of development also requires longitudinal data on individuals. Cross-sectional pictures of behavior can be informative for some purposes, but understanding pathways, turning points, and processes related to change requires longitudinal information.

Four decades of developmental psychopathology: A progress note

The progress and promise of developmental psychopathology as a framework for theory and research is reflected in the articles that comprise this special section. Developmental psychopathology as a science is becoming more developmental, contextual, multilevel, dynamic, multidisciplinary and collaborative. It is also becoming more complex, as one might expect to happen with the development of a relatively new and integrative approach to understanding behavioral health and development and its vicissitudes.

Perhaps the most striking advance in developmental psychopathology over the past 30 years is the degree to which this perspective, reflecting tenets much like those just delineated, has permeated research, theory, and practice on behavioral health and related disorders. From modest beginnings in studies of children at risk for psychopathology, albeit with deep roots (Cicchetti, 1984, 1990a; Masten et al., in press), this integrative perspective has become the prevailing model for understanding the origins and course of psychopathology across the lifespan. The DP *zeitgeist* has spread across multiple fields of study and levels of analysis, bringing with it new journals, handbooks, textbooks, symposia series, and research projects. Through the organizing principles of development and systems theory, developmental psychopathology has brought together once disparate fields of study and investigators to address complex questions of etiology and intervention.

The themes of developmental psychopathology can be observed across all the articles of this special section. The emphasis on multiple causes and multiple levels of analysis is salient in the reviews by Muris and by Vitaro et al., updating progress on internalizing and externalizing problems, respectively. Systems interaction is a prominent theme, as various articles discuss gene by environment interactions, individual and peer group interactions, the significance of popularity, the role of families, and the dynamics of larger systems involved in policy. The focus on longitudinal data and pathways is evident both in the articles reviewing the paths to internalizing or externalizing problems (by Muris and Vitaro), and also in the methodological article by Cole on quantitative strategies to capture continuity and change within and across individuals. The integration of normative and deviant development, competence and symptoms, risk and resilience is clear across the empirical reviews and the articles on translation of research to practice and policy (Lochman, Petersen). Muris, for example, discusses anxiety symptoms in relation to normative fear and the protective influences of perceived control.

Developmental progress in DP itself is also evident. The questions and analyses reflected in this set of articles are more nuanced and differentiated than one would have found 30 years ago on similar themes. Vitaro and colleagues, for example, argue persuasively that the trajectories of aggressive behavior need to be differentiated on the basis of form and function, discussing the developmental patterning of physical versus social and proactive versus reactive aggression. They describe how recent advances in person-focused statistical analyses have made it possible to identify distinct patterns over time, through semiparametric group-based modeling (Nagin, 2005), illustrating how this and other person-focused techniques may clarify what has been a confusing set of findings on the waxing and waning of externalizing behaviors described in the literature. These methods have revealed sometimes dramatic intraindividual change and patterns of normative growth or decline that were obscured by variable-centered analyses. These authors illustrate how seemingly contradictory findings on whether or not there are "late starters" can be reconciled by greater precision in concepts, measures and analyses. Such analyses can reveal different processes that accelerate or decelerate specific aspects of a broad behavioral

domain. Longitudinal designs with repeated assessments allow for the study of the dynamic interplay of two behaviors over time, such as the developmental interrelation of physical and relational aggression. For example, the possibility of developmental progression from physical to social forms of aggression can be examined. Such designs, delineating the developmental course of two aspects of behavior over time with careful and repeated measures, have the potential to build a compelling case for directionality of influence, even when causality cannot be established through experimental manipulation. This study by Vitaro and colleagues exemplifies in many ways the maturing of developmental psychopathology.

As a set, the articles in this special section illustrate the focus of contemporary developmental psychopathology on the *study of change* in individuals in relation to changes in relationships, experience, contexts, and their interactions. Studies of naturally occurring change, reviewed by Vitaro et al. and Muris, provide important clues for how one might set out deliberately to alter the direction of development. In contemporary DP, it is now more common to consider the variability in change itself, or periods of heightened change. Cole (this issue) provides an example by examining the changes in stability over time, illustrating how stability of depressive symptoms shows a dip for boys and girls after the transition to middle school, despite generally high levels of stability on this measure. Of course, this is a period of concentrated change across many aspects of context and function, so that there could be many explanations for a dip in stability. Most noteworthy in this article is the attention to stability and change itself, which is characteristic of a developmental systems perspective.

Change is also the goal of intervention. From inception, as noted earlier, developmental psychopathology has served the practical mission of guiding prevention and intervention (Masten, 2004). The progress and challenges of realizing translational goals in DP are described by Lochman and Petersen in each of their articles in this special section. As the developmental patterning and timing of specific problems and disorders is increasingly well known, particularly in relation to risks, protections, cascades, and progressions, it becomes possible to intervene with increasingly strategic timing and targets (Masten et al., in press). Petersen highlights the importance of systems thinking for policy making as a form of intervention, describing historic policy failures where good intentions were not matched by careful systems analysis and implementation. She also reviews the desired feedback loop for the continuous testing and improvement of policy-governed change.

In his article, Lochman reviews examples of carefully designed efforts to apply the knowledge base of DP to increase the probability of positive outcomes in development. He presents data from the Fast Track study and the Coping Power program to illustrate many of the issues and gains in applied DP directed at preventing the development or snowballing of problems. Each of these interventions is designed to address multiple systems in strategic ways and times. Peers, families, and neighborhoods have been considered.

Translation is also a bidirectional bridge across the divide of theory and practice. Interventions are the best means typically available to test causal models of either psychopathology or competence in development, since children cannot be randomly assigned to stressful life events or parents varying in quality. Over the past few decades, prevention and intervention science has advanced to a highly sophisticated level, with increasing impact on developmental theory and models of risk, resilience, psychopathology, and change (Cicchetti & Hinshaw, 2002; Kellam, Koretz, & Moscicki, 1999; Coie, Miller-Johnson, & Bagwell, 2000; Masten et al., in press). Contemporary intervention studies often test models of etiology, mediation, and moderation, as well as models of how the intervention works. Lochman's article (this issue) illustrates the progress in intervention science, which has advanced both DP theory and practice to prevent problems, promote positive development, and interrupt developmental cascades (Masten et al., in press). Here again, the development of DP is evident in the nuanced examination of theory-designed interventions, tested for efficacy and then effectiveness, the challenges of disseminating evidence-based practice and taking them to scale, and the power of intervention-tested theories of psychopathology and change. This article charts the refinements characteristic of progress in intervention research, both past and future.

It is clear across these articles, and particularly evident in the articles by Cole and by Vitaro et al., that quantitative advances and the availability of longitudinal data with repeated assessments have made it possible to use powerful new analytic strategies in DP. These new tools have provided a host of new insights, overturned old theories, and revealed sometimes surprising pictures of behavior across development in individuals. Both for variable-centered and person-centered analyses, the increasing accessibility of sophisticated statistical approaches, such as structural equation modeling and growth curve modeling, combined with large, longitudinal data sets on more representative samples, is beginning to yield a far more developmental and interesting account of psychopathology. More behavioral "arcs" have been revealed in development, as specific aspects of behavior wax and wane over time (see Vitaro et al. for examples in the aggression domain). Periods with increasing problems across multiple domains (such as risky behaviors and depression in early adolescence; see Dahl & Spear, 2004) have been confirmed at the same time that periods with striking desistance in multiple areas have been revealed (such as the transition to adulthood when there appears to be normative decline in multiple problem domains; see Arnett & Tanner, in press; Ge, Nishimura, & Conger, in press). There is growing evidence that many of the behavioral disorders that will ever be a problem have their onset in childhood or adolescence (Kessler et al., 2005). At the same time, these new tools make it possible to study the cascades and progressions from one level or kind of behavior to another (Masten et al., in press).

Notable progress also has been made in the analytical strategies to capture interactions between an individual and dyad. Bukowski and colleagues (this issue) review the progress in the study of interpersonal processes over the past decade in developmental psychopathology, highlighting recent studies of "co-rumination" (Rose, 2002) and "deviancy training" (Dishion, McCord, & Poulin, 1999). Dishion and Piehler (in press) also have suggested that similar processes can increase prosocial behavior in youth. This kind of research addresses social processes that may amplify (or dampen) internalizing and externalizing symptoms, respectively, through the interactions of peers. Bukowski et al. also describe their own research on the stability of aggression in relation to individual and dyadic effects. In each case, creative new methodologies for analysis of social dynamics in the peer system have made it possible to examine processes by which peers may

contribute to acceleration or deceleration of symptoms or positive behaviors. Moreover, as tools for analyzing larger peer social networks in relation to individuals have improved, there have been more studies in developmental psychopathology focused on influences of peer groups on individual development (Gest, Rulison, & Welsh, 2005; Kinderman, 1993; Wasserman & Faust, 1998).

Some progress can also be seen in DP studies of even larger system influences, such as culture or neighborhood effects, though the goal of understanding how culture or neighborhood affect individual development is complex conceptually and can be thorny from a methodological perspective (Greenfield, Keller, Fuligni, & Maynard, 2003; Leventhal & Brooks-Gunn, 2000; Sampson, Morenoff, & Gannon-Rowley, 2002). Bukowski et al. (this issue) note some of the progress in methods to measure and analyze cultural effects, though progress remains limited in this area. Similarly, understanding the role of media and internet communication in development is a challenging but important task (Brown & Witherspoon, 2002; Masten, 2004). As children and adolescents spend more time interacting through media and internet connections with ideas and people around the world, there is a pressing need to learn how this rapidly changing and complex social context is interacting with and influencing development.

Advances in methodology have also made it clear that "old" measures may not be optimal for the study of continuity or change with these new tools. Cole (this issue) argues persuasively for matching the timing of assessment waves to the goals of the research and the tools employed. Cole's proposed Trait-State-Occasion model of depression offers another example of progress with respect to refining theories and methods in DP.

Thus, the articles in this special section illustrate a number of key advances in developmental psychopathology. What is not captured here, however, is the dramatic progress in neurobehavioral development and biobehavioral processes that is currently revolutionizing the study of development and psychopathology (Cicchetti & Cohen, in press; Dahl & Spear, 2004; Evans et al., 2005; Masten, 2004; Steinberg et al., in press). Research on brain development and plasticity, genomics and epigenesis, gene-environment interactions, human and animal "knock-out" models, and all the other methodological advances in gene identification, brain imaging, etc., that have made this new work feasible are transforming the study of behavior and development, and opening new frontiers for prevention and intervention.

Pathways to the future of developmental psychopathology

At the outset of the 21st century, marked progress in developmental psychopathology can be noted, but a new day is dawning and new horizons are becoming clear. In some ways, breakthroughs in technology, statistics, genetics, and other areas are leading investigators back to the beginnings of developmental psychopathology, to fulfill the promise of diathesis-stressor models of psychopathology for interventions to prevent or ameliorate risk. The original risk researchers were aware that studies of the processes that altered risk and vulnerability in development awaited better specification of risk and vulnerability, and better tools to study those processes (Masten, 1989). Specificity and tools are rapidly advancing, and these are ushering in a new era of research on diathesis and stress, gene-environment interaction, epigenesis, etc., in developmental psychopathology. As research on brain plasticity and gene expression advances, it is also becoming clear that a new kind of change is conceivable, in which it is possible to "reprogram" adaptive systems, such as stress regulation or cognitive processing or attentional skills, or to protect brain development in vulnerable organisms, with interventions at many levels (from cellular to social) (Buonomano & Merzenich, 1998; Chang, Gallelli, & Howe, in press; Dahl & Spear, 2004).

Advances over the past four decades have set the stage for new integrative studies of normal and deviant development in which investigators armed with the ideas and tools of multiple disciplines, working across system levels of analysis, collaborate to illuminate the processes that shape and reshape development, to address questions of pressing public health urgency and the public good along with basic questions of how these processes work. At each level of analysis and work, advances in theory and technology are preparing the way for investigators to inform each other across system levels and to generate ideas for preventive and ameliorate interventions at each level of their interaction. As developmental psychopathology matures, and knowledge or theory grows more complex and differentiated, progress is going to require collaboration because single investigators cannot master all of the background and tools required to study development across levels or apply what is learned to practice and policy. New frontiers of opportunity also require new kinds of training, so that young investigators learn the skills of collaboration and communication across disciplines and levels of analysis, become conversant in the tools or languages of partner disciplines or levels, and still gain the requisite expertise within their own domain or level of focus.

It is an exciting time in the development of DP. Breakthroughs in mapping the human genome, specifying vulnerability, imaging the brain in action, connecting behavioral and brain development, assaying hormones, measuring social interaction at multiple levels, analyzing change and systems interactions over time, among many other advances, are revolutionizing science, including developmental psychopathology. At the same time, the tools for collaboration and communication across distances and fields are becoming readily available. Integrative research and practice across multiple levels of systems and multiple disciplines is well underway. The stage is set for rapid progress in the early 21st century on the enduring objective of developmental psychopathology – to prevent or reduce psychopathology and alleviate the burden of suffering it brings to individuals, families, and communities, while at the same time promoting healthy behavior and development.

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