



## Special Issue Article

# The Future of Developmental Psychopathology: Honoring the Contributions of Dante Cicchetti

## The next generation of developmental psychopathology research: Including broader perspectives and becoming more precise

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### Abstract

The current Special Issue marks a major milestone in the history of developmental psychopathology; as the final issue edited by Cicchetti, we have an opportunity to reflect on the remarkable progress of the discipline across the last four decades, as well as challenges and future directions for the field. With contemporary issues in mind, including rising rates of psychopathology, health disparities, and international conflict, as well as rapid growth and accessibility of digital and mobile technologies, the discipline of developmental psychopathology is poised to advance multidisciplinary, developmentally- and contextually- informed research, and to make substantial progress in supporting the healthy development of individuals around the world. We highlight key future directions and challenges for the next generation of developmental psychopathology research including further investigation of culture at multiple levels of analysis, incorporation of macro-level influences into developmental psychopathology research, methods advances to address heterogeneity in translational research, precision mental health, and the extension of developmental psychopathology research across the lifespan.

**Keywords:** Culture; developmental psychopathology; heterogeneity; lifespan; precision mental health

(Received 14 January 2024; accepted 21 January 2024; First Published online 14 February 2024)

### Introduction

As famously noted by Dante Cicchetti, special issues “mark significant and noteworthy points in the development and maturation of a scientific discipline” (Cicchetti, 1984, p.1). Indeed, the 1984 Special Issue of *Child Development* on the emergence of developmental psychopathology marked the crystallization of developmental psychopathology as a unified scientific discipline. By 1989, Cicchetti edited the inaugural issue of a new journal, *Development & Psychopathology*, which marked yet another step in the growth of the discipline. The current Special Issue also marks a major milestone in the history of developmental psychopathology; as the final issue edited by Cicchetti, we have an opportunity to reflect on the remarkable progress of the discipline across the last four decades, as well as challenges and future directions for the field.

Developmental psychopathology is an integrative discipline that has transformed our understanding of typical and atypical development. Whereas a full review of the history of developmental psychopathology and its core tenets is beyond the scope of this editorial, and has been well-described elsewhere (e.g., Cicchetti & Toth, 2009; Cicchetti, 1990; Valentino & Edler, *in press*), we highlight here a few salient features of the discipline that have been especially influential. First, developmental psychopathology has

challenged traditional notions of how to define psychopathology and has illuminated that we cannot separate the study of typical and atypical development from each other (Cicchetti, 1984; Sroufe & Rutter, 1984; Sroufe, 1990). Indeed, psychopathology is best conceptualized dimensionally, along a continua of symptoms from normative to pathological, rather than categorically (e.g., Achenbach et al., 2016; Beauchaine, 2003). Additionally, because psychopathology emerges over time in the transactions between developing individuals and their contexts, it is also essential to adopt a developmental and ecological perspective (Bronfenbrenner, 1979) to interpret whether behavior is typical or atypical, and to understand the processes contributing to adaptive and maladaptive pathways (Masten & Cicchetti, 2010; Sameroff & Emde, 1989).

Furthermore, because development is embedded in multiple ecological systems and is influenced by multiple risk and protective mechanisms operating at each level of ecology and across domains (Bronfenbrenner, 1979), development is an incredibly complex and heterogeneous process. Indeed, we can observe multiple developmental pathways to the same outcome (equifinality), as well as multiple possible outcomes originating from the same initial conditions (multifinality) (Cicchetti & Rogosch, 1996). Moreover, we must integrate transactions across multiple levels of analysis, across contexts, and across development to understand the emergence of adaptation and psychopathology (Cicchetti & Toth, 2009; Cicchetti, 2008). As such, multilevel and multidisciplinary investigations have become hallmarks of the developmental psychopathology approach.

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**Cite this article:** Valentino, K., & Edler, K. (2024). The next generation of developmental psychopathology research: Including broader perspectives and becoming more precise. *Development and Psychopathology* 36: 2104–2113, <https://doi.org/10.1017/S0954579424000142>

Over the last four decades, enormous progress has been made in incorporating these key principles into research. For example, we have observed a significant shift towards dimensional models of psychopathology including the Hierarchical Taxonomy of Psychopathology (HiTOP; e.g., Kotov et al., 2017). Similarly, building on the significant progress made in understanding the role of neurobiological, physiological, genetic, and epigenetic processes and transactions in both normative development and psychopathology, additional dimensional models such as the National Institute of Mental Health's Research Domain Criteria (RDoC; e.g., Insel et al., 2010) promote a mechanistic and multilevel approach to the understanding of psychopathology, with a heavy emphasis on biological units of analyses. Importantly, however, the constructs of development and context remain underemphasized or altogether missing from these models that currently predominate clinical psychology and psychiatry (Franklin et al., 2015; Tackett & Hallquist, 2022). Moreover, developmental psychopathology is not only concerned with the incorporation of biological units of analysis and related disciplines; instead, the developmental psychopathology perspective can be considered a macro-paradigm, or a framework for understanding development from multiple perspectives (Cummings & Valentino, 2015). As such, developmental psychopathology is an inclusive science that seeks to bridge all disciplines, perspectives, and levels of analysis (e.g., from genes and cells to broad sociocultural systems) and has room to grow in collaboration with additional disciplines that may bring expertise to the understanding of adaptation and psychopathology.

### Contemporary challenges and opportunities

The developmental psychopathology approach will continue to evolve both in rising to the challenges of contemporary society and in progressing forward with advances in technology and methodology. In terms of challenges, rates of psychopathology are at historic highs, especially among youth. In the United States, one in five children face a mental health disorder annually (Office of the Surgeon General, 2021) and those from low-income families and minoritized racial and ethnic backgrounds are disproportionately affected (Alegría et al., 2010). Prior to the COVID-19 pandemic, mental health challenges were already the leading cause of disability and poor life outcomes in youth (Perou et al., 2013). The pandemic further exacerbated these concerns, and rates of depression and anxiety increased at least two-fold (Racine et al., 2021). Furthermore, individuals belonging to minoritized racial and ethnic groups were disproportionately impacted by the consequences of the pandemic (Alcendor, 2020), serving as a stark example of the pernicious toll of structural racism on health and development in the United States (Dickinson et al., 2021).

Globally, with significant political violence, conflict, war, and terrorism across the world, there are nearly 30 million refugees, and approximately 40% of refugees are youth (UN Refugee Agency, 2023). Therefore, another global challenge is the mental health of refugees and other forcibly displaced persons (Daar et al., 2018). Refugees are trauma-exposed and especially vulnerable to psychopathology in the context of an uncertain future with limited resources and social support (Byrow et al., 2020; Nickerson et al., 2011). The developmental psychopathology perspective has often emphasized that pathological conditions or disruptions can provide unique opportunities to learn more about normative developmental mechanisms (Cicchetti, 1984; Sroufe & Rutter, 1984; Sroufe, 1990). For example, the study of child maltreatment as an 'experiment of nature' (Cicchetti, 2003) has allowed researchers to understand more

about the role of early adequate caregiving for children's developmental trajectories. In the same vein, examinations of political violence, war, and forcible displacement may provide an opportunity to learn more about how macro-level processes influence development and psychopathology (Masten & Narayan, 2012). Such investigations are important and could be leveraged to inform and develop new intervention approaches and policy recommendations to support youth mental health and well-being.

Another key feature of our modern society is the rapid advancement of digital and mobile technologies. In the United States, most two-year-olds use a digital device every day and 95% of adolescents own a smartphone (Anderson & Jiang, 2018; Kabali et al., 2015). By 2025, estimates suggest there will be 5.6 billion mobile connections that will be used by nearly three-quarters of the global population (Odea, 2020). The accessibility of mobile devices provides new opportunities, including the delivery of healthcare services to individuals throughout the lifespan and across contexts—particularly in places where accessibility to traditional, in-person services are limited including low-income and rural communities, as well as low- and middle-income countries (e.g., McCool et al., 2022).

The proliferation of mobile devices has enabled opportunities to conduct more ecologically valid research and to answer more nuanced research questions about within-person change; at the same time, its integration into our everyday lives necessitates more research on the effects of mobile technology itself on development and psychopathology. Regarding the former, smartphones can be leveraged for the collection of ecological momentary assessment data, where participants can report on their moods or behaviors in real time, multiple times per day. These rich, longitudinal, micro-time data allow us to answer questions about intraindividual dynamics. Additional wearable technologies and sensors can allow for real-world measurement of physiology, physical activity, sleep, proximity to others, and natural language exposure (e.g., George et al., 2017; King et al., 2021; Salo et al., 2021) and enable coordinated collection of multilevel data that can be used to study dynamic in-the-moment risk and protective mechanisms associated with emerging mental health problems.

As individuals integrate digital technologies into their everyday lives, developmental psychopathologists need to consider how these digital or virtual contexts are influencing (and are influenced by) individuals over time. Investigations into digital media are just now beginning to advance past main effects-type research that has primarily focused on the impact of the duration of screen time on child development, in part because of limitations in tools to assess children's media use and the family media context (Barr et al., 2020). Of course, more nuanced questions can and should be addressed, considering the child's developmental competencies and context as well as the timing, type, content, and quality of their digital technology use (Barr et al., 2020). Moreover, as technology is increasingly embedded in daily interactions, and as the boundaries between virtual and physical realms becomes less clear, it may be important to consider adaptations to ecological systems theory to include *virtual* microsystems, as suggested by emerging theories such as neo-ecological theory (Navarro & Tudge, 2023). Interestingly, individuals always participate in a virtual microsystem while being physically present in another (traditional) microsystem (e.g., at home, in school). Effects of technology on child development may be direct, or indirect through their influences on other microsystem processes. For example, one could imagine that family relationships dynamics may change as children spend more of their time at home interacting with others in virtual contexts. Moving forward, we need a better understanding of mechanisms operating

in digital contexts and their influence on development and psychopathology.

### Future directions

With the context of contemporary society in mind, including rising rates of psychopathology, health disparities, and international conflict, as well as rapid growth and accessibility of digital and mobile technologies, the discipline of developmental psychopathology is poised to advance multidisciplinary, developmentally- and contextually- informed research, and to make substantial progress in supporting the healthy development of individuals around the world. Below we highlight key future directions and challenges for the next generation of developmental psychopathology research.

### Culture & developmental psychopathology

First, it is important to further efforts to study culture and developmental psychopathology. This is not a new idea, but one that bears repeating because the incorporation of culture into developmental psychopathology research continues to lag behind the incorporation of other units of analysis (Causadias & Cicchetti, 2018; Causadias, 2013). Notably, developmental psychopathology has always emphasized that culture is a context that must be considered to interpret whether a particular behavior is normative or not (e.g., García Coll et al., 2000; Hinshaw & Cicchetti, 2000), and similarly, cultural processes have been long included in ecological transactional models of psychopathology (e.g., Cicchetti & Lynch, 1993; Cicchetti & Valentino, 2006). However, as noted by Causadias (2013), most conceptualizations of culture in psychopathology research have tended to be static rather than developmental. As such, an important priority for culture and developmental psychopathology research is to study culture in relation to psychopathology from a developmental and multilevel perspective.

Culture is a system of people, places, and practices, and operates dynamically at multiple levels of ecology rather than being static and distal (Causadias, 2020). Clearly, culture operates at the social level as it is created and shared by communities, and it provides meaning and goals to our societal systems. The social dimensions of culture are also reflected in the concepts of ethnicity and race, which are social concepts used to “represent group categorizations based on real or perceived commonalities, the social hierarchies these taxonomies reflect and enforce, and the biases and stereotypes they engender” (Causadias & Cicchetti, 2018, p.1550). Furthermore, as described by scholars such as García Coll and Spencer decades ago, culture operates at and influences processes at *every* level of ecology (García Coll et al., 1996; Spencer, 2006).

Significant progress has been made in identifying key cultural risk and protective factors, both across and within cultural groups. For example, racism, defined as “a system of dominance, power, and privilege based on racial group designations; rooted in the historical oppression of a group defined or perceived by dominant-group members as inferior, deviant or undesirable” (Harrell, 2000, p.43) is a cultural risk factor that adversely affects ethnic minority groups. Racism manifests at multiple ecological levels including the systemic level, as well through individual racialized discrimination and aggression (García Coll et al., 1996; Jones, 1972; Williams & Williams-Morris, 2000). Discrimination increases risk for psychopathology and other poor developmental outcomes (Paradies et al., 2015; Pascoe & Smart Richman, 2009; Williams et al., 2019). These

effects are observed directly, as well as indirectly through the effects of racism on other processes. For example, racism proliferates stress, which may increase family conflict and disrupt parenting (Brody et al., 2008; Murry et al., 2022), which have adverse effects on child development.

Cultural protective factors are related to positive developmental trajectories and decrease risk for psychopathology. For example, cultural values and pride are associated with positive youth adjustment (e.g., Gaylord-Harden et al., 2012; Hughes et al., 2006). Moreover, several protective factors have been identified to buffer the pernicious effects of exposure to ethnic-racial discrimination on youth mental health. For example, among Mexican origin adolescents, ethnic identity and social support attenuate the link between discrimination and maladjustment (Park et al., 2018). These ethnically homogenous, within-group designs focused on multilevel cultural risk and protective factors are essential for identifying culturally specific mechanistic prevention and intervention targets that will advance and inform culturally appropriate prevention and intervention programs for youth psychopathology. In sum, culture is not only a systemic/macro-level process, and progress in advancing developmental psychopathology must include further evaluation of cultural processes at all levels of analysis.

### Incorporation of broader structural levels of analysis

Integration of additional macro-level, structural constructs into our research, and collaboration with social scientists from additional disciplines such as public health, public policy, economics, social work and sociology are critical for gaining a greater understanding of the factors that are contributing to maladaptation, especially as we pursue the goals of promoting adaptive development throughout the lifespan and reducing mental health inequities. There is clear evidence that structural aspects of our contexts and society, including state and federal policies, have influence on development and psychopathology. For example, poverty is strongly associated with psychopathology across the lifespan (e.g., Peverill et al., 2021). To combat the adverse effects of poverty on child development, the US government sponsors several anti-poverty programs including cash assistance programs such as Earned Income Tax Credit and Temporary Assistance for Needy Families (TANF). TANF is intended to be work-focused and time-limited, aimed at promoting employment and reducing welfare dependency. States have discretion in the generosity and implementation of these programs, including time limits, family caps, and the severity of sanctions for noncompliance with work requirements (Dunifon et al., 2006). Increased TANF cash benefits and access are associated with decreased child physical abuse, whereas time limits are associated with increased abuse (Spencer et al., 2021). Moreover, the generosity of state anti-poverty policies may buffer associations between poverty and both youth brain development and psychological functioning (Weissman et al., 2023). In Weissman et al.s’ (2023) analysis of Adolescent Brain Cognitive Development study data of youth across 17 American states, lower income was associated with smaller hippocampal volume and greater internalizing symptoms; however, when youth lived in states with more generous cash benefits, these health disparities were reduced (Weissman et al., 2023). Altogether, this research implicates state-level macroeconomic factors as influential in the development of psychopathology. Because structural racism drives inequities in poverty and

health across racial and ethnic groups in the United States (Bailey et al., 2017), more generous anti-poverty programs may be a key way to reduce these health disparities.

Research on exosystem and macrosystem factors must then be incorporated into multilevel prevention and intervention efforts. Developmental psychopathologists often aim to translate research into individual- or family-level programs; however, not all conditions can be addressed, or should be addressed, with individual- or family-level treatment approaches (e.g., Alvarez et al., 2022; Jones et al., 2023). When we have evidence that factors from broader ecological levels are contributing to psychopathology, we must not only create programs that help individuals and their families cope with those factors; we must also advocate for structural and policy-level changes. For example, with regard to structural racism as a macro-level risk factor, Jones et al. (2023) consider how current conceptualizations of resilience among Black youth fall short. In particular, Jones et al. urge the field to not be complacent in helping Black youth successfully cope with racism, but move “toward collective efforts to transform our approach, *pushing back* against the perniciousness of racism” (Jones et al., 2023, p.1). Moreover, taking a public health approach, Alvarez et al. (2022) provide several recommendations both within and across the mental health and policy-level systems to attend to racism and mental health equity and to catalyze broader systems transformation. These recommendations include continued research on important individual- and family-level interventions aimed at enhancing ethnic-racial socialization (e.g., EMBRace; Anderson et al., 2018) and integrating racial socialization into trauma-focused cognitive behavior therapy (Metzger et al., 2021) while also attending to systems-level efforts. Just as developmental psychopathology has facilitated collaboration with genetics, biological science, immunology and physiology to transform our understanding of developmental trajectories towards adaptation and maladaptation, so too can enhancing our collaborative efforts with fields dedicated to broader, social and structural levels of analysis.

### *Methods advances to embrace heterogeneity in translational research*

A hallmark of the developmental psychopathology approach is its focus on heterogeneity in both manifestations of and developmental trajectories underlying typical and atypical development. Increasingly, there is evidence that prevention and intervention programs are not equally effective for all people, at all times, and in all contexts (e.g., Bryan et al., 2021; Kaiser et al., 2022); even more, there is acknowledgement that much more research is needed to understand the nuances of how treatments work (Mulder et al., 2017; Zilcha-Mano, 2021). In light of clear equifinality and multifinality in development more broadly and treatment research specifically, one key future direction for developmental psychopathology is the advancement of and uptake in use of methods that embrace heterogeneity; this is especially needed in the context of translational research.

Historically, psychological research has relied heavily on variable-centered, between-person analyses. The variable is the main unit of analysis in a variable-centered approach (Bergman & Magnusson, 1997; Laursen & Hoff, 2006); analyses could include examining the association between parental emotion dysregulation and harsh parenting behaviors, cross-sectionally or longitudinally. When an association is found between two variables at the between-person level, it indicates the extent to which people who

are above average in one variable also tend to be above (or below) average on the other (Wang & Maxwell, 2015). For example, variable-centered, between-person analyses suggest that parents who are above average in emotion dysregulation also tend to be above average in negative parenting behaviors (for a review, see Edler & Valentino, *in press*). These analyses are useful in that they demonstrate the presence of an association at the level of a sample. They can also teach us about what is happening on average in a given group, illuminating potential mechanisms for future translational research to target.

Yet, variable-centered, between-person analyses gloss over individual differences and the time-varying nature of many psychological processes, and can only be generalized to the individual under specific conditions that are difficult to meet in practice (Fisher et al., 2018; Molenaar & Campbell, 2009). They are also limited in their capacity to capture heterogeneity, given their reliance on the assumption that the population is homogeneous with respect to how one variable acts on another (see Laursen & Hoff, 2006 for a review). Even more, the presence of a between-person association does not mean that an association between the same variables exists in the same magnitude and or even in the same direction at the within-person level (e.g., Curran & Bauer, 2011; Hamaker et al., 2015; Wang & Maxwell, 2015; Zilcha-Mano, 2021). Thus, while variable-centered, between-person analyses are valuable, we must be cautious in considering how they may be applied to the development of intervention and prevention programs, and whether they may guide decisions at the individual level.

Advances in statistical methods and designs allow researchers to evaluate processes at the person-level. A researcher could use a person-centered analysis, in which the individual is the main analytical unit and individuals are clustered together based on their levels of multiple variables (Bergman & Magnusson, 1997; Laursen & Hoff, 2006); for example, researchers could seek to identify groupings of parents who engage in different levels of multiple emotion regulation strategies, and then examine whether these groupings are associated with harsh parenting behaviors. Or, researchers could take advantage of the opportunities that digital technologies provide to gather repeated measures of real-time data from participants with their smartphones, such as tracking emotion regulation and parenting multiple times per day. Disaggregation of between- and within-person components of a model using repeated measures data (Curran & Bauer, 2011; Hamaker et al., 2015; Wang & Maxwell, 2015) can allow a researcher to examine an association of interest at within-person level, such as whether parents engage in more harsh parenting behaviors *when* they are experiencing higher levels of emotion dysregulation. Finally, repeated measures data could enable researchers to conduct an *N*-of-1 study on a single parent to gain insight into unique, intraindividual processes (Kazdin, 2016; Schork, 2015). Apart from applied behavior analysis research, however, person-level methods are still relatively rarely integrated into program efficacy research, including randomized clinical trials (though see Deisenhofer et al., 2024 for a discussion of person-level methods in the treatment of psychopathology, and see Fisher et al., 2019 for an empirical example of using data from individuals to inform personalized treatment).

When appropriate distinctions are not made between group and individual levels, within- and between-person associations, and variable- and person-centered analyses, seemingly conflicting findings can emerge, and prevention and intervention programs may be designed based on imprecise evidence. Take for example



the literature on adverse childhood experiences (ACEs). Evidence suggests that people who are above average in number of exposures to childhood adversities also tend to be above average in psychopathology symptoms and physical health difficulties throughout the lifespan (e.g., Felitti et al., 1998). In the decades since this seminal ACE study, universal efforts to screen youth for their ACE scores as a way to determine who may benefit from trauma-informed care have surged. However, although ACE scores can predict mean group differences in some health outcomes, they have poor accuracy in predicting an individual's risk for poor health outcomes (Baldwin et al., 2021), leading some to caution against universal trauma screening and using ACE scores to guide clinical decisions (e.g., Anda et al., 2020). Altogether, these findings highlight the need for increased attention to different study designs and levels of analysis, and what they can and cannot tell us about individuals, groups, and who is likely to benefit from experimental manipulation of a mechanism (Fisher et al., 2018; Zilcha-Mano, 2021).

More broadly, consideration is needed regarding how developmental psychopathologists can make thoughtful methodological choices that apply the concepts of equifinality and multifinality to prevention and intervention design and evaluation. Calls have been made to move prevention and intervention research beyond group-level, main effects evaluations (Bryan et al., 2021; Mulder et al., 2017), and we reiterate that call here. As Bryan et al. (2021) have noted, "we must expect, study, and capitalize on the heterogeneity that characterize most effects in science" (p. 986). Developmental psychopathology fundamentally expects individual differences in constellations of risk and protective mechanisms and developmental trajectories. It is not surprising, then, that there is heterogeneity in pathways to psychopathology manifestation (equifinality) and pathways following treatment (multifinality). Moving forward, it is essential that both our theorizing and methods together align with the reality that there are many distinct pathways that can precede and follow an individual's involvement in a prevention or intervention program. Just as the developmental psychopathology approach pushed the field away from simple main effects to evaluate complex transactions over time and in context, our methods and translational research designs must now expand above and beyond group comparisons that assume homogeneity to mechanistic, idiographic research that can benefit individuals.

### *Developmental psychopathology & precision mental health*

Acknowledging the heterogeneity in treatment response both between individuals and within individuals over time (e.g., Bryan et al., 2021; Kaiser et al., 2022; Murphy, 2005), an important priority for the field is to identify methods to evaluate interventions in more personalized ways that can match individuals to the treatments that may be most effective for them. This personalized approach to health care is often referred to as precision or personalized medicine (e.g., Collins & Varmus, 2015; Schork, 2015). Precision medicine is sometimes narrowly focused on applications of genetic testing to guide treatment decisions; however, it can refer more broadly to evidence-based treatment recommendations based on individual features (DeRubeis, 2019). Personalized recommendations can include treatment selection, dosage, delivery mode, and timing, and can be informed by characteristics at multiple levels of analysis including an individual's biological, psychological, and contextual characteristics and circumstances (e.g., Collins & Varmus, 2015;

Deisenhofer et al., 2024; Ng & Weisz, 2016; Wright & Woods, 2020; Zilcha-Mano, 2021).

A multivariable, multilevel approach is likely critical for making significant progress in the identification of precision treatment rules that can guide treatment personalization. When focused on individual moderators of treatment efficacy, no single variable has emerged as powerful enough to be clinically meaningful or to guide treatment decisions, however, multivariable approaches appear to be a promising method for advancing personalized, precision treatment (DeRubeis, 2019; Lorenzo-Luaces et al., 2021). A recent meta-analysis of personalized psychological interventions versus standardized psychological interventions for adults reported a small but statistically significant effect, such that personalized treatments were more effective than standardized treatments; this effect remained statistically significant even after removing studies that had a high risk of bias (Nye et al., 2023). As this important work moves forward it will be important to further integrate aspects of developmental timing and context into these personalization endeavors. Moreover, the extension of these methods to the development of personalized *prevention* programs is an area ripe for innovation that has potential for high public health impact (August & Gewirtz, 2019; Supplee & Duggan, 2019).

Another promising approach for the optimization of individual outcomes is to consider sequential interventions. Given limitations in any single treatment approach, multiple interventions (or intervention components) may be used in sequence to improve individual outcomes; however, traditional randomized clinical trial designs often focus on the efficacy of one treatment at a time. An alternate RCT approach is the sequential multiple assignment randomized trial (SMART; Lavori & Dawson, 2004; Murphy, 2005) which can be used to rigorously evaluate tailored sequential interventions, otherwise known as adaptive interventions (Collins et al., 2008). This type of design may be especially useful in evaluating the effectiveness of tiered adaptive intervention approaches which begin with lower intensity treatments, assess for treatment response to the initial intervention, and then provide additional, more intensive treatment components to nonresponders. Adaptive, multicomponent programs that can flexibly provide treatments that match the needs of individuals is a promising approach to intervention and prevention. The Building Healthy Children program (Demeusy et al., 2021; Paradis et al., 2013) is an example of an adaptive model of home-visitation prevention services that includes a variety of treatment components including supporting maternal depression, maternal trauma, mother-child attachment, parenting skills, and families' concrete needs; it has been shown to have positive short and long term benefits for mothers and their young children (Demeusy et al., 2021). Although adaptive, multicomponent prevention programs may initially require a greater investment in training and evaluation, they have the potential for ultimately providing communities with effective and efficient solutions (Supplee & Duggan, 2019). Altogether, both precision medicine and sequential interventions have great promise for preventing and intervening to support psychological well-being and should be prioritized in developmental psychopathology research.

### *The extension of DP to understand lifespan development & psychopathology*

A final challenge and future direction for the field of developmental psychopathology is the expansion of research across the lifespan to better characterize the development of psychopathology among

adults. Although the onset of psychopathology often occurs during adolescence and emerging adulthood (Caspi et al., 2020), risk for psychopathology continues across the lifespan into middle and late adulthood (e.g., Durak et al., 2023). Of course, developmental psychopathology has long defined itself by its commitment to understanding trajectories of typical and atypical development across the lifespan. Perspectives on developmental psychopathology and young adulthood have been advanced (e.g., Burt & Paysnick, 2012; Cicchetti, 2023), previously mentioned dimensional models of psychopathology focus on adulthood (e.g., Insel et al., 2010; Kotov et al., 2017), and there is a rich literature on the psychology of aging (e.g., Greve & Staudinger, 2006; Ong et al., 2009; Rothermund et al., 2023). Nevertheless, the field of developmental psychopathology can do more to explicate stage-salient developmental tasks across adulthood, particularly middle and late adulthood. There is also a need for greater knowledge of risk and protective mechanisms of psychopathology that may be unique to middle and late adulthood (e.g., Kitayama et al., 2020; Stroebe et al., 2007; Teo et al., 2023; Yon et al., 2017). In sum, a more coherent framework for the development of psychopathology across adulthood is needed.

Infancy, childhood, and adolescence have been the focus of much of developmental psychopathology research. One reason for this is evidence for sensitive periods (see Gee & Cohodes, 2021; Sisk & Gee, 2022 for reviews) and stage-salient developmental tasks (see Cicchetti, 1993; Sroufe & Rutter, 1984; Sroufe, 1979 for reviews) during these developmental periods. Given that early experiences set the stage for development across the lifespan in an organizational, probabilistic manner, it is logical to focus basic and translational research on infancy, childhood, and adolescence, as many developmental cascades initiate based on success or failure resolving stage-salient tasks. However, into and across adulthood, there are additional developmental milestones and tasks. During the developmental period of emerging adulthood, for example, individuals may begin to live apart from their families, pursue vocational training or advanced education, enter the workforce, initiate and maintain romantic relationships, and start their own families (e.g., Arnett et al., 2014; Roisman et al., 2004). Across middle and late adulthood, adults may navigate familial transitions (e.g., adult children moving out of the house, becoming a grandparent, bereavement), career changes and retirement, age-related declines in functioning and corresponding changes in independence, and concerns about generativity, religiosity, mortality, and life purpose. Developmental milestones earlier in the lifespan (e.g., attachment, self-regulation) generally appear to be experienced during relatively short spans of time that are consistent across individuals. On the other hand, developmental tasks of emerging, middle, and late adulthood are unique in that, for some of them, whether and when they occur is variable and affected by cultural expectations and individual choices. Nevertheless, the extent to which any of these developmental tasks are successfully resolved could have an influence on psychological well-being across adulthood.

Take for example the transition to parenthood. Burgeoning evidence demonstrates the notable changes that occur at multiple levels of analysis and ecology as individuals become parents (e.g., Barrett & Fleming, 2011; Gettler et al., 2011; Hoekzema et al., 2017; Kim et al., 2016; Saxbe et al., 2018, 2023). As noted by Saxbe et al. (2018), the transition to parenthood is characterized by such neurobiological, psychosocial, and behavioral changes that it represents a key window for determining trajectories of mental and physical health (see also Howland, 2023). Still, while parenthood is

a life-changing developmental milestone for some adults, not all adults choose or are able to become parents; our study of adulthood must expand beyond simply considering adults in their roles as parents.

Indeed, the field of developmental psychopathology seems to lose track of adults outside of their role as parents. Once the transition to parenthood begins, parents tend to be viewed in relation to their children's developmental trajectories, such that the infant replaces the parent(s) at the center of the family's ecology (Valentino & Edler, *in press*). Even when parental psychopathology is the explicit subject of investigation, the motivating reason for understanding and intervening to address it is often its potential intergenerational, negative consequences on youth. There is great reason for attention to the downstream effects of parental psychopathology on youth, and this research should continue. At the same time, adult psychopathology research would benefit from the incorporation of developmental psychopathology principles.

Moving forward, the field of developmental psychopathology should advance research on the specific risk and protective factors involved in trajectories toward psychopathology and from the treatment of psychopathology within and across emerging, middle, and late adulthood. For adults who are parents, this should include attention to transactional dynamics, such as child-driven effects on parents (e.g., Paschall & Mastergeorge, 2016). As dimensional models of (adult) psychopathology continue to gain momentum (e.g., Insel et al., 2010; Kotov et al., 2017), there is much room for collaboration with developmental psychopathologists to incorporate developmental and contextual perspectives and to facilitate a better understanding of the development of psychopathology across the lifespan.

## Conclusion

In summary, developmental psychopathology has made tremendous strides and scientific contributions over the last four decades. The discipline has facilitated our understanding of typical and atypical development, developmental mechanisms and cascades, complexity and heterogeneity of developmental processes, and the translation of research into prevention and intervention approaches. As founder and Editor of the field's leading journal for the last 35 years, Dante Cicchetti has provided exceptional leadership for the discipline with his clear vision for the future, his nurturance of ideas, and his mentorship of students and junior scholars. Moreover, he created a top-tier platform for developmental psychopathologists to share their research with each other and the scientific community through the creation of the journal *Development & Psychopathology*. Notably, in an editorial on reactions, reflections and projections for developmental psychopathology, written in 1993, Cicchetti articulated "If I could choose one prediction that I hope will actually reach fruition, it would be the continuation and elaboration of the mutually enriching interchanges occurring between investigators of normal developmental theory and psychopathology" (Cicchetti, 1993, p. 496). As Cicchetti concludes his extraordinary tenure as Editor, it is clear that his prediction has indeed reached fruition; he has inspired new generations of scholars to continue developmental psychopathology research and the journal ensures these mutually enriching interchanges across disciplines will continue to have a home.

**Acknowledgements.** This research was supported by the R01HD091235.

**Competing interests.** The authors have no conflicts of interest to declare.

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