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Special Issue Article

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

Reflections on resilience

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Abstract

Resilience research has long sought to understand how factors at the child, family, school, community, and societal levels shape adaptation in the face of adversities such as poverty and war. In this article we reflect on three themes that may prove to be useful for future resilience research. First is the idea that mental and physical health can sometimes diverge, even in response to the same social process. A better understanding of explanations for this divergence will have both theoretical and public health implications when it comes to efforts to promote resilience. Second is that more recent models of stress suggest that stress can accelerate aging. Thus, we suggest that research on resilience may need to also consider how resilience strategies may need to be developed in an accelerated fashion to be effective. Third, we suggest that if psychological resilience interventions can be conducted in conjunction with efforts to enact system-level changes targeted at adversities, this may synergize the impact that any single intervention can have, creating a more coordinated and effective set of approaches for promoting resilience in young people who confront adversity in life.

Keywords: Mental health; physical health; resilience

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Interest in resilience has long formed a core focus of developmental psychopathology research. While resilience has been defined in multiple ways, definitions commonly center around the capacity of systems to adapt to adversity (Masten et al., 2021). Throughout the history of resilience research, types of adversities studied have included experiences such as poverty, war, maltreatment, natural disasters, and other significant negative life experiences. In this article, we reflect on resilience research and discuss several possible avenues that may be fruitful in future explorations. Our reflections center around 3 themes for future research:

1. Though researchers have acknowledged the importance of considering mental and physical health outcomes in tandem for holistic models of resilience, an underappreciated reason for doing so is that these outcomes can diverge within an individual
2. More recent stress models suggest that stress may accelerate aging; thus, developmental models of resilience may need to correspondingly consider how resilience strategies may need to be developed in an accelerated fashion to be most effective
3. Focusing on resilience interventions conducted within *systems* that also provide supports and resources will maximize the impact that psychologists can have in promoting healthy child development

Theme 1: Though researchers have acknowledged the importance of considering mental and physical health outcomes in tandem for holistic models of resilience, an underappreciated reason for doing so is that these outcomes can diverge within an individual

Resilience research in the developmental psychopathology field began with an interest in understanding variability in outcomes (including positive outcomes) among high-risk samples of children (Cicchetti & Garmezy, 1993; Garmezy, 1985; Rutter, 1987; Werner, 1993), and has undergone several shifts or "waves" across the decades (Masten, 2007). Throughout this time, the focus understandably has largely been on mental health or psychological adjustment when considering children's adaptation (Luthar, 2006; Masten, 2001). This research progressed from early studies that focused on individual traits that allowed certain children to thrive, to studying processes that contributed to good outcomes, to more recently taking systemic approaches that consider the contribution of multiple layers of systems to child development and adaptation (Masten & Narayan, 2012; Rutter, 1987; Ungar & Theron, 2020). These system-based approaches have broadened developmental psychopathology's focus, spanning a consideration of interacting systems, both internal and external to an individual, and have included levels ranging from neurobiological and genetic contributors to sociocultural contexts (Masten, 2016). Much of this expansion has come on the independent variable side, that is, the varying systems of influence on a developing child. However, when it comes to defining the outcome side of resilience studies – that is, successful adaptation –the focus in this field has largely remained on psychological, social, and behavioral manifestations of psychopathology, well-being, or adaptive functioning (Cicchetti, 2016; Luthar et al., 2000; Masten, 2018).

In parallel, the field of health psychology developed with similar questions focused around relationships between chronic stress and physical health, and a search for factors that could protect individuals from the physiologically deleterious effects of stress on the body, and as well, from the chronic diseases that can result from prolonged exposure to stress. This search for psychosocial buffers has identified both individual-level traits (e.g., perceived control, self-efficacy, coping strategies; Chen & Miller, 2012; Everson-Rose & Lewis, 2005; Turiano et al., 2014), as well as social

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network factors (e.g., stress buffering effects of social support: Cohen & Wills, 1985; Uchino et al., 1996); parental nurturance: (Evans et al., 2007; Miller et al., 2011) that can protect individuals from physiological and physical health consequences of stress or adversity. In these types of resilience studies, typically the focus is on physical health outcomes or physiological risk markers.

Researchers have long acknowledged the importance of considering multiple domains of outcomes in resilience research (Dunkel Schetter & Dolbier, 2011; Masten, 2007). And researchers generally endorse the idea that considering both mental and physical health would encourage a more holistic understanding of resilience. Additionally, on the surface, it seems like factors that promote mental health could also promote physical health. Nonetheless, the literature on resilience in the mental health versus physical health domains has largely proceeded along parallel, rather than intersecting lines. We argue that it would be important in future research to make greater efforts to consider both types of outcomes simultaneously within single studies. This is because recent research suggests that there might be circumstances under which a divergence in mental and physical health outcomes is evident and in fact can result from the same social processes (Jackson et al., 2010; Mezuk et al., 2013; Russotti et al., 2020; Tyrell et al., in press). Without more holistic approaches, researchers could risk mischaracterizing the effects of a resilience strategy as positive or negative, when in fact, it might be more nuanced across life domains.

For example, in a line of work on skin-deep resilience, our research group has documented across multiple US national longitudinal samples, that youth of color who experienced the adversity of growing up in low socioeconomic status (SES) households, but who succeed in rising above these conditions by graduating from college, displayed better mental health (lower levels of depression) in adulthood but at the same time, had a higher risk of metabolic syndrome (a cluster of risk factors, including high blood pressure, obesity, and elevated glucose levels that increases risk for diabetes and heart disease) compared to similarly low SES youth of color who did not attend college (Gaydosh et al., 2018). Similarly, when lifetime trajectories of SES were tracked, those who were upwardly mobile (starting out low SES in childhood, but moving to high SES in adulthood) had good mental health profiles (in terms of adult depression) similar to those who remained high in SES throughout their life (high-high group) and better than those who were low in SES throughout their life (low-low group). In contrast, the physical health profiles (in terms of risk of metabolic syndrome in adulthood) of this upwardly mobile group was worse than the high-high SES group and instead was similar to the low-low SES group (Miller et al., 2020). Taken together with other studies (Chen et al., 2015b; Courtin et al., 2019; Sims & Coley, 2019; Surachman et al., 2020), these findings point to a pattern termed skin-deep resilience, because it suggests that above the skin, those who make it out of adversity (e.g., conditions of poverty) through succeeding academically appear to be doing well by external metrics, or above the skin (i.e., having good mental health and well-being, getting good jobs, having high incomes), but below the skin, they appear to be struggling physiologically in ways that have implications for physical health, thus displaying resilience that is only skin-deep. Research has confirmed this idea of a tradeoff, finding that if participants are characterized in adulthood by the absence of depression but the presence of metabolic syndrome, individuals who moved from low childhood SES to high adult SES are significantly more likely to display this profile compared to other lifecourse trajectory groups (Miller et al., 2020).

Why do we see such a divergence of mental and physical health profiles? One psychological explanation is that youth seeking upward mobility often exert high levels of persistent striving, hard work, and self-control that help them to achieve successes in their lives, but that at the same time, can be exhausting and can take a cumulative physiological toll on their bodies (Chen et al., 2022). In support of this hypothesis, research has demonstrated that low SES youth of color who engage in high levels of striving during adolescence had lower levels of depression in adulthood (along with being more likely to have finished college and to be earning higher incomes). At the same time, however, these adolescents who were high strivers also had a higher risk of developing diabetes in adulthood (Brody et al., 2016). Similarly, individuals of color who grew up with low childhood SES but were high strivers (high in conscientiousness) had lower levels of depression in adulthood, but were more likely to develop a verified respiratory infection after being administered an experimental virus (Miller et al., 2016). These, along with other studies (Brody et al., 2020; Chen et al., 2019, 2020; Duggan et al., 2019), suggest that the same psychological trait (striving) could be simultaneously beneficial for mental health while at the same time, being detrimental to physical health, particularly in populations that have been marginalized in our society.

These findings highlight how if we want to understand, in a more holistic way, adaptation and resilience in children and adolescents as they progress through life, studies of resilience need to ensure that multiple and diverse domains of outcomes are assessed and analyzed together within a single study. The above findings provide just one illustrative example of a single factor (striving) that appears to produce divergent mental and physical health profiles in youth. There may be other factors as well, such as health compromising behaviors (e.g., comfort eating in response to stress) (Jackson et al., 2010; Mezuk et al., 2010, 2013), and factors at levels broader than the individual, that benefit mental health, but are detrimental to physical health. In the future, additional studies will be needed to determine what other strategies, processes, or systemic influences might be beneficial to mental health but somehow have the potential to compromise physical health. Or conversely, to determine whether there are strategies that benefit physical health but that actually do so at the expense of mental health. And as well, whether there are strategies, processes, or systemic influences that might be able to simultaneously benefit both physical and mental health in children who grow up under adversity.

Pursuing these types of research questions has implications both theoretically and for public health. That is, a divergence in mental and physical health profiles presents a puzzle that will require revisions of existing theories of resilience in order to solve. And understanding this divergence will have important public health implications in that researchers will have to be cautious to not identify protective processes prematurely, improving outcomes in one domain while not realizing that we have inadvertently worsened other domains. Researchers may need to develop ways to simultaneously assess multiple outcomes within the mental health domain and as well within the physical health domain, so as not to miss effects on a specific condition that may not generalize to other health problems. As we search for target points for intervention in children and adolescents exposed to adversity, we will need more of this type of comprehensive assessment of multiple outcomes simultaneously in order to learn how manipulating certain targets will affect health and well-being in overarching ways, across multiple domains and over time. If this type of divergence in mental and

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physical health profiles turns out to be relevant more broadly to multiple types of resilience processes, it may begin to challenge prevailing wisdom about what factors are actually good for adaptation among those exposed to adversity.

Theme 2: More recent stress models suggest that stress may accelerate aging; thus, developmental models of resilience may need to correspondingly consider how resilience strategies may need to be developed in an accelerated fashion to be most effective

Another area to consider for future research is how we might integrate resilience research with more recent stress models. That is, if resilience research is premised on the idea of adaptation to adversity, it may be helpful for resilience researchers to consider more contemporary models of stress and their implications for resilience research. While stress has historically been conceptualized as negative life experiences that broadly have damaging effects on a host of mental and physical health outcomes (Schneiderman et al., 2005; Thoits, 2010), more recently, some researchers have proposed that one specific function of stress may be to accelerate the process of aging in bodily systems.

Empirical evidence finds support for this stress and aging model biologically. For example, empirical studies have documented that childhood adversities that involve threat are associated with an acceleration of cellular aging, measured via both epigenetic aging and telomere length in humans (Shalev et al., 2013; Sumner et al., 2019). These associations have been summarized in various reviews (Gassen et al., 2017; Lyons et al., 2023). More controlled mechanistic human studies have been conducted that have demonstrated that when participants were experimentally exposed to a common cold virus, childhood adversity was associated with shorter adult telomere length specifically in cell types relevant to cancer and viral infections, and in turn, shorter telomere length in these specific cells partially mediated associations between childhood adversity and increased risk of developing infection and illness after virus exposure (Cohen et al., 2013a, 2013b). In addition, animal studies have documented causal evidence that experimental manipulations of stress accelerate multiple types of biological aging measures (Lyons et al., 2023; Poganik et al., 2023).

Other theoretical models also point to the aging effects of stress. For example, stressors associated with inequality, and in particular, a lifetime of experiencing social, economic, and/or political disadvantage and exclusion, as well as unfair distributions of resources, have been proposed to "weather" physiological systems, resulting in an acceleration in which chronic diseases appear, on average, earlier in life specifically among groups marginalized by society (Geronimus et al., 2006, 2020). In other models, stress has been theorized to accelerate the development of brain and body systems ("stress acceleration model") (Belsky, 2019; Callaghan & Tottenham, 2016). For example, both animal and human studies document that under conditions of stress, organisms learn emotion expression and emotion regulation behaviors earlier in life and display faster maturation of various neural structures (e.g., amygdala) that play a role in detecting and responding to threat (Callaghan & Tottenham, 2016). In addition, brain regions that regulate the activity of the amygdala (e.g., medial prefrontal cortex) develop more adult-like connections with the amygdala in children if they were exposed to adversity early in life (Gee et al., 2013a, 2013b). These theories suggest that stress may shift the timing of development so that systems mature (or age) more rapidly, and that children who encounter chronic adversity/stress end up "growing up" more quickly than other children.

If we accept this conceptualization on the stress end, perhaps notions of resilience would then also need to shift to fit with this stress model. That is, if stress accelerates aging, maturing systems more quickly, then perhaps successful adaptation to adversity or stress would involve shifting the timing of certain developmental milestones to fit this new timing of stress effects. Perhaps resilience could be conceptualized as the need to cultivate certain processes or factors at different developmental time points for those exposed to adversity. If stress accelerates aging, shifting the developmental timing of certain milestones, perhaps we need to find ways to shift in a corresponding way the timing of when resilience factors appear. Below we discuss two examples to illustrate how this might work.

The first example relates to the developmental timing of emotion regulation. As the expression of certain emotional responses (e.g., threat) develops at younger ages with stress, the development of emotion regulation skills at earlier ages might also become important for buffering the effects of adversity on the emotion system. The resilience literature suggests that there are certain coping strategies that are beneficial particularly for adversities that are uncontrollable, such as poverty. One such coping strategy is shift-and-persist – a constellation of strategies that involves both shifting the self (adjusting oneself in response to stressors, for example through emotion regulation strategies such as reappraisals that allow one to reframe the meaning of a stressor in a less threatening manner), as well as persisting (enduring adversity with strength, finding meaning in difficult situations, and maintaining optimism in the face of adversity) (Chen & Miller, 2012). The combination of shifting and persisting has been found to buffer youth growing up in low SES circumstances from inflammation, obesity, asthma symptoms, and depression (Chen et al., 2011, 2015a; Christophe & Stein, 2022; Christophe et al., 2019; Kallem et al., 2013; Lam et al., 2018). However, developmental research suggests that such strategies take time to emerge in the life span. For example, secondary coping strategies such as emotion regulation increase during the period of adolescence, and are not commonly seen in younger children (Compas et al., 1988; Rossman, 1992). In contrast, primary coping strategies such as problem-solving can be seen in younger children (Compas et al., 1991; Donaldson et al., 2000). Similarly, finding purpose and meaning in life is a process that also is thought to develop in adolescence (Damon et al., 2003; Erikson, 1968). This suggests that shift-and-persist might normatively develop in adolescence; however, if it were possible to foster shift-and-persist strategies at younger ages, this might help buffer these children from the effects of stress on aging processes and in turn, health outcomes.

Future research is needed, then, that layers this type of developmental timing perspective onto resilience studies. For example, longitudinal developmental studies could probe whether shift-and-persist has more long-term protective effects in individuals who develop this strategy in childhood as opposed to adolescence or adulthood. Research is also needed to explore what other emotion regulation strategies might typically come online in adolescence or adulthood, but could have added benefit if developed in childhood, particularly for children exposed to significant adversity. And as well, whether interventions can successfully teach such strategies to younger children, and if so, what are the mental and physical health implications of doing so?

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Another example of stress acceleration might be reflected in the adult roles that children and adolescents who grow up under adversity often have to take on. For example, for youth growing up under conditions of poverty, these can include responsibilities such as taking care of younger siblings, cooking meals for the family, getting a job, and helping with other family needs, particularly in families that have fewer resources at their disposal (Burton, 2007; Fuligni & Pedersen, 2002). Often these added responsibilities come about for youth because parents are working multiple jobs or evening shifts to make ends meet, or families have limited resources for dealing with ongoing life demands and have to lean on older children to help with family needs. Hence these youth are often compelled to take on adult roles at younger ages, and to do so must give substantial amounts of their time to support family members around them. And while many of these responsibilities may be thought of as normative in adulthood, adversity may accelerate the need for learning to do them at younger ages.

In turn, providing this type of ongoing support to the family can be costly to health. Research has shown that in adults, disproportionate giving of support to others, and related constructs such as caregiving (e.g., for a spouse with dementia), are associated with greater inflammation, slower wound healing, greater risk of infectious illness, depression, anxiety, and earlier mortality (Austin et al., 2021; Chen et al., 2021; Christian et al., 2023; Kiecolt-Glaser et al., 2003). In a similar vein, adverse childhood experiences have been found to be more strongly associated with allostatic load (a cumulative index of wear-and-tear on physiological systems) among children who are high in empathic concern (being concerned about and having compassion for others) (Phua et al., 2023), suggesting that children who might be more predisposed to helping others may experience stronger effects of adversity on health. Furthermore, while high levels of empathy in one person are associated with lower levels of inflammatory biomarkers in family members that they have close relationships with, they are at the same time associated with greater inflammation in the empathic provider (Manczak et al., 2016). If stress accelerates the need for developing such support-providing roles, then perhaps resilience factors that promote support-receiving also need to be accelerated to counteract the detrimental effects that the disproportionate giving of support can have on health and well-being. For example, researchers have found that when people can achieve a balance between support giving and support receiving, this is associated with lower levels of inflammation and reduced mortality (Chen et al., 2021; Jiang et al., 2022). Further, social support has long been one of the key resilience factors commonly identified in the literature (Masten et al., 2021; Masten, 2018); for example, supportive role models can buffer associations between low SES and inflammatory biomarkers in youth (Chen et al., 2013). This research suggests that being aware of different dimensions of support, such as the support that a child is providing in addition to that which they are receiving, might be important to assess, and as well, that finding ways to cultivate more balanced, or mutual, support will be important for children experiencing chronic adversities. Alternatively, another opportunity for intervention may lie in restorative health behaviors. Individuals who are dealing with multiple competing demands and are disproportionately giving support to others on average have less time for engaging in restorative behaviors, such as sleep, physical activity, or leisure pursuits (Chen et al., 2022; Joseph et al., 2015). This suggests that interventions targeting restorative activities may be beneficial in populations that are experiencing adversity (Hopwood & Schutte, 2017; Rottapel et al., 2020).

Taken together, these studies suggest that future research may want to conduct assessments of balanced support earlier in life, instead of focusing – as the resilience literature traditionally has – only on received support. Intervention studies could develop ways for children experiencing adversity to cultivate balanced support, even among youth who feel obligated to give a lot of support. Future research studies could investigate questions such as whether balanced support needs to come from the same person, or whether giving support to someone in one's network could be counterbalanced by receiving support from a different important other in one's life. Future intervention studies could also investigate what types of restorative activities are possible in the lives of young people encountering adversities, how best to teach ways to incorporate restorative activities into one's daily life, and whether doing so can counteract the impacts of adversity on health and well-being.

Theme 3: Focusing on resilience interventions conducted within *systems* that also provide supports and resources will maximize the impact that psychologists can have in promoting healthy child development

Resilience research has long been intertwined with intervention research, as both researchers and practitioners have recognized the importance of finding ways to help children who grow up under adversity, and as well, the advantages of the experimental designs of intervention research. Resilience interventions in developmental psychopathology traditionally have sought to modify individual child factors (e.g., executive function, coping skills, self-efficacy, health behaviors) as well as family level factors (e.g., parenting, attachment relationships) (Dray et al., 2017; Masten, 2011; Masten, 2018; van IJzendoorn et al., 2020), with reasonable success.

However, as resilience research has shifted into understanding the ways in which systems across multiple levels interact and are interdependent in influencing resilience processes (Liu et al., 2017; Masten et al., 2021), perhaps resilience interventions looking to the future could also incorporate systems perspectives more strongly. Systems approaches conceptualize embedded levels of individual, family, school, community, and societal level influences on children that operate in bidirectional ways and that involve systems interacting with other systems to affect child functioning in dynamic ways (Masten et al., 2021). And while there is acknowledgement of the importance of addressing larger structural factors that contribute to experienced adversities, it is still the case that many commonly identified resilience targets and interventions within psychology seek to change processes at the individual (e.g., self-regulation, problem-solving, optimism, motivation; Masten et al., 2021 or family level Masten, 2018). While these factors are undoubtedly important to study and foster in children experiencing adversity, and while it is possible to consider operationalizations of these factors at broader systemic levels (Ungar & Theron, 2020), one future direction might be for psychologists to also consider whether there are ways to be a part of broader structural-level changes that could help maximize the ways in which psychological factors can promote resilience.

Two examples of how psychologists might begin to do this are first, to study psychological processes that change when structural-level interventions are put into place; and second, to conduct psychological interventions in the context of structural-level changes to test whether effects can be amplified when changes across multiple levels are implemented simultaneously. With respect to the first, there are numerous examples of intervention

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studies that have aimed to address adversities at broader, structural levels. These interventions often take approaches that try to mitigate exposure to the adversity or that provide resources to compensate for adversities (Masten, 2011). These include policy-oriented solutions such as cash transfers, efforts to increase the minimum wage, changing tax policies to help low-income families accumulate more wealth, housing vouchers, health insurance or health care access for individuals living below poverty levels, and legislation to reduce discrimination and barriers that occur at the structural level (Assari, 2018; Braveman et al., 2010).

Cash transfer programs have been found to have beneficial effects on youth mental health. For example, in the Great Smoky Mountains Study, the opening of a casino on a Cherokee Indian reservation provided ongoing income supplements of profits distributed to tribal members. Children who remained in the persistently poor group had higher levels of conduct disorder and oppositional defiant disorder compared to children whose families moved out of poverty as a result of the income supplements (Costello et al., 2003), and benefits to psychopathology outcomes were maintained into adulthood (Costello et al., 2010). Similarly, in the Moving To Opportunities Study, a housing voucher given to families living in poverty to allow them to move to low-poverty neighborhoods had beneficial effects on girls' mental health (Kling et al., 2007), on adult well-being (Ludwig et al., 2012), and on adult obesity and diabetes (Ludwig et al., 2011) compared to a control group not offered vouchers. In systems-based interventions focused more squarely on health, providing health insurance to uninsured low-income adults was found to have beneficial effects: those who won a lottery providing them access to Medicaid as part of the Oregon Health Insurance Experiment reported one year later having better physical and mental health compared to the control group (Finkelstein et al., 2012), though differences were not found on objective physical health indicators (Baicker et al., 2013). These types of studies suggest that tangible resources to reduce experiences with adversities such as poverty have the potential to promote better mental and physical health outcomes. But because these studies were not always designed with psychological processes in mind, one gap that psychologists could potentially fill is to explain how structural-level interventions come to impact individual or psychological outcomes (see Turney et al., 2013, for an example). That is, what processes are changing at the individual or family level as a result of these structural-level interventions, and could these processes explain changes in health and well-being in individuals? For example, do cash transfers and vouchers benefit health because of the material resources they provide, allowing families to purchase needed food and improve living conditions? Or do they benefit health because they reduce the experiences of stress and anxiety that permeate daily life under conditions of poverty? Or because they improve feelings of social support and cohesion (connectedness) in families who move neighborhoods or who receive resources?

A second approach that might be fruitful for future research is to investigate the effects of psychological resilience interventions when they are conducted together with structural-level changes to assess whether effects can be amplified by intervening at multiple levels simultaneously. That is, structural-level interventions, for example cash transfers or housing vouchers to reduce experiences with poverty, or efforts to improve health care access, are typically not accompanied by psychological interventions that seek to promote the capacity of an individual to adapt to challenges or change. And perhaps interventions will be limited in their success if they take an approach such as providing monetary or other tangible goods without at the same time providing supportive resources to help children and families develop the coping skills needed to effectively navigate new circumstances – for example, the new systems and resources in theory available to families, but that often times contain barriers to access for certain groups (Assari et al., 2018). Conversely, psychological resilience interventions come with their own set of limitations in that when the focus is on changing individual-level factors, such as coping or executive function, these interventions run the risk of being criticized for "blaming the victim" or suggesting that internal change is sufficient to address systemic adversities. One example of how interventions across levels could be better blended comes from the pregnancy literature, where efforts to redesign health care systems – for example, by changing prenatal care from individual to group care involving multidisciplinary teams of physicians, psychologists, epidemiologists, public health care professionals, and others – produced reductions in rates of preterm birth and small-for-gestational age babies (Ickovics et al., 2007, 2016), and reductions in maternal depressive symptoms (Felder et al., 2017) among predominantly low-resource women. Such approaches capitalize on the strengths of multidisciplinary teams to simultaneously target individual-level factors (e.g., health behaviors and attitudes) together with institutional (e.g., health care quality) and societal (e.g., housing insecurity) level factors to promote health equity (Ickovics et al., 2019).

This suggests that future generations of psychologists may want to increase collaborations and expand their familiarity with and training in other disciplines in ways that will facilitate their ability to conduct research that is both psychologically- and systems-oriented. Opportunities to become more broadly trained on both the social structure side as well as on the health side may enable future psychologists to both pose more meaningful research questions about interventions that target multiple levels of change and to find ways to connect with, and learn from, researchers in other disciplines, such as sociology, epidemiology, public health, biology, and medicine, that can inform this type of research agenda. Perhaps future efforts that focus on blending intervention approaches at multiple levels will turn out to be more effective (Assari, 2018; Mezuk et al., 2013; Thoits, 2010) because they will simultaneously allow for synergies across levels to multiply the potential benefits of any single intervention, which will hopefully create a more coordinated and effective set of approaches for promoting resilience in young people in the face of adversity.

Summary and conclusions

The topic of resilience is an important one for understanding how healthy development is possible when children and adolescents have to confront adversities in life. In this article, we have provided reflections about where future research on resilience might head, with a focus on three themes. First, we suggest that research seeking to bring together the mental health and physical health literatures might provide a deeper understanding of resilience in youth. As well, research that investigates the timing of resilience factors and whether an "acceleration" of resilience factors to match the ways in which stress can accelerate aging may help with targeting interventions to optimal developmental stages. Lastly, we suggest that incorporating psychological interventions into structural-level interventions, where possible, could have the potential to amplify intervention effects through taking advantage of the ways in which systems at different levels operate and interact to influence a developing child.

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These suggestions for future research align with several of the core principles of developmental psychopathology and provide suggestions for how resilience research can continue to influence the field of developmental psychopathology in the future. For example, one core principle of developmental psychopathology is that there are developmental pathways to psychopathology that involve both multifinality (a given risk factor leading to multiple outcomes) and equifinality (multiple risk factors leading to the same outcome) (Cicchetti, 2013; Eme, 2017). Our illustration earlier of how the same risk factor can potentially lead to a divergence in mental health versus physical health outcomes suggests the importance of taking the multifinality perspective within developmental psychopathology and broadening it even further to encompass physical health outcomes. Developmental psychopathology has also long embraced the idea of developmental pathways to psychopathology that involve multiple contributors whose timing of emergence and changes over time contribute to both adaptive and maladaptive behaviors (Cicchetti, 2013; Eme, 2017). Our recommendation to consider how an acceleration of resilience factors may help counter the ways that stress can accelerate development and aging suggests that future resilience research could help shed light on developmental pathways to psychopathology through investigating the optimal timing of interventions targeting resilience factors that might help shift trajectories away from maladaptive, and toward more adaptive, behaviors. Lastly, another key principle of developmental psychopathology is its approach involving multiple levels of analyses (Cicchetti, 2013; Eme, 2017). Our third theme suggests that resilience research could help inform the future of developmental psychopathology by combining intervention approaches with a multisystem perspective that addresses resilience factors at the child or family level simultaneously with systemic level changes that aim to address the structural inequalities that some children and families experience in this society.

In a world in which the experience of adversities is inevitable for some children, understanding what can be done, when, and how becomes critically important. Continuing to push resilience research forward should remain a high priority for the future of developmental psychopathology, as intervening early in life, where possible, will maximize the likelihood that children and adolescents can emerge from adversity and progress along healthy trajectories throughout their adult years.

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