

## 1 The Story We Will Tell

This Element explores and refines the concepts of whole-child development, learning, and thriving through a dynamic systems theory lens, integrating knowledge across multiple disciplines, including developmental and learning sciences. We provide a new, theory-predicated and evidence-based description of whole-child development, learning, and thriving (Lerner, 2018) and a vision for how to design learning environments that promote comprehensive, holistic, and equitable outcomes for all children.

We focus on the United States and begin by noting historical challenges in public education, including the intentional inequitable distribution of resources, opportunities, and outcomes that perpetuate racial and gender inequities. We discuss why earlier efforts to infuse whole-child development into US public schools have not produced the transformational change required to unleash the potential and unique capabilities of all students. We propose that to transform US education developmental and learning scientists, in full collaboration with educators, policymakers, and other key stakeholders (e.g., parents) (Bornstein, 2019a), must use their knowledge to: (1) challenge the assumptions that drove the design of current US education; (2) articulate a revised definition of whole-child development, learning, and thriving, (3) create a paradigm shift in how the purpose of education is described in the context of social, cultural, and political forces, including the impacts of racism, ethnicity, socioeconomic privilege, and bias; and (4) introduce a dynamic “language” for measuring the full set of twenty-first century skills and mastery-level academic competencies.

Our story begins with a review of key concepts from developmental and learning sciences and dynamic systems theory. Next, we call for a twenty-first century education system that embraces the nature of human development and learning as part of an integrated and dynamic system of relations between individual and context (including, most superordinate, culture) (Immordino-Yang et al., 2019; Raeff, 2016). We explain that this system promotes design, practice, and measurement approaches optimizing opportunities for development, learning, and thriving for all children in all settings in which children grow and learn. The final sections of the Element offer a *blueprint* for practice with examples of organizations that have designed settings, programs, and tools to operationalize the principles set forth in this Element. We review research on the characteristics of settings that promote whole-child development, learning, and thriving and propose a framework to influence school design, educator practice, measurement, and policy. We conclude with a discussion of the impact of the contexts facing children, their families, and our learning systems as of January 2021 (the time of writing), considering the combined effects of

COVID-19, racialized violence, and economic instability, all of which disproportionately impact communities of color.

### 1.1 Conceptions of Whole-Child Development

“Whole-child development” can mean many different things to educators, researchers, foundations, and policymakers. Whole-child development has been referred to as: (1) a collaborative approach to integrating health services and programs more deeply into the day-to-day life of schools to ensure that all students are healthy, safe, engaged, supported, and challenged (Lewallen et al., 2015); (2) explicit social and emotional learning (SEL) instruction and integration of social, emotional, and academic skills development (Brackett et al., 2015); and (3) a comprehensive approach to children that builds on the understanding that physical conditions, emotional states, and social experiences (i.e., relationships) have a direct impact on learning and that student success and well-being must be conceptualized and measured to include more than academic skills and knowledge acquisition (e.g., Jones & Kahn, 2017). Each of these views of whole-child development is based on research and evidence. Each was created to challenge the status quo of US education, resulting in a plethora of policy standards, program offerings, and partnership models (e.g., wraparound student services, SEL curricula, community schools, whole-school transformation models). As we shall explain, these viewpoints are incomplete and do not address the holist, dynamics, and specificity of child development (Bornstein, 2019b; Rose, 2016).

Although these frameworks represent significant and important progress, none fully addresses the heart of the problem facing US education: Schools were designed based on incorrect (and often racist) assumptions about how children learn and develop. Current US education systems have been designed in a context of white supremacy, ethnocentrism, and a focus on certification, socialization, and social control (e.g., Fass, 1991; Payne, 1984; Tucker, 2020a, 2020b). Past approaches to whole-child development and associated programs and policies failed to address incorrect assumptions or the influence of racism on the design of schools. They were also not fully informed by (1) biological, social, behavioral, and social science research or (2) methodological innovations in measurement and data analysis. Together, these bodies of research and methods of analysis affirm that child development (and human development in general) involves a system of “dynamic” (i.e., mutually influential) relations among:

- (1) each child’s multiple biological processes (e.g., the nervous system and epigenetic influences on the developing brain);

- (2) each child’s psychological processes (cognitive, affective, and behavioral) and social relational processes; and
- (3) the collective set of coactive ecological and cultural contexts that each child encounters across the life span, ranging from proximal child–parent/family relationships to more distal contexts of schools and communities, to macro contexts involving societal institutions, culture, race, ethnicity, the natural and designed physical ecology, and histories (Bornstein, 2019a; Bronfenbrenner & Morris, 2006).

In this Element, we propose that a comprehensive understanding of whole-child development, learning, and thriving requires *a dynamic and integrated view of each child’s journey*. Current scientific understanding of these dynamic, individualized journeys must become the foundation for the beliefs and practices of practitioners, administrators, and policymakers. Specifically, practitioners, administrators, and policymakers must understand the learning processes, potentialities, and capabilities that can and will emerge in students across time and across dynamically coactive settings designed to promote whole-child development, learning, and thriving.

## 1.2 Thriving and Resilience

Thriving is a dynamic process that goes beyond well-being to include individual growth that is strength-based and multidimensional, reflecting positive growth across multiple domains including physical, emotional, and cognitive. These domains are linked to internal processes and external conditions that enable favorable change (Slavich & Cole, 2013). Thriving involves a child’s holistic, adaptive behavior and development that is, and can be, optimized during specific times in life and in specific community and cultural settings (Lerner, 2004).

Masten (2014b) discussed the concept of thriving and differentiated it from resilience, defining resilience as “the capacity of a dynamic system to adapt successively to disturbances that threaten system function, viability, or development” (p. 1012). She explained that this definition was intended to be “scalable across systems and disciplines, from the level of micro-organisms and systems operating within the human organism to the system of family, school, community, culture, economy, society, or climate” (p. 1012). Masten (2014b) was prescient in noting that a key reason for using this broad, dynamic systems-based orientation to resilience sprang from increasing international concern with integrating diverse scientific fields to comprehensively address problems that are based in interdependent systems of function and recovery. Masten’s vision is certainly relevant to the present authors, who wrote this

Element in the context of the COVID-19 pandemic and a period of heightened awareness of racialized violence and resulting civil unrest (see Section 7).

In distinguishing between thriving and resilience, Masten (2014b) noted that scholars studying thriving (Lerner, 2004) or positive youth development (PYD) (e.g., Lerner et al., 2015) conceptualize both resilience and thriving as involving dynamic, mutually influential relations between specific children and their contexts (youth $\leftrightarrow$ context relations). Moreover, both resilience and thriving involve “positive aspects of development, function, resources, and strengths, both in the individual and in the context” (Masten, 2014b, p. 1013). However, Masten (2014b) saw resilience as a subset of child $\leftrightarrow$ context relations located at the high end of a continuum of risk or adversity. Therefore, to both Masten (2014b) and the present authors, resilience is not a person or a context phenomenon; like thriving, resilience is a person $\leftrightarrow$ context relational phenomenon. Resilience is, then, an instance of adaptive functioning in high risk or adverse settings.

The concepts of thriving and resilience require attention to children’s positive adaptation to the specific features of their context. However, thriving focuses on optimal functioning, whereas resilience attends to adequate or “okay” functioning, largely because resilience research has focused on children and families facing enormous challenges, adversity, or trauma (e.g., see Masten, 2007, 2014a; Masten et al., 2015). We agree, then, with Osher, Pittman, et al. (2020) that thriving is a dynamic process of optimal learning and development, and that “Thriving is influenced by individual and community assets, one’s own sense of agency (i.e., belief in one’s ability to achieve), and connection to the world. Thriving is informed by and informs collective and individual meaning-making. Thriving is grounded in one’s beliefs and values” (p. 3). David Osher elaborates his views about thriving in Box 1.

Accordingly, in this Element we focus on thriving because we believe that our approach to whole-child development enables programs and policies to promote positive and healthy development, including for children who have experienced significant adversity and oppression. We propose that this knowledge be linked to policy and design recommendations and to adopting a different world view of twenty-first century education – one involving dynamic systems (versus fixed determinism). This world view would allow us to embrace the complexity of learning, development, and thriving rather than working to oversimplify them.

### 1.3 Historical and False Assumptions in Public Education

Public education in the United States was designed based on a set of false assumptions and without a comprehensive understanding or knowledge of

**BOX 1 MOVING FROM MINIMALIST TO ROBUST APPROACHES TO EQUITY AND THRIVING****David Osher**

Equity and thriving have been matters of policy and intellectual concern during the last two decades, but they are often discussed without reference to institutionalized racism and privilege. The social, emotional, physical, and economic effects of the COVID-19 pandemic, and their relation to and amplification of preexisting disparities have raised the salience of equity and thriving. The salience of these issues has been deepened by the increased visibility of state-sanctioned racist and ethnocentric violence and by palpable manifestations of the historical and ecological determinants of inequity and ill-being (Osher, Pittman, et al., 2020). George Floyd’s murder by police officers carrying out routinized behavior is a highly visible illustration of the experience of people of color almost since the first Europeans arrived in North America (Hinton et al., 2014; Takaki, 2012). Police ignoring of his statements regarding his health conditions, including his pleas that he could not breathe, embody an unwillingness to listen to those whom we “other” or fear as well as a willingness to ignore their fundamental humanity.

Although the concern for equity and thriving has been amplified, we need approaches to equity and thriving that are responsive to the perceptions, needs, and voices of groups that have been marginalized and minoritized – groups that have been subject to victim-blaming social policies that are justified by hegemonic thinking that reflects siloed and reductionist approaches, along with the institutionalization and mystification of privilege. New approaches to equity and thriving must address the historical nestedness and dynamic nature of thriving, including

dynamically related biological, phenomenological, and social processes that contribute to thriving (Osher, Pittman, et al., 2020).

Equity has often been conceptualized and operationalized in a siloed, static, formalist, culturally narrow, and minimalist manner. Although these minimalist approaches may open some socially created gates, they do not open them far enough. Test performance may still be a gatekeeper, but high-stakes tests do not measure attainment over time; measuring a narrow set of attributes at one time in one context does not measure readiness for life or make it likely that individuals will have the capacity to realize a meaningful and healthy life.

Perhaps more important, approaches to equity and thriving driven by minimalist standards do not provide learners with a means to address institutionalized racism and privilege – they neither enable individuals to fully address opportunity structures that are stacked against them nor do they prepare individuals to work with others to change the conditions that affect them. For example, eliminating formal bias (say, to enrichment opportunities) does not eliminate informal and sometimes less visible barriers (e.g., microaggressions, stereotype threat, and acculturative stress). The success of any individual in overcoming these obstacles does not eliminate the impacts of the need to address oppression or eliminate socially constructed hurdles that others will face. A richer approach to equity includes universal access to opportunities to develop attributes that contribute not only to well-being, but dynamically to individual and collective thriving – socially, emotionally, physically, cognitively, spiritually, and economically – in coacting dimensions that collectively foster thriving. As the COVID-19 pandemic and the Black Lives Matter movement vividly illustrate, thriving cannot just be individual. Our capacity to thrive, particularly over time, is dynamically linked to the well-being of others. This relation includes our proximal environment, those who support us, or with whom we affiliate, live, or work, the other living beings on the planet, and the health of our globe.

developmental and learning science. Table 1 presents these false assumptions about whole-child development, learning, and thriving and the information needed to correct mistakes derived from these assumptions. Specifically, formal education was designed without recognizing the integrated, dynamic, and individual nature of human development that undergirds the learning process itself. Across states, public education focused on delivery and acquisition of content – primarily math and English – using standardized approaches that presume a bell

**Table 1** False assumptions and correct information about whole-child development, learning, and thriving

False assumptions	Knowledge and evidence
<p>1. Genes are the primary determinant of learning and development (rather than context). Contexts and relationships (in school and outside) are secondary contributors to skill development and mastery of content. Intelligence and cognitive abilities are fixed, and personality is stable. (This view is a genetic reductionist assumption.)</p>	<p>1. Contexts – relationships, environments, and experiences in and out of school – are the primary determinants of learning and development (e.g., Immordino-Yang et al., 2019; Slavich, 2020).</p>
<p>2. Talent and skills are scarce, distributed in a bell curve. Specific students (in too many cases, white or middle- and upper-class white boys) have talent and skills (determined by genes); others (in far too many cases, students of color, poor students, and girls) do not. The system should be designed to identify and support those with purported innate talent and skills.</p>	<p>2. Talents and skills are ubiquitous. Education should be designed to reveal the talents and skills in each child (Bloom, 1985; Bornstein &amp; Putnick, 2019; Csikszentmihalyi et al., 1993).</p>
<p>3. An average score on a test usually administered once a year represents a student's competency and is a good enough approximation of what the student knows. Measuring an average score is sufficient for understanding the competency of individuals.</p>	<p>3. There is no such thing as an average child; an average of anything rarely represents any attribute of the individuals being measured in the average (Molenaar, 2007; Rose, 2016).</p>
<p>4. Memorization of content and facts will lead to mastery, competence, and higher-order thinking skills. Measurement of content acquisition is a good representation of student competency.</p>	<p>4. Mastery of content, competence, and higher-order thinking skills come when educators scaffold and teach essential skills and engage each child with challenging, relevant content within the child's zone of proximal development during each period of development, to accomplish mastery of multiple competencies (Vygotsky, 1978).</p>

**Table 1** (cont.)

<b>False assumptions</b>	<b>Knowledge and evidence</b>
<p>5. The potential of a student as a learner is knowable in advance; some children arrive at school ready to engage in learning (especially white, middle- and upper-socioeconomic status children), and others (especially lower socioeconomic status and children of color) do not. Skill and competency development are discrete, linear, and measurable. Growth trajectories are predictable.</p>	<p>5. The potential of a child is not knowable in advance. The purpose of education should be to develop and extend the talents and potential in each child. Human development is a jagged process with peaks and valleys along the way (Rose, 2016).</p>
<p>6. Student agency and beliefs about intelligence are not relevant to identity formation and require adjustments in expectations and opportunities by leaders and teachers. Specifically, children of color are assumed to be growing up in poverty, ill-suited to educational settings and academic rigor, and even prone to criminality.</p>	<p>6. Student agency and student and teacher beliefs about intelligence are highly relevant to identity formation (Dweck, 2016).</p>
<p>7. Adversity does not disrupt learning or developmental processes.</p>	<p>7. Adversity can have effects on the neural systems that govern learning and behavior, but with support from caring, trusted adults, these effects are preventable and reversible; children can overcome the effects of adversity and thrive (McEwen, 2013; Slavich, 2020; Slavich &amp; Cole, 2013).</p>

curve of abilities and talents, with most children falling in the middle of the distribution. The systems have not responded to the variation in how students learn by using more personalized approaches or by developing crucial twenty-first century metacognitive and deeper learning skills (Bornstein & Putnick, 2019). They were not designed to intentionally develop the learner or to promote equity; they were designed to offer access to rich learning opportunities to specific

groups but not to marginalized groups based on race, gender, and culture (Raeff, 2016). Indeed, Osher, Pittman, et al. (2020) and Tucker (2020a, 2020b) noted that the US education system was designed to select and sort, and that institutionalized racism, classism, and segregation remain embedded in this system. Although space limitations preclude our discussing this history of US education and its contemporary (at this writing) manifestations, interested readers may consult several reviews documenting these points (see Farrington, 2020; Nasir et al., 2020; Okonofua et al., 2016; Wilkerson, 2020; Winthrop, 2018) and, several of the Boxes included in this Element.

The reviews we have noted document how the failure to address inequitable funding, opportunities, and outcomes result from persistent systems of institutional and individual oppression in US schools and communities (e.g., racial, ethnic, and gender stereotypes, fixed mindsets, historical inequities in opportunities for deeper learning). Failure also derives from an unwillingness to address and eliminate inaccurate and unchecked assumptions about how children learn, develop, and respond to adversity and opportunity. Finally, failure derives from underestimating or ignoring the power and potential of individuals and systems to enhance life and academic outcomes, perhaps most importantly for children who have experienced adversity and stress over extended periods. Researchers, educators, and policymakers should understand individual children's specific sensitivities to the effects of cumulative stress, or allostatic load (McEwen, 2013), associated with specific inequities of socioeconomic and relational resources available in their specific contexts, and to the stresses experienced by their caregivers, family members, teachers, and child workers (e.g., Laceulle et al., 2019; Osher, Cantor, et al., 2020). For instance, McEwen (2013) noted that:

The brain, itself, is also a target of stress and stress-related hormones and it undergoes structural and functional remodeling and significant changes in gene expression that are adaptive under normal circumstances but which can lead to damage when stress is excessive. The growing recognition of the adaptive plasticity and stress vulnerability of the brain itself, beginning with the hippocampus, now includes other brain regions such as the amygdala and prefrontal cortex and fear related memories, working memory, and self-regulatory behaviors. The interactions between these brain regions during the biological embedding of experiences over the life course determines whether events in the social and physical environment will lead to successful adaptation or to maladaptation and impaired mental and physical health, with implications for understanding health disparities and the impact of early life adversity and for intervention and prevention strategies. (p. 673)

As we begin to discuss in the next portion of this section, US education and the experience it produces for students would be very different if it directly addressed institutionalized racism, privilege, and bias and used foundational knowledge from developmental and learning sciences (e.g., Bailey et al., 2019). Understanding how to influence learning and developmental processes in learning settings, both formal and informal (i.e., in out-of-school-time, youth development programs) (Lerner et al., 2015), will help to create a different educational reality with substantially better outcomes for many more children.

### 1.4 The Science of Learning and Development

There is burgeoning scientific knowledge about the biologic systems that govern human life, including the systems of the human brain. Today, researchers can study the brain's structure, wiring, metabolism, and connections to other systems of the body and to the external world (Immordino-Yang et al., 2019). This work underscores the “nurture of nature” by documenting a new understanding of the deep interdependence of biological and sociocultural processes in the growth of the brain (Immordino-Yang et al., 2019). Researchers know much more than they did when twentieth century US public education was designed. It is the responsibility of all people interested in children's thriving to use this knowledge to design a system characterized by *robust* equity (Osher, Pittman, et al., 2020, p. 3).

When thinking about how to apply new science to reshape the US education system, it is helpful to consider fields such as medicine. What was done when researchers learned that germs – not miasma – cause disease? When we learned that cancers can be transmitted, not like infections, but instead through gene mutations? Although health disparities continue to exist, there have been dramatic changes in medicine in the last fifty years based on new knowledge – cures for diseases, changes in how scientists conduct research, and changes in how physicians practice medicine, in part because of a willingness to challenge assumptions and build new knowledge. Unfortunately, the same willingness to challenge assumptions and the magnitude of advances have not happened in US public education.

To apply the new knowledge of human development and learning, developmental and learning researchers, educators, and policymakers must: (1) challenge the assumptions and goals that serve as the foundation for current US public education; (2) articulate and popularize a revised conception of whole-child development, learning, and thriving so that these are the norm across educational settings; (3) accept – rather than seek to simplify – the complexities in how humans develop; and (4) create a profound paradigm shift in how the purpose of education is described and enacted by educators, in communities, and among policymakers.