Investment in Early Childhood Development Lays the Foundation for a Prosperous and Sustainable Society

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The first years of life are important, because what happens in early childhood can matter for a lifetime. Science shows us what children must have, and what they need to be protected from, in order to promote their healthy development. Stable, responsive, nurturing relationships and rich learning experiences in the earliest years provide lifelong benefits for learning, behavior and both physical and mental health.[1] In contrast, research on the biology of stress in early childhood shows how chronic stress caused by major adversity, such as extreme poverty, abuse or neglect, can weaken developing brain architecture and permanently set the body’s stress response system on high alert, thereby increasing the risk for a range of chronic diseases.[2]

The following basic concepts, established over decades of neuroscience and behavioral research, help illustrate why healthy child development from birth to five years provides a foundation for a

prosperous and sustainable society.[3,4]

Brains are built over time, from the bottom up. The basic architecture of the brain is constructed through an ongoing process that begins before birth and continues into adulthood. Early experiences affect the quality of that architecture by establishing either a sturdy or a fragile foundation for the learning, health and behavior that follow.[3] In the first few years of life, 700 new neural connections (called synapses) are formed every second.[5,6] After this period of rapid proliferation, these connections are reduced through a process called pruning, so that brain circuits become more efficient.[7] Sensory pathways, like those for basic vision and hearing, are the first to develop, followed by early language skills and later by higher cognitive functions. Connections proliferate and prune in a prescribed order, with later, more complex brain circuits built upon earlier, simpler circuits.[8,9,10,11]

The interactive influences of genes and experience shape the developing brain. Scientists now know a major ingredient in this developmental process is what has been called a “serve and return” relationship between children and their parents and other caregivers in the family or community. Young children naturally reach out for interaction through babbling, facial expressions and gestures, and adults respond with similar kinds of vocalizing and gesturing back at them.[3] In the absence of such responses – or if the responses are unreliable or inappropriate – the brain’s architecture does not form as expected, which can lead to disparities in learning and behavior.[12]

The brain’s capacity for change decreases with age. It is most flexible, or “plastic,” early in life to accommodate a wide range of environments and interactions, but as the maturing brain becomes more specialized to assume more complex functions, it is less capable of reorganizing and adapting to new or unexpected challenges. For example, by the end of the first year, the parts of the brain that differentiate sounds are becoming specialized according to the language the baby has heard. At the same time, the brain is already starting to lose the ability to recognize different sounds found in other languages. Although the “windows” for complex language learning and other skills remain open, these brain circuits become increasingly difficult to alter over time. Early plasticity means it’s easier and more effective to influence a baby’s developing brain architecture than to rewire parts of its circuitry during adolescence and the adult years.[7]

Cognitive, emotional, and social capacities are inextricably intertwined throughout the life course. The brain is a highly integrated organ, and its multiple functions operate in a richly

coordinated fashion. Emotional well-being and social competence provide a strong foundation for emerging cognitive abilities, and together they are the bricks and mortar that make up the foundation of human development. The emotional and physical health, social skills and cognitive-linguistic capacities that emerge in the early years are all important prerequisites for success in school and, later, in the workplace and community.[11,13,14]

Although learning how to cope with adversity is an important part of healthy child development, excessive or prolonged stress can be toxic to the developing brain. When we are threatened, our bodies activate a variety of physiological responses, including increases in heart rate, blood pressure, and stress hormones, such as *cortisol*. When a young child is protected by supportive relationships with adults, he learns how to adapt to everyday challenges and his stress response system returns to baseline. Scientists call this positive stress. Tolerable stress occurs when more serious difficulties, such as the loss of a loved one, a natural disaster, or a frightening injury, are buffered by caring adults who help the child adapt, thereby mitigating the potentially damaging effects of abnormal levels of stress hormones. When strong, frequent or prolonged adverse experiences, such as extreme poverty or repeated abuse, are experienced without adult support, stress becomes toxic and disrupts developing brain circuits. Toxic stress experienced early in life can also have a cumulative toll on learning capacity as well as physical and mental health. The more adverse experiences in childhood, the greater the likelihood of developmental difficulties and other problems. Adults with more adverse experiences in early childhood are also more likely to have chronic health problems, including alcoholism, depression, heart disease and diabetes.[15]

Early intervention can prevent the consequences of early adversity. Research shows that later interventions are likely to be less successful – and in some cases are ineffective. For example, when children who experienced extreme neglect were placed in responsive foster care families before age two, their IQs increased more substantially and their brain activity and attachment relationships were more likely to become normal than if they were placed after the age of two.[16] While there is no “magic age” for intervention, it is clear that, in most cases, intervening as early as possible is significantly more effective than waiting.[7]

Stable, caring relationships are essential for healthy development. Children develop in an environment of relationships that begin in the home and include extended family members, early care and education providers, and other members of the community.[1] Studies show that toddlers who have secure, trusting relationships with their parents or non-parent caregivers experience

minimal stress hormone activation when frightened by a strange event, and those who have insecure relationships experience a significant activation of the stress response system.[2] Numerous scientific studies support the conclusion that providing supportive, responsive relationships as early in life as possible can prevent or reverse the damaging effects of toxic stress.[2]

Conclusion

The basic principles of neuroscience indicate that providing supportive conditions for early childhood development is more effective and less costly than attempting to address the consequences of early adversity later.[4] To this end, a balanced approach to emotional, social, cognitive and language development will best prepare all children for success in school and later in the workplace and community. For children experiencing toxic stress, specialized interventions – as early as possible – are needed to target the cause of the stress and protect the child from its consequences.[15]

From pregnancy through early childhood, all of the environments in which children live and learn, and the quality of their relationships with adults and caregivers, have a significant impact on their cognitive, emotional and social development. A wide range of policies, including those directed toward early care and education, primary health care, child protective services, adult mental health, and family economic supports, among many others, can promote the safe, supportive environments and stable, caring relationships that children need.

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