



# Cradle to Career: BRAIN SCIENCE

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**The New York State Early Childhood Advisory Council vision is that all young children are healthy, learning and thriving in families that are supported by a full complement of services.**

Today's students are tomorrow's innovators, business leaders and policy makers; and the performance of our nation's economy is directly linked to their success. The future prosperity of our society will be determined by the health and development of our children. The State of New York's Early Childhood Advisory Council (ECAC) is focused on strengthening the system of education and care in New York State as a critical element in the pipeline from cradle to career.

The early years of life matter because early experiences affect the architecture of the maturing brain. As it emerges, the quality of that architecture establishes either a sturdy or a fragile foundation for all of the development and the behavior that follows — and getting things right the first time is easier than trying to fix them later.

*Stimulating early experiences lay the foundation for later learning. The environment of relationships in which young children live literally shapes the architecture of their brains.*

Higher cognitive function begins developing before birth and peaks before a child even enters school. Early experiences literally shape the brain for good or for ill. When young children engage in meaningful and engaging interactions with caring adults, the architecture of the developing brain is being built, much like a house is built from the bottom up. Each sequential step lays the groundwork for the next set of skills — like reading and math and for a lifetime of learning, success and productive, responsible citizenship.

## WHAT WE KNOW ABOUT BRAIN SCIENCE IS THAT:

- *Young children's brains develop 700 synapses — neural connections that transmit information — every second.*
- *By age three, a child's brain has reached more than 85 percent of its adult weight.*
- *What derails development are certain kinds of stressors in a child's environment. Toxic stress in early childhood is associated with such things as extreme poverty, abuse or maternal depression. It damages the developing brain and can lead to lifelong problems in learning, behavior and both physical and mental health.*

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- *Toxic stress can be buffered by a strong and responsive environment of relationships. We now know that the active ingredient in shaping the brain is the “serve and return” relationships that children have with their parents and other caregivers in their family or community. Like the process of “serve and return” in games such as tennis and volleyball, young children naturally reach out for interaction through babbling and facial expressions and adults respond by getting in sync and doing the same kind of vocalizing and gesturing back at them. If a child is put in a center-based program where the teachers are overwhelmed by too many children or a lack of training, they are unlikely to respond in a way that keeps the children’s development going well.*<sup>1</sup>
  - *The disruption of those relationships caused by such things as teacher inexperience or turnover, the lack or removal of a parent’s attention or exposure to violence inside and outside the home can harm the child because they literally disrupt the orderly architecture of the developing brain and weaken its structure for further skill development.*

If we want our society to thrive, we need to pay serious attention to how children develop and invest wisely in making that process go well. Fortunately there is now a strong science base to help us to do just that.

What is the State of New York doing to make development go well for all of our children? Under the leadership of the ECAC, New York State is coordinating the development and implementation of programs that increase the knowledge and competencies of the early care and education workforce; and opportunities for all families to gain the knowledge, skills, confidence and social supports needed to nurture the health, safety and positive development of children.

These early investments reap dividends as child development translates into economic development later on. A child with a solid foundation becomes part of a solid community and contributes to our society.

## RESEARCH

<sup>1</sup> Compiled from various publications from the Center on the Developing Child, National Council on the Developing Child, including “Excessive Stress Disrupts the Architecture of the Developing Brain working paper 3”.