

1. Learning Begins at Birth (The Earliest Years Count)

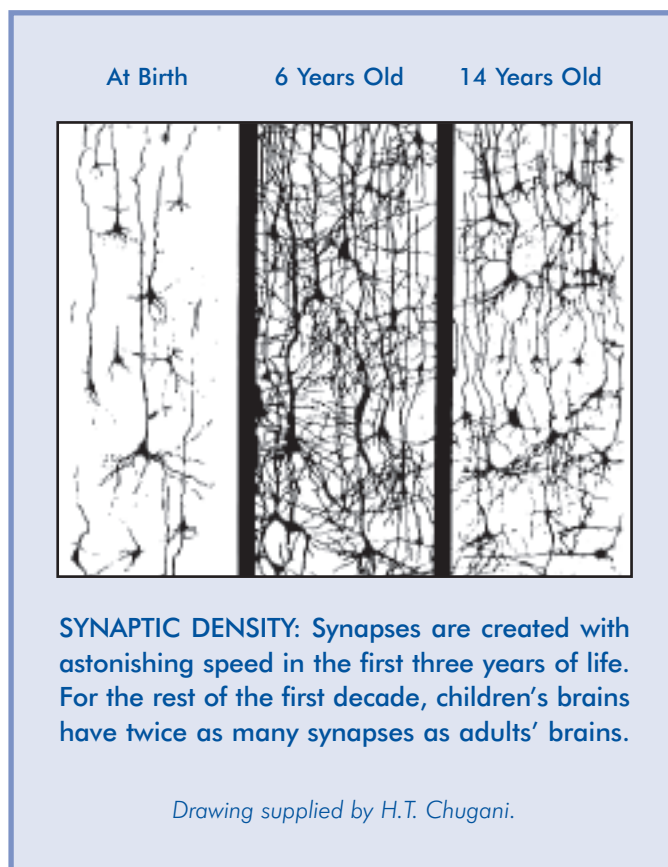
The first years of life are crucial to a child’s lifelong growth and development. Brain research has proven that most of the brain’s actual physical growth occurs during the first two years of life, when vital neural connections are made in response to the child’s environment. At birth, there are roughly 100 billion neurons already developed in a child’s brain; few will be produced for the rest of the child’s life. A newborn’s neurons have “tentative connections,” which, through the child’s experiences, will become the hardwired connections responsible for all of a child’s major cognitive and emotional functioning, including vision, language, emotions, and movements.

Stimulation and interactions are essential to the development of these connections and the brain’s hardwiring. These are produced at their highest rate in the first few years of life. By age 3, roughly 85 percent of the brain’s core structure will be formed.

The three pictures of neurons and synaptic links among them are shown for three ages—at birth, age 6, and age 14. As the pictures show, synapses are created at astonishing speed in the first six years of life. For the rest of the first decade of a child’s life, a child’s brain has twice as many synapses as an adult’s brain, attesting to the rapid learning and hardwiring during the early years.

Brain research has shown that nurturing in the earliest years is crucial for emotional and social, as well as intellectual, development. In particular, children develop their sense of trust and attachment very early in life, as well as begin to develop their cognitive and pre-literacy skills. The hardwiring that forms affects basic response patterns to stress and ways of relating

to others. Severe abuse or neglect during the earliest years of life can produce nearly irremediable damage, including a predilection to violence and specific psychological disorders.



While there is a great deal of plasticity in brain development (people continue to learn and change throughout life), there is no doubt that the earliest years are those of greatest growth and those most susceptible to influence by external factors. The first years of life do not dictate what a child will become, but they do lay the foundation for his or her educational—and life—success.

SCHOOL READINESS BRIEFING PAPER 1 *(continued)*

The following chart provides a very basic overview of the changes in thinking that have occurred as a result of brain research.

Sources for More Information

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RETHINKING THE BRAIN	
Old Thinking	New Thinking
How a brain develops depends on the genes you are born with.	How a brain develops hinges on a complex interplay between the genes you are born with and the experiences you have.
The experiences you have before age 3 have a limited impact on later development.	Early experiences have a decisive impact on the architecture of the brain, and on the nature and extent of adult capacities.
A secure relationship with a primary caregiver creates a favorable context for early development and learning.	Early interactions don't just create a context; they directly affect the brain's development.
Brain development is linear; the brain's capacity to learn and change grows steadily as an infant progresses toward adulthood.	Brain development is nonlinear; there are prime times for acquiring different kinds of knowledge and skills.
A toddler's brain is much less active than the brain of a college student.	By the time children reach age 3, their brains are twice as active as those of adults.

Source: Rethinking the Brain

