Brain Architecture

Early experiences affect the development of brain architecture, which provides the foundation for all future learning, behavior and health. Just as a weak foundation compromises the quality and strength of a house, adverse experiences early in life can impair brain architecture, with negative effects lasting into adulthood.

Brains are built over time, from the bottom up.

- In the **first three years of life**, the brain is most impressionable, forming more than 1 million new neural connections every second.
- The **billions of connections** that form between neurons in the early, most active years provide either a strong or weak foundation for connections that form later.

Toxic stress weakens the architecture of the developing brain.

- Toxic stress, the excessive activation of stress response systems without supportive adults, can lead to **lifelong problems** in learning, behavior, and physical and mental health.
- Experiencing stress, an important part of healthy development, produces a wide range of physiological reactions that prepare the body to deal with threat.
- When stress responses are activated at high levels for significant periods of time, neural connections developing in the areas of the brain dedicated to higher-order skills are weaker and fewer in number.
- This damaging level of continual stress can be prevented or reversed by supportive and responsive relationships with caring adults in the earliest years of life.

The interactions of genes and experiences shape the developing brain.

- The "serve and return" relationship that occurs when parents and caregivers respond to children shapes learning and behavior.
- In the absence of responsive caregiving, the brain’s architecture lacks opportunities to form strong connections.
- Genes and experiences work together, shaping the structure of the brain then reinforcing it through repeated use, laying a strong foundation for future learning.

Cognitive, emotional and social capacities are inextricably intertwined throughout life.

- Emotional well-being and social competence provide a strong foundation for emerging cognitive abilities, and together they are the bricks and mortar of brain architecture.
- The socio-emotional, physical and cognitive capacities that are built in the early years are all important for later success in school, the workplace and the larger community.

Learn more about the scientific case for investing in the first three years of life at [www.thencit.org](http://www.thencit.org).

SOURCE: Center on the Developing Child at Harvard University.
http://developingchild.harvard.edu/science/key-concepts/brain-architecture