

Brain science & lifelong well-being: Making the connection

Most folks intuitively understand that childhood experiences shape adult lives. But in recent years, we've learned much more about the underlying social and physical processes that drive that dynamic—and how nurturing, stable environments help children develop the cognitive and emotional skills they need to thrive as adults.

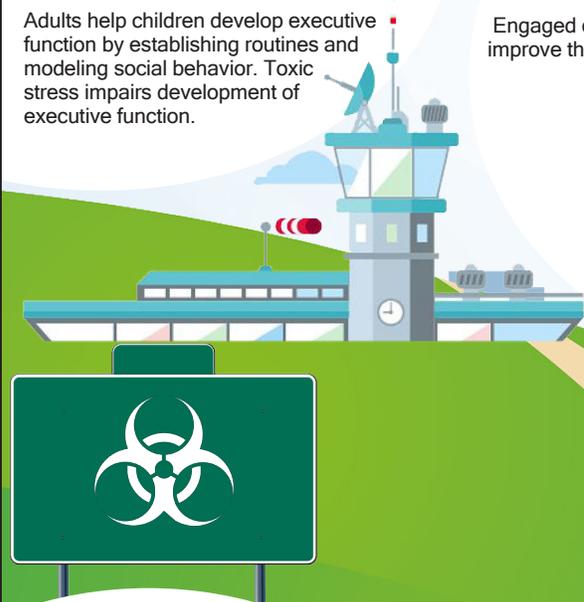
The research shows how childhood adversity can derail those processes, leading to a host of health problems and risky behaviors in adulthood. Many of today's struggling parents themselves experienced adversity when they were children.

Here are some key concepts that explain how these dynamics work.

Air traffic control

Executive function is the air traffic control system of the brain—the **mental processes that enable us to plan, focus and juggle tasks**. Just as air traffic control at a busy airport manages the arrivals and departures of many aircraft on multiple runways, the brain needs these skills to filter distractions, prioritize tasks and achieve goals.

Adults help children develop executive function by establishing routines and modeling social behavior. Toxic stress impairs development of executive function.



Toxic stress

Learning to cope with adversity is part of healthy development. When we are threatened, our bodies prepare us to respond by increasing our heart rate, blood pressure and stress hormones like cortisol.

Some kinds of stress are normal and essential for development. But **toxic stress occurs when a child experiences frequent or prolonged adversity without adequate support**. Prolonged activation of stress response systems disrupts brain architecture.

What are ACEs?

Adverse childhood experiences, or ACEs, are incidents during childhood that harm social, cognitive and emotional functioning. Frequent or prolonged exposure to such events creates toxic stress that damages the architecture of the developing brain.

The first ACEs study identified 10 types of childhood adversity, including having a family member with mental illness or substance abuse, an incarcerated family member, witnessing domestic violence and experiencing child abuse or neglect. An expanded view folds in other experiences, including poverty and racism.

A 2016 study found more than half of Iowa adults reported experiencing at least one ACE and 15 percent experienced four or more. Iowa adults who report experiencing four or more ACEs compared to those with none are:

- about **2 times** as likely to have diabetes
- over **3 times** as likely to have a stroke
- **6 times** more likely to be diagnosed with depression

56%
of Iowa adults experienced
at least one ACE

Information below is from the Center for the Developing Child at Harvard University (developingchild.harvard.edu)

Brain architecture

The brain's architecture is comprised of billions of connections between individual neurons across different areas of the brain. Brains are built over time, with fastest development in the earliest years: **a child's brain develops 1 million neural connections per second up through age 3**.

Engaged caregivers help build brain architecture in children and improve the odds of positive outcomes.

Serve & return

Brain architecture is shaped by responsive relationships. Young children naturally reach out for interaction by babbling, making faces and gesturing. In a supportive environment adults respond in kind. These **"serve and return" interactions are essential for healthy brain circuits**.

Adults may be unable to engage in healthy interactions because of significant stress brought on by financial problems, lack of social connections or chronic health issues. Persistent absence of "serve and return" limits brain stimulation and activates the body's stress response, flooding the developing brain with potentially harmful stress hormones.

Resilience

Resilience is the ability to overcome serious hardship. Resilience results from a mix of biological and social protective factors, including "serve and return" relationships with caregivers.

Imagine a seesaw. As a child grows, **protective experiences and coping skills on one side counterbalance adversity on the other**. When good experiences outweigh bad ones, the "scale" tips toward positive outcomes. Understanding why some children do well despite adversity is crucial to effective approaches to help children reach their full potential.

Federal programs support healthy brain development



They play a key role in helping families prevent, manage and overcome adversity. Here are some examples:



MIECHV

Home visiting equips parents with the tools and support they need to create a safe and stable home and establish nurturing relationships with their kids. **Families who participate in home visiting are better positioned to navigate and overcome challenges when they arise** and act as a buffer from toxic stress. Evidence shows that home visiting decreases child abuse and neglect and boosts the share of parents earning a high school diploma or GED.

All have elements that:

- encourage positive interactions between children and caregivers
- reduce material deprivation that leads to toxic stress
- help families and children build resilience



Medicaid & CHIP

These health insurance programs cover the majority of vulnerable children who might otherwise go uninsured—those with low incomes, with disabilities or in foster care. In Iowa, 38 percent of children on Medicaid or CHIP (hawk-i) experienced two or more adverse family experiences, compared to only 10 percent of those with private insurance. **Children covered by Medicaid are more likely than uninsured peers to get quality prevention and early-intervention services to keep development on track.** And Iowa's decision to expand Medicaid gave more parents the ability to receive the health services—including mental health care—they need to parent effectively.



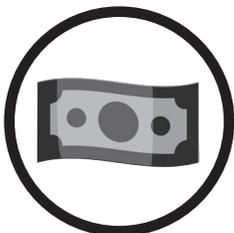
SNAP

Food insecurity in the home—when household members go hungry or struggle to avoid hunger at times during the year—can be a tremendous source of family stress. Poor nutrition in early childhood has also been linked with a lifelong shift in the body's metabolism and metabolism-related disease, including diabetes and heart disease. SNAP helps 1 in 9 Iowans—nearly three-quarters in households with children—put food on the table. Research has shown that **adults who received food stamps as young children are less likely to suffer long-term health problems like obesity and heart disease.**



Head Start

Head Start and Early Head Start promote school readiness of young children from low-income families with a comprehensive approach. They promote language and literacy as well as social skills and emotional well-being, offering development screenings, nutritious meals, mental health support and a **strong family-support component to help strengthen parent-child relationships.**



EITC

Growing up in poverty is one of the greatest threats to healthy development. Children in poverty are more likely to experience stress and deprivation that can severely affect all aspects of development: social, emotional, physical and cognitive. The Earned Income Tax Credit is a proven strategy to help working parents make ends meet, including **meeting basic needs like child care and transportation so they can remain employed**—and their families stable.