

## Science briefing How we grow an emotionally healthy brain

**The Centre for Early Childhood's Explainer on growing a healthy brain explains why early relationships, surroundings and experiences are central to children's development and can have lasting effects throughout life.**

This film highlights how interactions with caring adults help shape healthy development.

The other films in the Explainer Series explore the specific ways adults can support early development through their everyday interactions with children.

You can use this first overarching film to help people understand why nurturing care in early childhood is foundational for children's wellbeing, development and life chances.

This briefing summarises the science behind this animation.



Watch the Explainer Series on the  
Centre for Early Childhood website  
[centreforearlychildhood.org/  
the-explainer-series/](https://centreforearlychildhood.org/the-explainer-series/)

## Early development is shaped by our relationships, surroundings and experiences

The period from pregnancy to age five is one of uniquely rapid growth of our brains and our bodies. During this time, more than one million new neural connections are formed every second<sup>1</sup>.

Development is influenced by a complex interplay of different factors<sup>2</sup>. While genes provide a broad blueprint for development, children's brains do not develop in a fixed and pre-determined way.

Relationships, surroundings and experiences in the womb and after birth change how children's brains and bodies develop. For example, although our brain is born with millions of neurons, input from the outside world – such as the words we hear – shapes which neurons connect, and repeated use of neurons strengthens connections<sup>3</sup>.

Children's development is a dynamic process, and children actively influence their environments too. For example, a child's temperament can shape how adults respond to them<sup>4,5</sup>.



**“During early childhood, more than one million new neural connections are formed every second.”**

## The brain is more malleable in early childhood than at any other time

The brain is particularly plastic in the earliest years of life, meaning it is particularly malleable and open to change<sup>6</sup>. It is easier to shape brain circuits as they are forming, rather than to modify them once they are mature<sup>7,8</sup>.

Connections and circuits in the brain can form and change throughout life, but it gets harder as we age.

Brains and bodies are adaptive: they are shaped by our experiences and environments in ways that make them better suited for those environments. For example, our brains become better at processing the sounds in languages we hear regularly<sup>9</sup>. These adaptations may not always be helpful to us. For example, early adversity – such as abuse – can lead to adaptations in the brain, and the development of a stress response system that may be useful in threatening environments (e.g., heightened vigilance). But this is less helpful in safe, predictable settings. These adaptations can also increase the risk of emotional and behavioural difficulties<sup>10</sup>.

Alongside the brain, other organs and biological systems also develop in early childhood, such as our cardiovascular, immune and metabolic systems. They also adapt to our environment and early childhood experiences in ways that can influence our lifelong health and wellbeing<sup>11</sup>.

## **Development in the early months and years of life lays the foundations for what happens next**

When we are building a house, things happen in a sequence. We need strong foundations to support the next stages of a building. If foundations are weak, this can impact the strength of the later structure, even if we build it carefully.

Brain development is similar. Brains are built over time “from the bottom up”. In pregnancy and early childhood, neurons in the brain start to form new connections and circuits<sup>12</sup>. Simple neural connections develop first, followed by more complex circuits which enable our brain to do more sophisticated things. The early connections made in a baby’s brain form the foundations for the more complex connections that form later<sup>13</sup>.



**“The early connections made in a baby’s brain form the foundations for the more complex connections that form later.”**

If there are significant adversities in a baby's life that influence their early brain development, it can have detrimental effects on later development and functioning, even if the child goes on to live in a healthy and nurturing environment<sup>14</sup>. This is known as latent vulnerability<sup>15</sup>. Just as a house built on unstable foundations might require reinforcement, so too, a child who has had a difficult start in life may need extra support later on. Understanding a child's early experiences can help explain current difficulties and to tailor appropriate support. Whilst early adversity does not define or determine our life chances, it can shape how we develop and interact with the world around us.



The skills that we develop in early childhood can also be understood as foundations for later development. In particular, social and emotional skills lay the foundations for the development of a range of other abilities, functions, or behaviours later in life.

Developing these skills in early childhood also helps us to seize further learning and development opportunities. Learning to focus our thoughts, for example, is important if we are going to go on to acquire academic knowledge and technical skills.

Because early development is the foundation for later development, disruptions at this stage can have a disproportionate impact compared to disruptions that might happen later when a child already has firm foundations<sup>16</sup>.

## Early interactions with our parents and caregivers are crucial

Relationships between parents and other caregivers and babies or young children are possibly the most crucial factor that can influence social, emotional and cognitive development in early childhood. They are often referred to as the “active ingredients” in the environment that influences human development<sup>17</sup>.



The Explainer Series explores the different, interrelated ways in which warm, responsive adult-child interactions support children to develop the social and emotional skills they need to thrive.

Relationships are not just important for children's development. They are also part of what makes the day-to-day moments of life meaningful, fun and rewarding for both children and adults.

Parents and other consistent caring adults in a child's life not only provide children with positive and stimulating early experiences, they are also a source of resilience. If a child experiences adversity it will be less stressful in the presence of a trusted adult who can provide reassurance and care<sup>18,19,20,21</sup>. This not only helps the child in the moment but also reduces the risk of long-term negative consequences<sup>22</sup>.



Whilst early interactions are the most important factor in shaping a child's development, they are not the only thing that makes a difference. When talking to parents about early parent-child interactions, it is important to keep three things in mind:

- Parents and caregivers alone cannot determine a child's outcomes. As leading academic and psychologist Alison Gopnik describes, parents are not carpenters who can make a child into very specific final product, but rather gardeners, who nurture the growth of a child in the context of other factors<sup>23</sup>.
- Children do not need the adults in their lives to be perfect. Science proves that children just need "good enough" parenting and actually gain helpful learning when adults do not get everything right, provided the "ruptures" in their interactions are repaired by a return to sensitive, responsive care<sup>24</sup>.
- Adult-child interactions do not occur in a vacuum. An adults' experience now and in the past, influences how they care for babies and young children. Adults are best able to nurture a child when they have good social and emotional skills themselves, when they are healthy, and when they have the resources and support they need<sup>25</sup>. Parents who experience high levels of stress might need help to address the causes of this stress so they have the capacity to be the parent they want to be. Parents who have experienced significant adversity themselves – including in their own childhoods – may need more support to meet their child's developmental needs<sup>26,27</sup>.



## Positive early interactions develop social and emotional skills: these underpin health and happiness throughout our lives

Positive early interactions develop social and emotional skills: these underpin health and happiness throughout our lives

There is clear evidence that warm, sensitive early relationships support the development of social and emotional skills. These skills are linked both to wellbeing in early childhood, and to improved outcomes across our lives<sup>28</sup>.

**The Royal Foundation Centre for Early Childhood’s Shaping Us Framework describes the social and emotional skills which academic, clinical and practice experts agree matter most to our human development. The framework describes thirty social and emotional skills, grouped into six clusters. All these skills have their roots in early childhood but continue to develop throughout life.**



Social and emotional skills are fundamental to both our wellbeing and our development throughout life. Skills such as the ability to manage emotions and focus attention in the pre-school years are important components of school readiness<sup>29</sup>. They enable a child to make friends, play and learn. These skills also help a child to be mentally healthy in childhood and adolescence, to develop a positive sense of self, to do well at school, and form positive, nurturing relationships<sup>30</sup>.

As an adult, social and emotional skills enable us to form lasting friendships and healthy intimate relationships, to be nurturing parents, and to succeed in the workplace<sup>31</sup>.



## **Early adversity can cast long shadows, but it's never too late to develop and grow**

Although early childhood shapes us, our future is not pre-determined by what happens in the first years of life. With the right support, children who have faced early adversity can go on to thrive. Conversely, a child who has had healthy early relationships may still face challenges later. Brains and other biological systems are most adaptable early in life, but we can always develop and grow. Our skills and wellbeing continue to be shaped through life.

What happens early matters most – but it is never too late to improve a child's life and life chances<sup>32</sup>.



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