

# A RESEARCH SNAPSHOT

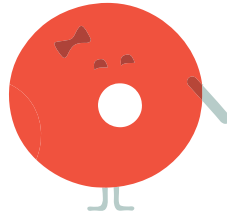
## Brain development in early childhood

### Introduction

Early childhood is a time of rapid change – particularly for the development of a child’s brain.

A healthy and positive start to life can provide the basis for strong brain development and set up a child for lifelong success.

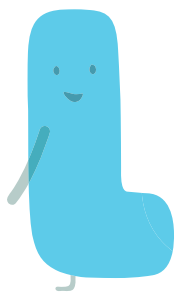
However, a poor start in life can have a negative effect on brain structure and function, and limit a child’s ability to reach their full potential.



### A good foundation

A child’s development relies on a combination of biology and environmental experiences to lay the foundations for their future wellbeing.

During the first few years of life, more than one million neural connections are formed every second.



These are the “bricks, mortar and wiring” of brain-building and provide the foundation for life-long health, wellbeing, learning and behaviour.

Experiences and relationships in early childhood matter and can leave lasting changes on a child’s brain.

### Brain Development

The brain begins developing soon after conception and continues into the adult years.

Many parts of the brain develop from “the bottom up”, and the neural circuits become more complex to support higher level skills.

If lower-level skills have not developed as they should, then it becomes more difficult for the higher-level skills to develop.

### Sensitive times

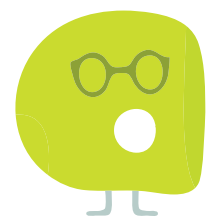
Certain parts of the developing brain are more sensitive to the environment or experiences at certain times.

For example, a sensitive period for vision, hearing and touch ends in the first years of life.

However, a sensitive time for the development of communication, reasoning and decision-making skills occurs later.

The brain is ‘plastic’ or moldable in the early years of life which means that children can generally recover or make up for missed experiences.

Although, providing the right conditions for healthy development early generally produces better outcomes than trying to address problems later.



## Relationships and experiences

The experiences - both positive and negative - that a child has in their early life influences the developing structure of their brains.

This highlights how important relationships and environments are in shaping early brain development.

Stable and predictable experiences support healthy brain development.

However, highly stressful early life experiences such as neglect and abuse can disrupt brain development.

This can then affect how children are able to manage adversity later in life.

Positive “back and forth” interactions with a child (e.g. a caregiver responding to their babbling and gestures) provide rich learning opportunities.

However, if these “serve and return” interactions between children and their caregivers are limited, it can weaken the developing brain.



## Stress

Some stress is normal and an important aspect of child development as it helps a child to learn how to cope with adversity.

However, extreme or ongoing stress can have negative consequences for children’s brain development and lifelong health.

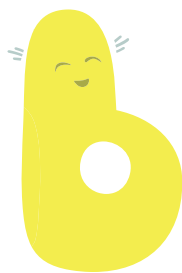
“Toxic stress” can be triggered by poverty, physical or emotional abuse, chronic neglect and repeated exposure to violence.

This type of stress activates the body’s alert systems and can have a negative influence on the development of a child’s brain.

Toxic stress increases a child’s stress hormones and can cause permanent changes in their brain structure and function.

It can also put children at an increased risk of both physical and mental illness, including cardiovascular disease, type 2 diabetes and depression.

This is especially the case when children do



not have a sensitive and responsive caregiver to help protect them from the negative effects of “toxic stress”.

Therefore, it is very important that children have strong, supportive relationships with their caregivers, and live in safe and protective environments.

## More to learn

Neuroscience has provided valuable insight into our understanding of early childhood.

It has shown how brain development provides the foundations for learning, behavior and life-long health.

However, the influence of social, psychological and behavioural factors are also important and should not be overlooked.

Considering all these factors together can enhance our understanding of early childhood and positively influence child development.

## Reference

1. Baker, S. (2017). Brain development in the early childhood [CoLab Evidence Report]. Retrieved from <https://colab.telethonkids.org.au/resources>