CoLab EVIDENCE REPORT

Executive function and self-regulation in early childhood

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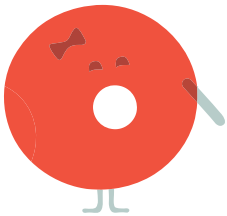
Early childhood is an important time for the development of the brain's executive functions.

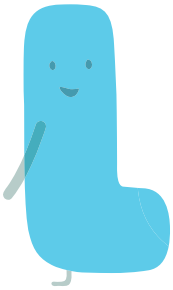


These are mental skills that - like an air traffic control system at a busy airport - help the brain manage multiple streams of information, filter distractions and make decisions.

Executive function is made up of three areas:

- Working memory, which is the ability to hold and use information for short periods of time.
- Inhibitory control, which helps children manage their thoughts and actions, prioritise and direct focus and sustain attention.
- Cognitive flexibility, which allows children to adjust their goals, switch between tasks, change their priorities and learn from mistakes when they learn new information.

Through these processes, children can learn to regulate their own emotions and behavior; this ability to self-regulate is necessary for the many challenges they face in a range of everyday settings.



School achievement, social and behavioural functioning

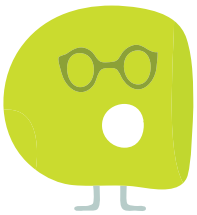
Children's executive function and self-regulation skills are important building blocks for their future social development, cognitive learning, school readiness and academic success.

In the first years of life children respond in reflexive and automatic ways to situations. For example, having a tantrum at the supermarket if they don't get a treat. But by the time they reach school, their executive function has developed to a point where they can manage and moderate their own behaviour and emotions.

Executive function skills predict a child's later literacy and numeracy skills, school achievement, personal behaviour, communication skills and emotional regulation.

Self-regulation skills also mean that a child can learn how to maintain an optimal level of alertness, which can change depending on the situation they are in.

Brain development



Early brain building in the first years of life supports the development of executive function.

The different environments a child experiences are critical to this development as these can determine which pathways in the brain are strengthened or reduced, depending on whether they are used or not.

These changes in the brain both contribute to, and are shaped by, the development and refinement of executive function.

Individual differences

Children can differ widely in their ability to follow rules, maintain focus, control their impulses and adjust to changing situations.

Genetic make-up, temperament and developmental delays can all influence differences in children's executive function. Factors within a child's family and other environments are also important to whether their executive function skills develop as well as they should.

Children need supportive environments to practice their executive function skills.

Negative emotion or stress can limit their ability to develop and use these skills, because the child is instead focused on responding to perceived threats.

Even children with well-developed executive function can have trouble using their skills if they are experiencing the toxic stress of a chaotic home environment.

Family environment and adversity

The relationships young people experience as they grow have a powerful influence on the development of their executive function. Responsive relationships with caregivers and access to safe environments are crucial.

However, this can be a challenge for some parents experiencing adversity such as poverty.

Poor quality housing, overcrowding, household instability and mental health issues can all limit parents' ability to provide a positive home environment.

Growing up in stressful, chaotic and unpredictable environments in early childhood can impair the development of the part of the brain that controls executive function skills.

Executive function delays in early life can create learning differences between children that can widen over time and have far-reaching effects that lead to poorer social and economic outcomes well into adulthood.

Parenting

Executive function skills are important for parents, too, helping them provide responsive care for their child, manage a household, maintain employment and contribute to the community.

However, when parents are exposed to ongoing stressful or threatening situations - such as poverty, violence, addiction and mental illness - the part of the brain that controls these functions can become overwhelmed.

These stressors can affect their ability to use their executive function skills, triggering reactive or impulsive behaviour.

Parents' executive function can also be affected by their own experiences in childhood.

The good news is that, with support, it's never too late for parents to develop these skills to cope with adversity and parent successfully.

Parents can be supported to build or restore their own self-regulation or executive function skills. This can include learning how to identify emotional triggers and slow down impulsive reactions.

Conclusion

Mastering executive function skills is a key part of children's developmental milestones, helping them to thrive at school and beyond.

Growing up in adversity, such as poverty, can hinder the development of these skills and have a negative effect on children's academic, social and economic outcomes.

However, with support and practice, executive function skills in children and adults can be improved to help close the developmental gaps between disadvantaged children and their peers.

Reference

1. Monks, H., & Barnes, A. (2018). The impact of poverty on the developing child [Evidence Report]. Retrieved from https://colab.telethonkids.org.au/