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Developmental differences in children who have experienced adversity: *Difficulty with executive functioning*

CFCA PRACTICE GUIDE
(DEVELOPMENTAL DIFFERENCES: 3 OF 4)

Sara McLean

Child Family Community Australia | information exchange



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Australian Institute of Family Studies, Level 4, 40 City Road, Southbank VIC 3006 Australia
Phone: (03) 9214 7888 Internet: <aifs.gov.au>

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Overview

Childhood maltreatment is a powerful predictor of poor mental health later in life. We need to better understand the ways in which childhood maltreatment imparts this vulnerability; so that we can develop more effective support. Emerging research suggests that childhood maltreatment may be related to four areas of developmental difference; which increase vulnerability to developing mental health and behavioural concerns. This series of practitioner resources describes these four areas of developmental difference and outlines principles for supporting affected children.

Key messages

- Childhood maltreatment may result in developmental differences in key areas of cognitive and social functioning.
- These developmental differences may carry latent vulnerability for the development of mental health concerns later on.
- These developmental differences include changes in the effectiveness of executive functioning and emotional regulation; and changes in the processing of social information related to social threat and social reward.
- There is a need to develop effective preventative approaches that can reduce the likelihood of mental health and behavioural concerns developing. Principles for supporting children are outlined in this resource.

Introduction

Childhood adversity and maltreatment affects children's development and increases a child's vulnerability for mental health concerns later in life (Anda, Felitti, & Bremner, 2006; Green et al., 2010; McCrory, Gerin, & Viding, 2017; McLean, 2016; Price-Robertson, Higgins, & Vassallo, 2013; Vachon, Krueger, Rogosch, & Cicchetti, 2015). The range and complexity of adverse circumstances is well known to practitioners and includes trauma, maltreatment, exposure to violence, bullying or victimisation, loss and bereavement, and relocation (McLean, 2016; Young Minds, n.d.). It has been suggested that a third of adult mental health conditions can be directly linked to adverse experiences in childhood (Young Minds, n.d.).

Until recently, the pathways by which early adversity makes children more vulnerable to poor mental health outcomes haven't been well understood (McCrory & Viding, 2015; McLean, 2016; Pineau, Marchand, & Guay, 2014). Recent research approaches have focused on dynamic and "real-time" brain responses to social stimuli; and have helped us develop a better understanding of the way that a child's brain responds to everyday events. These types of studies, called functional brain imaging studies, explore in real time how a child's brain *reacts* to the social world; giving a more accurate picture of the cognitive processes that underlie children's reactions to social stimuli and what children's experience of the social world might be.

This approach has identified some of the *key developmental differences* that may make children who have experienced adversity more vulnerable to mental health concerns over time (McCrory et al., 2017). These are diminished social reward; emotional dysregulation; difficulty with executive functioning; and enhanced threat bias (see Box 1). This series of practitioner resources looks at these developmental differences and is intended for professionals (psychologists, mental-health social workers, therapeutic specialists) supporting vulnerable children and families. Each resource addresses one of the developmental differences and provides suggestions for supporting children who are school age or older.

The focus of this practitioner resource is difficulty with executive functioning; which we believe may put a child at increased risk of learning and behavioural issues over time.

Box 1: Childhood adversity and developmental differences



Emotional dysregulation

Children exposed to early adversity may not process and regulate emotions in the same way as others; leading to suppressed or intensified emotional expression. This developmental difference could lay the neural foundation for the development of mood disorders in adolescence and later life.



Diminished social reward

Children exposed to early adversity may not respond in the same way as non-abused peers to rewarding events or activities. This developmental difference could lay the neural foundation for the development of depression and addiction in adolescence and later life.



Difficulty with executive functioning

Children exposed to early adversity may not be able to plan, organise, execute and monitor their activities and their behavioural responses as easily as same age peers who have not experienced abuse. This developmental difference could lay the neural foundation for the development of learning and behaviour disorders in adolescence and later life.



Enhanced threat bias

Children exposed to early adversity can over-react to everyday events and stimuli; triggering an automatic “threat” bias. This developmental difference could lay the neural foundation for the development of anxiety disorders in adolescence and later life.

Source: McCrory et al., 2017

- * Children who have experienced adversity may benefit from professional psychological treatment. If you're concerned about a child, consider referring them to a general practitioner who can determine if the child should be referred to a psychologist.

What is executive functioning?

Executive functioning (executive control) is a set of brain functions that are centrally involved in metacognitive and behavioural control. Metacognitive skills include the ability to organise and plan, respond flexibly to changing circumstances, and anticipate the consequences of actions. These metacognitive skills are central to day-to-day functioning (Snyder, Miyake, & Hankin, 2015). Most models of executive functioning include the skills of working memory and attention, task shifting and response inhibition as key components of executive control (McCrory et al., 2017; McLean, 2016, 2017; Miyake et al., 2000). The smooth coordination and interaction of these three functions are involved in effective monitoring of attention and learning; and in the self-regulation of behaviour.

Emerging research on impaired executive functioning

In a recent comprehensive review of functional brain imaging studies published in the *Journal of Child Psychology and Psychiatry* that summarised the emerging evidence for developmental differences in brain development and their significance, McCrory and colleagues (2017, p. 352) cautioned that:

There is almost no provision for those children who have experienced maltreatment but who do not present with a manifest psychiatric disorder; indeed, such children have generally not been viewed as the concern of mental health professionals at all despite a compelling evidence documenting the significantly elevated risk of future disorder that characterise these children.

Collectively, the research on brain development suggests that predictable developmental differences in brain functioning precede the development of mental health and behavioural concerns. This argues for the provision of evidence-based *preventative* mental health protocols for all children who have experienced maltreatment.

McCrory and colleagues (2017) concluded that children who experience childhood maltreatment demonstrate poorer performance on tasks of executive control together with reduced neural efficiency and more effortful processing relative to non-maltreated children. It is unclear at this stage whether this is a direct result of maltreatment or a corollary of pre-existing cognitive and socio-economic vulnerabilities (Danese et al., 2016; McCrory et al., 2017). Irrespective of the precise causal pathway, this difficulty with executive control may increase the risk for future mental health, learning and behavioural concerns (McCrory et al., 2017).

How does executive functioning affect children?

All social behaviour and learning is underpinned by the brain's executive functioning skills. Strong executive functioning skills are associated with the ability to pay attention and engage working memory (a necessary prerequisite of learning). Executive functioning skills allow us to direct our attention to any given task or activity and to take steps towards achieving everyday goals. This is why executive functioning skills are so important for everyday life. Without this "control centre" of the brain working smoothly and efficiently, our attention, our thinking, our approach to learning and our behaviour can be disorganised, erratic or seem inappropriate to context.

Executive functioning difficulties are commonly found in childhood "disorders" such as autism, attention deficit hyperactivity disorder (ADHD), fetal alcohol spectrum disorders (FASD), and mood and anxiety disorders; although exactly how the executive skills are compromised varies between these disorders. For example, a child with autism may have difficulty with forward planning, goal setting and self-regulation, and have a restricted focus of attention. Children with ADHD can have difficulty with behavioural inhibition, sustained attention and self-regulation. A child with FASD can have difficulty with working memory and shifting attention from task to task.

The significance of executive functioning for children

Poor executive skills have been associated with poor emotional regulation; which, in turn, is linked to a range of psychopathologies (McCrory et al., 2017; Snyder, Kaiser, Warren, & Heller, 2015; Snyder, Miyake et al., 2015). In children, this may present as ADHD, conduct and oppositional disorders, psychosis and mood disorders (Cortese et al., 2012; Eysenck, Derakshan, Santos, & Calvo, 2007; Holmes et al., 2005; Morgan & Lillienfeld, 2000; Rubia, 2011; Sattler, 2016; Snyder, 2013; Snyder, Kaiser, et al., 2015; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005).

Supporting children experiencing difficulty with executive functioning

The emerging literature on brain development in the context of maltreatment suggests the importance of supporting *all* children who have experienced adversity with evidence-informed principles to scaffold and support the development of executive skills (Dawson & Guare, 2010, 2012; McLean & McDougall, 2014).

It is common for children with executive control difficulties to benefit from highly structured and predictable settings. They often have difficulty in unpredictable and unstructured environments, and have difficulty in coping with transitions (see McLean, 2017). These difficulties are associated with a concrete, inflexible approach to learning and ineffective emotional and behavioural control that often mean a child will experience difficulty in the school setting (Dawson & Guare, 2012). The following principles can be used to support children with executive control difficulties (Dawson & Guare, 2010; McLean, McDougall, & Russell, 2014).

1. Provide a structured and predictable care and learning environment

Children of all ages with difficulty in executive functioning perform best in a highly structured and predictable learning environment. Caregivers and teachers can help children by making their environment as structured, predictable and free from distractions as possible. Children experiencing difficulty with executive functioning may feel calmer when they have clearer expectations and routines. These children may need to have social rules and social expectations explained to them explicitly; as they struggle with subtle differences in social expectations that vary from setting to setting.

2. Use scaffolding strategies to build executive control skills

There is a range of strategies that can be used by practitioners to scaffold a child who is experiencing difficulty in executive functioning. These strategies can be used to support, facilitate and enable a child to develop their cognitive skills. Lev Vygotsky (1978) argued that learning occurs when the learner, through interaction with more competent others, is operating above what they can do independently; and through creating a “zone of proximal development”—a learning zone just above what learners can do independently.

Strategies to support the child with planning and starting activities, and with keeping on track

Children of any age with compromised executive functioning often have difficulty in initiating tasks, and difficulty in organising, planning and executing tasks. Some have difficulty with organising themselves to start a task (difficulty in initiating tasks). This difficulty can be seen as laziness, lack of motivation or procrastination. These children will benefit from having sequences clearly stepped out for them. Similarly, a child with planning and organisation difficulties may struggle to break a task into smaller steps, and is easily distracted. They may find a simplified, structured and predictable environment with clear routines and where expectations are spelled out step by step for the child helpful.

Children with these difficulties benefit from routines, especially for key daily transitions (e.g., waking up or going to bed; leaving for school, coming home from school). It can be helpful to have key routines demonstrated as visual sequences, using cartoons or photos to demonstrate the steps in daily routines. It can also be useful to teach children monitoring “self-talk” such as “What am I supposed to do now? What’s the next step?” This will need to be modelled by adults first, before children can internalise the self-talk. For more detail on how to build planning, monitoring and organisational skills see McLean (2017) and the resources at <developingchild.harvard.edu/resources/activities-guide-enhancing-and-practicing-executive-function-skills-with-children-from-infancy-to-adolescence/>.

Strategies to support the child with their working memory

Working memory underpins many of the tasks we do in day-to-day life. One example that we are all familiar with is trying to memorise a new phone number, which we rely on our working memory for. In this case, we usually rehearse the number in our minds in order to keep from forgetting it—this rehearsal strategy relies on intact working memory.

Poor working memory will often mean that children are unable to follow multi-step instructions; meaning they can be viewed as inattentive or disobedient. Without intact working memory, it is difficult for a child to keep track of conversations and social interactions, often leading to social difficulties.

Working memory can be improved in many instances through targeted strategies. Children of any age with poor working memory can be supported by simplifying your interactions with them (e.g., using shorter sentences, repeating instructions, and using visual prompts). Teach children the skills of “chunking” (combining smaller pieces of information together into larger units, called chunks) and rehearsal strategies to strengthen their short-term memory capacity. Children may also benefit from memory rehearsal games and commercial memory training programs such as CogMed or the Amsterdam Memory and Attention training program (McLean, 2016; Rasmussen, Treit, & Pei, 2010). For more detail on how to support the development of working memory skills in children see McLean (2016, 2017) or visit <childdevelopment.com.au/areas-of-concern/working-memory/>.

Strategies to support children to build cognitive flexibility

One of the main executive functioning difficulties that can be linked to behaviour problems is a lack of flexible thinking (poor cognitive flexibility). Flexible thinking refers to the ability to alternate between different thoughts and actions; to shift easily from task to task; to come up with alternative responses to problems when frustrated; and to anticipate and respond adaptively to new situations or changing circumstances and surroundings. Being cognitively flexible means you are adaptable and able to respond quickly to a changing environment. Difficulty with cognitive flexibility means that children may struggle with:

- adapting behaviour to suit different settings;
- transitioning from task to task; and
- altering behaviour in response to negative feedback.

A hallmark feature of poor cognitive flexibility is difficulty in managing change, including transitioning from activity to activity. It is helpful to provide children with poor cognitive flexibility with ample pre-warning about any impending change or transition. This can be done using a timer, a cue such as a bell or a paper linked-chain to warn of impending change in activity (e.g., removing links in the paper chain one at a time as the time for transition draws near). Others find it helpful to use a transition object; especially when this object provides a clue about what to do first in the next setting (i.e., tells them where they need to go and what they need to do next; e.g., “Bring this note to the next lesson’s teacher and ask her what to do first”).

Children with poor cognitive flexibility will find it difficult to follow changing rules and expectations. Children can be helped to manage change by pointing out to them how new situations are similar (and different) to familiar situations (e.g., “Jonny’s house is the same as our house because they have two dogs as well. But Jonny’s house is different because they have different rules”) (McLean, 2017). The aim is to minimise the child’s experience of change and uncertainty as much as possible. It can also be important to model and teach coping self-talk for times when change or transition is unavoidable or unexpected. For more detailed strategies on supporting flexible thinking, see Dawson & Guare (2012) or McLean (2017).

Strategies to support children to develop emotional and behavioural control

Children with diminished executive control have difficulty in inhibiting inappropriate thoughts and actions, and regulating their emotions and actions.

Difficulty with behavioural regulation and impulse control may be supported by using strategies to reduce a child's overall arousal level (such as mindfulness, yoga or tai chi) and by helping children make the connection between their mind and bodies. Teach and rehearse "Stop-Think-Do" strategies with the child; and use visual and physical prompts as reminders for the child (e.g., snapping an elastic band around your wrist) that can act as a "stop gap" between impulse and action. Teaching and rehearsing acceptable and safe "cool off" strategies ahead of time will also help a child to react more appropriately when emotions become overwhelming (see <stopthinkdo.com/prog_core.php>).

Conclusion

Emerging research suggests that children who have experienced early life adversity can experience more difficulty with executive control; affecting their planning, monitoring of cognitive and attentional processes, and capacity for behavioural inhibition. It is believed that this may lay the foundation for the development of learning and behavioural concerns. Children who have experienced adversity may benefit from professional psychological treatment. These children can also benefit from engaging with evidence-based strategies to support and improve poor executive functioning skills; through structuring the environment; creating visual, verbal and non-verbal scaffolds to learning; and directly and explicitly teaching missing executive control skills.

Dr Sara McLean is a Consultant Psychologist in Child Protection, and Adjunct Research Fellow, Australian Centre for Child Protection.

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