Executive functioning and autism

Researchers have suggested that the difficulties seen in children on the spectrum, including social difficulties and repetitive behaviours, may be attributed to difficulties with executive functioning (Happe et al., 2006). This cognitive theory of autism is in part based on the similarities noted in patients with acquired frontal lobe damage.
(the location of most executive function skills) and those on the spectrum, such as repetitive behaviour and social
difficulties (White, Burgess & Elizabeth, 2009).

Research has also indicated that differences in executive functioning skills exist between children on the spectrum and typically developing control groups. It is important to note however, that executive functioning problems are unlikely to provide a complete explanation for autism, partly because the executive functioning deficits seen are not specific to autism, but are also observed in children with diagnoses including attention deficit hyperactivity disorder (ADHD), and other disabilities (Happe et al., 2006; Liss et al, 2001).

While research indicates that children on the spectrum generally show deficits in executive functioning, it is not yet agreed which elements are most impaired and whether these impairments apply to all children on the spectrum. Some researchers have found that children on the spectrum show poorer performance than typically developing children and those with ADHD on measures of inhibition, working memory and flexibility (Corbett et al., 2009). Others have found difficulties with inhibition and flexibility, as well as with planning and verbal fluency (Geurts et al., 2004) but they possess better skills in working memory. Happe et al. (2006) suggest inhibition is relatively strong in children on the spectrum, but that they showed more difficulty in monitoring tasks.

It is likely that there may be no common executive functioning impairment across all people on the spectrum (White et al., 2009); rather, it is possible that a range of executive functioning deficits contribute more generally to some of the functional, academic and social difficulties experienced by children on the spectrum.

Some of the difficulties related to executive functioning that may be seen in children on the spectrum include:

- Difficulties with flexibility – it is possible that observed difficulties coping with changes, as well as the tendency for repetitive behaviour, may be strongly related to cognitive flexibility deficits
- Planning – many children on the spectrum need support to break tasks down into sections, understand the order in which to complete tasks and how to go about undertaking each task
- Working memory – while some children show strong memory skills, others may show poor working memory skills and struggle to remember longer instructions and other difficulties which can impact on learning
- Inhibition – for some children, difficulties with inhibition mean that they may struggle to take turns appropriately, wait for information before starting a task or have difficulty managing their own behaviour

Encouragingly, some research has indicated that while executive functioning skills continue to be an area of significant weakness in children with ADHD, children on the spectrum show improvement in executive functioning as they get older (Happe et al., 2006).

**How is executive functioning assessed?**

Best practice suggests that information is gained from a variety of sources, including parent history, parents and teacher questionnaires, formal assessment and observation (Dawson & Guare, 2010; Cantin, Mann & Hund, 2012). Elements of executive functioning can be formally assessed by psychologists using a range of tools including formal assessment and parent/teacher questionnaires. It is important to note, however, that testing alone may not provide evidence of executive dysfunction (Dawson & Guare, 2010). Rather, information about the child’s real life functioning is crucial in determining whether executive functioning issues may be playing a role in a child’s difficulties at school and home. Teachers play a vital role in the assessment process by making observations about student functioning across a range of areas and by completing questionnaires.
What are the impacts of poor executive functioning on children on the spectrum?

Children with impaired executive functioning can be significantly affected by these difficulties in the classroom, playground and at home. Some of the common difficulties that may be seen in children with executive functioning difficulties include:

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<tr>
<th>Characteristic</th>
<th>Impact / Implication (what might we see at school/home?)</th>
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<tr>
<td><strong>Difficulties with flexibility</strong></td>
<td>• Difficulty changing from one activity to another&lt;br&gt;• Difficulty managing changes in plans and schedules&lt;br&gt;• Anxiety when plans or expectations change</td>
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<td><strong>Difficulties with working memory</strong></td>
<td>• Difficulty completing more than one step at a time&lt;br&gt;• Difficulty remembering all the information, may just recall the last bit&lt;br&gt;• May forget to return to work after pausing&lt;br&gt;• May remember the last part of an instruction but not earlier parts&lt;br&gt;• May ask for instructions to be repeated&lt;br&gt;• May forget homework, equipment, books etc.</td>
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<td><strong>Difficulties with planning &amp; organising</strong></td>
<td>• Difficulty knowing how to start and complete a task&lt;br&gt;• Difficulty prioritising and completing steps in a long term and/or multi-element project&lt;br&gt;• Difficulty with sequencing a task&lt;br&gt;• May not bring the correct equipment to class or home from school&lt;br&gt;• May have difficulty with editing for relevance and completing organised pieces of writing&lt;br&gt;• Notes are often incomplete and/or may not focus on the most important elements&lt;br&gt;• Homework may not be completed</td>
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<td><strong>Difficulties with inhibition</strong></td>
<td>• May respond quickly to questions, without thinking about the answers - may respond immediately then change response&lt;br&gt;• Begins task without all the information required&lt;br&gt;• Difficulty taking turns, particularly waiting for a turn&lt;br&gt;• May interrupt, speak out of turn or make insensitive comments</td>
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<td><strong>Difficulties with attention</strong></td>
<td>• Frequent switching between activities&lt;br&gt;• Easily distracted in class and at home by relatively minor distractions&lt;br&gt;• May give up on tasks quickly or become discouraged by harder tasks&lt;br&gt;• Difficulty studying for tests&lt;br&gt;• May have difficulty listening to stories or long pieces of verbal information in class</td>
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<td><strong>Difficulties with emotional/self-regulation</strong></td>
<td>• May become upset if a mistake is made (out of proportion reactions)&lt;br&gt;• Difficulty with managing impulsive behaviour&lt;br&gt;• Difficulty with managing anxiety&lt;br&gt;• Displays range of emotions that may not reflect how feeling&lt;br&gt;• May have difficulty recognising and explaining feelings</td>
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What strategies can help?

There are a range of strategies that are used to support children with executive functioning difficulties. Ideally, these strategies will be implemented after careful consideration of all the child’s needs in consultation with the team supporting the child. Close monitoring of all strategies is also crucial to ensure that the ideas that are put in place are useful, timely and serving their intended purpose. It is important that teachers and parents consider the
characteristics of the child, along with the day-to-day impact the executive functioning difficulties are having on the child at home and at school. In general, useful strategies will also match the strengths of children on the spectrum. Visual supports may be particularly useful. Visuals match the learning style of most children on the spectrum and can be used for a variety of reasons, including helping with flexibility by explaining change and transitions, making steps in a project explicit, and to help manage emotions. Practical strategies, such as breaking tasks into smaller steps, providing scaffolds for writing tasks and using timers, planned breaks and rewards, can also have a positive impact on executive functioning skills at home and in class.

Other resources

- Centre of the Developing Child – Harvard University: Video (5 mins) plus resource sheets, mostly younger children.

References


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