

## Executive functioning in children with autism

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### Introduction

Meet James. James is good at football and PE is his favourite lesson, but today he has forgotten his PE kit again so he doesn't get to take part.

When James gets to his first lesson, James' teacher asks the class to write a short story based on the topic of yesterday's lesson. James fiddles with his pen and looks out of the window. James can't remember what yesterday's lesson was and he doesn't know where to start.



It's Friday, and James loves 'Fish Fridays' at school. He can't wait to have fish and chips for lunch. But today it's pie on the menu. James feels overwhelmed by this change and starts shouting at the dinner lady.

At break time James is talking to his friends about the latest superhero film he saw over the weekend. His friends haven't seen it yet so ask James not to tell them what happens, but James is really excited about the film and accidentally blurts out the ending.



Some of James' teachers think that James has a poor work ethic; they think he is lazy, unmotivated, and that he needs to stop procrastinating in class.

But the truth is, James really enjoys school and he wants to do well in lessons, and all the situations above. However, James has executive functioning difficulties, which underlie the day-to-day problems he experiences.

### What is Executive Functioning?

Executive functioning can be described as "the CEO of the brain." That's because these skills enable us to set goals, plan, and get things done. Executive functions are responsible for the initiation of tasks and the monitoring of action. These processes have been associated with the front section of the brain, known as the frontal lobe.

Executive dysfunction, however, occurs when there are difficulties with these executive skills. Executive function is not the same as intelligence, so someone may have a high IQ but struggle applying their knowledge and skills due to executive function issues.

Executive functions include basic cognitive processes such as:

- **Initiation** – Initiation refers to the ability to start activities, focus, and sustain attention. In people with executive dysfunction this may present as a lack of motivation, difficulty starting tasks, and becoming distracted or losing focus.
- **Inhibition** – Inhibition is concerned with impulse control. It involves thinking before acting, selecting appropriate responses, evaluating the impacts of behaviour, and tuning out information that is irrelevant to the task at hand. Signs of executive dysfunction can include difficulties in suppressing responses and managing your own behaviours.
- **Flexibility** – This refers to shifting from one activity/idea to another, recognising when a strategy isn't working and trying a new approach, accepting multiple ways of seeing or doing things, and being able to multi-task or think about multiple things at once. For example, when driving a car most people can quite easily absorb lots of information at once and switch their attention quickly from one task to another. In the case of executive dysfunction, this may present as an inability to see other people's perspectives, difficulties adjusting to changes, and getting 'stuck' on certain tasks or routines.

- Working memory – The working memory system is responsible for temporarily retaining information while performing a task and then recalling and using this information. For example, mental maths requires working memory skills as you need to remember the calculation and use this to work out the answer. Those with executive dysfunction may struggle to remember information relevant to the task or may have difficulties in knowing how to use that information to reach the task goal.
- Organisation – This refers to keeping track of resources, setting priorities, and time management. People with executive dysfunction may encounter problems in being on time, preparing for a task, and selecting priorities and using these to structure their time.
- Planning – This function encompasses preparing for future events, modifying a plan of action accordingly, and problem-solving skills. When a person experiences executive dysfunction, they may struggle to find new approaches to tasks, find it difficult to prepare for future events, and may have an inability to visualise possible outcomes to different situations.
- Self-monitoring – This skill is responsible for tracking your performance, keeping your goals in mind, and being aware of your own emotions. In the case of executive dysfunction, this may present as a lack of self-reflection, difficulties noticing your own thoughts and feelings, and an inability to regulate your own emotions.

RED	BLUE	GREEN
PURPLE	YELLOW	BLACK
RED	BLUE	GREEN
YELLOW	PURPLE	BLACK

Try this: Look at the words above and say aloud the font colour for each word, without reading the word itself. It's often trickier than it looks!

The Stroop Test (pictured) is a good example of when we need to use our inhibition skills, as we have to filter out the meaning of each word in order to say the font colour.

## Executive Function and Autism Spectrum Condition (ASC)

Research has found that problems with executive function in early childhood were linked to autistic traits later in life (Kenny, Cribb, & Pellicano, 2019). Executive dysfunction has also been linked to Attention Deficit Hyperactivity Disorder (ADHD) in a number of studies (Lukito et al, 2017).

- Some children with autism tend to have difficulties with inhibition – inhibiting inappropriate responses, inhibiting behaviours, talking only about their interests.
- Some children with autism tend to be inflexible – may get stuck on ideas or behaviours, dislike changes to routine and transitions, struggle to accept different viewpoints.
- Some children with autism tend to have difficulties planning – preparing for activities, planning for the future.

## What can you do to help?

Supporting a person with executive functioning issues can have its challenges, but the good news is that executive functioning skills can be improved upon and supported. There are many strategies you can explore to make everyday life easier for you and the young person.

### Initiation

- Graphic organisers: Use visual timetables to inform the young person of what is due first/next. Give prompts and motivators to start tasks.
- Routines: Increased structure in the environment or in an activity can help with initiation difficulties. Building in routines for everyday activities is often important, as routine tasks and their completion become more automatic, reducing the need for independent initiation.
- Limit distractions: This might include strategic seating, visual and auditory distractions, other students, or activities that can pull the young person's attention away from a task.

### Inhibition

- Teaching coping skills: Teach the young person coping skills (such as deep breathing) that can help them to think more rationally before reacting.
- Play Snap: The card game Snap requires self-restraint, as you have to wait until the right moment to shout "snap", therefore playing this game can help the young person to practice their inhibition skills.
- Model appropriate emotional control: It may be helpful for parents and teachers to model appropriate emotional responses. They might talk aloud through a situation that provokes feelings of anger or sadness and explain how they will deal with their feelings.

### Flexibility

- Make a Plan B: Explain to the young person that things don't always go to plan, so it's best to prepare for these situations. Come up with a 'Plan B' for some situations that the young person may face on a daily basis, e.g. activity is cancelled, item is unavailable, etc.

### Working memory

- Break it down: Give the young person step-by-step instructions (e.g. "put your shoes on") one at a time instead of generic tasks (e.g. "get ready to leave"). Ask the young person to repeat the instruction back to you.
- Fun mnemonics: Help the young person form associations that connect different details and make them more memorable. For example, Mr. BULK says (B)AG (U)niform (L)unch (K)ey.

### Organisation

- Checklists: Get the young person to think about what they will need for an activity (e.g. swimming) and get them to check off each item as they pack it.
- Daily routines: Working with the young person to create daily routines can help them remember everything they need to do, as repeating the same tasks in the same order each day will form habits.

## Planning

- Play Jenga: Jenga requires players to think ahead and predict the consequences of their actions. It prompts players to ask questions such as: "What will happen if I remove this block from this tower? How will pulling it out quickly affect the stack?"

## Self-monitoring

- Be "reporters": Make use of occasional opportunities for the young person to sit back and observe other children in small groups. At the playground, the beach, or the shops; take turns reporting on social interactions you can watch "live". Make guesses about what might be going on. Then point out any physical actions, facial expressions, behaviours, or tones of voice that give clues to support or disprove your imagined story. Encourage the young person to link this back to situations they have been in and their own emotions.
- Self-evaluation: Encourage the young person to identify their strengths and weaknesses for specific tasks or activities. Allow the comparison of pre-activity prediction of performance with post-activity evaluation and provide feedback.

## Conclusion

Executive functions are the brain's self-management system. They work together to help the brain organise and act on information. Executive functioning is different to cognitive abilities, meaning that even people with a high IQ can experience executive dysfunction. People with executive dysfunction have a genuine inability to initiate tasks, even when they're enjoyable and/or important, and they may find it difficult to gather information, structure it and change their behaviour in response. Executive dysfunction is heavily linked with autism and ADHD, and these skills can be developed over time.

## Useful Information

- National Autistic Society - <https://network.autism.org.uk/knowledge/insight-opinion/executive-functioning-problems-autism-personal-perspective>
- Organization for Autism Research - <https://researchautism.org/improving-executive-function/>
- Healthline - <https://www.healthline.com/health/executive-dysfunction>
- Autism Awareness Centre - <https://autismawarenesscentre.com/executive-function-what-is-it-and-how-do-we-support-it-in-those-with-autism-part-i/>
- Understood: for learning and attention issues - <https://www.understood.org>
- Smart Kids with Learning Disabilities - <https://www.smartkidswithld.org/getting-help/executive-function-disorder/principles-for-improving-executive-skills/>
- EBook - [https://www.crcpress.com/rsc/downloads/AMGUILP1802\\_Executive\\_Function\\_FB\\_revised\\_r1.pdf](https://www.crcpress.com/rsc/downloads/AMGUILP1802_Executive_Function_FB_revised_r1.pdf)

## References

### Images:

- <http://veenusastro.freepressjournal.in/wp-content/uploads/2018/06/brain-png-20.png>
- <https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/a-day-in-the-life-of-a-child-with-executive-functioning-issues>

### Books:

- Smart but Scattered Teens, Richard Guare, Peg Dawson, and Colin Guare
- Solving Executive Function Challenges: Simple Ways to Get Kids with Autism Unstuck & On Target, Lauren Kenworthy, Laura Gutermuth Anthony, Katie C. Alexander, Monica Adler Werner, Lynn Cannon, Lisa Greenman
- Unstuck & On Target! An Executive Function Curriculum to Improve Flexibility, Planning, and Organization, Lynn Cannon, Lauren Kenworthy, Katie C. Alexander, Monica Adler Werner, Laura Gutermuth Anthony

### Websites:

- <https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/a-day-in-the-life-of-a-child-with-executive-functioning-issues>
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- Hill, E. (2004). Executive dysfunction in autism. *Trends In Cognitive Sciences*, 8(1), 26-32. doi: 10.1016/j.tics.2003.11.003

### Research:

- Kenny, L., Cribb, S.J. & Pellicano, E. J *Abnorm Child Psychol* (2019) 47: 1089. <https://doi.org/10.1007/s10802-018-0493-8>
- Lukito et al. *Molecular Autism* (2017) 8:60 DOI 10.1186/s13229-017-0177-1

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