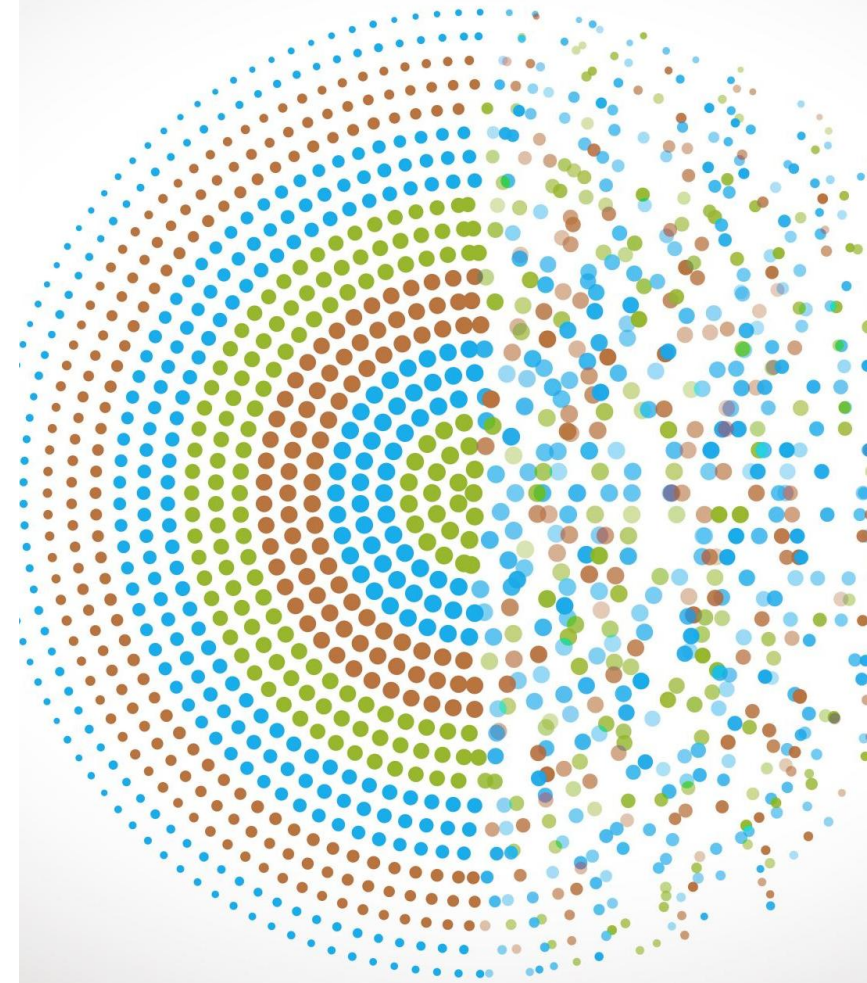


EXECUTIVE FUNCTION AND ATTENTION SKILLS

Tameside Educational Psychology Service



SESSION AIMS

To explore executive functioning as a concept and the different executive functions.

To think about executive function skills within the school context and how this can be supported.

To consider attention in more detail, including its psychological basis and different attentional skills.

To discuss ways of developing and supporting children's attention skills, and some of the barriers to this.



WHAT IS EXECUTIVE FUNCTIONING?

- Executive functioning is an umbrella term for a range of cognitive processes (i.e., executive functions) which together enable us to regulate goal-directed behaviour.
- Different brain regions are used for different executive functions, but the overall regulation of goal-directed behaviour is underpinned by the frontal lobe.

HOW MANY EXECUTIVE FUNCTIONS CAN YOU LIST?

- Working in pairs or small groups, list as many executive functions as you can think of.
- Don't worry if you don't know any!
- Clue: one of them will be our focus later on...



EXECUTIVE FUNCTIONS

Planning:

Creating a roadmap to achieve a goal or complete a task.

Organisation:

Keeping track of information and materials.

Time Management:

Using time effectively to complete tasks.

Working Memory:

Holding and manipulating information in mind.

Task Initiation:

Starting tasks without undue procrastination.

Metacognition:

Thinking about one's own thinking processes.

Flexibility:

Adapting to new situations and changing plans.

Self-Control:

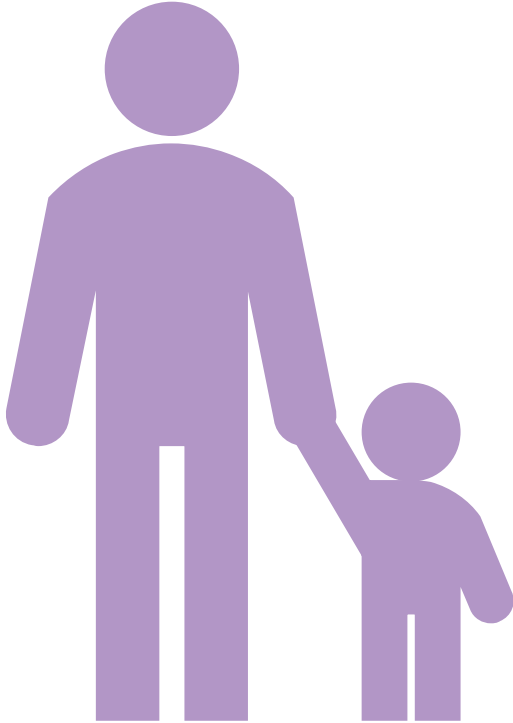
Regulating one's emotions and behaviours.

Attention:

Focusing on tasks and ignoring distractions.

Perseverance:

Persisting through challenges to achieve goals

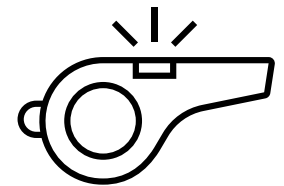


DEVELOPMENT OF EXECUTIVE FUNCTIONING

- Welsh et al. (1991) studied children aged 3- to 12-years and argued for three distinct developmental stages:
 - Age 6 (following first growth of grey matter) – competence with simple planning and organisation.
 - Age 10 – hypothesis testing and behavioural/ emotional regulation.
 - Adolescence (following second growth of grey matter) – complex planning/ sequencing, cognitive fluency and metacognition.

EXECUTIVE FUNCTIONING DIFFICULTIES

- Executive functioning difficulties is a generic term used when a child has difficulties with two or more executive functions.
- There are also several within-child diagnoses where executive functioning difficulties are common, including:
 - Acquired brain injury (frontal cortex)
 - ADHD
 - Autism
 - Foetal Alcohol Spectrum Disorder



REFLECTION ACTIVITY: “WHAT IS EXECUTIVE FUNCTIONING?”

Take some time to reflect on your own executive functioning skills:

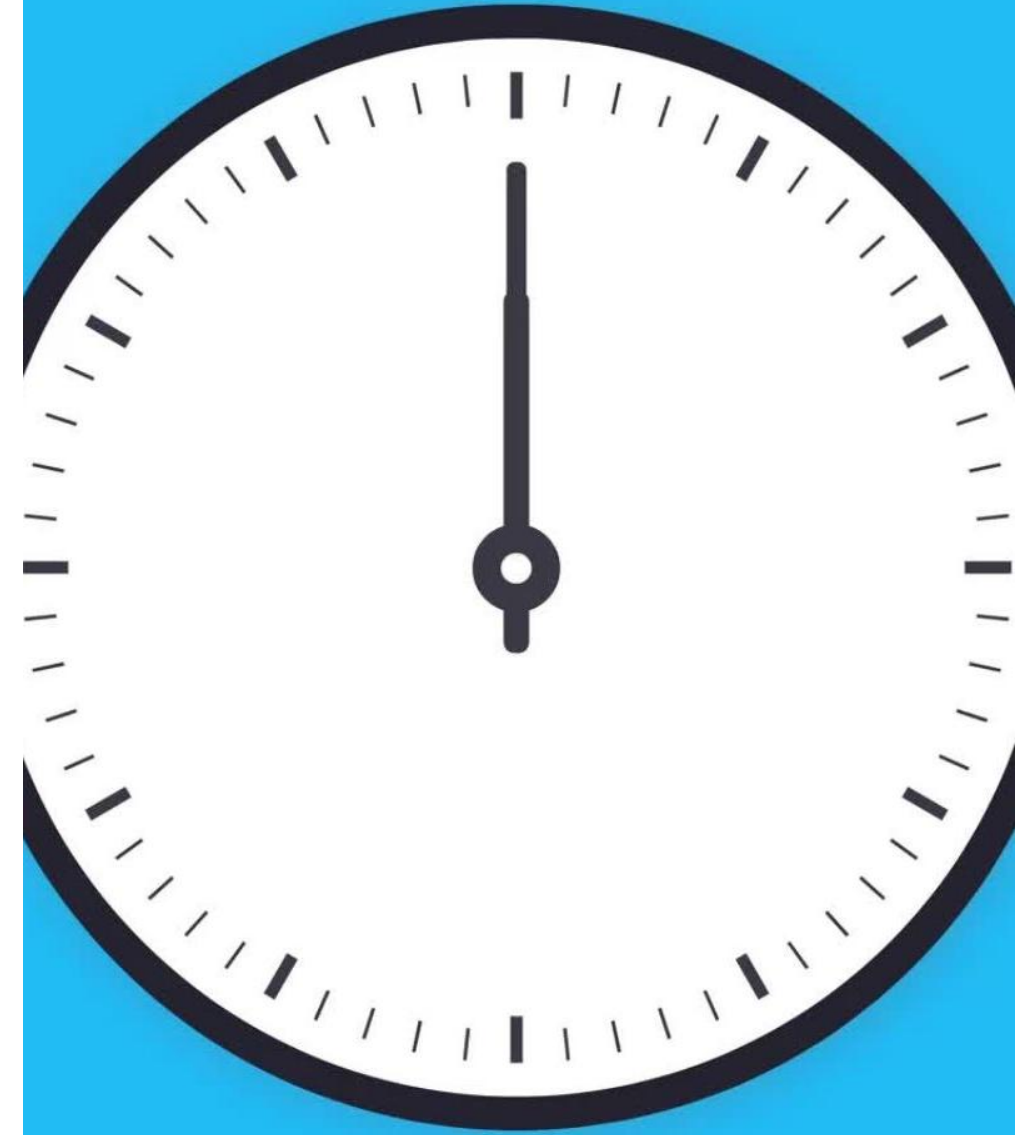
- How do you prioritise your tasks for the day or week?
- What methods do you use to stay on schedule and avoid procrastination?
- What helps you to remember important information from meetings?
- How do you handle frustrations or setbacks in your work?
- How do you assess your own performance and identify areas for improvement?

In groups: How might these skills appear in children and why they are essential for learning?

BEAT THE CLOCK: MULTI-STEP TASK

Activity:

- In your groups, you have 3 minutes to write down as many animals as you can think of.
- You must write one response before passing on to the person next to you. You cannot repeat any previous responses.
- Listen out for any further instructions!



BEAT THE CLOCK: REFLECTION



Think about how students can often feel overwhelmed when juggling multiple demands and consider some strategies to help them (e.g., completing one task at a time, using visual checklists).

EXECUTIVE FUNCTION INTERVENTION

- In general, Dawson and Guare (2010) promote the following approach to intervention:
 - Collect assessment information from a variety of sources
 - Identify key areas for intervention and link these to specific executive functions
 - Set SMART targets for each key area of intervention
 - Intervene at the level of the environment and the child, and include motivating factors and home-school links
 - Evaluate the SMART targets using a response to intervention approach

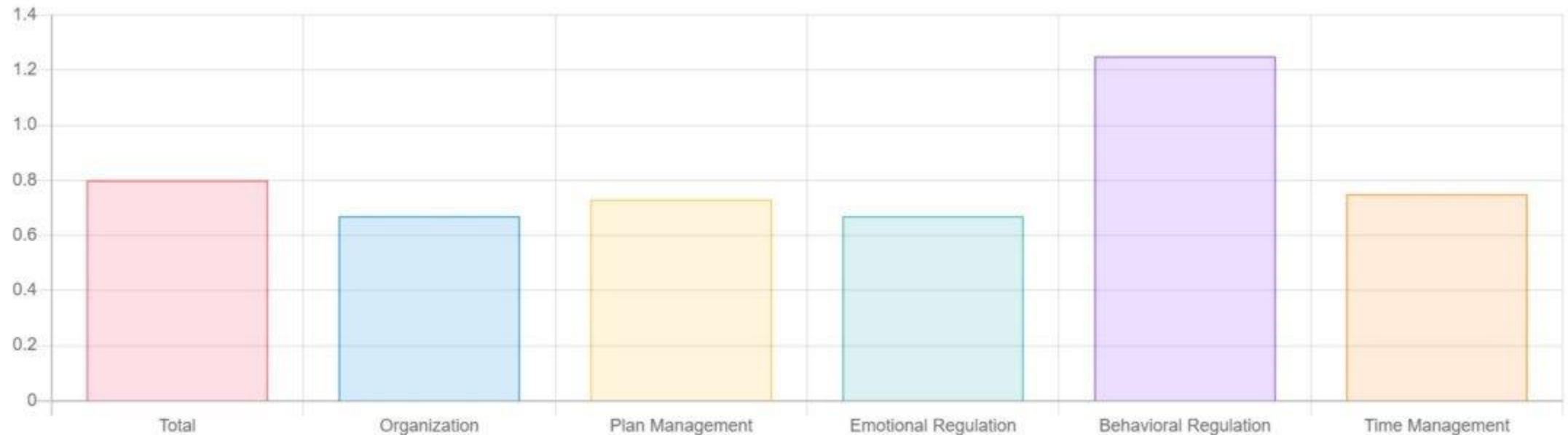
EXECUTIVE FUNCTION ASSESSMENT

- Dawson and Guare checklists:
 - Parent/Teacher report
 - Eexecutive Skills Questionnaire*
- Other resources:
 - Resources - Smart But Scattered Kids
- A note on copyright.

*For children and young people aged 14+

SMART TARGETS

- Here are my results on the executive skills questionnaire – revised (ESQ-R).
- Can you identify an area of need and write a SMART target?



INTERVENE AT THE LEVEL OF THE ENVIRONMENT

01

Adapt the
classroom
environment

02

Adapt the
curriculum/
academic
demands

03

Adapt teacher
input

INTERVENE AT THE LEVEL OF THE CHILD

Teach

Explicitly teach new skills, either at an individual, small group or whole-class level

Model

Explicitly model new skills using adults and/ or peers

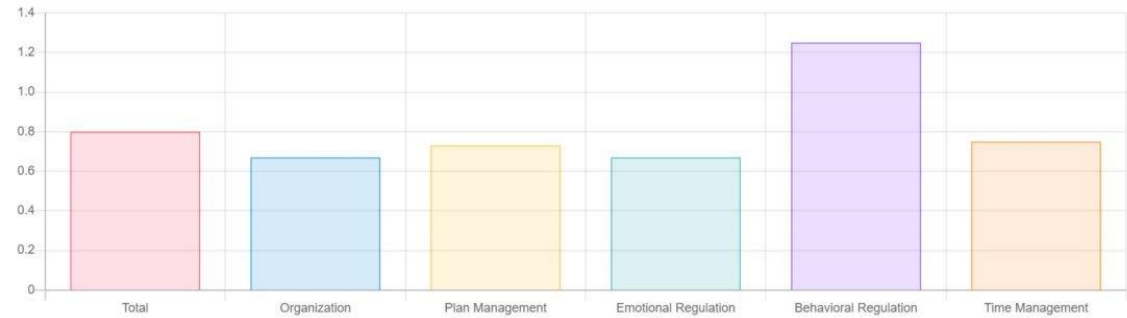
Motivate

Use motivating factors (e.g., a favoured activity or resource)

Home

Ensure that parents/ carers are involved, so as to provide opportunities for generalisation at home

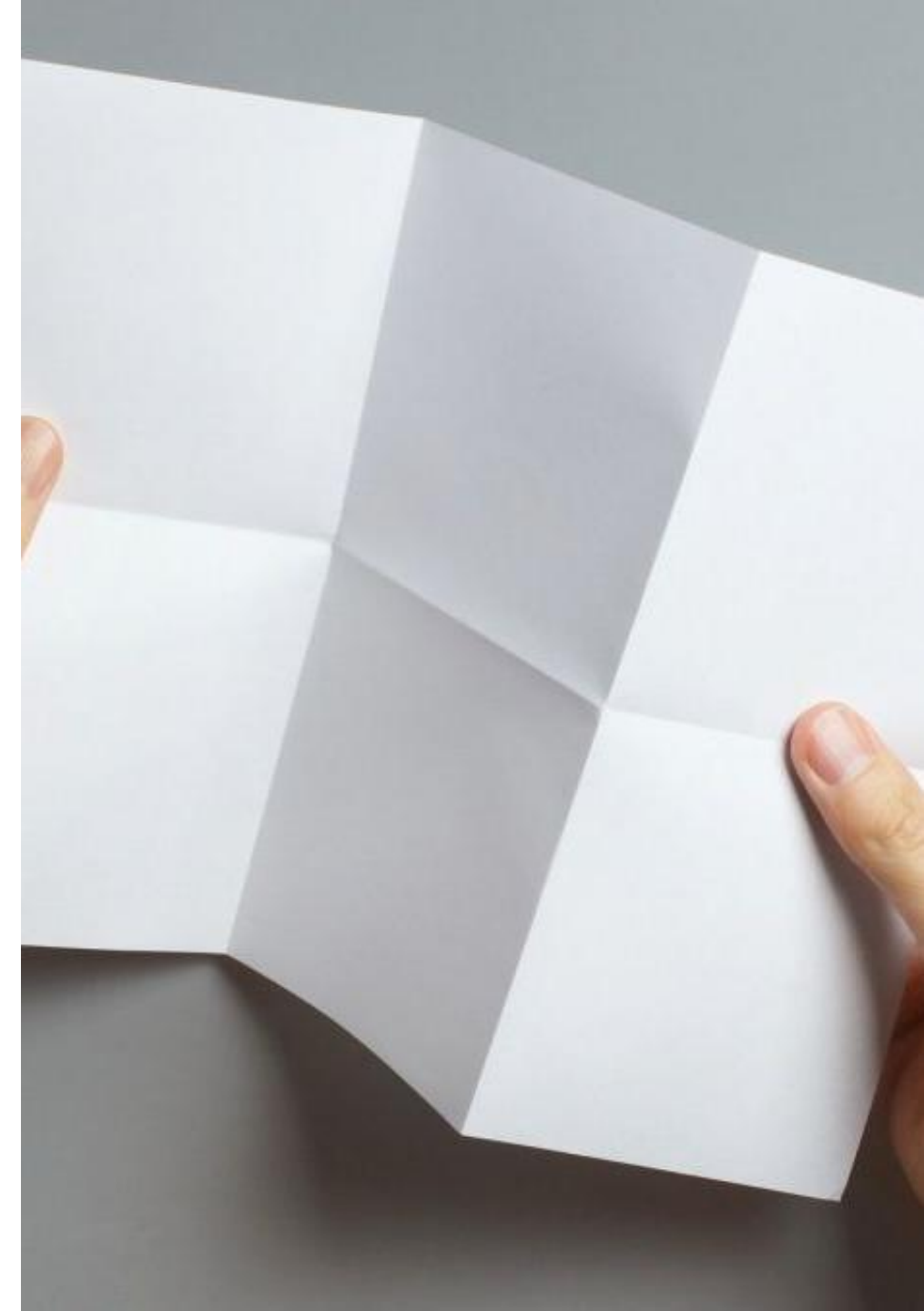
EVALUATING SMART TARGETS



- Let's say the target you wrote was:
 - *By the end of Year-4, Aidan will be able to use an appropriate focussing strategy when he is off-task with prompts from an adult.*
- How could you evaluate this using response to intervention?

STRESS REGULATION: CALMING TOOLKIT

- Fold your paper to create 6 sections. Write a strategy or useful resource in each section to create a “calming toolkit” for your classroom (e.g., breathing exercises, sensory toys, visual timers).
- Reflect on how teaching these techniques to children can help them self-regulate in stressful situations.



ATTENTION

A state in which cognitive resources are focused on certain aspects of the environment rather than on others and the central nervous system is in a state of readiness to respond to stimuli.



ATTENTION

- According to the American Psychological Association (APA):
 - It has been presumed that human beings do not have an infinite capacity to attend to everything, instead focusing on certain items at the expense of others.
 - Much of the research in this field has focussed on the factors that influence attention and the neural mechanisms that are involved in the selective processing of information.
- Attention is defined by its limited capacity (our "attention span") and its response to meaningful sensory stimuli (like sounds and sights).

LURIA (1973)

Reflexive attention	Volitional attention
An involuntary response to external stimuli. It is triggered by sudden changes in the environment.	Deliberate and conscious effort to focus on specific tasks or information. It is guided by our goals, intentions, and prior knowledge.
Fast and automatic, requiring no conscious effort. It helps us quickly respond to potential threats or important changes in our surroundings.	Slower and requires more cognitive resources. It allows us to maintain focus on a task despite distractions and to switch focus between tasks as needed.
Present from a young age.	Development continues into early adulthood.
Higher order cognition is <i>not</i> required.	Higher order cognition <i>is</i> required.



THE DINNER PARTY EFFECT

- Imagine you're at a party with lots of people talking, but you can still pay attention to the person you're speaking with, even though there are many other conversations happening around you. This effect shows how our brain can filter out background noise and focus on what's important to us.
- If you hear your name spoken across the room, your attention will be automatically drawn to the mention of your name. This happens because your brain is particularly attuned to personally relevant information, like your name, even when you are concentrating on something else

TASK: FIVE ATTENTIONAL SKILLS

Attentional skill	Definition
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1. Suppressing attention	A. The capacity to maintain focus and alertness over time, or vigilance
2. Focusing attention	B. The ability to inhibit prepotent responses, or to suppress impulsive responses
3. Divided attention	C. The ability to change attentive focus in a flexible and adaptive manner
4. Sustaining attention	D. When two or more tasks have to be carried out at the same time
5. Shifting attention	E. The ability to select target information from an array for enhanced processing

ANSWERS: FIVE ATTENTIONAL SKILLS

Attentional skill Definition

1. Suppressing attention	B. The ability to inhibit prepotent responses, or to suppress impulsive responses
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HIERARCHY: FIVE ATTENTIONAL SKILLS

Attentional skill	Definition
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Focusing attention	The ability to select target information from an array for enhanced processing
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Sustaining attention	The capacity to maintain focus and alertness over time, or vigilance
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Suppressing attention	The ability to inhibit prepotent responses, or to suppress impulsive responses
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Shifting attention	The ability to change attentive focus in a flexible and adaptive manner
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Divided attention	When two or more tasks have to be carried out at the same time
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STROOP TEST ACTIVITY

Exploring Cognitive Flexibility and Inhibitory Control

How to Perform the Stroop Test

List 1 (Congruent Colors):

- Words and ink colors match. Read the ink color aloud.
- Example: If the word 'RED' is in red ink, say 'Red.'

List 2 (Incongruent Colors):

- Words and ink colors do not match. Ignore the word and read only the ink color aloud.
- Example: If the word 'RED' is in blue ink, say 'Blue.'

Goal: Complete each list quickly and accurately while focusing only on the ink color.

Congruent Colors (List 1)

RED	GREEN	RED	BLUE	BLACK	GREEN	YELLOW
GREEN	RED	YELLOW	BLACK	BLACK	BLUE	ORANGE
ORANGE	ORANGE	BLUE	GREEN	RED	YELLOW	GREEN
BLUE	BLUE	BLACK	ORANGE	YELLOW	YELLOW	ORANGE
YELLOW	GREEN	BLACK	RED	BLUE	BLACK	RED
ORANGE	BLACK	RED	YELLOW	GREEN	ORANGE	BLUE

Incongruent Colors (List 2)

BLUE	RED	RED	GREEN	GREEN	BLACK	YELLOW
GREEN	YELLOW	BLACK	BLUE	ORANGE	BLACK	ORANGE
YELLOW	RED	BLUE	ORANGE	YELLOW	ORANGE	RED
GREEN	BLUE	BLACK	RED	ORANGE	GREEN	YELLOW
BLUE	ORANGE	GREEN	YELLOW	BLACK	BLACK	RED
RED	YELLOW	BLUE	BLUE	GREEN	ORANGE	BLACK

REFLECTION

- How did List 2 feel compared to List 1?
- What does this tell us about managing distractions and cognitive interference?
- How can this relate to challenges children face in the classroom?



ASSESSMENT OF ATTENTIONAL SKILLS

- Attention is an executive function and therefore tends to be alluded to within more holistic assessments of executive functioning, including:
 - The BRIEF-2 (Gioia et al., 2015)
 - The Executive Skills Questionnaire, parent/ teacher and student versions (Dawson & Guare, 2010)
 - The executive functions rating scale from Salford EPS

CAN WE INTERVENE WITH CHILDREN'S ATTENTIONAL SKILLS?

The brain's structure influences how attention develops in children, while the environment determines how much of this potential is achieved.

The primary classroom gives teachers a great chance to improve the environment for students, helping them develop and enhance their attention skills.

ATTENTION TRAINING VS. ATTENTION STATE TRAINING

- There are two broad methods of attentional intervention (Petersen & Posner, 2012):
 - Attention training focuses on improving specific cognitive skills through repetitive practice and structured tasks.
 - Attention state training aims to achieve a state of improved attention and self-regulation through practices that enhance overall mental state.

ATTENTION TRAINING



Computer-Based Exercises: Programmes designed to enhance attention through tasks like memory games, puzzles, and reaction time activities.



Classroom Activities: Structured tasks such as sorting exercises, sequencing activities, and timed tasks to improve focus and attention span.



Cognitive Behavioral Techniques: Strategies like goal-setting, self-monitoring, and feedback to help students improve their attention skills.

ATTENTION STATE TRAINING



Mindfulness Meditation: Practices that involve focusing on the present moment, such as breathing exercises and body scans, to improve sustained attention and reduce stress.



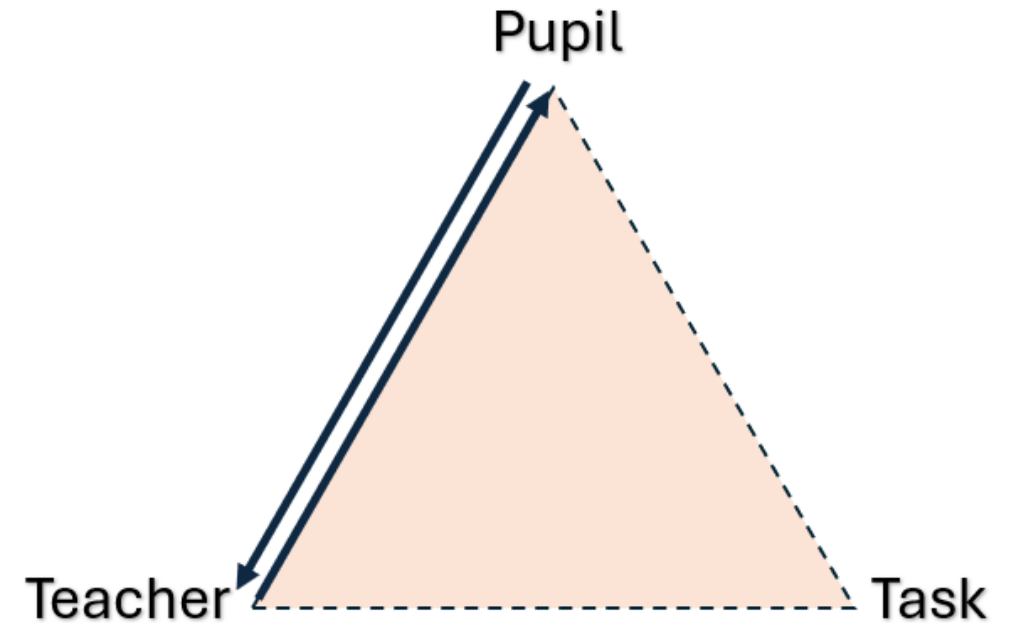
Integrative Body-Mind Training (IBMT): A form of meditation that combines relaxation, mental imagery, and mindfulness to enhance attention and self-regulation.



Yoga and Tai Chi: Physical activities that incorporate mindfulness and focus on body movements, helping to improve attention and reduce anxiety.

FACTORS AFFECTING ATTENTION

- Neurodevelopmental conditions
- Life experiences
- Attachment style
- Sensory processing differences
- Emotional and behavioral need
- Sleep and nutrition
- Classroom environment
- Curriculum demands



CASE STUDY

Alex is a 7-year-old student in Year 3. His class comprises of 26 students, with one teacher and a teaching assistant. He is a bright, curious child who enjoys creative activities like drawing and building with LEGO. However, there are concerns about his ability to focus, manage tasks, and regulate his emotions, particularly in structured classroom settings. These difficulties are impacting his academic performance and social interactions with peers.

Alex struggles to maintain attention during teacher-led activities and often appears distracted by noises or movements in the classroom, which is open-plan. When his teacher gives verbal, multi-step instructions, Alex often seems overwhelmed and needs reminders to begin. He frequently starts tasks but does not complete them, leaving his work unfinished or rushing through it with errors. Alex becomes frustrated quickly when he finds tasks challenging, sometimes leading to tears or refusal to continue. He struggles to wait his turn during group activities and can become upset if he feels ignored or left out.

Alex has difficulty organizing his belongings, frequently misplacing his pencil case, worksheets, or lunchbox.

While Alex enjoys playing with friends, he often interrupts others or shifts the focus of group activities to suit his interests, which can lead to conflicts.

At home, Alex's parents have noted that mornings are chaotic, often resulting in Alex arriving at school feeling unsettled. His parents are supportive but admit they struggle to establish consistent routines or enforce clear expectations.

Questions

What are Alex's strengths and needs? Consider these in relation to executive functions and attention skills.

What factors are contributing to Alex's difficulties?

What strategies would you put in place to support Alex?