Outsourcing Executive Function with AI

How Generative AI Tools Can Assist in Managing ADHD-Related Challenges

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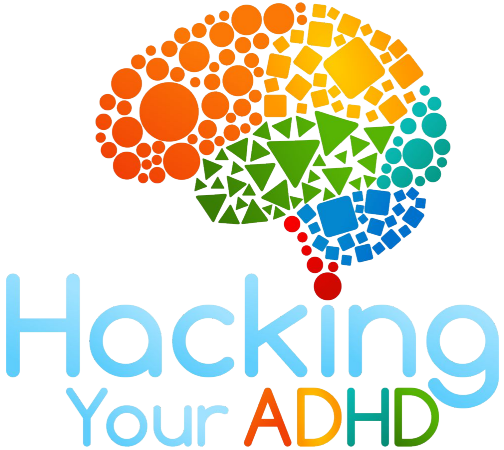


Executive Functions

Executive functions are like the brain's control center, guiding us when we're not on autopilot.

Dr. Russell Barkley's model of Executive Functions

- Primarily about self-regulation, particularly the ability to manage time and behavior to achieve future goals.

Executive functions are often broken into three core categories:

- Working Memory
  - Difficulty remembering steps in tasks, such as forgetting an ingredient mid-recipe.
- Cognitive Flexibility
  - Struggling with unexpected changes; ADHD individuals may excel in creativity but have trouble adapting to surprises.
- Inhibitory Control
  - Difficulty resisting distractions or impulses, such as ignoring background noise during tasks.

Using Executive Functions

We use EFs in a variety of ways including:

- Paying attention
- Organizing, planning, and prioritizing
- Starting tasks and staying focused on them to completion
- Understanding different points of view
- Regulating emotions
- Self-monitoring (keeping track of what you're doing)

Long-term Impact of Executive Functions

Crucial for success

- Executive functions help with self-regulation, especially when working toward long-term goals, like resisting distractions in favor of productivity.

Executive function deficits

- People with ADHD may struggle with self-regulation, planning, and managing time due to weakened executive functions.

Important to understand that while common, EF difficulties are not part of an ADHD diagnosis.

What is AI?

In computer science, **artificial intelligence (AI)** refers to systems or algorithms designed to **simulate human cognitive functions** like learning, reasoning, problem-solving, perception, and language processing. True AI systems are built to adapt and improve from data,using a few key approaches:

- Machine Learning
- Deep Learning
- Natural Language Processing
- Computer Vision

AGI is beyond the scope of this presentation

It’s Not Always “AI”

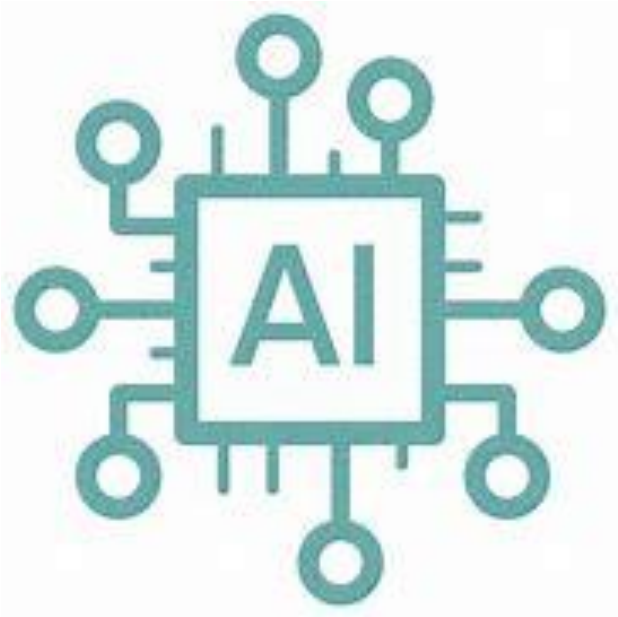
AI as a buzzword can also make navigating this field more complex

- Basic automations
- Advanced analytics or algorithms
- Predefined responses or templates

Real AI (Computer Science): Adapts and improves autonomously through learning from data. It can process, predict, and provide insights based on complex models that simulate aspects of human intelligence.

Misused "AI" (Marketing/Pop-Tech): Often encompasses any automation or data-driven application without genuine learning or adaptation. It’s applied to systems that follow pre-set rules and lack the ability to independently evolve based on new data.

Generative AI



Large Language Models

- ChatGPT (OpenAI)
- Claude (Anthropic)
- Co-Pilot (Microsoft)
- LLama (Meta)
- Gemini (Google)

At this point the specific model isn't particularly important and each will continue jockeying for "first place" - ignore the hype and use what works best for you

Use Cases

- Educational Support:
  - AI-based tools are helping students with ADHD by offering personalized learning plans and accommodations.
- Task Management and Productivity:
  - AI-powered productivity tools are being used to help individuals with ADHD stay organized and on track.
- AI for Early Diagnosis:
  - In addition to supporting treatment, AI and LLMs are increasingly being used for early ADHD diagnosis.
- Customized Therapeutic Sessions:
  - providing behavioral prompts and engaging in interactive scenarios but do provide some ethical concerns.

Use Cases (cont)

- Task Prioritization
- Daily or Weekly Planning
- Organization Tips
- Blank Page Syndrome: Cut down on Executive Function needs by providing a starting point

Prompting Guide

Prompt Engineering

- Becoming far less necessary
- You still need to know how to ask for what you want

Bad prompts give bad outputs because generative AI does not “know” the difference between good output and bad output

Best Practices

Ask AI to cite sources when necessary

Asking for multiple examples

Using prompts to have the AI ask you questions (but one at a time)

Example Prompts

- I need help figuring out what I want to prioritize this months can you ask me a few questions to help me figure out what I should focus on first? Please ask me these questions one at a time.
- Help me create a daily plan that includes timed work and break intervals to help me stay focused on a project for 2 hours in the morning and 2 hours in the afternoon.
- Help me prioritize these tasks: [list of tasks]. I need to focus on the most urgent and important ones first.
- I’m planning a project with a deadline in one month. Can you help me break it down into weekly goals, including time for unexpected delays?
- Can you explain the pros and cons of this decision from multiple perspectives, including ethical, financial, and environmental angles?

ChatGPT - Clean Up Together — Tidy Rooms

Prompt:

How should I approach cleaning up this counter?

1. Clear Out Trash and Recycling

- Start by removing anything that's obviously trash or recyclable, like empty packaging (the M&M bag, wrappers, and anything else disposable).
- Look for paper products, like the napkins or tissues, and toss those.
- Get rid of the banana peels and any other food waste on the counter.

2. Sort and Group Items

- **Water Bottles and Cups**: I see several reusable water bottles and cups (the colorful ones on the right and scattered around). Group them together in one spot to later take to the sink or wherever they belong.
- **Art Supplies**: Gather the paintbrushes, markers, and any other craft items. You could set up a designated bin or drawer for art supplies once sorted.
- **Personal Care Items**: I notice several skincare and other personal products (e.g., lotions, sanitizer, medicine bottles). Group all of these together, and relocate them to the bathroom or storage space.
- **Tools**: There's a drill on the counter. Set aside any tools and hardware into a separate pile to move to your garage or toolbox later.

3. Return Kitchen Items

- Move any food items, like the box of Triscuits, ketchup bottle, and apple cider jug, back to the pantry or fridge.
- The coconut on the counter—if it's for cooking, place it with your fresh produce or fridge; if it's decorative, find a more permanent spot for it.
- Any kitchen appliances like the blender should stay organized in one section.

4. Consolidate Paperwork

- Any papers, notebooks, or cards should be put into a stack. You can sort through them after the counter is cleared to decide what needs to be kept, tossed, or filed.

5. Tidy Miscellaneous Items

- Any random items, like the hats or jackets on the counter, can be grouped to take to their appropriate storage (coat rack or closet).
- Toys or other non-kitchen items should also be put aside in their designated spot.

Other Tools for EF Support

Ways we use Executive Functions

- Paying attention
- Organizing, planning, and prioritizing
- Starting tasks and staying focused on them to completion
- Understanding different points of view
- Regulating emotions
- Self-monitoring (keeping track of what you're doing)

Tools to Help

- Goblin Tools
- Todoist and Microsoft To-Do
- Trello and Asana
- Clockwise and Reclaim.ai
- Otter.ai and Scribe
- GrammarlyGo
- Autistic Translator

Limitations of AI Tools

Not foolproof: AI tools provide starting points but shouldn’t replace the need for careful planning and doing the work.

Avoid blind reliance: Always check the accuracy of AI-generated content, as AI can make mistakes or "hallucinate" incorrect information.

Ethical Concerns

- Data Privacy
- Bias in AI (how was the data trained?)
- Over-reliance on AI (although watch out for when we start hearing that AI causes ADHD)
- Transparency and Accountability
- Ethical Use of AI in Mental Health
- Acquisition of Training Data

Citations

[2307.14385] Mental-LLM: Leveraging Large Language Models for Mental Health Prediction via Online Text Data

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