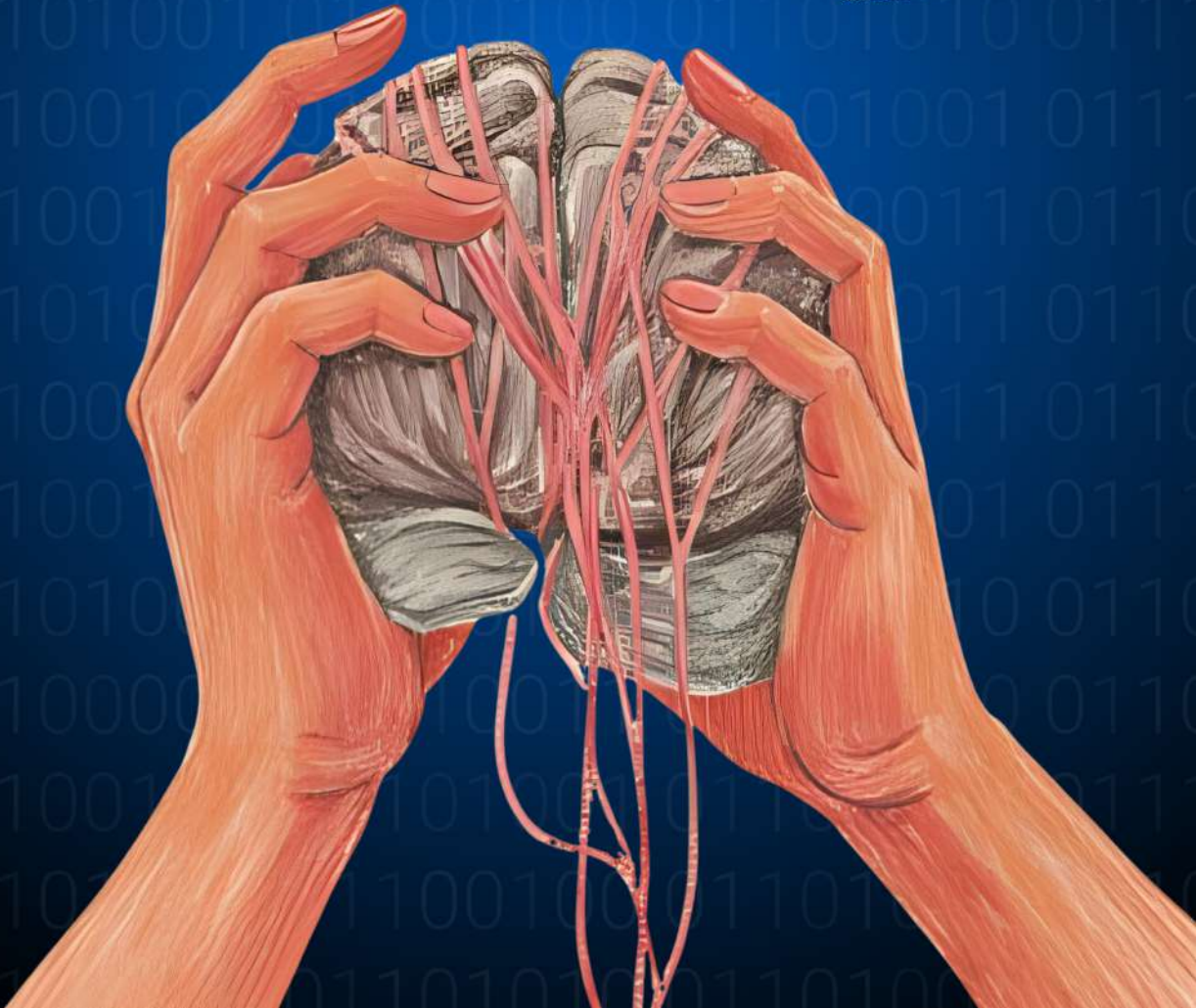




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CHATGPT'S

EFFECT ON YOUR BRAIN: A CAUSE FOR CONCERN?





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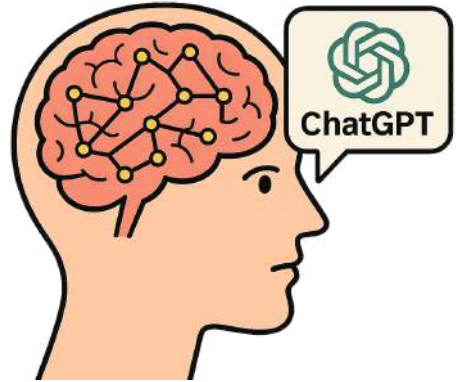
By Midhet Mansoori, Rida Salman, and Momin Waleed, Research Interns

Midhet is an A-Level student committed to creating social impact, advancing gender equity and promoting economic literacy- empowering youth through media, economics and advocacy.

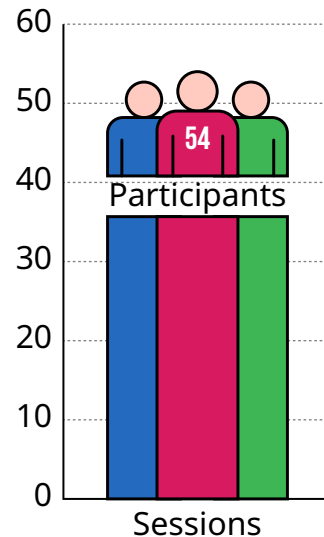
Rida is a university student with a deep interest in economics and how it affects people's everyday lives. She's particularly focused on issues like inequality, access, and digital safety in an increasingly connected world.

INTRODUCTION

MIT's recent study, "Your Brain on ChatGPT", has drawn significant attention for its intricate breakdown of how AI tools, specifically large language models (LLMs) like ChatGPT impact the human brain. This blog post will walk you through the findings of the study, its implications for the tendency to over-rely on LLMs in education, workplaces, and beyond, and tips on how to avoid this overreliance.



The researchers in the study unpacked neural engagement using EEG data and how AI writing influences memory and personal connection to one's work. The research tracked 54 adults over four sessions lasting four months. The participants were divided into groups including those using no tools, those using a search engine and ChatGPT. Their roles were swapped in the fourth session, where the LLM group participants were asked to use no tools (referred to as LLM-to-Brain), and the Brain-only group participants were asked to use LLM (Brain-to-LLM).



During every session the data was carefully monitored, allowing a score to be noted down, using both human observers and an AI Judge. The NLP analysis revealed a measurable difference in neural connectivity, writing quality and recall which offered important insights into how deeply LLMs may shape not how we think but what we write.

One finding of the study is that the writing produced by ChatGPT tended to be less original and more formulaic, where essays that were evaluated scored lower than those written without the use of AI just minutes prior by the same participant. The research described how LLMs generate text by predicting the next word based on patterns in massive datasets such as ChatGPT and often lack creativity altogether.

During the fourth session, however, a surprising discovery emerged. In this session, the roles were swapped, so the Brain-only participants were asked to use LLM (Brain-to-LLM), and vice versa. Having already developed their own original ideas in the previous session, in this session the Brain-to-LLM group showed heightened neural activity across the cognitive bands being measured: attention, memory load, semantic processing, and engagement.

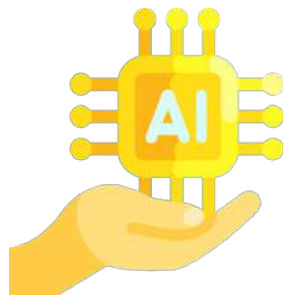
This key finding demonstrates that ChatGPT or similar LLMs do not make you 'dumber', as long as you don't hand over the thinking to them too soon in the process. It's a matter of smartly using a combination of your own brain power and using the LLM as a tool to possibly enhance your capacity.

Conversely, during the session it was observed that reported ownership of the LLM-to-Brain group's essays was low, and they fell behind in their ability to quote from the essays they wrote just minutes prior, demonstrating how the use of such tools affects the brain in processing certain scenarios.

In the study, the researcher used a term called "cognitive debt", which they define as a mental burden on someone overly relying on shortcuts instead of understanding or remembering something. Think of it as mental laziness that builds up over time, every time you use an LLM to replace an instance of critical thinking. The researchers refer to cognitive debt as the result of an individual failing to critically engage with a subject; their writing might become biased and superficial with the use of AI to replace this critical engagement. This accumulation of cognitive debt replaces the cognitive processes required for independent thinking, as it can impair critical thinking creativity and memory over time.

WHY THIS MATTERS

While the study's findings are quite interesting, they point to a much deeper issue. There is an obvious impact on education of using LLMs as aids. As students begin to use tools like ChatGPT to pass their courses, they skip the learning curve entirely. This means they now lag in developing critical thinking skills compared to their peers who did not rely on AI assistance. Taking this further, these same students will be utterly unprepared as they lack the cognitive skills required to excel in their professional careers. All ideas will start to become redundant, with no unique, out-of-the-box solutions. Cognitively, it's going to set us back by centuries. It's worth noting that the study also found that when participants relied on LLMs before engaging in independent thought, their neural activity remained low. In contrast, those who first reflected and then used AI to polish their work showed heightened brain engagement.



Apart from individual students or careers, there are broader implications for society as a whole. Over-reliance on AI could diminish the art of writing, and eventually, it could dilute art itself, with AI generating everything from images to audio. By asking AI to make decisions for us, we risk losing the ability to reason ethically and independently. As a society, we may slowly become incapable of making honest, thoughtful decisions. Humans will gradually become unable to lead other humans. What's more, is that when most people end up using the same tool to generate their work, it kills both individuality and culture. In turn, this also reinforces the ideas behind the 'Dead Internet Theory', which suggests that most online content is now produced by bots and AI rather than real people.

Now let's be honest. We've all been tempted to let ChatGPT do our assignment for us. It's an incredibly easy fix. However, using AI isn't the issue, it's how we use it that's the problem. AI-powered tools can be pretty useful, even when used within ethical boundaries. They can help us rephrase, brainstorm, or refine our work. But real learning stems from struggle—the journey from forming an idea to bringing it to fruition.

TIPS TO AVOID OVER-RELIANCE ON AI

To avoid integrating AI into your work, start by brainstorming ideas about the subject and writing down a draft yourself. Even in cases where it seems impossible to think of ideas, use the browser to search for relevant media, such as articles, videos and blogs and through fuelling your knowledge and making pointers. However, once done, then you may take the help of AI to make sure you haven't left out any point rather than letting AI do your work. Therefore, don't let it dictate your thinking and decision-making.

Similarly, play with your psychology. Push yourself to write on intricate and debatable topics, explore your self-capacity and do not let yourself be handicapped by artificial intelligence. AI is meant to be more of a helping tool rather than a cheat sheet or a shortcut; it's there to give assistance to everyday tasks and not to replace the effort behind it.

CONCLUSION

As discussed earlier, AI is rapidly advancing in various fields, including education and the corporate world. It is essential for us to establish a balance in its use. While AI can significantly reduce time consumption and increase efficiency, it should never replace human intelligence. Additionally, over-reliance on AI may hinder our independent thinking and problem-solving abilities.

The goal is not to eliminate AI but to limit its usage and ensure that we use it wisely, thereby enhancing our productivity and cognitive skills. Therefore, the question to ponder upon is: Are we using AI to expand our potential, or are we using it to avoid our responsibilities?



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