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Over Reliant on Artificial Intelligence and Their Depleting Effects on Natural Intelligent Quotient: A Critical Review

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Abstract- ***Artificial intelligence (AI) has emerged as a transformative force in the twenty-first century, reshaping education, healthcare, business, governance, and everyday social interaction. The widespread accessibility of AI-driven systems, particularly generative and conversational models, has created unprecedented opportunities for human augmentation. Yet, alongside these opportunities lies the danger of overdependence – what may be described as "wrong addiction" to AI – characterized by unreflective reliance that substitutes rather than complements natural intelligence. This critical review synthesizes literature across cognitive psychology, philosophy of technology, and educational theory to examine how wrong addiction depletes natural IQ, especially in the domains of memory, critical thinking, creativity, and social intelligence. Unlike earlier technologies, AI introduces a unique risk through its interactive and generative capabilities, which can encourage cognitive substitution rather than extension. The paper identifies significant gaps in empirical research, particularly concerning long-term impacts of AI dependence on creativity and social cognition, and calls for the development of digital literacy frameworks and pedagogical interventions that safeguard human intellectual resilience in an age of intelligent machines.***

Keywords: Artificial Intelligence, Brain Dormancy, Cognitive Atrophy, Over-reliance, Wrong Addiction

I. INTRODUCTION

The relationship between human cognition and technological innovation has always been fraught with ambivalence. On one hand, tools extend the boundaries of human capability; on the other, they often introduce dependency and reshape fundamental faculties of thought. From the ancient suspicion of writing expressed by Socrates who feared it would erode memory to the modern debates about the internet's effect on attention spans, history demonstrates that technological advances often provoke concerns about intellectual decline. In the current era, artificial intelligence represents the latest and most sophisticated challenge.

Unlike calculators, which merely expedite numerical computation, or search engines, which streamline access to information, AI systems actively generate responses, simulate reasoning, and engage in naturalistic dialogue. These affordances create the impression of partnership, where human and machine seem to share cognitive labor. However, this same capacity invites overreliance: users not only consult AI for information but often outsource judgment, problem – solving, and creativity. Such behavior constitutes what this paper terms wrong addiction – a compulsive, uncritical reliance on AI that undermines rather than enhances natural cognition.

The concern is sharpened by the pervasiveness of AI. In education, students increasingly rely on generative models to produce essays and solve problems; in professional contexts, decision-making is increasingly delegated to algorithmic systems; in personal life, AI companions and chatbots substitute for social interaction. If such trends persist, they may weaken the very faculties - curiosity, memory, critical reasoning, and empathy that define natural human intelligence. This paper provides a critical review of the literature on this phenomenon, evaluating evidence, identifying gaps, and proposing avenues for future research.

II. OVER RELIANT EFFECTS

Causes brain dormancy and its resultant dangers

The concept of *brain dormancy* can be understood as a cognitive state in which the natural faculties of the human brain - such as memory, problem-solving,

creativity, and critical thinking - become underutilized due to over-reliance on external aids like artificial intelligence, digital assistants or automated systems. Although the brain remains biologically active, its higher-order cognitive processes are left unchallenged, leading to a kind of "mental idleness." Neuroscientific research supports the principle of "use it or lose it," which suggests that neural pathways weaken when they are not consistently engaged, just as muscles atrophy from disuse (Draganski *et al*., 2006).

AI and Cognitive Atrophy/Offloading: Memory as the First Casualty

One of the most immediate dangers of brain dormancy is cognitive atrophy, where the underuse of memory and reasoning skills weakens neural connections that are critical for analytical thinking. Studies have shown that technology-mediated cognitive offloading such as using GPS devices for navigation can impair the hippocampus's role in spatial memory, making individuals less capable of independent orientation (Dahmani & Bohbot, 2020). In a similar vein, outsourcing calculations to digital devices has been associated with a decline in mental arithmetic skills among students, suggesting that when tasks are automated, the brain stops exercising those functions (Geary, 2011).

One of the earliest and most studied effects of technology on cognition is cognitive offloading, the delegation of memory or reasoning tasks to external systems. Sparrow, Liu, and Wegner (2011) demonstrated that individuals who believed information was retrievable online were less likely to remember it themselves, a phenomenon now referred to as the "Google effect." With AI, this tendency intensifies. Instead of searching and filtering results, users receive synthesized responses, further reducing the incentive to encode and retain knowledge.

The University of London (2005) reported that digital interruptions and reliance on external devices reduced workplace IQ scores more than psychoactive substances such as cannabis. Although this study predated advanced AI, its implications are clear: overdependence on technological mediation weakens mental endurance and attentional capacity. In educational contexts, where learning traditionally depends on rehearsal, recall, and cognitive struggle. AI threatens to displace formative experiences that anchor long-term memory.

Critical Thinking and Intellectual Agency

Beyond memory, natural intelligence thrives on the ability to analyze, question, and evaluate evidence. Critical thinking is cultivated through grappling with uncertainty and engaging in debate. AI-generated content, however, is often presented with syntactic fluency and persuasive coherence, even when factually flawed. This creates what Floridi (2014) describes as "epistemic opacity," where users are unable to discern the reliability of machine-generated knowledge.

Turkle (2017) warns that when individuals accept machine outputs uncritically, they risk intellectual passivity. In such cases, users may acquire answers but lose the intellectual agency to challenge them. Wrong addiction, therefore, is not only a cognitive deficit but also a democratic concern, as citizens who cannot critically interrogate algorithmic information may become vulnerable to misinformation and manipulation.

Another danger lies in the erosion of critical thinking. By accepting machine-generated content without scrutiny, individuals risk becoming passive consumers of information rather than active evaluators. This problem is particularly concerning in the age of generative AI and deepfake technologies, where misinformation can spread rapidly. Without the habit of questioning and validating information, individuals and societies become increasingly vulnerable to manipulation (Floridi & Chiriatti, 2020).

Creativity, too, is at risk. When humans outsource idea generation, design, and problem-solving to AI systems, their own imaginative faculties may stagnate. Chaytor and Schacter (2021) argue that imagination and innovation are products of effortful cognitive recombination of knowledge; when effort is removed, creative thought may diminish. Over time, this reliance could produce a society that is technologically advanced but creatively impoverished.

The problem of decision-making vulnerability further compounds these effects. AI is increasingly deployed in high-stakes sectors like healthcare, finance, and defense, where human actors may defer excessively to machine recommendations. Research on automation bias suggests that individuals are likely to trust machine outputs even when errors are evident, leading to poor decision outcomes when technology fails (Mosier & Skitka, 2018). Thus, over-reliance fosters a fragile human decision-maker who may be unable to act confidently or competently in the absence of AI support.

Memory and learning are also impacted. Sparrow, Liu, and Wegner (2011) found that the availability of search engines has altered human memory patterns, with people remembering where to find information rather than the information itself. While this "Google effect" improves efficiency, it also reflects a reduction in the brain's capacity to retain knowledge internally, creating shallow learning experiences that do not build long-term intellectual resilience.

Finally, the psychological and social dangers of brain dormancy cannot be overlooked. Dependence on AI can erode self-confidence and promote learned helplessness, where individuals feel incapable of solving problems without technological support (Maier & Seligman, 2016). Moreover, as moral reasoning and empathy are increasingly delegated to algorithms, the subtle human dimensions of judgment and social intelligence may be diminished, affecting interpersonal relationships and ethical decision-making.

Creativity and the Risk of Homogenization

Creativity represents one of the most celebrated dimensions of human intelligence, traditionally seen as resistant to automation. Generative AI challenges this assumption by producing art, music, and literature that mimic human expression. While these tools can serve as sources of inspiration, overdependence risks homogenization of creativity. Carr (2010) argues that deep creativity arises from prolonged engagement, synthesis of diverse experiences, and persistence through difficulty. By contrast, AI delivers instant novelty without struggle. The danger lies not in AI surpassing human creativity but in humans internalizing derivative patterns generated by machines. When creators lean excessively on algorithmic prompts, they risk echoing machine recombination's rather than cultivating authentic originality. In this sense, wrong addiction depletes the resilience and imaginative risk-taking central to natural intelligence.

Social and Emotional Intelligence in the Age of AI Companions

An often-overlooked aspect of natural IQ is social and emotional intelligence - the ability to empathize, negotiate relationships, and navigate interpersonal conflict. The rise of AI companions and conversational agents introduces new risks in this domain. While such systems can provide comfort and simulate dialogue, their predictability lacks the complexity of authentic human interaction. As Turkle (2017) emphasizes, empathy is cultivated through navigating the unpredictability of real relationships, not through exchanges with programmed responses.

Overreliance on AI companionship may, therefore, attenuate the capacity for deep human connection. This is particularly concerning for younger users who may form relational habits with AI that discourage vulnerability, patience, and negotiation - skills essential for emotional maturity. Wrong addiction here depletes not intellectual faculties alone but also the socio-emotional dimensions of natural IQ.

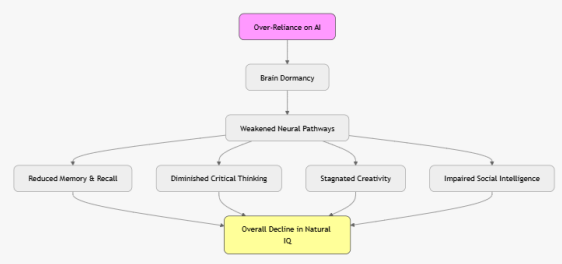
III. CRITICAL SYNTHESIS AND EMERGING GAPS

The literature reviewed converges on several key insights: technological dependence erodes memory, diminishes attention, and encourages cognitive shortcuts; AI amplifies these effects by providing generative, interactive, and seemingly authoritative outputs; and wrong addiction risks substituting machine cognition for human reasoning. However, significant gaps remain.

First, empirical studies specifically targeting AI are still scarce. Most evidence derives from earlier research on internet use, smartphones, or digital distractions. The unique interactivity of AI warrants dedicated longitudinal studies. Second, while cognitive aspects such as memory and critical thinking have received attention, domains like

creativity and social intelligence remain underexplored. Third, little is known about how educational and cultural contexts mediate wrong addiction - whether certain pedagogical practices, for example, can encourage reflective AI use rather than blind dependence.

IV. FUTURE RESEARCH DIRECTIONS



Future scholarship should prioritize empirical studies that measure the cognitive and emotional impacts of prolonged AI use. Experimental designs could examine whether students who rely on AI for assignments demonstrate weaker retention and transfer of knowledge over time. Longitudinal studies could track how AI companionship shapes empathy and relational skills among adolescents. Cross-cultural research could reveal whether different societies, shaped by varying educational philosophies, exhibit distinct vulnerabilities to wrong addiction.

Moreover, research must move beyond pathology to explore strategies of resilience. What pedagogical interventions foster balanced AI use? How might design ethics encourage systems that prompt reflection rather than passive acceptance? Addressing these questions will be essential for ensuring that AI enhances rather than depletes natural intelligence.

V. CONCLUSION

The phenomenon of over reliant on AI illustrates the paradox of technological progress: tools designed to amplify human intelligence may, when misused, weaken the very faculties they seek to enhance. Unlike earlier technologies, AI's generative and interactive capacities foster substitution rather than extension of cognition, raising risks of diminished memory, critical thinking, creativity, and social intelligence. This review highlights the urgent need for critical literacy, ethical frameworks, and empirical research to safeguard natural IQ in an AI-saturated age. The challenge is not to resist AI but to cultivate reflective practices that preserve human uniqueness while embracing technological innovation.

Brain dormancy is not simply a metaphorical concern but a real cognitive risk emerging from the overuse of artificial intelligence and digital automation. It undermines critical faculties across memory, creativity, decision-making, and judgment, posing significant dangers to both personal development and collective human progress. While AI offers immense advantages, unchecked dependence could result in the gradual depletion of the very qualities that distinguish human intelligence.

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