ISSN: 2349-6002

Human-AI Interaction and cognitive creativity: A Psychological Perspective

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doi.org/10.64643/IJIRTV12I8-190931-459

***Abstract*—The Rapid integration of artificial intelligence (AI) into everday human activities has transformed how individuals think, create and solve problems. This paper examines the relationship between Human-AI interaction and cognitive creativity from a psychological perspective. Drawing on therios of creativity, cognition and human- computer interaction the study explores how AI systems influence creative thinking processes, including divergent thinking, problem-solving and metacognition. The paper reviews existing literature, proposes a conceptual framework for understanding AI-supported creativity and discusses psychological benefits, risks and ethical considerations. Implications for research, education and applied psychology are highlighted.**

***Index Terms*—human-AI interaction, cognitive creativity Psychology, Artificial intelligence, creative cognition.**

I. INTRODUCTION

Artificial intelligence has become an integral part of modern human life, influencing decision-making, communication, learning and creativity. From generative text models and imange synthesis tools to intelligent turoting systems and creative assistants AI increasingly collaborates with humans in cognitive tasks traditionally considered human. This shift has raised important psychological questions regarding how intersction with AI affects human cognition and creativity.

Creativity is a core component of human cognition, involing the ability to generate novel and useful ideas (Runco & jaeger, 2012). Psychological research has long focused on understanding the cognitive, emotional and social processes underlying creativity with the emergnnce of AI systems capable of producing creative outputs, the boundary between human and machine creativity has become blurred. Human-AI interaction (HAI) provides a framework for examing how humans perceive use and adapt to AI systems during creative tasks.

The purpose of this paper is to examine the role of HAI in shaping cognitive creativity. Specifically, it addresses how AI tools influence creative thimkimg processes the psychological mechanisms involved in human-AI collaboration and the impllications for psychological theory and practice. The paper is organized into sections covering theorectical foundstions literature reviews cognitive mechaisms, benefits and challenges ethical considerations and future research directions.

II. THEORETICAL BACKGROUND

Creativity in cognitive Psychology

Creativity in psychology is commonly defireans the ability to produce ideas or products that are both novel and appropriate (Sternberg & Lubart, 1999). Cognitive theories of creativity emphasize mental processes such as divergent thinking, associative thinking , insight and problems restructuring. Guilford's (1967) model highlighted divergent thinking as a key component while later models incorporated executive functions working memory and metacognition.

From cognitive perspective, creativity is not a single trait but a dynamic process influenced by knowledge, motivation, environment and cognitive control contemporary theories view creativity as an interaction between individual cognition and external tools, making AI a potentially powerful cognitive extension.

Human - AI interaction

Human -AI interaction is an extension of human-computer interactin (HCI) that focuses on intelligent adaptive and autonomous systems unlike traditional

tools AI systems can learn from users, generate content and make recommendations. Psychological aspects of HAI include trust, agency, transparency and perceived intelligence (shneiderman, 2020).

In creative contexts, AI can act as a collaborator, advisor or generator of ideas. This partnership[raised questions about authorship, control and the distribution of cognitive labour between humans and machines.

III. LITERATURE REVIEW

AI As a Creative Tool

Research has shown that AI tools can enhance creative performance by providing inspiration, reducing cognitive load and enabling rapid prootyping (Lubart,2005). Generative AI Systems, such as language and image models can produce a wide range of outputs that stimulate human imagination. studies suggest that exposure to AI- generated ideas can increase divergent thinking, although excessive reliance may reduce originality.

Cogntive offoading and creativity

Cognitive offloading refers to the use of external tools to reduce mental efforts.AI systems can offload tasks such as information retrival, pattern generation and evaluation. While this can free cognitive resources for higher-level thinking it may also lead to reducerd engagement in deep cognitive processing. Psychological research indicates that balanced offloading supports creativity, whereas overreliance may hinder skill development.

Social and Collaboarative Dimensions

Human-AI collaboration shares similarities with human collaboration. Social psychological factors such as attribution, social comparison and feedback influence how users respond to AI is perceived supportive rather than competitive, users show higher creative confidence and engagement.

Cognitive Mechanisms in Human-AI creative Interaction

AI Systems can support divergent thinking, AI can assist in evaluating and refining ideas. The interaction between human judgment and AI- generated options creates a Hybried cognitive process that differs from purely human creativity.

Metacognition and self-Regulation

Metacognition plays a crucial role in creative work, allowing individuals to monitor and regulate their thinking. AI feedback can enhance metacognitive awareness by making implicit patterns explicit. However. opaque AI systems may reduce user's understanding of the creative process, limiting reflective learning.

Motivation and creative self-Efficacy

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Motivation and creative self- Efficacy

Motivation is a key predictor of creativity.AI tools that provide immediate.AI tools that provide immediate feedback and adaptive challenges can enhance intrinsic motivation. Conversely, if users attribute success primarily to AI =, creative self- efficacy may decline. Psychological design of AI systems should therefore support user agency and ownership.

IV. BENEFITS OF HUMAN-AI INTERACTION FOR CREATIVITY

1.Enhanced Idea Generation: Can rapidly generate diverse ideas, expanding the creative search space.

2. Accessibility: AI tools lower barriers to creative expression for individuals with limited technical skills.

3. Personalization: Adaptive AI systems tailor suggestions to individual cognitive styles and preferences.

4. Learning and Skills Devlopment: when used reflectively, AI can serve as a cognitive tutor, modeling creative strategies. these benefits suggest that AI has the potential to augment, rather than

replace, human creativity when designed and used appropriately.

V. CHALLENGES AND RISKS

Overreliance and cognitive Dependency

Excessive dependence on AI may lead to reduced crearive efforts and originality. Psychological research warns Againts automation bias, where users uncritically accept AI outputs.

Loss of Authenticity

The use of AI in creative work. Raised concerns about authenticity and personal expression. Individuals may struggle to distinguish their own ideas from AI-generated content, affecting identity and meaning-making.

Inequality and Access

Unequal access to advanced AI tools may widen creativity gaps across sociecreatic groups, posing challenges educational and social equality.

Ethical Considerations

Ethical issues in Human-AI creative interaction include authorship, intellectual property, transparency and responsibility. Psychologists emphasize the importance of informed use, where users understand AI limitations and biases. Ethical design should prioritize human well- being, autonomy and fairness.

VI. IMPLICATION FOR PSYCHOLOGY AND EDUCATION

Research Implications

Psychological research must devlop new models of creativity that incorporate human-AI systems as part of the cognitive environment. Experinmental designs should examine long- term effects of AI use on creative development.

Educational Implication

In educational settings, AI can support creative learning if integrated with padalogical goals. Educators should emphasize critical thinking, reflection and ethical awareness alongside AI-assisted creativity.

Future Directions

Future research should explore cross- cultural perspectives on Human-AI creativity, developmental differences and doain-specific applicatins such as art, science and the. therapy Interdisciplinary collaboration between psychologists, computer scientists and educators will be essential.

VII. CONCLUSION

Human-AI Interaction represents a significant shift in the cognitive landscape of creativity. From a psychological perspective AI can function as a powerful cognitive partner that enhances creative thinking when used throughtfully. However, risks releted to dependency, motivation and ethics must be carefully managed. By integrating psychological theory with responsible AI design, reserchers and practitioners can ensure that AI supports rather than diminishes human cognitive creativity.

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