The Effects of Human-AI Collaboration on Creativity

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Introduction

How does human-AI interaction in creative tasks (co-creativity) affects human originality and diversity of thought?

Previous work points to homogenization of AI when performing creative tasks: They are overly consistent (homogenized) in their responses, whereas humans exhibit variability

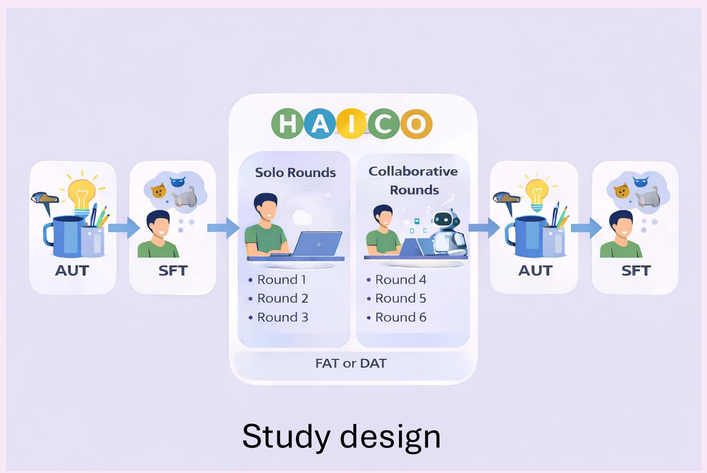
We empirically study whether repeated human-AI interaction in creative tasks impacts human creativity

Participants

100 participants completed the Forward Association Task (FAT; 60.0% female) with a mean age of 43.40 years (SD = 13.40 years)

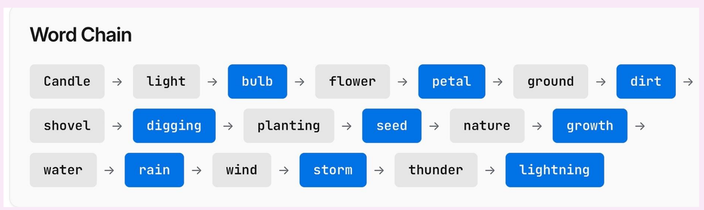
101 participants completed the Divergent Association Task (DAT; 48.5% female) with a mean age of 45.90 years (SD = 12.80 years)

Human-AI Creative Collaboration (HAICCO)



Study design

Solo



Collaborative

HAICCO (**left**) comprises of participants undergoing either FAT or DAT first on their own (solo; **right top**) and then with an AI agent (collaborative; **right bottom**)

Pre- and post-HAICCO, they undergo a creativity assessment task (AUT) and a control semantic retrieval task (SFT)

Cognitive Assessment (Pre/Post)

Alternative Uses Task (AUT) – In two minutes generate all possible creative uses for an object. Responses measured by **fluency** (number of responses) and **originality** (calculated from a LLM, CLAUS)

Semantic Fluency Task (SFT) - in two minutes, generate all category exemplars as possible. Responses measured by **fluency** (number of responses) and **semantic breadth** (FF)

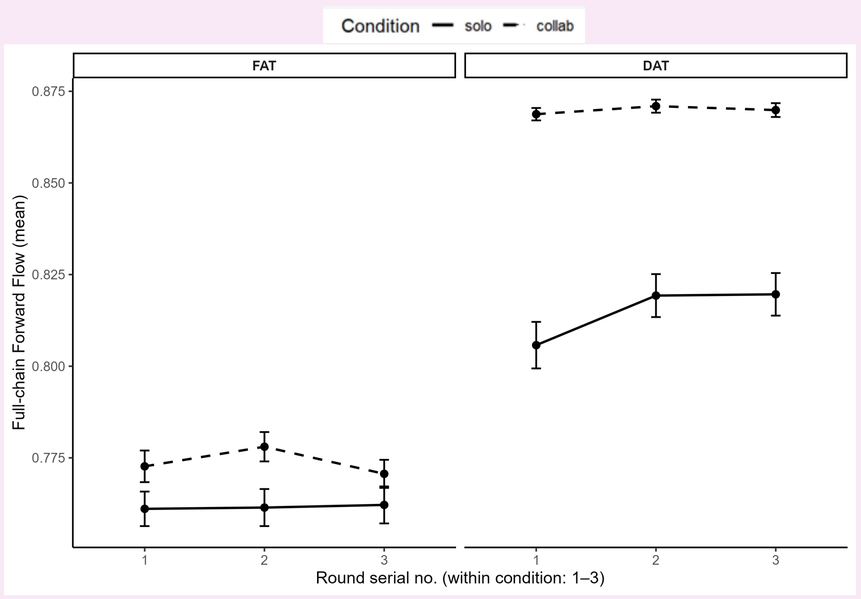
HAICCO Tasks

Forward Association Task (FAT) – Creating a chian of associations, one word at a time. **Forward Flow** (FF) quantitatively measures the semantic/conceptual distance between all pairs of words

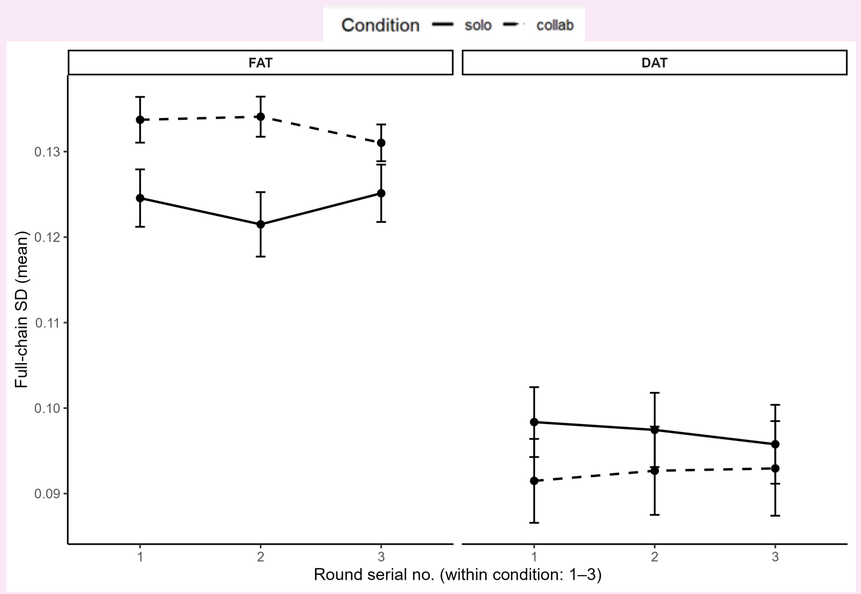
Divergent Association Task (DAT) – Create a list of words as different from each other as possible, one word at a time. **FF** assesses the semantic distance between all pairs of words

Results

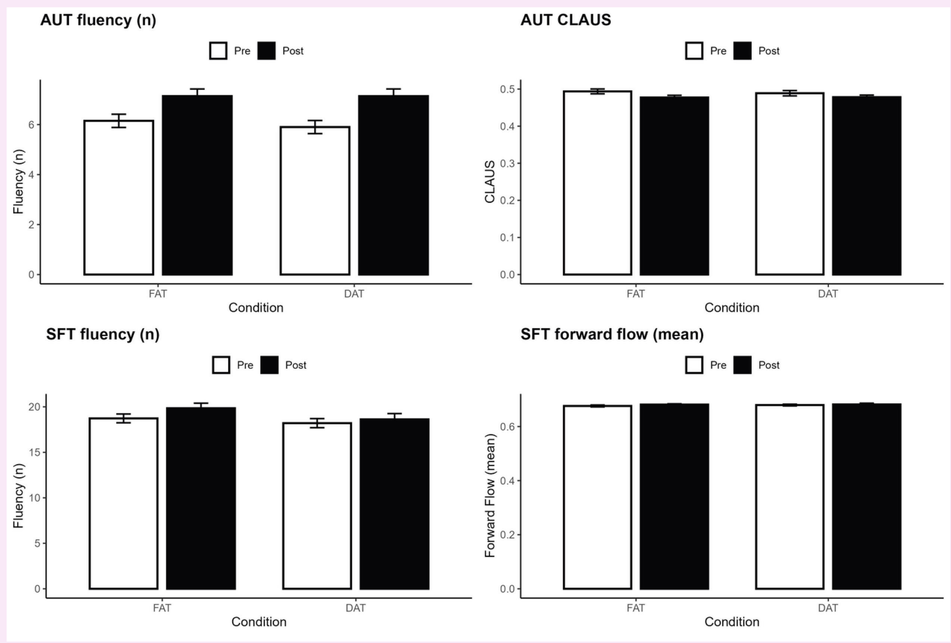
Analysis of Mean



Analysis of Standard Deviation



Regardless of task, collaborative rounds generates more original responses; In the DAT, collaborative rounds are less variable



Top – regardless of task, AUT fluency (left) increases and originality (right) decreases post-HAICCO

Bottom - post-HAICCO, SFT fluency (left) increases in the FAT condition; SFT breadth (right) does not change

Conclusions

Post HAICCO—regardless of condition—participants exhibit higher fluency and lower originality in the AUT, possibly demonstrating AI-based induced homogenization

Human-AI collaboration on the DAT results in lower variability and increased originality, demonstrating homogeneity

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Poster:

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