



Ctrl + Create: The Potential of AI to Permit Unbounded

Creativity



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Introduction

Research Question: In our study, we aimed to find a more specific interaction between AI usage and creativity, and how it might be related to people's creative self-efficacy.

Rationale:

Previous literature has found that AI improves learning outcomes, because it can adapt to the individual needs of students (Zhang, 2021). This connects to our topic because AI can boost people's creativity by tailoring the brainstorm of ideas towards their personality.

Supporting Theories:

- Construal Level Theory (Liberman, 2010): When choices are more psychologically distant, consumers use more abstract levels of construal during decision-making
- Self-Efficacy Theory (Bandura, 1977): People's belief in their ability to execute behaviors determines their motivation and effort
- Creative Self-Efficacy Theory (Tierney & Farmer, 2002): Involves specifically people's belief in their ability regarding creativity.
- Hybrid Human-AI Regulation Theory (Molenaar, 2022): When people use AI, their control and regulation has to shift between the user and AI, which requires metacognitive skills

Hypothesis:

Participants in the AI-allowed condition would produce higher creativity scores than the participants in the no-AI condition.

Interactions:

- Participants with high habitual AI usage were predicted to benefit the most from the AI-allowed condition than those with lower habitual AI usage.
- Participants with high AI media literacy were predicted to benefit the most from the AI-allowed condition than those with low AI-media literacy.
- Participants with low creative self-efficacy were predicted to show greater increases in creativity outcomes with AI-usage.

Measures

- **IV:** Creative Problem-Solving Task (Urban et al., 2024)
 - Open-ended; subjectively coded by four independent inter raters using Torrance Tests of Creative Thinking (Torrance, 1974)
- **Moderator:** ChatGPT Usage Scale (Urban et al., 2024)
 - 1 item, 5-point Likert scale
 - 1-6; median split of ordinal single item; 0-1 binary
- **Moderator:** AI Literacy Scale (Ma et al., 2024)
 - 15 items, 5-point Likert scale
 - 15-75; median split of the summed scale; 0-1 binary
 - $\alpha = .72$
- **Moderator:** Short Scale of Creative Self (Karwowski et al., 2018)
 - 6 items, 5-point Likert scale
 - 6-30; median split of the summed scale; 0-1 binary
 - $\alpha = .71$
- **DV:** Torrance Tests of Creative Thinking (Torrance, 1974)
 - Composite; sum 0-9
 - Overall inter rater $\alpha = .91$
 - Intraclass Correlation Single Measure $B = .71$

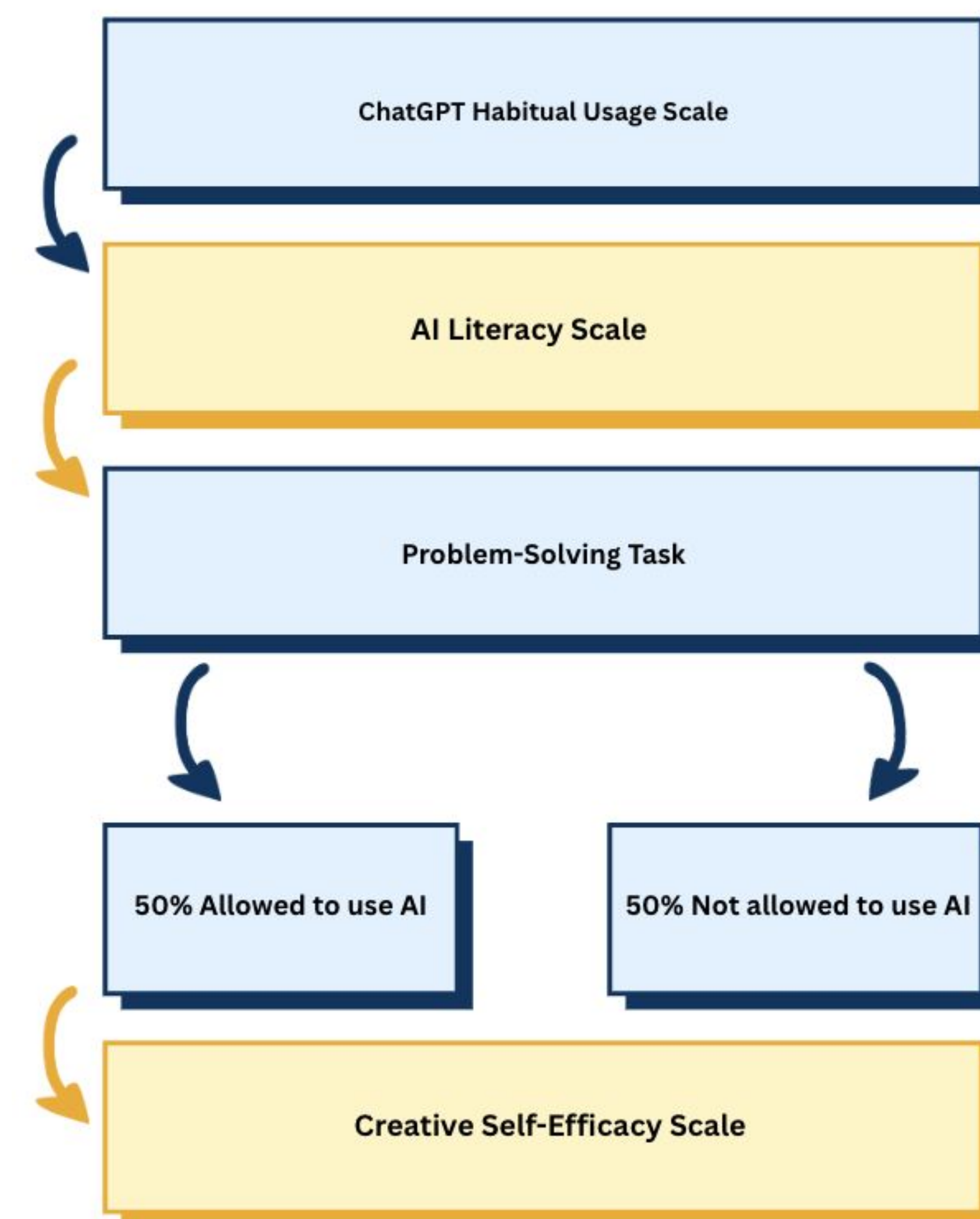
Methodology

- Data collection consisted of a single survey sent out to mainly undergraduate students at a single university in February 2026
- Final sample size was $N = 44$
- Number of transfer students = 6 (13%)
- Age: $M = 21.3$
- Cohort
 - Freshman: 0
 - Sophomore: 3
 - Junior: 5
 - Senior: 36

Problem Solving Task:

Mattel is an American toy manufacturer. In terms of sales, it is the second largest toy manufacturer in the world, right after the Lego Group. However, Mattel's goal for this year is to become the largest toy manufacturer in the world. Imagine you have been hired by Mattel as a consultant. Your first task is to come up with three ideas to improve an ordinary stuffed bunny, about 12" in size, to make it more fun to play with. How can the bunny be improved so Mattel's sales are higher than the Lego Group? [With the assistance of ChatGPT/Without using AI agents], you are asked to create one solution that is both as original as possible and as useful as possible to help Mattel achieve higher sales than the Lego Group. (Urban et al., 2024)

Procedure:



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We would like to thank Professor Delwin Carter and our TA, Luna Li, for all their guidance throughout the process of creating our research study.

Results

AI Use x Habitual Use

AI Use:

- $F(1, 40) = 30.18, p < .001, \eta^2 = .430$

Habitual Use:

- $F(1, 40) = 1.23, p = .274, \eta^2 = .03$

Interaction:

- $F(1, 40) = 1.08, p = .305, \eta^2 = .026$

AI Use x Creative Self-Efficacy

AI Use:

- $F(1, 40) = 30.58, p < .001, \eta^2 = .433$

Creative Self-Efficacy:

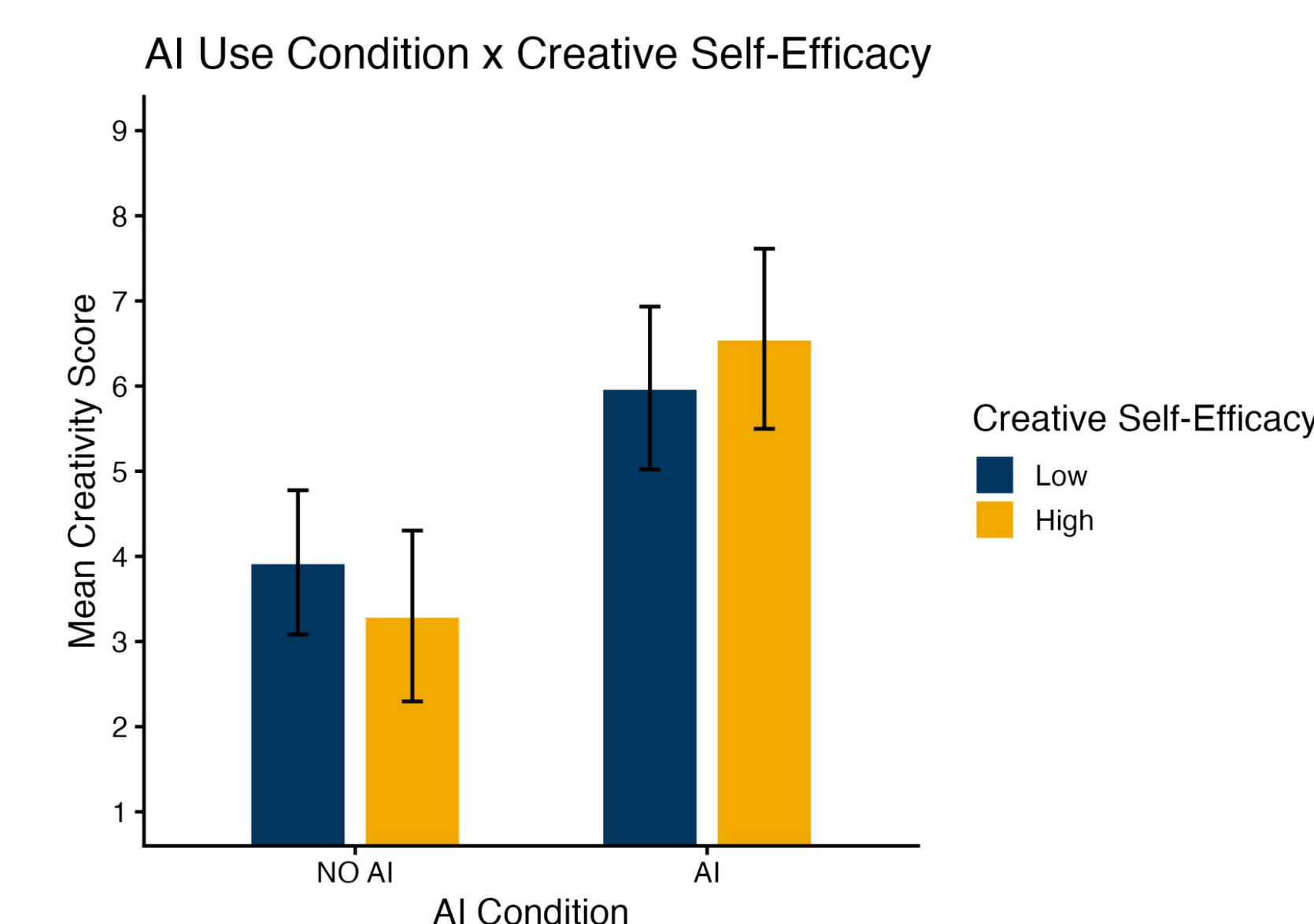
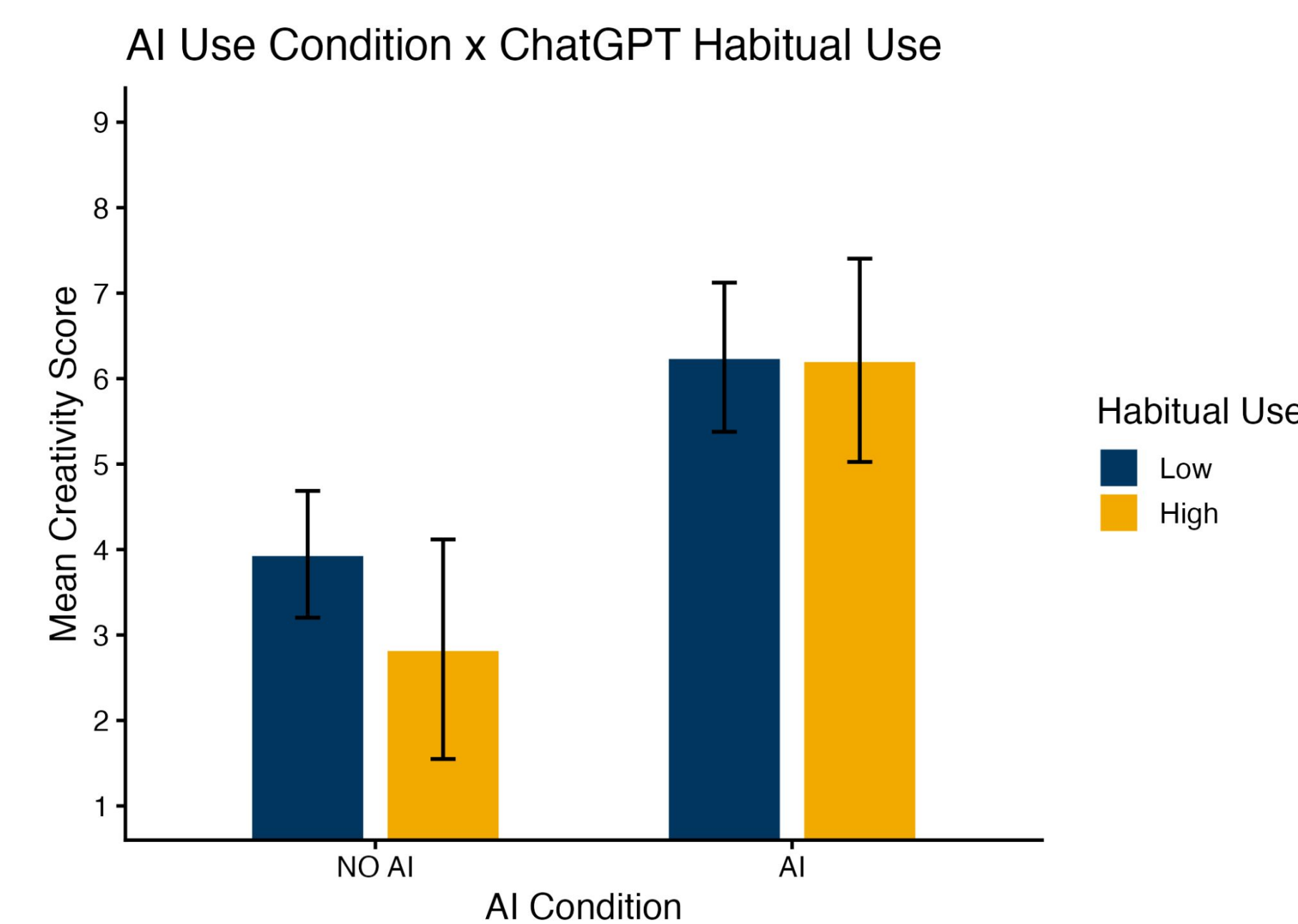
- $F(1, 40) = .00, p = .958, \eta^2 < .001$

Interaction:

- $F(1, 40) = 1.58, p = .216, \eta^2 = .038$

Findings

- Significant effect for AI use across all conditions
- No significant effect for habitual use
- No significant effect for AI literacy
- No significant effect for CSE
- No significant interaction effects



Discussion

Main findings:

- Across conditions, AI support during the creativity task increased scores
- Levels of AI Habitual Use, AI Media Literacy, and Creative self-efficacy had no effect on creative scale scores
- Findings support CLT (Liberman, N., & Trope, Y., 1998): perhaps AI increased psychological distance promoting abstract thinking
- HHAIR (Molenaar, 2022): AI can expand the constraints of human thinking by providing novel perspectives, identifying unapparent patterns, and highlighting overlooked information

Limitations:

- Creativity Index as a rater-subjective measure
- AI Experimental condition not enforceable
- ChatGPT utilizes the same model across users, likely gave similar answers for multiple users, leading many of those in the AI use group to have similar responses, reducing originality scores
- Huang (2025) has shown that AI use has a curvilinear effect on creativity, moderate AI use is more effective than high or low use

Future Directions:

- Studies that examine AI-use effects in other settings, such as workforce/everyday life
- Using current study findings to correlate with standardized academic outcomes, such as GPA

Conclusion

- Important for educational systems to recognize the benefits and setbacks of these tools, as they are increasingly used by students
- Research can be used to make decisions on whether these tools should be allowed in certain circumstances
- The study supports that using AI improves creative outcomes, which have been correlated to moderately predict high academic achievement (Akpur, 2023).
- These findings support the possibility that responsible AI implementation may be beneficial in academic settings.

Key References

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