

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Serendipity by Design: Evaluating the Impact of Cross-domain Mappings on Human and LLM Creativity

Permalink

<https://escholarship.org/uc/item/98j09450>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 48(0)

Authors

Liu, Qiawen

Dubova, Marina

Conklin, Henry Coxe

et al.

Publication Date

2026

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Serendipity by Design: Evaluating the Impact of Cross-domain Mappings on Human and LLM Creativity

Qiawen Ella Liu

Princeton University, Princeton, NJ, USA

Marina Dubova*

Santa Fe Institute, Santa Fe, NM, USA

Henry Conklin*

Princeton University, Princeton, NJ, USA

Takumi Harada

Princeton University, Princeton, NJ, USA

Toyota Motor North America, Inc., Plano, TX, USA

Thomas L. Griffiths

Princeton University, Princeton, NJ, USA

*Equal contribution

Abstract

Are large language models (LLMs) creative in the same way humans are, and can the same interventions increase creativity in both? We evaluate a promising but largely untested intervention for creativity: forcing creators to draw an analogy from a random, remote source domain (“cross-domain mapping”). Human participants and LLMs generated novel features for ten daily products (e.g., backpack, TV) under two prompts: (i) cross-domain mapping, which required translating a property from a randomly assigned source (e.g., octopus, cactus, GPS), and (ii) user need, which required proposing innovations targeting unmet user needs. We show that humans reliably benefit from randomly assigned cross-domain mappings, while LLMs, on average, generate more original ideas than humans and do not show a statistically significant effect of cross-domain mappings. However, in both systems, the impact of cross-domain mapping increases when the inspiration source becomes more semantically distant from the target, and above a distance threshold, cross-domain mapping benefits the most capable LLMs too. Humans and LLMs differed in how they used the source: Humans tended to transfer surface features of the source, whereas LLMs transferred structural and functional properties. Our results highlight the role of remote association in creative ideation and systematic differences in how humans and LLMs respond to the same intervention for creativity.

Keywords: Creativity; Analogy; Large Language Model