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Title

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Journal

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

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Publication Date

2026

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Peer reviewed

Uncovering predictors of dream report similarity: An NLP exploration with transformer embeddings

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Abstract

Dreams are valuable for the study of cognition as unique internally generated experiences, yet a large-scale analysis via self-reports remains challenging. This study explores Large Language Models (LLMs) for the semantic analysis of dream reports. Using a Dream Bank dataset, we analyzed text similarity with Sentence-T5 Large and emotional content with RoBERTa, employing Representational Similarity Analysis (RSA) and Sentiment Analysis. Results show that dream similarity is best predicted by their characters' similarity, followed by the dreams' settings and evoked emotions, confirming the consistency of the model's numerical representations. While Sentiment Analysis captured general emotions, discrepancies occurred when external context influenced the dreamer's feelings. We conclude that LLMs are powerful tools for large-scale dream research; however, their limitations require expert oversight to validate outputs. This work highlights the potential of LLMs in cognitive science while emphasizing the necessity of a nuanced, human-in-the-loop approach to automated dream analysis.