

Presentation of master thesis topic:

Modeling Creativity Through Attention: Language Model–Based Predictors of Verbal Fluency

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Understanding the linguistic and attentional mechanisms that underlie creative thinking offers a promising intersection between cognitive science and computational modeling. My thesis will build on my research project where I applied language model–based predictors mentioned in Oh and Schuler (2022) on the creativity-oriented verbal fluency dataset from Zarrieß et al. (2025).

Using large language models (LLMs) such as GPT-2 and others, I want to test predictors related to attention distribution (e.g., entropy, Manhattan distance, and Earth Mover’s Distance) on participants’ word-generation sequences. These predictors are examined in relation to behavioral and personality measures to test whether attention patterns differ between highly creative and less creative individuals. Additional analyses might explore whether (mini-) fine-tuned LLMs can better regenerate or predict word lists from creative versus non-creative participants and whether semantic network properties capture similar distinctions. By integrating psycholinguistic measures, semantic networks, and neural attention patterns, this work aims to contribute to our understanding of how creative cognition may be reflected in both human and artificial language systems.

References:

- Byung-Doh Oh and William Schuler. 2022. Entropy- and Distance-Based Predictors From GPT-2 Attention Patterns Predict Reading Times Over and Above GPT-2 Surprisal. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing*, pages 9324–9334, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics. URL: <https://aclanthology.org/2022.emnlp-main.632/>
- Sina Zarrieß, Simeon Junker, Judith Sieker, and Özge Alacam. 2025. Components of Creativity: Language Model-based Predictors for Clustering and Switching in Verbal Fluency. In *Proceedings of the 29th Conference on Computational Natural Language Learning*, pages 216–232, Vienna, Austria. Association for Computational Linguistics. URL: <https://aclanthology.org/2025.conll-1.15/>