

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

An investigation of the cognitive and neural correlates of semantic memory search related to creative ability

Permalink

<https://escholarship.org/uc/item/18768524>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 44(44)

Authors

Ovando Tellez, Marcela
Benedek, Mathias
Kenett, Yoed
[et al.](#)

Publication Date

2022

Peer reviewed

An investigation of the cognitive and neural correlates of semantic memory search related to creative ability

Marcela Ovando Tellez

Paris Brain Institute, Sorbonne university, Paris, France

Mathias Benedek

University of Graz, Graz, Austria

Yoed Kenett

Technion - Israel Institute of Technology, Haifa, Israel

Thomas Hills

University of Warwick, Warwick, United Kingdom

Sarah Bouanane

Paris Brain Institute, Sorbonne university, Paris, France

Matthieu Bernard

Paris Brain Institute, Sorbonne university, Paris, France

Joan Belo

Paris Brain Institute, Sorbonne university, Paris, France

Théophile Bieth

Paris Brain Institute, Sorbonne university, Paris, France

Emmanuelle Volle

Paris Brain Institute, Sorbonne university, Paris, France

Abstract

How creative ideas emerge remains unclear. We designed an associative fluency task based on polysemous words to explore the neurocognitive correlates of semantic search related to creativity. We distinguished two search components by assessing clustering and switching performance from participant's responses. We related these components to creativity, executive abilities, and semantic memory structure explored via semantic networks, and identified their predictive functional brain connectivity patterns. Clustering correlated with divergent thinking, and relied on interactions between control, salience, and attentional networks. Switching correlated with the ability to combine remote associates, memory structure, and executive abilities, and was predicted by connectivity between and within the default, control, and salience networks. These results suggest that switching captures interactions between memory structure and control processes guiding the search, while clustering may capture controlled processes related to persistent search. These findings shed new light on the neurocognitive mechanisms of semantic search supporting creativity.