UC Merced

Title
Russian-language semantic categories and their brain activity correspondence

Permalink
https://escholarship.org/uc/item/7b6673bp

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

Authors
Zabotkina, Vera Ivanovna
Kotov, Artemy
POZDNYAKOVA, ELENA M

Publication Date
2022

Peer reviewed

Russian-language semantic categories and their brain activity correspondence

Vera Zabotkina
Russian State University for the Humanities, Moscow, Russian Federation

Artemy Kotov
Kurchatov Institute, Moscow, Russian Federation

ELENA POZDNYAKOVA
Moscow State Institute of International Affairs (University), Moscow, Russian Federation

Abstract

The study presents the experimentally developed technique to determine how and where semantic categories are represented in the human brain. For this purpose, the combination of linguistic annotation of oral texts in Russian with the registration of BOLD signal in functional MRI subjects' testing was applied. The goal is to correlate groups of words in input texts and patterns of brain activation. The algorithm of the texts' markup consisted of four sequential procedures: (1) time annotation, (2) lemmatization, (3) vectorization, (4) indexation of words-attributes. Regarding the issue of brain activity allocation, the corresponding activation distributed nature can be noted. It proves our hypothesis that conceptual information during text comprehension is processed in different (however specific) areas of the brain and is not compactly localized. The main result is that the allocated lexical clusters are composed of paradigmatically close words (synonyms, hyponyms) and situationally related words.