Real world event schemas offer modality-independent conceptual bases for verb argument structures

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Abstract

Gonering & Corina (2023) argued that abstractions over visual scenes (i.e. schemas or situation models) provide a semantic scaffold for acquiring verb argument structures. We provide a systematic meta-analysis of 158 fMRI studies of verb processing (from NeuroSynth) and 208 fMRI studies of visual event processing (from NeuroQuery) suggestive of their hypothesis. Functional maps produced using Activation Likelihood Estimation via the Neuroimaging Meta-Analysis Research Environment package (Salo et al., 2022) (cluster-level family-wise error corrected using Monte Carlo method) showed overlapping regions of activation in the left inferior parietal lobule and Brodmann's area 47 bilaterally, suggesting shared neural resources for processing verbs and visual scenes. Meta-analyses on additional visual scene and verb processing studies from NeuroSynth and NeuroQuery, respectively, are also underway. We further intend to show that a hierarchical Bayesian model can learn verb argument structures from input statistics, even when they deviate from strong prior event semantic knowledge.

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