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Divided Yet United: Mapping the Interplay of Semantic and Executive Control

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Control processes play a fundamental role in everyday life, guiding the activation of semantic representations and supporting the retrieval of task-relevant information to enable appropriate inferences. A growing body of research suggests that semantic control (SC)—control processes specific to the semantic domain—interacts with broader executive functions (EF), which govern goal-directed behavior and higher-order cognition.

In these studies, we investigated the relationship and specificity of SC and EF in information retrieval across childhood and adulthood. Participants completed a battery of online tasks designed to assess SC and EF using both semantic and visuospatial stimuli. We applied structural equation modeling to the various behavioral measures, testing competing theoretical models in which SC is posited as (1) independent from, (2) related to, or (3) equivalent to EF. In the child sample, we also examined developmental trajectories by comparing semantic and executive control abilities across different task types.

Our results align partially with the controlled semantic cognition framework and converge with existing neuropsychological and neuroimaging evidence. They suggest that SC and EF are best characterized as partially distinct but strongly interrelated systems sharing core mechanisms. These findings underscore the importance of considering both the unity and diversity of control processes when developing a comprehensive theory of cognitive control.

If you're submitting a symposium talk, what's the symposium title?

Semantic Memory: A Multidimensional System Under Control

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

No

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