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Dissociating mental imagery and mental simulation: Evidence from aphantasia

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Abstract

Intentional visual imagery is a component of numerous aspects of cognition. Related to visual imagery, mental simulation plays a role in embodied theories of language comprehension that propose activation of modality-specific regions of the brain takes place as part of people understanding language. The extent to which the processes underlying conscious, voluntary visual imagery versus less conscious, more automatic mental simulation overlap is unclear. We investigated this issue by having aphantasics (people who are unable to experience conscious voluntary visual imagery) and control participants perform a property verification task in which they were asked whether a property is a physical part of an object (e.g., lion-tail). We manipulated the false trials in that the two words either were associated (semantically related) but did not form an object-part combination (monkey-banana), or were not associated (apple-cloud). Solomon and Barsalou (2004) demonstrated that word association influenced responses when the words in the false trials were not associated, whereas when they were related, perceptual measures most strongly influenced the results, indicating mental simulation. Here control participants and aphantasics demonstrated similar evidence of the use of both mental simulation and word association when verifying whether the words formed an object-part combination. These results provide evidence that visual imagery and mental simulation are at least somewhat separable cognitive processes.