Trends in Cognitive Sciences

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Letter

Defending the episodic memory account of aphantasia

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Responding to Adam Zeman's excellent article in *TiCS* on aphantasia [1], Michel *et al.* [2] raise the intriguing possibility that aphantasia represents a case of access consciousness without phenomenal consciousness of mental imagery. This entails that people with aphantasia could perform tasks using mental imagery, while being unaware of doing so.

Given this possibility, they argue against my proposed account of aphantasia as involving complex and varied deficiencies in episodic memory processes [3]. They suggest that my explanandum, (the finding that people with aphantasia recall fewer memory details compared with controls [4,5]), does not represent a genuine finding and, hence, my account need not be invoked. Instead, people with aphantasia could have access to the encoded information, without volunteering this when prompted; this would be similar to cases of blindsight.

Here, I raise two pertinent issues in response to their criticism, supporting that the episodic memory deficits are genuine. First, Michel *et al.* doubt the behavioural evidence of lower episodic memory recall in aphantasia. In response, I would like to draw attention to additional neural evidence supporting this claim [5]. In line with my hypothesis, Monzel *et al.* recently showed that people with aphantasia exhibit an altered activity pattern during episodic memory recall and resting state [5]. In particular, hippocampal activity is decreased and occipital activity is increased compared with controls when attempting to recall an episodic memory. By contrast, controls exhibit strong negative functional connectivity between the hippocampus and visual cortex during recall. These different activation patterns, particularly the involvement of the hippocampus, indicate that aphantasia is characterised by a genuine neural difference in retrieval processes, as suggested by my account. Furthermore, if Michel *et al.* were correct in their analysis of the memory findings as not being genuine, these neural data would be puzzling because their metacognitive account does not predict the differential hippocampal–occipital activation. However, this result is predicted by the episodic memory account.

Second, to support their case, Michel *et al.* appeal to a study in which people with aphantasia appear to have metacognitive access to encoded object memory details [6]. However, predicting a similar result for an episodic memory task is not straightforward. Note that the retrieval phase in this study took place mere minutes after the encoding phase, which is vastly different from the timescale of the episodic memory studies, and it crucially cuts out potential effects due to sleep-based consolidation. By comparison, episodic memory studies on aphantasia have queried people with aphantasia on memories from past months and years, and found fewer details reported for both recent and remote memories [4]. Hence, there is no clear inference from information being accessible a few minutes after an encoding phase to the information still being present (but potentially inaccessible) at a later postconsolidation stage.

Now, how should we go about testing episodic memory in aphantasia? Michel *et al.* suggest that episodic memory should be tested in a forced choice paradigm, similarly to paradigms used to study blindsight [1]. They argue that doing so could reveal that people with aphantasia do have access to encoded details that are not otherwise reported. I am sceptical that such a paradigm could give us clear results. Memory is highly suggestible, and a forced choice paradigm could easily elicit false positives, namely reports of false memory. This has been well studied in the Deese–Roediger–McDermott (DRM) paradigm [7], where participants are asked to make a forced choice between a studied word and a novel word. One such experiment showed that accuracy was at chance level after a 7-day delay [8]. Rather than a report being due to a genuine memory, it could be elicited by the activation of a related schema, similar to the elicitation of memory errors in semantic paradigms. Using open-ended interview questions for episodic memory is a way to minimise the risk of false positives due to participants being cued by the researchers' questions. Nevertheless, we ought to expand our research past interview-based strategies to better assess accuracy and memory errors [9], as well as investigate encoding, consolidation, and recall at different time intervals. In a battery of tasks, a forced choice paradigm could be a viable option if carefully designed to avoid false positives, but we should not expect clear answers from this alone.

Finally, I concur with the sentiment that there is great heterogeneity in aphantasia, as noted by both Zeman [1] and Michel *et al.* [2]. The account raised by the latter is certainly an intriguing possibility, and one that could explain a subset of aphantasia, while still recognising a genuine episodic memory deficit. We should prioritise advancing the research programme on different subtypes of aphantasia, and keep an open mind with regard to different possible explanations for these different subtypes [10].

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