Re-examining the gesture engram hypothesis. New perspectives on apraxia of tool use

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Résumé en anglais	In everyday life, we are led to reuse the same tools (e.g., fork, hammer, coffee-maker), raising the question as to whether we have to systematically recreate the idea of the manipulation which is associated with these tools. The gesture engram hypothesis offers a straightforward answer to this issue, by suggesting that activation of gesture engrams provides a processing advantage, avoiding portions of the process from being reconstructed de novo with each experience. At first glance, the gesture engram hypothesis appears very plausible. But, behind this beguiling simplicity lies a set of unresolved difficulties: (1) What is the evidence in favour of the idea that the mere observation of a tool is sufficient to activate the corresponding gesture engram? (2) If tool use can be supported by a direct route between a structural description system and gesture engrams, what is the role of knowledge about tool function? (3) And, more importantly, what does it mean to store knowledge about how to manipulate tools? We begin by outlining some of the main formulations of the gesture engram hypothesis. Then, we address each of these issues in more detail. To anticipate our discussion, the gesture engram hypothesis appears to be clearly unsatisfactory, notably because of its incapacity to offer convincing answers to these different issues. We conclude by arguing that neuropsychology may greatly benefit from adopting the hypothesis that the idea of how to manipulate a tool is recreated de novo with each experience, thus opening interesting perspectives for future research on apraxia.
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