

Actions speak louder than words when it comes to memory

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Brady Roberts, Ph.D. candidate in cognitive neuroscience in the Department of Psychology. Credit: University of Waterloo

Whether you're old or young, memory can be a challenge for all kinds of reasons, and most of us would welcome strategies to help improve our memory. Waterloo's researchers in psychology have been helping with this area of cognition for years—and the impact of their research on what we know about memory continues with graduate students.

"When you stop and think about it, memory permeates throughout most other cognitive functions," says Brady Roberts, a Ph.D. candidate in cognitive neuroscience in the Department of Psychology. "I've seen the real need for memory research in my own grandmother who is starting to demonstrate memory deterioration that comes with aging."

Roberts' doctoral research looks at memory encoding techniques—how we can best transform information into memory. "I'm interested in the ways that we remember the world around us through [body movements](#) and what we perceive with our eyes—especially if we can harness that information to improve memory."

Understanding a powerful memory strategy

This year, he had a study accepted for publication in the journal *Psychological Bulletin* on the enactment effect, a phenomenon whereby performing physical actions associated with a word or phrase improves memory. Clapping, for example, will aid your memory for the word "clap" more so than simply reading the word. "Our objective was to contextualize the enactment effect as a powerful memory strategy, and we found it can benefit people across a range of demographics and cognitive abilities," he says.

As lead author, Roberts worked with his supervisors Myra Fernandes and Colin MacLeod, both professors in psychology, to conduct a [systematic review](#) and [meta-analysis](#) of the past 60 years of research on the enactment effect. Meta-analyses chronicle what previous studies have shown and assess various factors in the studies including how [study design](#) influences the reliability of results.

"While the enactment effect is well-established, there is still debate about the mechanisms underlying how it works," says Roberts. "Our new paper offers a novel three-pronged approach by incorporating

behavioral, neuroimaging, and patient studies to advance understanding, and more specifically, to answer eight key questions we had about how enactment improves memory."

Importantly, the research suggests that the memory benefit of enactment could stem from an initial phase where the action is planned, which is then combined with the subsequent action itself. "Enactment is a great example of rich multi-sensory encoding," explains Roberts. "Our meta-analysis found that even Parkinson's disease patients who struggle to execute actions can have their memory improved by enactment, possibly because their planning abilities remain intact."

To get these insights, Roberts conducted a systematic examination of 145 behavioral, seven neuroimaging, and 31 neurological patient studies. From this range of work, he compared findings of different encoding strategies such as physical action, reading words or phrases, watching another person perform actions, and imagining performing actions.

Roberts hopes researchers will use the review as a context and foundation for determining what empirical work needs to be done. "Given the potency and ease-of-use of enactment in real-world settings, including improving [memory](#) in patients with Alzheimer's disease, it's an important area of research worthy of further exploration."

"The Enactment Effect: A Systematic Review and Meta-Analysis of Behavioral, Neuroimaging, and Patient Studies" is published online and forthcoming in print in *Psychological Bulletin*.

More information: Brady R. T. Roberts et al, The enactment effect: A systematic review and meta-analysis of behavioral, neuroimaging, and patient studies., *Psychological Bulletin* (2022). [DOI: 10.1037/bul0000360](https://doi.org/10.1037/bul0000360)

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