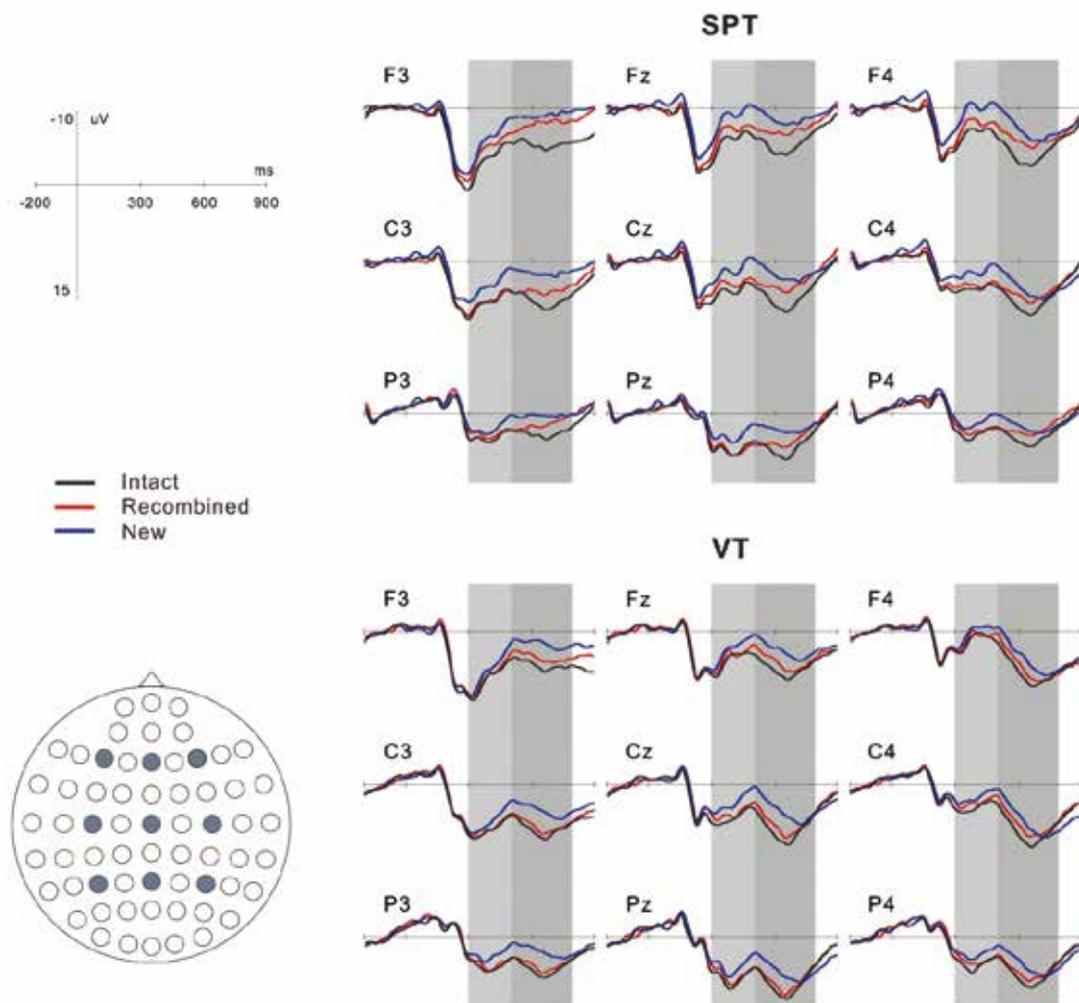


Performing Actions Can Enhance Associative Memory

Every day, we experience action events in which we must remember whether we have done something or not. Previous evidences have suggested that participants' memory for performed actions is superior to that for actions that were only heard or read in item memory tasks. Does enactment

(i.e., performing actions) improve associative memory? And how does enactment change the contribution of memory processes (i.e., familiarity and recollection) to associative memory?

A recent study by Dr. FU Xiaolan's team from the Institute of Psychology, Chinese Academy of



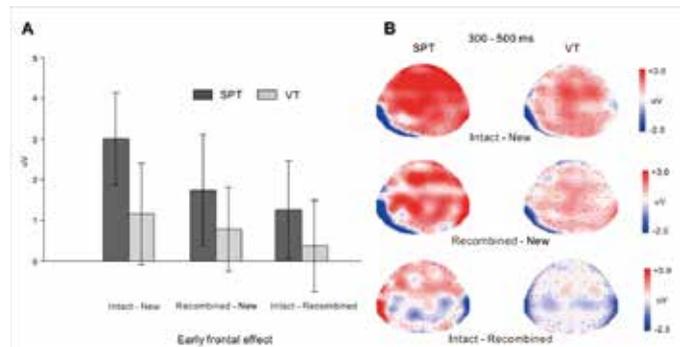
Grand average ERPs corresponding to correct responses for the intact, recombined and new phrases at frontal (F3, Fz, F4), central (C3, Cz, C4) and parietal (P3, Pz, P4) sites in the SPT and VT conditions.

Sciences and Dr. Hubert D. Zimmer from Saarland University, Germany has directly addressed these issues by using Event-related potentials (ERPs) technique. Forty-eight students participated in this experiment. They were randomly assigned to either the subject-performed task (SPT) or verbal task (VT) group. During studying, participants of the VT group were asked to try to memorize verb-object pairs, while participants of the SPT group were additionally asked to pretend to perform the actions with imaginary objects. Then, during testing, they discriminated between intact, recombined and new items and made Remember/Know judgments. Their EEGs were also recorded.

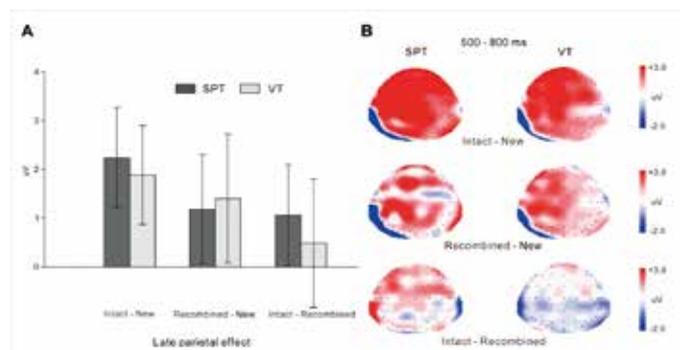
Behavioral results showed that associative recognition was better following SPT than VT. ERP results revealed that early frontal event-related potentials (ERPs) were graded according to the item status following SPT (intact>recombined>new), but no such effects were found after VT. Similarly, the late parietal ERPs were graded following SPT, whereas these effects were smaller and did not differ between intact and recombined items following VT (intact=recombined>new).

The researchers believed it was a correlate of memory retrieval of one's own performance of the studied action ("I was the actor of the action denoted by the intact phrase or I did this specific movement while performing this action"), and argued that this feature is only available after SPT and is different from the recombined phrases. Their findings provide convergent evidence that (a) familiarity can contribute to associative recognition if items are unitized during study, (b) SPT supports unitization, (c) SPT enhances associative recognition, and (d) both familiarity and recollection contribute to this improvement.

These results demonstrated for the first time that enactment also enhances associative memory of action components, suggesting that performing actions is probably an effective approach to improving associative memory, which promises practical progress



Early frontal old-new effect (300-500 ms). Error bars represent within subject 95% confidence intervals (Jarmasz & Hollands, 2009).



Late parietal old-new effect (500-800 ms). Error bars represent within subject 95% confidence intervals (Jarmasz & Hollands, 2009).

of improving human learning and memory especially associative memory. The study also deepens the current understanding of how enactment enhances action memory and of the role of unitization in associative memory and advances both lines of research and theories of memory.

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