

**It's not just representation:
The movement of co-speech gestures boosts recall of verbs**

Elena Nicoladis & Candace Lam
University of Alberta

Observing co-speech gestures can help people remember the concepts expressed simultaneously through speech and gesture (e.g., Wesp, Hesse, Keutmann, & Wheaton, 2001). This effect may be particularly strong for gestures with verbs (e.g., Kelly, McDevitt, & Esch, 2009). Kelly et al. (2009) showed that English-speakers remembered more Japanese verbs after short exposure when the verbs were accompanied by representational gestures than without. Kelly et al. (2009) included a condition in which the Japanese verbs were repeated (with English translations), ruling out the possibility that gestures help memory through twice as much exposure to conceptual information. They argued that gestures help memory through the simultaneous bimodal exposure to concepts of gesture and speech. This argument is in line with recent theoretical arguments, suggesting that representational gestures activate motor imagery (Hostetter & Alibali, 2008).

In this study, we question whether gestures help memory through representational means. It is possible that gestures help memory of verbs, not because they resemble the referent but because the movement of the hands is associated with movement in the conceptual representation (therefore the meanings of verbs). In support of this alternative explanation, Ravizza (2003) showed that simply tapping a pencil could help with lexical access, as had previously been shown with representational gestures. Also, Marentette and Nicoladis (2011) showed that preschool children associate gestures with actions.

148 monolingual English speakers were assigned to learn Chinese nouns and Chinese verbs in one of these conditions: 1) Word-only, 2) still-cartoon, 3) moving cartoon, 4) hands-up, or 5) representational-gesture. In all conditions, a speaker of Cantonese spoke the target words. In the second condition, the video of her saying the words was accompanied by a cartoon picture of the meaning of the referent. In the third condition, this same cartoon moved. In the fourth condition, the speaker threw her hands up in the air while saying the word. In the fifth condition, the speaker produced a gesture resembling the referent (e.g., slapping one hand for the target word 'hit'). If exposure to bimodal representations helps memory, we reasoned that participants in the still cartoon, the moving cartoon, and the representational-gesture conditions would remember more words than participants in the Word-only and the hands-up condition. If gestures help memory through movement, then participants in the moving cartoon and the hands-up and the representational gesture conditions would remember more target words than participants in the Word-only and the still-cartoon conditions.

The results did not correspond to either of these predictions. The participants in the representational-gesture condition recalled the fewest target words than participants in any other condition. However, in examining the words that they thought they had seen, we found that more verbs were recalled in the conditions with movement (either the hands or the cartoon) than in the other conditions. These results suggest that one way in which co-speech gestures can boost memory for verbs is through movement. In other words, co-speech gestures may help memory not just in representing the referent, but by the very fact that they are moving.