The communicative influence of gesture and action during speech comprehension: gestures have the upper hand

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Abstract

Hand gestures combine with speech to form a single integrated system of meaning during language comprehension (Kelly et al., 2010). However, it is unknown whether gesture is uniquely integrated with speech or is processed like any other manual action. Thirty-one participants watched videos presenting speech with gestures or manual actions on objects. The relationship between the speech and gesture/action was either complementary (e.g., “He found the answer,” while producing a calculating gesture vs. actually using a calculator) or incongruent (e.g., the same sentence paired with the incongruent gesture/action of stirring with a spoon). Participants watched the video (prime) and then responded to a written word (target) that was or was not spoken in the video prime (e.g., “found” or “cut”). ERPs were taken to the primes (time-locked to the spoken verb, e.g., “found”) and the written targets. For primes, there was a larger frontal N400 (semantic processing) to incongruent vs. congruent items for the gesture, but not action, condition. For targets, the P2 (phonemic processing) was smaller for target words following congruent vs. incongruent gesture, but not action, primes. These findings suggest that hand gestures are integrated with speech in a privileged fashion compared to manual actions on objects.

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