

The Action-Sentence Compatibility Effect in ASL: The role of semantics vs. perception (English)

Evidence from the embodied cognition literature suggests that humans use the sensorimotor system in processing language and that one mechanism by which this occurs is mental simulation (Barsalou, 2008; Gallese & Lakoff, 2005). Effects of this simulation on motor execution have been demonstrated in stimulus-response compatibility effects such as the Action-sentence Compatibility Effect (ACE) (Glenberg & Kaschak, 2002). Response times (e.g., for sentence plausibility judgments) are facilitated when the motor response (e.g., pressing a 'yes' button that requires a movement toward the body) is congruent with the movement direction implied by the semantics of a written or spoken sentence (e.g., "You open the drawer"). Such facilitation provides evidence for the involvement of sensorimotor systems in language comprehension. In sign languages, however, there is a potential conflict between sensorimotor systems and linguistic semantics because movement away from the signer's body is perceived as motion toward the addressee's body (who is facing the signer). For example, semantics of the verb PUSH involve movement away from the body, but the addressee perceives the movement of the verb PUSH as toward, rather than away from their own body. Kaschak (2005) found that perceiving nonlinguistic visual motion toward or away from the perceiver impacts the comprehension of motion sentences expressing motion toward or away from the body. We examined whether perceptual processing of linguistic sign movement modulates the ACE or whether the ACE is driven purely by the semantics of the verb. If the latter, then the direction of visual movement seen in the sign should have little effect on the motor response. If the former, then conflicting perceptual and semantic motion should affect the ACE. Deaf ASL signers performed a semantic judgment task while viewing signed sentences that expressed motion away (e.g., "you threw a ball") or toward (e.g., "you grabbed a cup"), responding with button presses requiring movement away from or toward the body. We found that there was a significant congruency effect only when responses were categorized in relation to the semantic motion rather than the perceptual motion of the sentence. This result indicates that a) the motor system is involved in the comprehension of a visual-manual language and b) motor simulations for sign language are modulated by verb semantics rather than by the perceived visual motion of the hands.

References

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