

EARLY LINKS BETWEEN ICONIC GESTURES AND SOUND SYMBOLIC WORDS: EVIDENCE FOR MULTIMODAL PROTOLANGUAGE

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1. Iconic Gestures and Sound Symbolic Words: Motivated Link between Form and Meaning

When we speak, we spontaneously produce hand gestures that are co-expressive with speech. Many such gestures are "iconic gestures", which depict shape, motion and action based on similarity between gestural hand movement and the referent (e.g., flat hand moving downwards repeatedly to depict a water fall). This study addresses the question of how humans evolved to produce iconic gestures with speech, i.e., the origins of speech-gesture link.

In iconic gesture, form and meaning are related in a motivated (non-arbitrary) way. This is in sharp contrast with typical words with an arbitrary link between form and meaning. However, sound symbolic words also have form and meaning that are "naturally" related with each other, similar to iconic gestures. Many languages of the world, including Japanese, have a large class of

sound symbolic words (Kita, 2008; Nuckolls, 1999). These words can refer to not only sounds (i.e., onomatopoeia) but also a wide range of non-auditory experiences including manner of movement (Kita, 1997, 2008).

2. Ontogenetic and Phylogenetic Linkage between Iconic Gestures and Sound Symbolic Words

We examined how the link between speech and iconic gestures develop in children. We presented animated cartoons to Japanese-speaking 3- and 5-year old children and adults (n = 20 in each group). They narrated the cartoons to another person, in which they spontaneously produced iconic gestures depicting the protagonists' movements. We analyzed linguistic and gestural expression of manner of motion (e.g. jumping, rolling). The statistical analysis revealed the following results. (1) Children had a stronger preference to use sound symbolic manner words to express manner of motion (e.g., "pyonpyon" for jumping and "korokoro" for rolling) than adults, as opposed to non-sound symbolic manner verbs (e.g., "tobu" for jumping and "kaitensuru" for rolling/rotating). (2) Sound symbolic manner words were more likely to be accompanied by co-expressive iconic gestures than non-sound symbolic manner verbs, and this tendency was especially strong in children. In other words, the speech-gesture link started out with sound symbolic words in ontogeny.

Based on the above results, we infer that the link between speech and iconic gesture started in sound symbolic words and spread to "ordinary" non-sound symbolic words with arbitrary form-meaning mapping. We propose that our ancestors once used a protolanguage that combined iconic gestures and sound symbolic words. In other words sound symbolic words may be the "missing link" in the explanation for why speech and iconic gesture are tightly coupled in modern humans. Our data is also compatible with the idea that sound-symbolic words and iconic gestures emerged simultaneously when our ancestors developed an ability to cross-modally represent information in an iconic way.

References

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