Communicative efficiency in sign languages: the role of the visual modality-specific properties

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Research on communicative efficiency, so far, has been systematically studied in spoken languages, which are characterized by their linear structure and predominantly arbitrary form (Levshina, 2022). However, sign languages are expressed entirely in the visual modality which gives raise to the modality-specific properties: simultaneity and iconicity. In this talk, we propose a new perspective on communicative efficiency by shifting the focus from spoken to sign languages. We present a series of recent studies, which provide experimental evidence for the central role of the visual modality-specific properties in communicative efficiency in sign languages.

Dependency distance minimization is a principle used for communicative efficiency by placing related words closer together in a sentence (Gibson et al., 2019). However, in sign languages, the distance between related elements can be minimized not only linearly, as is done in speech, but also simultaneously. Signers can use multiple body articulators (hands, torso, head, eye gaze, facial expression) to encode multiple event elements at the same time (Dudis, 2004; Veermerbergen et al., 2007). Furthermore, signers can use iconicity, i.e., motivated form-meaning mappings (Perniss et al., 2010; Taub, 2001), to depict event elements and establish a motivated relationship between them to form a single construction (Figure 1). Thus, signers can use simultaneous and iconic constructions to cluster related event elements closer together to achieve communicative efficiency. In three experimental studies, we showed that simultaneous and iconic constructions evolve and are actually used for communicative efficiency (Slonimska et al., 2020, 2021, 2022).

In all three studies, we used an experimental design in which we systematically increased the informational density (number of semantic information units) of events asked to be described in a director-matcher task. First, we collected data from 23 deaf Italian adult signers of LIS. Results revealed that when signers faced increasing informational demands, they increased simultaneity in their encodings (Slonimska et al., 2020). Next, we investigated the data in regard to the linguistic strategies used and we found that as the information in the events increased, so did the use of highly iconic depicting strategies (Slonimska et al., 2021). Finally, we collected data from 23 Italian hearing adults who did not know any sign language but were asked to use only their gestures to communicate (i.e., silent gesture paradigm). We predicted that if simultaneous and iconic constructions have evolved within a linguistic system for communicative efficiency, then signers should use more simultaneous and iconic constructions compared to hearing adult participants using silent gestures. Results showed that signers used these constructions more and in more flexible ways than non-signers (Slonimska et al., 2022).

Taken together, these findings constitute first experimental evidence that the modality in which language is expressed influences how communicative efficiency can be achieved. We show that signers take advantage of the visual modality-specific properties to be communicatively efficient and that these properties evolve in a linguistic system for this function. As such, we propose a new avenue for future research to broaden our understanding of communicative efficiency through a lens of a multimodal view of language.

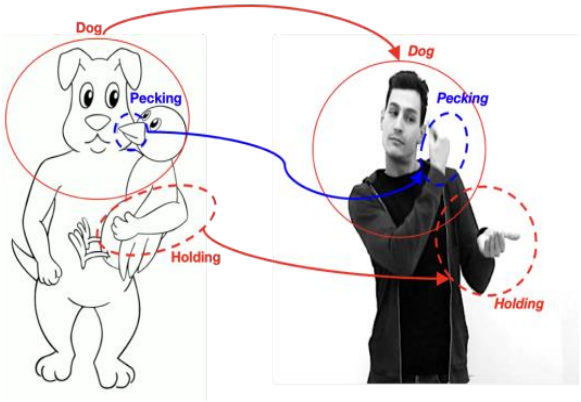

Fig. 1: An example of a signer using simultaneous and iconic construction depicting a dog holding a bird while the bird is pecking the cheek of the dog.

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