Gestural production as a window to semantic effect on word order in noun phrases
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Pantomime or gestural production has been informative for investigating cognitive biases about word order at the sentence level (e.g., [1-3]). This method has also been used to explore effects of isomorphism in the word order within the noun phrase [4]. The current study takes the first step in examining whether the motivation for typologically-preferred word orders may arise from semantic considerations. We focus on the relative order of nouns (N) and adjectives (Adj) within the noun phrase, asking whether their dominant order cross-linguistically – N-Adj in 64% of language [5] – is preferred because the interpretation of an adjective is relative to the meaning of the noun. To this end, we examine adjectives from two classes: size adjectives that are dependent on noun meaning for their interpretation, and shape adjective that are intersective, and thus are much less dependent on the noun [6]. We tested speakers of English (consistently N-Adj), Arabic (consistently N-Adj) and Spanish (most adjectives are post-nominal, but some are pre-nominal).

Method. To elicit noun phrases, we employed a referential communication task where participants saw an array of four images, and had to instruct a partner to click on one of them using gesture (participants repeated the task using language; cf. 2). We included four conditions (8 items per condition), labeled by the information needed to differentiate the target image: (A1) N-Adj, size adjective; (A2) N-Adj, shape adjective; (B) N-Num, included as control (because number and noun do not show this asymmetry); (C) N-AdjSHAPE-Num (exploratory).

Results (English: N=24; Arabic: N=20; Spanish: N=25). When examining both adjective classes together (not plotted), Arabic and Spanish speakers showed a preference for N-Adj order (z=3.09 p = .002 and z = 3.41 p = .0006), whereas English speakers were at chance. Most important, there was a main effect of adjective type (z = 3.928, p < .0001), with the N-Adj order being more likely for size adjectives which are more dependent on the noun. The N-Num condition, where speakers of all three languages were at chance, confirms that this preference is specific to adjectives. In the N-AdjSHAPE-Num condition (not plotted), English speakers mirrored their language, preferring Num-Adj-N (50%; chance is 17%); surprisingly, for Arabic (36%) and Spanish (39%), the preferred order was N-Num-Adj for, which is both typologically rare and does not mirror the language.

Conclusion. We find preliminary evidence for the proposal that the typologically-dominant order N-Adj is (at least partially) guided by semantic interpretation. Future work will explore similar considerations with numerals and related elements.