

ASL signers vary adjective position to maximize efficiency: A reference production study

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In a recent eye-tracking study, Rubio-Fernández, Mollica and Jara-Ettinger (2017, under review) investigated the effect of adjective position on reference assignment and observed that when English and Spanish speakers looked for a blue triangle in the same visual display, English speakers searched for the referent by color and used shape to disambiguate the instruction (e.g., ‘the blue triangle’) whereas Spanish speakers searched by shape and disambiguated by color (e.g., ‘el triángulo azul’). Importantly, incremental processing also affected the degree to which redundant color adjectives were produced in the two languages, supporting the hypothesis that redundant color adjectives are efficient when they facilitate the listener’s visual search for the referent (Rubio-Fernández, 2016; Rubio-Fernández et al., 2017).

Here, we further tested the hypothesis that adjective position may be used to maximize efficiency by running a referential communication task in American Sign Language. Unlike English or Spanish, ASL has free adjective position (i.e. both ‘blue triangle’ and ‘triangle blue’ are acceptable), a grammatical feature that may allow us to see if speakers of the same language use prenominal or postnominal adjectives depending on their relative efficiency. As observed by Rubio-Fernández et al. (2017; see also, Eberhard et al., 1995; Spivey et al., 2001), prenominal color adjectives are an efficient visual cue, more so than in postnominal position. However, not all adjectives are more efficient in prenominal position. Scalar adjectives, for example, are interpreted in relation to a comparison class (Kennedy, 2001), which might make them more efficient in postnominal position since they are readily interpretable once the noun has been processed. It therefore follows from the semantics of relative and absolute adjectives and the incrementality of language processing that if ASL signers exploit adjective position for efficiency, they should use color adjectives prenominally and scalars postnominally (supporting Fukumura’s (2018) ‘discriminatory efficiency hypothesis’). Note, however, that scalars do not need a comparison class in the visual context (e.g., ‘big’ for a cat), so their position may vary.

We recruited 34 native ASL signers and presented them with a battery of 48 displays of 4 objects, one of which was marked with an asterisk (see Fig.1). Their task was to refer to that object in a way that would allow a new participant in the task to uniquely identify it (even without the asterisk and the position of the pictures being scrambled). In order to avoid possible priming across trials, materials were presented in two blocks, one including color trials and the other scalar trials, counterbalanced in two separate lists. We excluded from analyses all responses that did not include both adjective and noun (21%). We used Logistic Mixed Effects Regression (with subjects and items as RE and maximal RE structure) to model Adjective Position (prenominal = 1, postnominal = 0) with Condition (color / scalar) and Order (Color-Scalar / Scalar-Color) as Fixed Effects. As predicted, there was a main effect of Condition ($\beta=-3.9231$, $p<.001$) with greater prenominal modification in the color condition. There was also a main effect of Order ($\beta=-1.5858$, $p<.05$): those administered the Color-Scalar order used more prenominal adjectives than those administered the Scalar-Color order, suggesting stronger carry-over effects from the color block to the scalar block than vice-versa. Given the effect of Order on Adjective Position, we ran an LMER model with the data from Block 1 only and found the same pattern across participants: there was a main effect of Condition ($\beta=-4.5905$, $p<.001$), with greater prenominal modification with color adjectives.

These results support the hypothesis that ASL signers use their free adjective position to maximize the efficiency of their interlocutor’s search for a referent – similar to what has been observed with English and Spanish speakers. We are currently collecting production data for a follow-up looking at the effect of visual salience on adjective position in ASL, and also processing data with eye-tracking glasses to investigate how ASL signers perform a visual search for a referent while parsing instructions from another signer (for computer-based referential communication studies, see Lieberman et al., 2017; Lieberman and Wienholz, 2018).

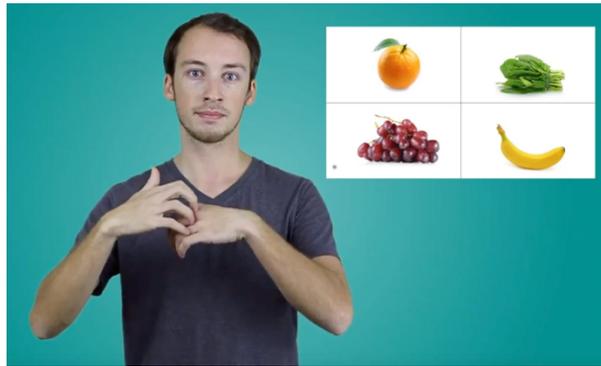


Fig.1: Screen shot of the instructions video for ASL participants (top). Sample displays from the color condition (bottom left) and the scalar condition (bottom right).

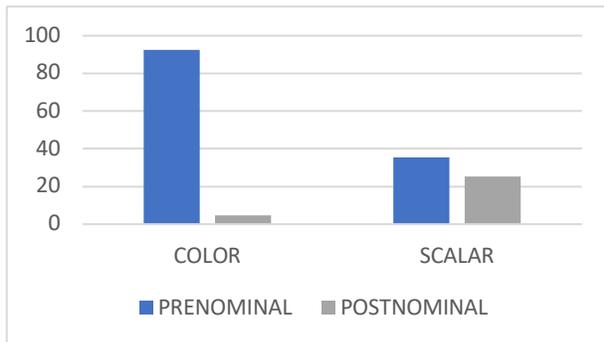


Fig.2: Percentage of Prenominal and Postnominal uses by Adjective Type.

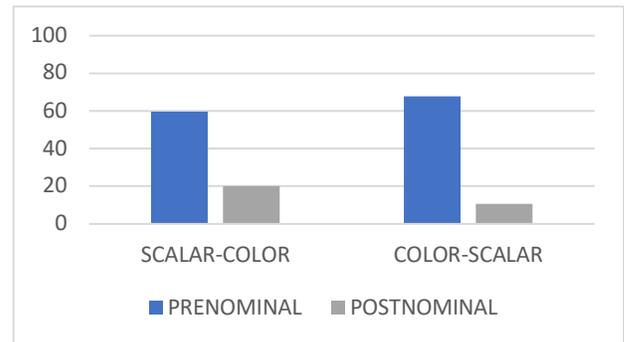


Fig.3: Percentage of Prenominal and Postnominal uses by Block Order.

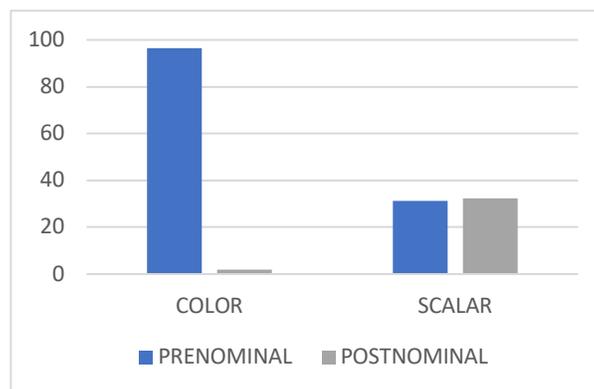


Fig.4: Percentage of Prenominal and Postnominal adjectives in Block 1 (between participants).