The color/size asymmetry in redundant modification replicates cross-linguistically

Speakers produce redundant color adjectives more frequently than redundant size adjectives [1-3]. For example, in contexts like Fig. 1, where size is sufficient for establishing the target referent, speakers frequently produce color redundantly ("the small green apple" instead of "the small apple"). Whether this asymmetry is the result of an asymmetry in the referential utility of mentioning lexicalized concepts -- e.g., because color is more perceptually salient than size and thus likely to increase the probability of communicative success [3-5] -- or the result of incremental language processing pressures [6,7] is an open question. Cross-linguistic studies of redundant modification are important to this debate: similar cross-linguistic rates of redundant modification across languages that differ in relevant syntactic properties would implicate lexicalized concepts as the source of redundant modification. In contrast, lower prevalence of redundant modification in languages with post-nominal modification implicates a strong role for incrementality. Thus far, studies addressing redundancy in referring expressions have mostly been conducted on a handful of pre-nominal modification languages (e.g., English [1-4], German [8] and Dutch [9]). Notable exceptions include [10, 11], who observed less redundant color modification in Spanish, a post-nominal modification language, than in English, providing initial evidence for the role of incrementality. However, these studies were conducted on a set of contexts in which only redundant color but not redundant size modification was investigated.

Aim. We ask whether the propensity for redundant modification and in particular the color/size asymmetry replicate in two particularly interesting languages, which we compare to English: Spanish and Central Taurus Sign Language (CTSL, see Tab. 1 for details). As a language in its infancy, CTSL provides us with the unique opportunity to test the extent to which, with no established conventions, redundant modification patterns mirror those previously documented.

Methods. Participants (see Tab. 1) played an interactive reference game (see Fig. 1). On each trial, participants saw a display of objects. The director was asked to communicate the target object marked by a green border in their display to the addressee, who selected an object. On half of trials, color was sufficient for unique reference, and on the other half, size was sufficient. Participants were recorded during the task and their responses were transcribed and translated to English for analysis. Productions of both color and size were coded as redundant.

Results. Modification in CTSL and Spanish was overwhelmingly postnominal (~90%). Both CTSL signers and Spanish speakers were more likely to redundantly mention color than size **(**β=4.95**,** 95% CI = [3.73, 6.32], see Fig. 2**)** at rates similar to those previously reported [3]. Compared to English, there was no evidence that rates of redundant modification differed in Spanish (β=-0.02, CI = [-1.75, 1.61) or in CTSL (β=1.21, CI = [-0.13, 2.56]). These null results may be due to low power for Spanish and CTSL; data collection for Spanish is still ongoing.

Discussion. In neither predominantly post-nominal adjective language was redundancy lower than in the pre-nominal English baseline. These results are at odds with those of [10, 11] and with explanations of redundancy that ascribe a large explanatory role to incremental pressures. Instead, the results preliminarily suggest that the underlying systematicity in redundant adjectival modification is due to lexicalized concepts that differ fundamentally in referential utility. With the aim of rigorously comparing such explanations, in ongoing work we evaluate quantitative computational theories of referring expression production that differ in whether speakers plan utterances in anticipation of incremental pressures, and/or whether adjectival modifiers receive a Boolean intersective semantic analysis or a noisy, continuous one [3,7].

Fig. 1: Example display from the director's perspective on a size sufficient trial.

Language	English	Spanish	CTSL
Syntactic features	Pre-nominal adjectives	Post-nominal adjectives	No established ordering conventions
Participants	60 dyads (re-analysis of data reported by [3])	9 dyads (data collection still in progress)	11 dyads
Modality	written	written	signed
Examples	*small green apple*	*manzana verde pequeña la pequeña, verde*	APPLE GREEN SMALL SMALL APPLE GREEN

Tab. 1: Tested languages and their features. CTSL is an emerging village sign language that arose naturally within the last half century in a small isolated community in Southern Turkey as a result of high incidence of hereditary deafness, and in the absence of a conventionalized language model. Both Spanish and CTSL allow for post-nominal modification and split pre- and post-nominal modification, shown in table. CTSL also allows purely pre-nominal modification.

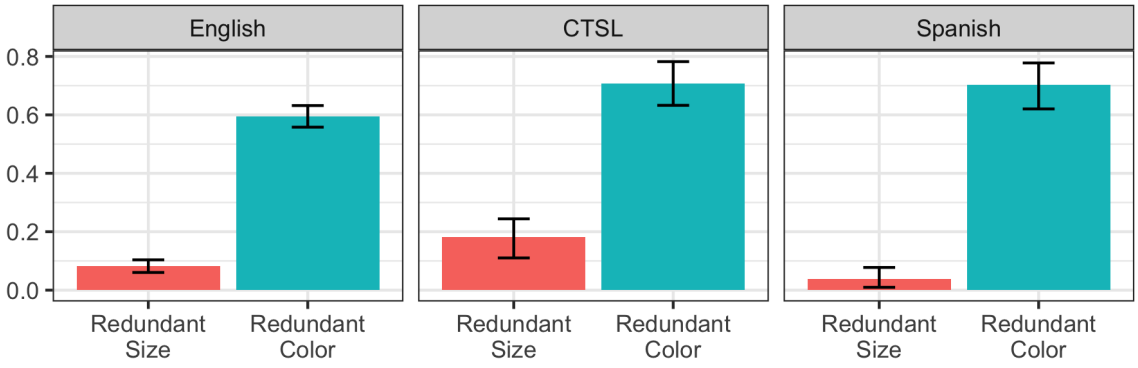

Fig. 2: Proportion of redundant "color and size" mentions by condition and language.

References [1] Pechman (1989) [2] Sedivy (2003) [3] Degen et al. (2020) [4] Kursat & Degen (2020) [5] Rubio-Fernandez et al. (2020) [6] Rubio-Fernandez & Ettinger (2020) [7] Waldon & Degen (2021) [8] Belke (2001) [9] Koolen et al. (2013) [10] Rubio-Fernandez (2016) [11] Wu & Gibson (2020)