

Contrastive effects with color, material & scalar adjectives in English, Hindi & Hungarian

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In her classic eye-tracking paradigm, Sedivy (2004) investigated contrastive inferences with different types of adjectives. In hearing ‘Pick up the tall...’ in a display with a tall glass, a short glass and a tall jar, it should be possible to anticipate the noun ‘glass’ if the adjective is interpreted contrastively. However, without the short glass, it is not possible to disambiguate the adjective ‘tall’ (see displays for 2 vs 1 Competitor conditions in Fig.1). Sedivy observed contrastive effects with scalar and material adjectives, but not with color adjectives, which she interpreted as a result of color adjectives often being used redundantly. However, Aparicio et al. (2017) have recently reported contrastive effects with both size and color adjectives. Given these inconclusive results, we investigated contrastive inferences with color, material and scalar adjectives in three languages with prenominal modification: English, Hindi and Hungarian.

While color adjectives are often used redundantly, a number of factors affect the rates of redundant color modification (e.g., color typicality; Rubio-Fernandez, 2016). It is therefore unlikely that, as Sedivy (2003, 2004) argues, the ‘default description’ for objects with variable colors should include a color adjective, making the interpretation of color adjectives non-contrastive. We suspect that the different results observed with color adjectives in different eye-tracking studies may be related to methodological differences (note Sedivy’s studies were reported in book chapters without Methods sections and are therefore difficult to replicate).

We hypothesize that, as Sedivy and Aparicio et al. observed, scalar adjectives will reveal strong contrastive effects given the semantics of relative adjectives (Kennedy, 2001). While color and material are both absolute adjectives, their perceptual properties are different, with color contrast being generally easier to detect than material contrast (see Fig.1). We therefore predict that contrastive effects should be observed not only with material adjectives, but also with color adjectives. As discussed by Sedivy (2003, 2004), the anticipatory effects that mark a contrastive interpretation in this paradigm may be manifest in three ways: increased looks to the referent (Target boost), less looks to the competitor (Competitor reduction), or both. While future research needs to investigate what these different patterns reveal in terms of the underlying processes of perception and interpretation, we will follow Sedivy (2003) and take the strongest contrastive effects to be those involving a Target boost.

The eye-tracking samples were collected in the US, India and Hungary (N=28 per group), spanning three different language families (West Germanic, Indo-Aryan and Finno-Ugric). As predicted, strong contrastive effects were observed in the Scalar condition, where all three languages revealed a Target boost (English: 4.76% increase in Target fixations between 1C-2C during the NP window; 95% CI: 0.581% – 9.17%; Hindi: 5.27% increase; 95% CI: -0.003% – 10.8%; Hungarian: 5.68% increase; 95% CI: 1.52% – 10.3%). Confirming our predictions, contrastive effects were observed in the Color condition, where English revealed a reliable Target boost (5.51% increase; 95% CI: 0.426% – 10.8%), whereas a reliable Competitor reduction was observed in Hindi (-6.53% difference; 95% CI: -11.7% – -1.61%) and Hungarian (-5.82% difference; 95% CI: -9.70% – -1.96%). In the Material condition, English revealed both a reliable Target boost (4.51% increase; 95% CI: 1.01%-8.19%) and a reliable Competitor reduction (-7.01% difference; 95% CI: -12.5% – -1.98%), whereas neither effect was reliable in Hindi or Hungarian (although the strongest trend was a Competitor reduction).

Our results confirm that contrastive inferences may be derived when processing all three types of adjectives, contrary to what Sedivy (2004) had observed. The strongest contrastive effects (Target boost) were observed with scalar adjectives (Aparicio et al., 2017), with color and material adjectives revealing a mixed pattern of effects. While we did not predict any cross-linguistic differences, English speakers may have revealed a Target boost across adjective types because of their greater engagement in the task. Future investigations of individual differences should look at the effect of task engagement on depth of pragmatic reasoning.

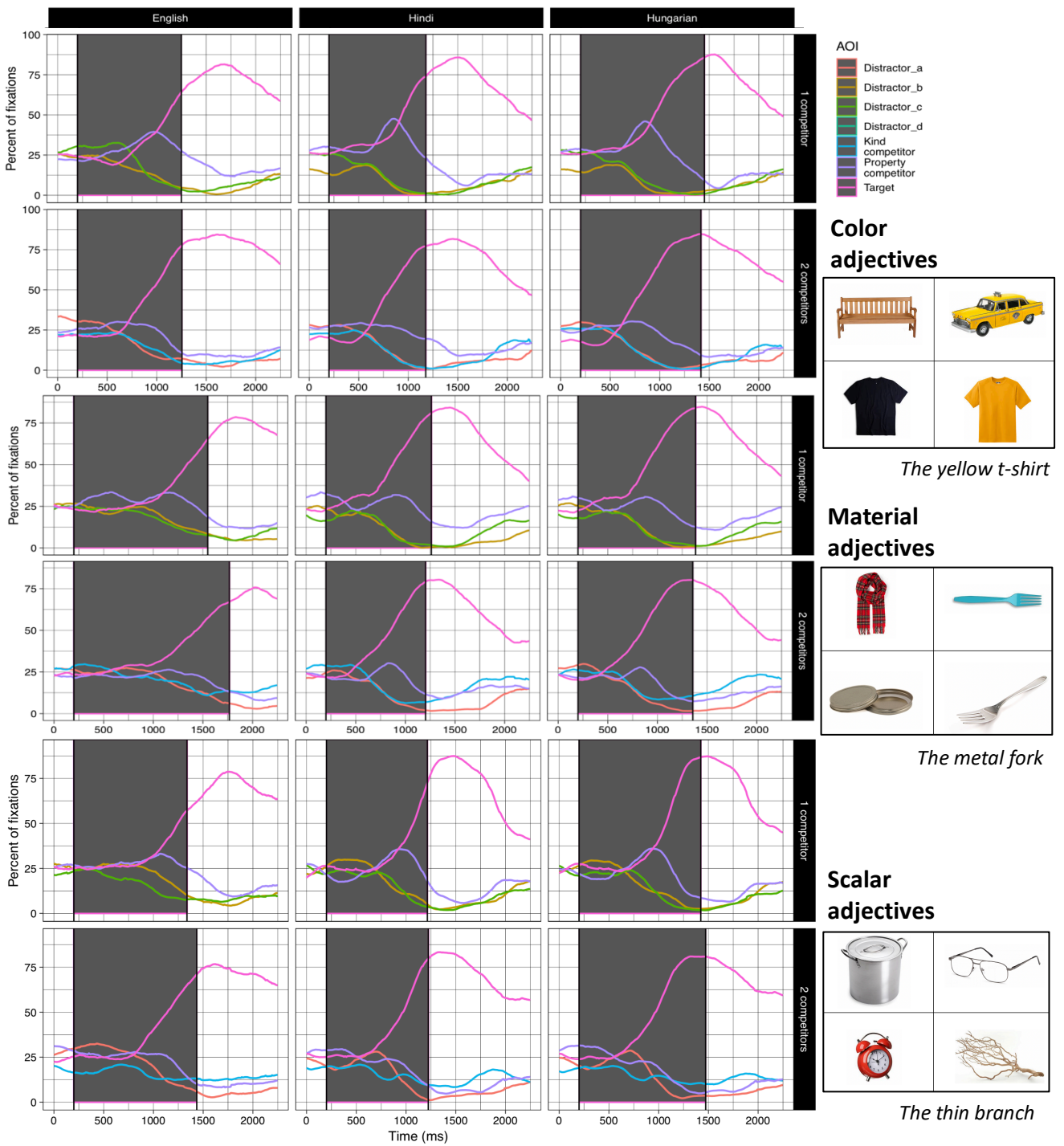
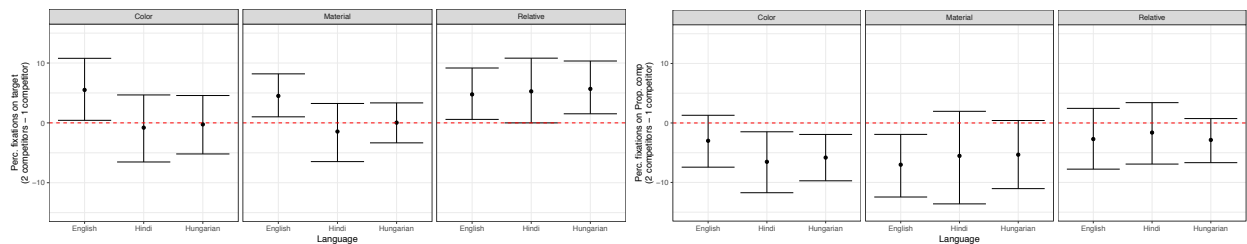


Fig. 1: Mean percentages of fixations on the objects in display over time. The gray area represents the mean duration of the noun phrase. Color and material sample displays are from 2C and scalar from 1C.



Figs. 2 and 3: Mean percentages of fixations on the Target (left) and the Property Competitor (right) in the 2 Competitor vs. 1 Competitor conditions (Error bars are bootstrapped 95% CIs).