Word Order Predicts Cross-linguistic Differences in the Production of Redundant Color and Number Modifiers

Sarah A. Wu & Edward Gibson (Massachusetts Institute of Technology)
sarahawu@mit.edu

According to Grice's Maxim of Quantity, in order to communicate successfully, people should say enough to uniquely identify a referent but avoid redundancy by saying no more than is necessary (Grice, 1975; Olson, 1970). However, people often use redundant adjectives in referential communication (Engelhardt et al., 2006; Koolen et al., 2013; Sedivy, 2005), especially redundant color words (Arts et al., 2011a, 2011b; Brown-Schmidt & Konopka, 2011; Rubio-Fernández, 2016). Interestingly, Rubio-Fernández, Jara-Ettinger & Mollica (2018) observed that Spanish speakers tend to produce fewer redundant color words than English speakers.

This interesting cross-linguistic difference has been attributed to a difference in word ordering across the two languages, which leads to a difference in incremental planning. However, the original study was run in two different countries, leaving the possibility that perhaps cultural factors, differing experience with behavioral studies, or subtly differing study methodologies between the two locations led to the observed pattern of data.

The goal of the current study was to evaluate a task that tests the incremental planning hypotheses against alternative cultural factors. We examined a case where English speakers tend to produce redundant descriptors, but word order is the same in both languages: the domain of number words. Crucially, number words occur on the same side of the noun in both English and Spanish, thus providing a control that allows the interpretation of a potential difference in production for redundant color words. If cultural factors caused the difference in color word production between English and Spanish, then the same difference should hold for number words. In contrast, the incremental planning hypothesis predicts an interaction between language and modifier type, due to different ordering for color words but identical ordering for number words in English and Spanish.

Our study was preregistered and 400 English speakers and 600 Spanish speakers were recruited from Amazon Mechanical Turk. Using the same experimental design and materials as in Rubio-Fernández et al. (2018), we asked participants to label figures such that someone else could later use their response to identify the correct figure from a grid (see Figure 1). Participants' responses were coded for the use of redundant modifiers (color or number) and a logistic mixed effects model was fit to the trial-by-trial modifier use data.

We found that English speakers used color adjectives in 81.1% (n = 977) of color trials, which was significantly higher than Spanish speakers who used color words in 62.6% (n = 853) of trials (beta = 0.625, p = 0.00956). For numbers, on the other hand, English speakers used number modifiers in 84.2% (n = 948) of trials and Spanish speakers used them in 81.6% (n = 815) of trials, which was not a significant difference (see Figure 2). Most importantly, our model showed a significant interaction between language and modifier type (beta = –0.277; p = 0.0115), indicating strong support for the incremental planning hypothesis.

Our study replicated the observation that English speakers produce more redundant color modifiers than Spanish speakers. Furthermore, we found no difference in the production of redundant number modifiers across the two languages. These data thus provide strong evidence for the incremental planning hypothesis over alternative explanations of redundant color word production. These results demonstrate how seemingly small differences in language that we speak – here, just the order of adjectives relative to nouns – can cause us to describe the world in surprisingly different ways.
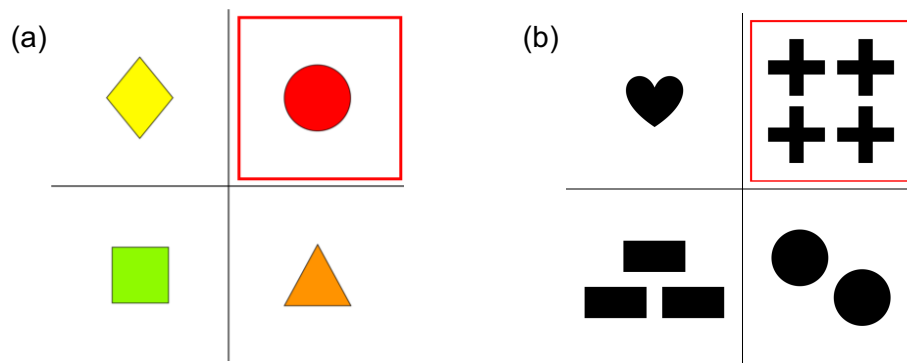
Figures

Figure 1. (a) Sample stimuli for the color condition. All four objects differ in both color and shape, so subjects could uniquely identify the boxed target either with a redundant modifier (e.g. "the red circle") or without one (e.g. "the circle"). (b) Sample stimuli for the number condition. All four quadrants consist of groups of different numbers of different shapes, so subjects could similarly identify the target either using a redundant modifier (e.g. "the four crosses") or not (e.g. "the crosses"). The target always consisted of two, three, or four objects.
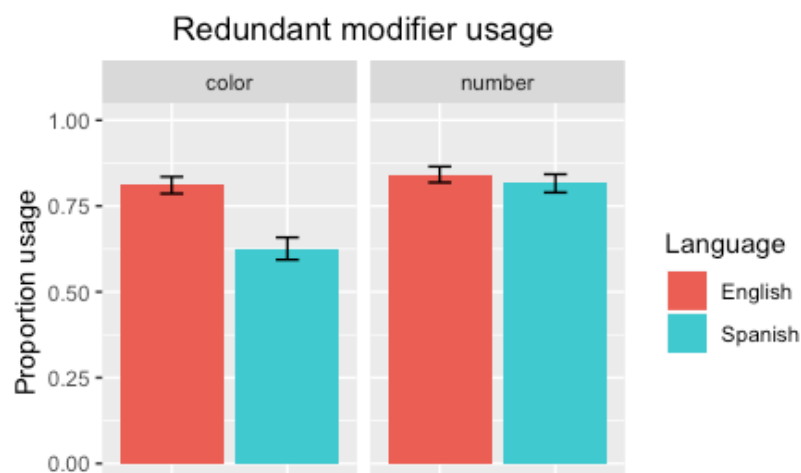

Figure 2. Proportion usage of redundant color (left) and number (right) modifiers by language, indicated by color. Error bars represent 95% bootstrapped confidence intervals.

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