Subjectivity predicts adjective ordering preferences

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Abstract here...

language | ordering preferences | subjectivity | faultless disagreement

Introduction... summary of the literature on adjective ordering preferences.

Corpus Counts

Description of our corpus work.

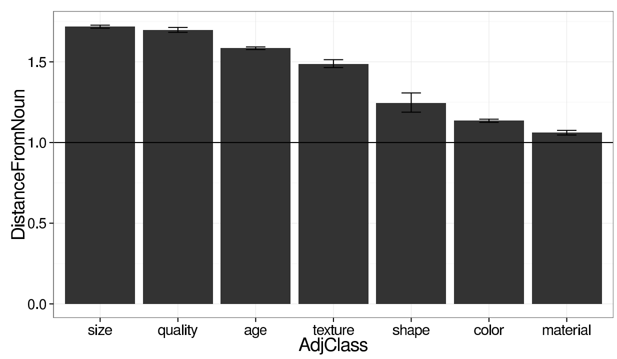

Fig. 1. Average distance from noun by adjective class for cases with at least two modifying adjectives (39,199 cases).

Based on the average distance-from-noun scores calculated in Fig. 1, we may infer the ordering preferences in 1.

$$size \geq quality > age > texture > shape > color > material \quad [1]$$

Behavioral Experiments

Subjectivity. We conducted experiment 1 to evaluate the subjectivity of adjectives and the broader classes to which they belong. Participants either evaluated the potential for faultless disagreement between two differing descriptions of an object (*Experiment 1a: Faultless Disagreement*), or the potential "subjectivity" of a single object description (*Experiment 1b: Subjectivity*). The results of these two measures are highly correlated with each other ($r = XXX$; $P < XXX$) (Fig. **??**).

Ordering preferences. We have so far established a connection between adjective subjectivity (measured by faultless disagreement scores in Expt. 1) and adjective proximity to nouns (obtained from corpus counts in Section **??**). Our next task is to verify the adjective ordering preferences that we have inferred from the corpus and from the literature on the topic, and to evaluate the predictive power of subjectivity in determining adjective order. To that end, we elicited naturalness judgments on adjective-adjective-noun object descriptions, permuting the relative order of adjectives. We then compared these naturalness judgments with the faultless disagreement scores.

For each pair of adjective classes, we determine the preferred ordering on the basis of the ratio of ratings for the each order. Ratio scores greater than 1 indicate the preferred ordering; these ratio scores for the preferred orderings are plotted in Fig. 2.

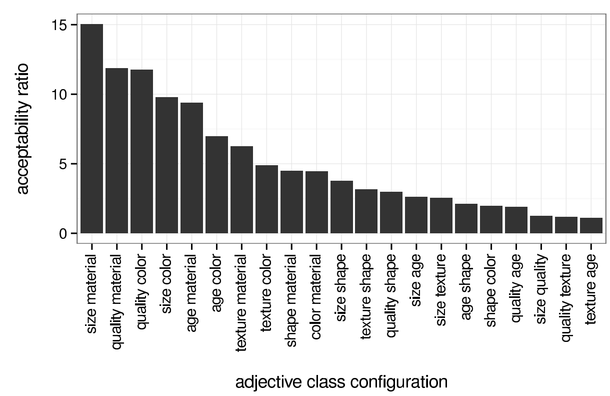

Fig. 2. Accpetability ratios for the preferred adjective class orderings.

On the basis of these preferred orderings, we may calculate the average distance from noun for each class, plotted in Fig. 3. Comparing Fig. 3 with the corpus-based distance scores reported in Fig. 1 confirms the reliability of the current paradigm: we replicate near exactly the qualitative order of adjective class distance from noun.

Significance

Speakers exhibit robust ordering preferences when it comes to modification involving more than one adjective. We present experimental and corpus results showing that these preferences track the subjectivity of the adjectives at play such that less subjective adjectives occur closer to the nouns they modify.

Reserved for Publication Footnotes

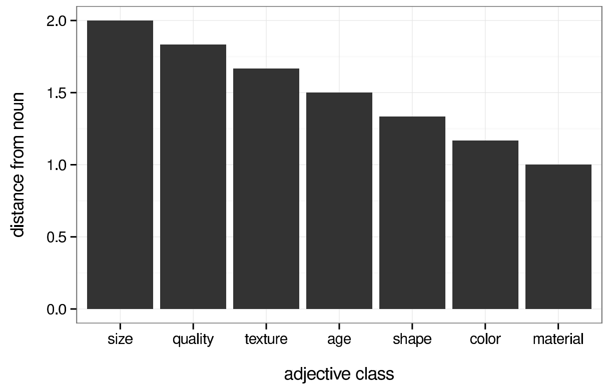

Fig. 3. Average distance from noun for each adjective class calculated from order preference ratings.

We may infer the order preferences in 2 (cf. the preferences inferred from corpus counts in 1 above).

$$size > quality > age > texture > shape > color > material \quad [2]$$

In addition to calculating preference ratios by class configurations, we also calculated preferred orderings for all of the specific adjective pairings. On the basis of how often an adjective from a given class occurred first in an adjective-adjective-noun configuration, we may infer the relative distance from the noun a given class prefers. Fig. 4 plots these average distance scores, where a value of 2 signals that a class's adjectives always occur first in preferred adjective-adjective-noun orderings, and a value of 1 indicates that a class's adjectives always occur second.

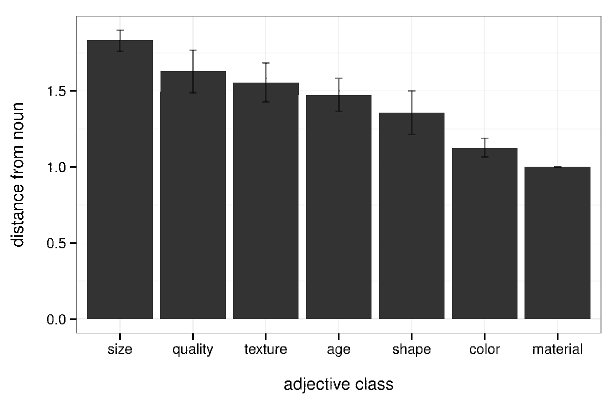

Fig. 4. Average distance from noun for each adjective class by computing how often adjectives from that class occur first in preferred adjective-adjective-noun orderings.

Finally, and most directly related to our hypothesis concerning adjective subjectivity in ordering preferences, we compared acceptability ratings from the current experiment with faultless disagreement scores from Expt. 1. To do so, we first calculated a difference score for each class configuration, CLASS1–CLASS2, subtracting the average faultless disagreement score for CLASS1 from the average faultless disagreement score for CLASS2. Fig. 5 plots class configuration acceptability ratings against faultless disagreement difference scores.

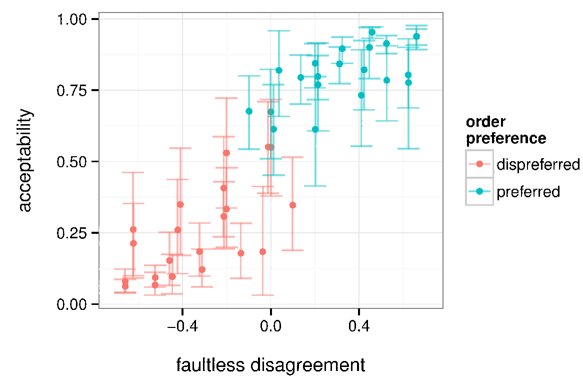

Fig. 5. By-class adjective order preferences plotted against difference in faultless disagreement.

Discussion

Materials and Methods

Corpus counts.

Experiment 1a: Faultless Disagreement. Something about our methods and how we ran the experiment

adjective	class	adjective	class	noun	class
old	age	good	quality	apple	food
new	age	bad	quality	banana	food
rotten	age	round	shape	carrot	food
fresh	age	square	shape	cheese	food
red	color	big	size	tomato	food
yellow	color	small	size	chair	furniture
green	color	huge	size	couch	furniture
blue	color	tiny	size	fan	furniture
purple	color	short	size	TV	furniture
brown	color	long	size	desk	furniture
wooden	material	smooth	texture		
plastic	material	hard	texture		
metal	material	soft	texture		

Experiment 1b: Subjectivity.

Experiment 2: Ordering preferences. We recruited 50 participants through Amazon.com's Mechanical Turk crowd-sourcing service. Participants were compensated for their participation.

Participants were asked to indicate which of two descriptions of an object sounded more natural. Each description featured a noun modified by two adjectives, for example "the red small chair" or "the small red chair". Description pairs contained the same words, with relative adjective order reversed. Descriptions were random combinations of two adjectives and a noun from the list in Table 1 (compiled via the procedure described in Section ??), with the constraint that no description contained adjectives from the same adjective class. On each trial, participants indicated which description sounded more natural by adjusting a slider whose endpoints were labeled with the competing descriptions; an example trial appears in Fig. 6.

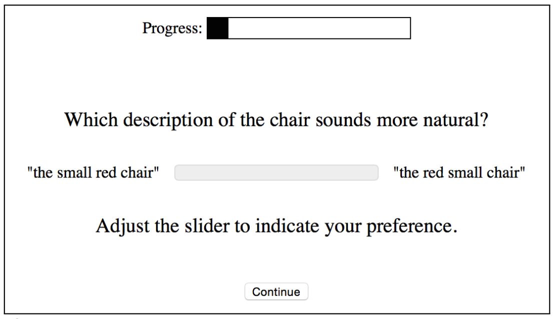

Fig. 6. Example trial from Expt. 1; participants indicated the more natural of two adjective-adjective-noun descriptions on a sliding scale.

Only native speakers of English with IP addresses located within the United States were included in the analyses; we analyzed data from 45 participants.

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