Subjectivity predicts adjective ordering preferences

From English to Hungarian to Mokilese, speakers exhibit strong ordering preferences in multi-adjective strings: "the big blue box" sounds far more natural than "the blue big box." We show that an adjective's distance from the modified noun is predicted by the adjective's meaning: less subjective adjectives occur closer to the nouns they modify. Subjectivity synthesizes—rather than supplants—many of the previous approaches to adjective ordering, incorporating notions like "inherentness" and "context dependence" into an intuitive psychological construct that readily operationalizes as a behavioral measure. We established two empirical constructs: first, the preferences themselves, which we measured using naturalness ratings (Expt. 1: 26 adjectives, n=45; Expt. 2: 70 adjectives, n=473) and validated with corpus statistics; and second, adjective subjectivity, which we measured directly (Expts. 3 & 4; n=217) and corroborated with potential for faultless disagreement (Expt. 5: n=40). An adjective's semantics predicts its distance from the modified noun, such that less subjective adjectives occur linearly closer to nouns they modify; subjectivity accounts for between 70% and 85% of the variation in our estimates of the ordering preferences (Fig. 1). To evaluate the *relative* success of subjectivity, we investigated the predictions of three other hypotheses from the literature: intersective vs. subsective modification (i.e., the mode by which an adjective composes semantically with the noun it modifies; Truswell, 2009; Fig. 2), concept-formability (i.e., whether an adjective composes with a noun to form a complex, idiomatic concept; McNally and Boleda, 2004; Bouchard, 2005; Svenonius, 2008; Fig. 3, top), and adjective inherentness (i.e., how essential an adjective's meaning is to the noun it modifies; Sweet, 1898; Whorf, 1945; Fig. 3, bottom). In each case, we found that subjectivity has greater predictive power.

Adjective ordering preferences have received considerable attention throughout the history of generative grammar and cognitive psychology, owing to their remarkable stability within and across languages. Yet while descriptions of the phenomenon abound, an explanation continues to prove elusive. Our findings serve to narrow the space of possible explanations: rather than representing these preferences as a fully specified ranking according to semantic classes or syntactic projections, our results demonstrate that ordering preferences more likely emerge from a desire to place more informative, less subjective content closer to the substantive head of a nominal construction (i.e., closer to the modified noun). Subjective content allows for miscommunication to arise if speakers and listeners arrive at different judgments about a property description. Hence, less subjective content is more useful at communicating about the world. An explanation along these lines, based on pressures to facilitate successful reference resolution, would have to depend on the hierarchical, not linear, ordering of adjectives: noun phrases are built semantically outward from the noun, and more useful, less subjective content enters earlier into this process (cf. the mirroring of preferences in pre- vs. post-nominal languages). The success of subjectivity in predicting adjective ordering preferences provides a compelling case where linguistic universals, the regularities we observe in adjective ordering, emerge from cognitive universals, the subjectivity of the properties that the adjectives name.
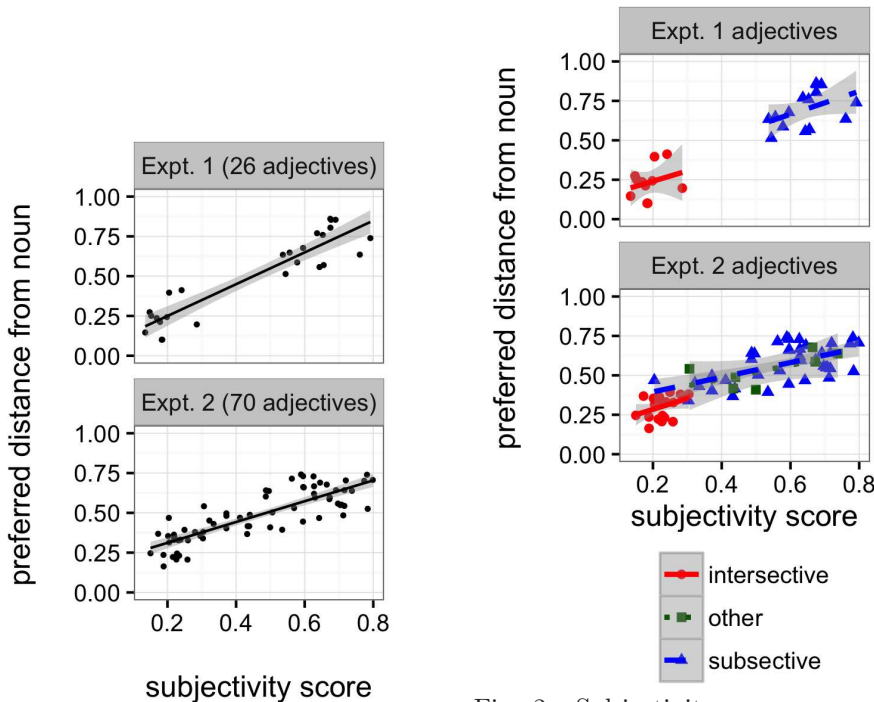

Fig. 1: Ordering preferences plotted against mean subjectivity scores for each of the adjectives tested in Expt. 1. (*top*; $r^2 = 0.85$, 95% CI [0.75,0.90]) and Expt. 2 (*bottom*; $r^2 = 0.70$, 95% CI [0.58,0.78]).
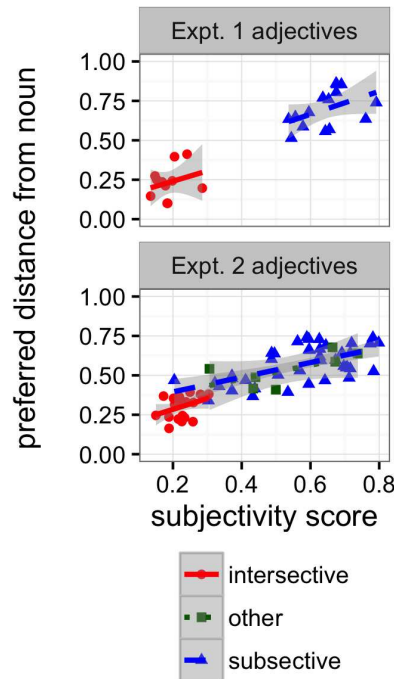
Fig. 2: Subjectivity scores grouped by subsectivity vs. intersectivity (i.e., composition mode) for the adjectives tested in Expt. 1 (*top*) and Expt. 2 (*bottom*). Even within subsectivity classes, subjectivity continues to predict ordering preferences.
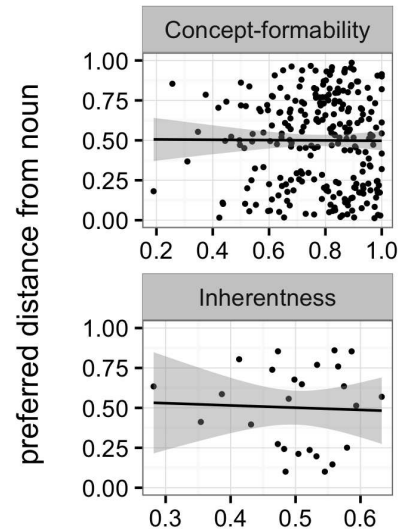
Fig. 3: Ordering preferences plotted against mean adjective-noun concept-formability scores (*top*; n=40; $r^2 = 0.00$, 95% CI [0.00,0.00]) and mean adjective inherentness scores (*bottom*; n=41; $r^2 = 0.00$, 95% CI [0.00,0.02]) for the 26 adjectives tested in Expt. 1.