Subjective little learners:
Hyperarticulated input and the early development of adjective ordering preferences

Adults have robust adjective ordering preferences, which determine the relative ordering of adjectives in multi-adjective strings: "small gray kitten" is preferable to "gray small kitten" in English and many other unrelated languages. Scontras, Degen, and Goodman (2017) (**SDG**) determined that the best predictor of adult ordering preferences is adjective subjectivity (rather than, e.g., semantic class; Dixon, 1982; Cinque, 2014), with less subjective adjectives preferred closer to the modified noun. Despite its cross-linguistic stability, it remains unknown when and how the preference develops—a preference that involves both the cognitive representation of subjectivity and the mapping of that cognitive representation onto the linguistic representation of adjective order. We conduct a corpus analysis of English child-produced and child-directed speech and compare it against the adult-to-adult data from SDG, finding evidence for

(i) qualitative similarity between adult-to-adult and child-directed data, but with hyperarticulation (Kuhl et al., 1997) of subjectivity-based adjective ordering preferences, and

(ii) development of adult-like subjectivity-based preferences as early as age two.

SDG calculated adjective distance from the modified noun in adult-to-adult corpora (Figure 1, top), with adjectives coming from semantic classes such as VALUE (*good*), DIMENSION (*small*), AGE (*old*), PHYSICAL (*soft*), SHAPE (*square*), COLOR (*blue*), and MATERIAL (*wooden*). SDG then measured perceived adjective subjectivity in adults, finding roughly three levels: VALUE [HIGH] > DIMENSION, AGE, PHYSICAL [MIDDLE] > SHAPE, COLOR, MATERIAL [LOW]. The adult ordering preferences correlated strongly with adjective subjectivity. We extend SDG's corpus methodology to use naturalistic productions to calculate young children's ordering preferences. This method conservatively assesses when stable, adult-like preferences emerge. We also calculate ordering preferences evidenced in child-directed input from adults. This assesses (i) whether child-directed speech differs from adult-to-adult data at the level of adjective ordering preferences (since it often does for other linguistic domains: Ma et al., 2011), and (ii) whether child adjective ordering output transparently reflects the input. Our corpus analysis consists of 1,069,406 English child-produced utterances and 688,428 English child-directed utterances from CHILDES (MacWhinney, 2000), for children ages 2;00-4;11.

When adjective distance from the noun is viewed through the lens of subjectivity (Figure 1, right) rather than semantic class (Figure 1, left), we see evidence for adult-like preferences in child-produced data as early as age two (HIGH and MIDDLE are farther from the modified noun than LOW subjectivity adjectives) and fully adult-like preferences by age three (HIGH is farther than MIDDLE, which is farther than LOW). Moreover, child-directed speech shows the same qualitative pattern as adult-to-adult data (HIGH farther-than MIDDLE farther-than LOW), but noticeably hyperarticulates the HIGH vs. MIDDLE differential. Our results provide support for

(i) the salience of subjectivity in the development of adjective ordering preferences,
(ii) the similarity of adult-to-adult data and child-directed speech at this level of abstraction,
(iii) hyperarticulation in child-directed speech concerning ordering preferences, and
(iv) child preferences as a fairly transparent reflection of their input.

Future experimental work can assess the development of children's perceived subjectivity of adjectives as the cognitive underpinning of the development of their adjective ordering preferences.

Word count: 496

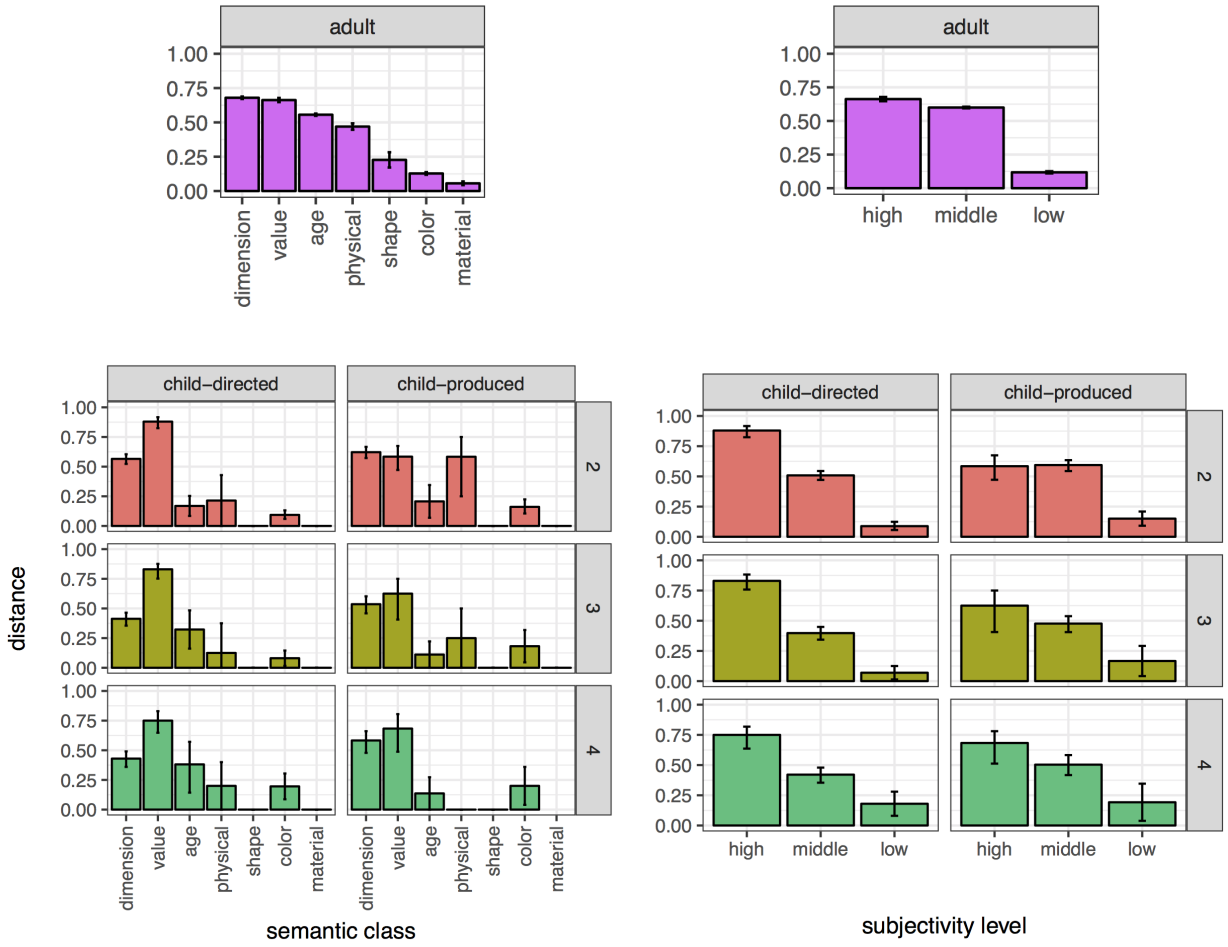

Figure 1: Adjective *distance* from the modified noun by *semantic class* (Left) and perceived *subjectivity level* (Right). Adult-to-adult data are shown in the Top panels (*adult*), while *child-directed* and *child-produced* speech from ages 2, 3, and 4 are shown in the Bottom panels.

References

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