

Strategic use of adjectives as a marker of egocentric production

Ella Bohlman & Jessica L. Montag, University of Illinois Urbana-Champaign

Speakers often make implicit choices that make language production easier for themselves (e.g., MacDonald, 2013). These choices include producing more lexically accessible words earlier in utterances (Bock & Warren, 1985; Tanaka et al., 2011) or repeating a sentence structure to take advantage of a recently activated plan (Ferreira & Bock, 2006). Another speaker choice is to produce a short frequent word before harder-to-plan phrases to provide more time to plan an upcoming phrase (Ferreira & Dell, 2000). While disfluencies (Clark & Fox Tree, 2002) or function words such as complementizers (Ferreira & Bock, 2006) are typically investigated for their role in egocentric production, the present work investigates whether speakers also strategically use content words, in the case, adjectives, before harder-to-plan upcoming words. To manipulate production difficulty, items varied in name agreement. High agreement objects have a single label (banana) while low agreement objects have multiple labels (coat/jacket). Speakers are consistently slower to name objects with low agreement (Griffin, 2001; He et al., 2021; Vitkovitch & Tyrell, 1995).

Method: 36 individuals participated in an English sentence production task with 54 target items. Participants saw an array of 4 inanimate items and described the target object outlined in a green box (Figure 1). The study used a 2x2 within-participants design. On half the trials, the array contained a competitor that matched the target item in a different color, such that participants needed to produce an adjective to sufficiently identify the target (Same Shape Competitor vs. No Competitor). The second manipulation was the name agreement of the 54 target objects (High Agreement vs. Low Agreement). Name agreement norming was performed by a separate group of participants. Trials consisted of 54 target and 108 filler trials. Targets appeared in both conditions, but participants saw each target only once. The key dependent measure was the use of adjective (*a blue hat* vs. *a hat*), as well as timing measures including initiation latencies and speaking durations of the utterance. If speakers use adjectives egocentrically, we hypothesized a key interaction: Speakers should produce more adjectives before the harder-to-produce low name agreement targets, when the trial does not require the use of an adjective (no same shape competitor).

Results: Adjective Use: Participants' use of adjectives was consistent with our predictions (Figure 2). Participants produced uniformly high rates of adjectives on trials with a same shape competitors (Low Agreement: 86.7%; High Agreement: 88.6%). On trials with no same shape competitor adjective use was overall lower, with a higher rate of use for low name agreement trials (Low Agreement: 56.2%; High Agreement: 49.6%). A mixed effect logistic regression model with maximal converging random slopes (Table 1) showed our predicted interaction.

Speaking Times: Consistent with longer naming latencies for low name agreement items attested in the literature, speakers took longer to begin producing utterances containing low name agreement objects (Table 2). Consistent with participants' use of adjectives in our studies as optional words to give themselves more planning time, in utterances that contained adjectives, speaking duration of adjectives was longer in utterances with low name agreement objects (Table 3). Target object frequency (Subtlex-us; Brysbaert & New, 2009) did not affect adjective use or any measure of speaking times.

Conclusions: We find evidence that in addition to disfluencies and function words, speakers can use adjectives strategically to give themselves planning time in a sentence production task. Consistent with existing results, we find that speakers often use adjectives when not necessary to perform the task (Pechmann, 1989). While adjectives undoubtedly serve a communicative function to aid the listener (Jara-Ettinger & Rubio-Fernandez, 2022), we suggest that adjectives can also serve an egocentric function, to give speakers extra planning time before hard-to-produce words and phrases. An egocentric use of adjectives is consistent with the more frequent use pre-nominal than post-nominal adjectives cross-linguistically (Dye et al., 2018;

Rubio-Frenandez, 2016) and may explain speakers' violations of the Gricean Maxim of Quantity which can be disadvantageous to listeners (Engelhardt et al., 2006).



Figure 1: Sample experimental items. Left array demonstrates a same-shape distractor, right array demonstrates no distractor

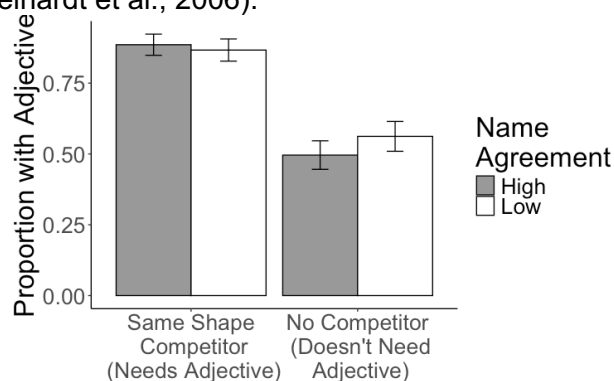


Figure 2: Adjective use by condition

Table 1: Mixed effect logistic regression model predicting adjective use by Agreement (High = -0.5, Low = 0.5) and Competitor (No Competitor = -0.5; Same Shape Competitor = 0.5)

	Est.	SD	z	p
Intercept	2.31	0.48	4.73	< 0.001*
Agreement	0.0007	0.44	0	0.99
Competitor	4.13	0.61	6.8	< 0.001*
Agree x Comp	-0.94	0.38	-2.47	0.014*

Table 2: Mixed effect linear regression model predicting initiation latency (time to begin speaking) by Agreement and Competitor. Adjective use did not predict initiation latencies.

	Est.	SD	t	p
Intercept	1.63	0.066	25	< 0.001*
Agreement	0.22	0.055	4.05	< 0.001*
Competitor	-0.068	0.036	-1.88	0.06
Agree x Comp	0.08	0.069	1.23	0.22

Table 3: Mixed effect linear regression model predicting speaking duration of adjectives (in utterances with adjectives) by Agreement and Competitor.

	Est.	SD	t	p
Intercept	0.56	0.047	12.05	<0.001*
Agreement	0.14	0.057	2.43	0.017*
Competitor	0.024	0.037	0.65	0.52
Agree x Comp	-0.03	0.072	-0.42	0.67

References

- Bock, J. K. & Warren, R. K. (1985). Conceptual accessibility and syntactic structure in sentence formulation. *Cognition*, 21, 47–67.
- Brysbaert, M., & New, B. (2009). Moving beyond Kučera and Francis: A critical evaluation of current word frequency norms and the introduction of a new and improved word frequency measure for American English. *BRM*, 41(4), 977–990.
- Clark, H. H., & Fox Tree, J. E. (2002). Using uh and um in spontaneous speaking. *Cognition*, 84(1), 73–111.
- Dye, M., Mili, P., Futrell, R., & Ramscar, M. (2018). Alternative solutions to a language design problem: The role of adjectives and gender marking in efficient communication. *Topics in Cognitive Science*, 10(1), 209–224.
- Engelhardt, P., Bailey, K., & Ferreira, F. (2006). Do speakers and listeners observe the Gricean Maxim of Quantity? *Journal of Memory and Language*, 54(4), 554–573.
- Ferreira, V. S., & Bock, K. (2006). The functions of structural priming. *Language and Cognitive Processes*, 21(7–8), 1011–1029.
- Ferreira, V. S., & Dell, G. S. (2000). Effect of ambiguity and lexical availability on syntactic and lexical production. *Cognitive Psychology*, 40(4), 296–340.
- Griffin, Z. M. (2001). Gaze durations during speech reflect word selection and phonological encoding. *Cognition*, 82(1), B1–B14.
- He, J., Meyer, A. S., Creemers, A., & Brehm, L. (2021). Conducting language production research online: A web-based study of semantic context and name agreement effects in multi-word production. *Collabra: Psychology*, 7(1), 29935.
- Jara-Ettinger, J., & Rubio-Fernandez, P. (2022). The social basis of referential communication: Speakers construct physical reference based on listeners' expected visual search. *Psychological Review*, 129(6), 1394–1413.
- MacDonald, M. C. (2013). How language production shapes language form and comprehension. *Frontiers in Psychology*, 4, 226.
- Pechmann, T. (1989). Incremental speech production and referential overspecification. *Linguistics* 27, 89–110.
- Rubio-Fernández, P. (2016). How redundant are redundant color adjectives? An efficiency-based analysis of color overspecification. *Frontiers in Psychology*, 7, 153.
- Tanaka, M. N., Branigan, H. P., McLean, J. F., & Pickering, M. J. (2011). Conceptual influences on word order and voice in sentence production: Evidence from Japanese. *Journal of Memory and Language*, 65(3), 318–330.
- Vitkovitch, M., & Tyrrell, L. (1995). Sources of disagreement in object naming. *The Quarterly J. of Exp. Psych.*, 48(4), 822–848.