

Availability-based production predicts speakers' real-time choices of Mandarin classifiers

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Speakers often face choices as to how to structure their intended message into an utterance. When multiple options are available to express more or less the same meaning, what general principles govern speaker choice? Here we investigate the influence of contextual predictability on the encoding of linguistic content manifested by speaker choice in a classifier language.

In English, a numeral modifies a noun directly (e.g., three tables). In classifier languages such as Mandarin Chinese, it is obligatory to use a classifier (CL) with the numeral and the noun (e.g., three CL.flat table, three CL.general table). While different nouns are compatible with different specific classifiers, there is a general classifier “ge” (CL.general) that can be used with most nouns. We focus on the alternation of using the general classifier versus a specific classifier with the same noun where the options are nearly semantically equivalent. When the upcoming noun is less predictable, the use of a specific classifier would reduce surprisal at the noun thus potentially facilitating comprehension (predicted by Uniform Information Density (UID; Levy & Jaeger, 2007)). But the use of that specific classifier may be dispreferred from a production standpoint if accessing the general classifier requires less effort (predicted by Availability-Based Production (ABP; Bock, 1987; Ferreira & Dell, 2000)). We ask: 1) Does the general classifier require less effort to produce compared to a specific classifier? 2) Does noun predictability affect classifier choice, and if so, in which direction? Here we use a picture-naming experiment with noun predictability differences arising from differences in noun frequency to investigate these questions.

Predictions:

P1. Time pressure: If producing the general classifier requires less effort than producing a specific classifier, speakers would produce the general classifier more often when they are under time pressure in real-time language production.

P2. Noun predictability: UID predicts that speakers choose a **specific** classifier more often for lower-frequency nouns, which would be unpredictable if a general classifier were used. ABP predicts that speakers choose the **general** classifier more often for lower-frequency nouns, because accessing the appropriate specific classifier(s) involves accessing the noun lemma, and lemmas of low-frequency nouns take longer and are harder to access.

Picture-Naming experiment: Mandarin-speaking participants were presented with scenes of various countable object kinds such as cabbages and tables. In each scene, there were several instances of the same object kind. Participants were asked to describe the number and the name of the object in Mandarin, eliciting utterances such as “three CL apples”, which we recorded. In the **Quick** condition, recording started 50 ms after the picture was shown, each trial ended after 5 seconds of recording, and the next trial began automatically. In the **Slow** condition, recording started 3 seconds after the picture was shown, and participants clicked on the screen to move to the next trial. To estimate noun predictability, we used log noun frequency from SogouW (Sogou, 2006), a word frequency dictionary for online texts in 2006.

Results & discussion: Our results (Fig.1) show that the lower frequency the noun, the more likely the speaker is to use the **general** classifier ($p < 0.001$). This trend is consistent with previous results from a corpus analysis investigating the role of noun predictability on classifier choice (Zhan & Levy, 2018), and supports the Availability-Based Production account. Furthermore, speakers tend to use the general classifier more often when they are under time pressure than when they are not (Fig. 2, $p < 0.05$), suggesting that specific classifiers are slower than the general classifier to access, and thus also supporting the Availability-Based Production account.

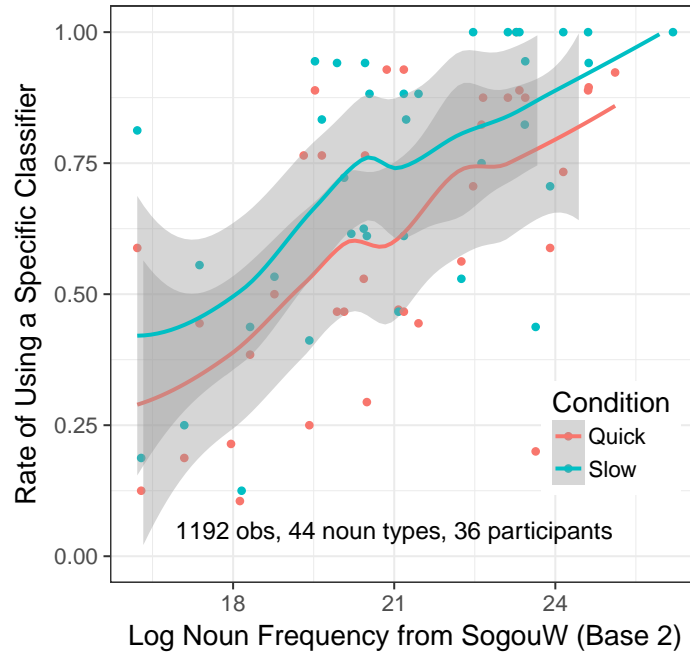


Figure 1: Unigram estimated noun predictability and rate of using a specific classifier (as opposed to the general classifier *ge*).

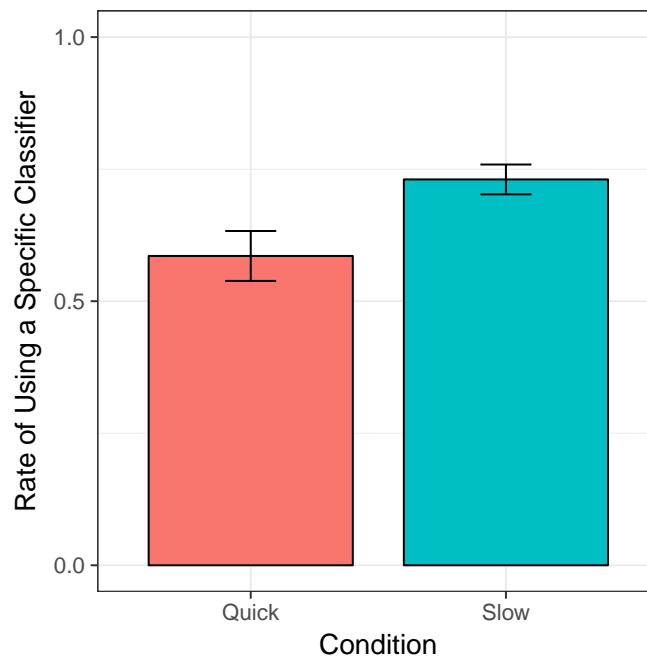


Figure 2: Quick vs. Slow manipulation and rate of using a specific classifier as opposed to the general classifier *ge*. Error bars are standard errors over by-participant means.

References:

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