

Prediction is pervasive in language comprehension. Predictability effects have been most extensively documented at the word level (Kutas & Federmeier, 2011), but words are often not unanalyzable units. The word “killer”, for example, is composed of two morphemes: the stem “kill” and the suffix “-er”. Recent magnetoencephalography (MEG) work has shown that listeners use the first morpheme to make predictions about the second during spoken word processing. Specifically, auditory cortex activity is reduced in response to predictable suffixes (Ettinger, Linzen & Marantz, 2014). The present study investigates how competition among potential suffixes affects the predictions that listeners make about the suffix. If all potential suffixes are activated at the stem, higher suffix competition should result in increased activity during the first morpheme. The opposite effect is expected if listeners instead commit to a single predicted suffix when competition is low, but refrain from making strong predictions when competition is high. Additionally, competition may modulate the effect of predictability at the suffix: if listeners strongly commit to a single predicted high probability suffix in low competition scenarios, an unexpected suffix may be more surprising in low competition than in high competition cases.

A total of 280 bimorphemic words were selected in four conditions: high vs. low suffix competition and high vs. low suffix predictability (70 items in each condition). The degree of competition among suffixes was quantified using the entropy of the suffix distribution, which captures the intuition that competition is stronger when there are more potential affixes and when their distributions are more balanced. Predictability was quantified using the negative log conditional probability of the suffix (its surprisal). The four conditions were matched for whole word frequency. An additional 100 filler items with various properties were included. All words were recorded by a native speaker of American English. Participants ($n = 24$) listened to the words while MEG data were recorded. About 15% of the words were followed by comprehension questions.

Neural activity was time-locked to one of two anchors: 1) the morpheme boundary, i.e., the point in time at which the stem ends and the suffix begins; 2) the end of the word. Distributed source solutions were obtained using the MNE-Python package. Activity was averaged in a region around the left auditory cortex, identified based on grand average activity. Two time windows were considered for each of the two anchors: the 100 ms time window prior to the anchor, and the 100 ms time window following it. Averaged activity in each time window was submitted to a mixed-effects ANOVA. Higher competition led to increased neural activity in the pre-morpheme-boundary window ($p = 0.01$). Competition and predictability interacted in the pre-word-end window ($p = 0.01$). Planned comparisons revealed that the predictability effect was observed only in the high-competition condition. These results confirm that predictable morphemes elicit reduced neural signals. They support the hypothesis that higher competition leads to increased neural activity, and do not support the hypothesis that lower competition leads to stronger commitment to a single strong prediction.