

The Strength of Stress-Related Lexical Competition Depends on the Presence of First-Syllable Stress

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Abstract

Dutch listeners' looks to printed words were tracked while they listened to instructions to click on one of them. When presented with targets from word pairs where the first two syllables were segmentally identical but differed in stress location, listeners used stress information to recognize the target before segmental information disambiguated the words. Furthermore, the amount of lexical competition was influenced by the presence or absence of word-initial stress.

Index Terms: word recognition, suprasegmentals, lexical stress

1. Introduction

In word recognition, Dutch listeners use lexical stress cues, which in Dutch are mainly suprasegmental [1]. Hearing the first two syllables of a word (e.g. 'OCto'); stress marked in capitals) facilitated the recognition of a stress-matching target word (e.g. 'OCtopus') but inhibited a segmentally matching, but in stress pattern mismatching competitor (e.g. 'okTOber'). However, while two syllables were enough to provide listeners with disambiguating stress information, one syllable was not. We used eye-tracking to ask more precisely when, over the course of the first two syllables of a word, stress information has its effect. Our focus was on whether the location of the words' primary stress modulates lexical competition.

2. Eye-tracking experiment

2.1. Stimuli

Twenty-four Dutch word pairs with two segmentally identical onset syllables which differ in stress position were recorded as uttered at the end of the carrier "Klik nog een keer op het woord X" ("Click once more on the word X"). Seven pairs had a stress contrast on the first vs. the second syllable (1-2 contrast); 17 word pairs had stress on the first vs. the third syllable (1-3 contrast; e.g., 'CENTimeter' vs. 'sentiMENT'). Stress pairs were displayed with distractor pairs that were equally phonologically similar to another but different from the stress pair (e.g., 'alias' and 'alligator').

2.2. Participants and procedure

Twenty-four Dutch native listeners from the MPI pool participated. Eye-movements were recorded while participants heard on each trial a sentence instructing them to click on one of the four printed words, displayed 1200 ms before target onset. Responses to both stress pair items were collected from each participant. Order of presentation was counterbalanced.

2.3. Results and discussion

Listeners used stress information to recognize words (see figure 1): Before pairs could be distinguished by segmental information, fixations on targets became more frequent than fixations on their stress competitors ($t(95)=6.69, p<.001$). This effect was located during the processing of the second syllable. Furthermore, the amount of competition depended on the stress pattern of the competitor. Words with initial stress were stronger competitors than words with non-initial stress ($F(1,23) = 7.67, p < .05$). That is, non-initially stressed targets suffered more from competition.

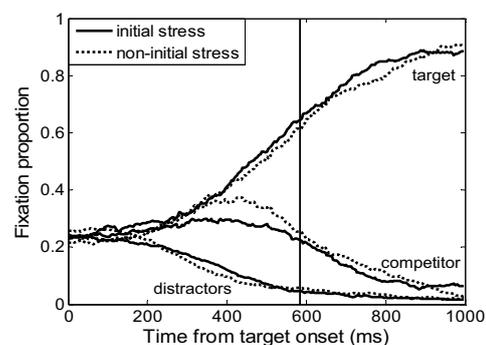


Figure 1: Mean fixation proportions over time on targets, competitors, and distractors for word-initially stressed targets (solid lines) vs. non-initially stressed targets (dotted lines). The vertical line marks the earliest point at which segmental information could have an effect.

3. Conclusions

We draw two conclusions. First, Dutch listeners use lexical stress information in spoken word recognition, but at least some information from the second syllable is needed. Second, different primary stress locations have different effects on the competition process: Competitors with word-initial stress are stronger competitors in the absence of word-initial stress cues than competitors without initial stress are when stress cues are present. This asymmetry suggests that the presence of stress cues is more salient than their absence. It could also be at least partially due to a bias induced by the fact that word-initial stress is the most common pattern in Dutch [2].

4. References

- [1] van Donselaar, W., Koster, M. and Cutler, A., "Exploring the role of lexical stress in lexical recognition", *Quarterly J. Exp. Psychol.*, 85A(2):251-273, 2005.
- [2] van Heuven, V. and Hagman, P., "Lexical statistics and spoken word recognition in Dutch", in P. Coopmans and A. Hulk [Eds], *Linguistics in the Netherlands*, 59-68, Fortis, 1988.