Processing to the beat: metrical segmentation in Dutch, Turkish, Polish and Hungarian

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With the current study we investigated the use of stress in segmentation in four metrically different languages. Previous studies have shown that listeners interpret stressed or strong syllables as potential word-beginnings in a.o. English (Cutler & Norris, 1988), and Dutch (Quené & Koster, 1998; Vroomen & de Gelder, 1995). This is interpreted as evidence for the Metrical Segmentation Hypothesis, which predicts that listeners have and use a parsing ability based on edge-aligned stress. The saliency of a stressed syllable makes it a suitable boundary marker, as it may e.g. signal the parser to start a lexical access attempt. Unfortunately, most empirical evidence supporting this hypothesis comes from languages with (statistically dominant)\(^1\) word-initial stress. Evidence for a facilitatory effect of right-edge aligned stress is sparse and inconclusive (see a.o. Toro-Soto et al., 2007, Cunillera et al. 2008, Kabak et al., 2010), even though right-edge-aligned stress, like left-edge-aligned stress, is typologically highly common (Goedemans & van der Hulst, 2011). This raises the question of whether listeners use native metrical cues in segmentation, or whether stress has universal edge-marking properties in segmentation, despite differences between language systems.

To address this question, we designed a non-word spotting task in which speakers of Dutch (penultimate word-stress, variable), Polish (penultimate word-stress, fixed), Turkish (word-final stress, variable) and Hungarian (word-initial stress, fixed) were taught two auditory disyllabic non-words, which they had to spot in the test phase, now embedded in a five-syllabic nonsense phrase. The artificial language was strictly controlled for each of the four languages and the experimental conditions differed only on the basis of stress pattern, obtained through phonetic resynthesis. For each studied language, one of the six experimental conditions was the most native metrical pattern, whereas the other conditions contained a non-native metrical pattern on either the context or the target, or on both.

The results showed that listeners make use of language-specific stress cues in segmentation. A mixed effects model of the reaction times revealed a significantly facilitative effect of the native metrical pattern for each of the languages. Irrespective of whether the studied language had fixed or variable stress, peripheral (initial or final) or penultimate stress, participants benefited from the condition containing the native pattern on both context and target. Zooming in on the partly non-native conditions, the results reveal a more distinct overall reliance on the native pattern for the Turkish group as compared to the other groups. So, besides the finding that listeners use native metrical cues in segmentation, the results invite us to further investigate the role of peripherality and variability of stress in segmentation.

References


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\(^1\) Dutch has predominant prefinal stress (Kager 1989; Trommelen & Zonneveld 1989), but with many exceptions. Statistically it is a hybrid between initial and prefinal stress (Vroomen & de Gelder 1995).


