

Is There “Deafness” to Stress Contrasts: A Case of English and Serbian Speakers

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A general perceptual insensitivity to stress contrasts, termed a stress “deafness” effect, has been observed in previous research (Peperkamp & Dupoux 2008, Dupoux et al. 2001, 2008, Domahs et al. 2012). Rahmani et al. (2015) found that the “deafness” effect emerges in speakers of languages whose adult lexicon does not contain any prosodic markings (i.e., no stress-based contrasts, no tonal contrasts, and no pitch accent-based contrasts).

In the present study, our goal was to test the hypothesis that listeners of languages with prosodic markings should *not* exhibit stress “deafness” by asking whether speakers of English and Serbian are “deaf” to stress contrasts in non-words. Serbian is a lexical pitch accent language, and stress is marked at the lexical level in English, as well, thus making them both prosodically marked languages. To that end, our study was divided into two experiments. In the first experiment, separate tokens of non-words were produced with stress on the first syllable and stress on the second syllable. The non-words produced, [pilu] and [keno], were patterned according to Serbian phonotactic rules, and with Serbian vowel quality. They were all produced by a male speaker. Seventeen English and ten Serbian listeners carried out an online Sequence Recall Task (SRT) in which they were asked to identify the stressed syllable in each non-word by associating each stress pattern with a keyboard label. After hearing individual sequences of four, five, and six non-words, they attempted to press the appropriate label keys in the order in which they heard the non-words. The second experiment asked the participants to carry out the same SRT task, but this experiment included tokens that were phonotactically common in English, such as [nallit] and [kabest], with English vowel quality. It also included tokens similar to Serbian words, [bosa] and [keno], with Serbian vowel quality. These non-words were produced by both a male and female talker, and we also included the appendix word ‘OK’ at the end of each sequence.

To analyze the data, we ran a Bayesian analysis by using an open-source R Package for Bayesian Statistics in Psychology, *bayes4psy* (Demšar et al. 2020). In the first experiment, the English participants successfully recalled these stress sequences 60% of the time, while the Serbian listeners successfully recalled 73 % of the sequences. The analysis of the experiment showed that the probability that the Serbian participants were more accurate on the SRT task than the English listeners was 96% ($\pm 0.002\%$), and the 95% HDI (highest density interval) indicated that there was a higher probability of difference (than non-difference) in the distribution of responses between the two groups since the HDI only marginally included 0 ([-0.26, 0.01]). In the second experiment, English were successful 87%, and Serbian 82% percent of the time. The second experiment analysis revealed that neither group was performing better than the other, and that the 95% HDI indicated non-difference between the two groups as the HD quite clearly included 0 [-0.14, 0.32].

The findings of the study challenge the hypothesis that speakers of languages with lexically marked prosody do not have difficulties with perceiving stress contrasts. The results of the experiments thus indicate that the existence of lexical prosodic marking in one’s native language is not the sole determining factor in the perception of stress contrasts as claimed by

Rahmani et al. (2015). Instead, the results suggest that the interplay of the word-prosodic marking and other cues to stress such as phonotactic patterns and vowel quality ought to be considered in stress perception, and that the emergence of the stress “deafness” effect occurs in a more gradient fashion.

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