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"Deafness" to Lexical Pitch Accents: The Case of Non-Native Listeners

Previous research showed that non-native listeners displayed a general insensitivity to word-prosodic categories depending on their acoustic properties and the function they had in one's native language. This insensitivity effect, termed a "deafness" effect, was observed in the perception of both stress and tone contrasts (Dupoux et al. 2001, 2008, Domahs et al. 2012, Braun et al. 2014, Correia et al. 2015, Rahmani et al. 2015). For example, French speakers could not distinguish between Spanish stress contrasts (Dupoux et al. 2008), while English speakers had difficulties perceiving Mandarin tone contrasts (Braun et al. 2012). While the previous research focused mainly on the "deafness" effect with stress and tone contrasts, "deafness" was not explored with yet another word-prosodic category - *lexical pitch accent*.

Therefore, in the present study, I ask whether non-native (naïve) speakers are "deaf" to lexical pitch accents. In particular, the present study explores how speakers of English, a stress-accented language, perceive Serbian lexical pitch accent contrasts. To that end, four disyllabic CVCV non-words were recorded by a trained linguist, a native speaker of Serbian. Each non-word was produced with one of four Serbian lexical pitch accents: an H*+L pitch accent which can be either short or long depending on the vowel duration, and an L*+H which can also be either short or long (as per Godjevac 2005). Thus, the main acoustic correlates of Serbian lexical pitch accents are F0 contour and duration (Subotić et al. 2012). In this study, eighteen English and ten Serbian speakers carried out a sequence recall task in which they were asked to identify the lexical pitch accent contrasts, associate them with the keyboard labels, and recall the sequences of four, five, and six non-words by pressing the keys in the appropriate order.

The results revealed that English speakers performed above the chance level on each sequence (as per two-tailed binomial test, $p < 0.01$). The proportion test showed that Serbian and English participants did not significantly differ on their overall performance [$\chi2(1) = 0.05$, $p = 0.89$]. In addition, the logistic regression analysis revealed that there was a significant effect of lexical pitch accent categories on participants' accuracy rates [$\beta = 0.85$, $SE = 0.12$, $z = 6.778$ $p < 0.01$]. For example, both Serbian and English speakers were more sensitive to duration than to F0 contrasts, as their accuracy scores were significantly higher when listening to lexical pitch accents contrasted in duration rather than F0 (e.g. long H*+L vs. short H*+L) [Serbian - $\chi2(1) = 29$, $p < 0.01$, English - $\chi2(1) = 17$, $p < 0.01$].

The main finding of the study is that English speakers are not "deaf" to lexical pitch accents because of their ability to attune to robust acoustic parameters, F0 and duration. Contrary to the indications of the previous perception studies on stress and tone contrasts (Dupoux et al. 2008, Braun et al. 2014), this finding suggests that even if the perceived word-prosodic category is not phonemically contrastive in one's native language, this does not preclude its successful discrimination and recall. The present study therefore adopts an explanation offered by Correia et al. (2015), who claim that "deafness" can be observed only in cases when non-native or native listeners are unable to perceive phonetic details of the contrasts. Since this was not the case with non-native speakers in the present study, "deafness"

has not been observed. The study also reveals that duration could be a more robust acoustic parameter of Serbian lexical pitch accents as both native and non-native speakers are more sensitive to duration than to F0 contours. This finding calls for further research as duration and F0 are traditionally considered to be equally important for Serbian pitch accents.

References

Braun, B., Galts, T., & Kabak, B. (2014). Lexical encoding of L2 tones: The role of L1 stress, pitch accent and intonation. Second Language Research, 30(3), 323-350.

Correia, S., Butler, J., Vigário, M., & Frota, S. (2015). A stress "deafness" effect in European Portuguese. Language and speech, 58(1), 48-67.

Domahs, U., Knaus, J., Orzechowska, P., & Wiese, R. (2012). Stress "deafness" in a language with fixed word stress: an ERP study on Polish. Frontiers in psychology, 3, 439.

Dupoux, E., Peperkamp, S., & Sebastián-Gallés, N. (2001). A robust method to study stress "deafness". The Journal of the Acoustical Society of America, 110(3), 1606-1618.

Dupoux, E., Sebastián-Gallés, N., Navarrete, E., & Peperkamp, S. (2008). Persistent stress 'deafness': The case of French learners of Spanish. Cognition, 106(2), 682-706.

Godjevac, S. (2005). Transcribing serbo-croatian intonation. Prosodic typology: The phonology of intonation and phrasing, 146-171.

Rahmani, H., Rietveld, T., & Gussenhoven, C. (2015). Stress "deafness" reveals absence of lexical marking of stress or tone in the adult grammar. PloS one, 10(12), e0143968.

Subotić, L., Sredojević, D., & Bjelaković, I. (2012). Fonetika i fonologija: ortoepska i ortografska norma standardnog srpskog jezika. Novi Sad: Filozofski fakultet.