

Voice onset time of Hungarian voiceless plosives in Multiple Sclerosis

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Multiple sclerosis (MS) is inflammatory disease of the central nervous system, and one of the most common neurodegenerative diseases. Its symptoms are quite various. Almost 2/3rd of the MS patients have some language or speech symptoms. Among these the most frequent ones are the following: dysarthria, word finding difficulties, deteriorating verbal fluency, problems in sentence repetition, limitations of the higher level language processes (Laakso et al. 2000), and reduced inclination for communication (Gerald et al. 1987).

Patients often reported that they difficulties in speech increase by the effects of fatigue (Blaney & Lowe-Strong 2009). One of the most examined symptoms in MS is the change of speech rate and articulation rate while we have only a few results on the articulation of MS patients compared to controls. In this presentation, the effect of the disease on voiceless plosives is analysed using acoustic measurements.

15 MS patients and 15 age- and gender-matched control speakers participated in the analysis. Speech recordings analysed in this study were parts of a longer session of recordings which consisted of more different types of tasks. Participants were asked to read aloud nonwords in the same sentence. Voiceless plosives [p, t, k] occurred in VCV clusters before the vowels [i:, a:, u:]. Each consonants occurred 36 times in one recording, this means that 108 plosives from each speaker were analysed. Measurements were carried out by Praat 5.0 (Boersma – Weenink 2008). VOT and the duration of the syllables which contained the plosives were measured (syllables were measured from the burst to the end of the vowel, Fischer & Goberman 2010). After that VOT ratio in the syllables were calculated for eliminate the differences in the articulation rate between the speakers. Finally, data were compared between the two groups.

Results show that MS has an effect on VOT. There were differences between MS patients and controls depending on the developmental phase of the disease in VOT and VOT ratio. The difference was higher in the former case. This means that VOTs of MS patients were longer than those of control speakers. However, the difference in VOT ratio was lower between the groups since the articulation rate of the patients was slower.

Results show new details of the difficulties in the speech of MS patients, and they provide new aspects for speech therapy.

References

- Blaney, B. E., & Lowe-Strong, A. (2009). The impact of fatigue on communication in multiple sclerosis. The insider's perspective. *Disability and rehabilitation*, 31(3), 170-180.
- Boersma, P., & Weenink, D. (2008). Praat: doing phonetics by computer (Version 5.0.1). http://www.fon.hum.uva.nl/praat/download_win.html
- Fischer, E., & Goberman, A. M. (2010). Voice onset time in Parkinson disease. *Journal of Communication Disorders*, 43(1), 21-34.

- Gerald, F. J. F., Murdoch, B. E., & Chenery, H. J. (1987). Multiple sclerosis: Associated speech and language disorders. *Australian Journal of Human Communication Disorders*, 15(2), 15-35.
- Laakso, K., Brunnegård, K., Hartelius, L., & Ahlsén, E. (2000). Assessing high-level language in individuals with multiple sclerosis: a pilot study. *Clinical linguistics & phonetics*, 14(5), 329-349.