Speech rate and phonological processes in first and second language in an adolescent autistic individual

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An increasing number of studies reports that speech production may be distorted in autism (Kjelgaard and Tager-Flusberg 2001). There have been a few studies investigating phonological processes (PPs) in autistic individuals (e.g., Wolk And Giesen 2000; Wolk And Meiser 1993), yet, to our knowledge, there has been no acoustic study comparing the occurrence of PPs in first (L1) and second (L2) language. Previous studies on PPs employed by clinical populations with intermediate L2 proficiency (e.g., Połczyńska 2009; Marecka and Połczyńska 2009) indicate that more processes tend to be applied in L2 than in L1 because L2 is a more demanding linguistic context. A neuroimaging study by Halsband (2006) suggests that L1 motor patterns are automatic and overlearnt, thus, L1 phoneme sequences are easier to produce. The aim of this study is to analyze PPs in L1 (Polish) and L2 (English) of an adolescent autistic individual. Application of PPs will be correlated with the rate of speech tempo (measured in syllables per second) and average duration of an uninterrupted articulation of speech sounds. We hypothesize that there may be more phonological processes in L1 than in L2 because L2 articulation was considerably slower and, thus, more intelligible. The subject was a 16-year-old Polish autistic girl. She started her formal education two years later than her peers and she was attending a regular junior high school at the time of the experiment. Her L2 (English) proficiency was intermediate. A matched group of healthy controls comprised 10 subjects (Połczyńska-Fiszer 2008). The subjects performed selected tasks from two tests: (1) the *Polish Dysarthria Test* (Połczyńska-Fiszer and Pufal 2006) and (2) the *English as the Second Language Test in Dysarthria* (Połczyńska-Fiszer 2006). Both tests were modified and adjusted to the patient's abilities and interests. The recordings were made and analyzed acoustically with *Praat* (Boersma and Weeink 2010) and phonetic transcription of the subject's speech was made. Errors resulting from L1 pronunciation of L2 words (e.g., word-final devoicing) were not treated as PPs. The results show that in non-spontaneous speech tasks (e.g., repetitions), the subject applied few PPs both in L1 and L2. However, in the spontaneous speech task, there were 14 PPs per 100 phonemes in L1 and only 0.75 PPs in L2. Speech rate in L1 was 0,18 syllables per second and in L2 – 0,33 syllables per second. The significantly lower L2 speech rate resulted in a small number of PPs in this language. The average duration of an uninterrupted articulation of speech sounds was 1,3 sec. in L1 and 1,00 sec. in L2. The most common PP in L1 was vowel centralization (66.3% of all the PPs applied; centralization is a clinical process in Polish). The remaining twelve PPs employed in L1 were applied 5,3% or less. The results show that speech rate may be a powerful factor influencing the frequency of occurrence of PPs in clinical populations.

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