

Title: *An EPG analysis of the articulatory patterns in Down Syndrome: A case study.*

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The purpose of the study was to investigate the articulatory patterns in Down Syndrome by means of EPG in order to examine the possible nature of articulation problems that is observed in this population (Hamilton, 1993, Timmins et al, 2007). Previous research has suggested a number of different factors that may lead to speech impairment in Down Syndrome (DS) including physiological variations, hypotonia, phonological delay or disorder and poor speech motor control (Hamilton, 1993, Kumin, 2006, Timmins et al, 2007). Today, controversy on the nature of speech impairment still exists. The present study was the first to present articulation data from a Greek speaker with DS.

Acoustic and articulatory data were collected during the production of fricative sounds by a Greek adult with DS and a Greek adult speaker matched for age. The fricative consonants /s/, /z/, /x/, /ç/, [ç], [j] and the clusters /st/, /sp/, /sk/, /ts/, /ps/, /ks/, /str/, /spr/, /skr/ were examined in different word positions and stress conditions, followed by the vowels /i/, /a/ and /u/. EPG analysis included examination of total amount of tongue-palate contact, contact at the front region and the central region of the palate, and center of gravity. The two speakers were also tested in a diadochokinetic task (DDK), in which they were asked to repeat the syllables /pa/, /ta/, /ka/, as well as the sequences /ta_ka/ and /pa_ta_ka/ at a comfortable speech rate. Analysis of the diadochokinetic task included the number of syllables produced in a second.

The results of this research suggested that articulation problems in DS probably result from a breakdown at different levels of the speech production process. The articulatory patterns of the speaker with DS, namely less overall linguo-palatal contact, differences in lingual placement and constriction characteristics, and smaller coarticulatory effects may be interpreted as presence of dysarthria (Hardcastle et al., 1985, Hamilton, 1993, Wood, 1995) resulting from difficulties in lingual control. Significantly lower DDK rates were also observed in the speaker with DS. Slower DDK rates can be interpreted as a sign of dysarthria, resulting from the speaker's inability to rapidly alternate the articulatory movements for the production of the sequences, as well as a sign of dyspraxia, which results from a breakdown in a speaker's motor control during the production of speech (Timmins et al. 2007).

References

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