Perceptual and acoustic correlates of DBS of subthalamic nucleus versus globus pallidus interna for IPD: a comparative pilot study

NIINA RUTANEN (1) JAYNE WHITE (2) AND HELEN MARWICK (3), (1)

University of Jyväskylä, Finland; (2) University of Waikato,

New Zealand; (3) University of Strathclyde, United Kingdom

Purpose: This study compared bilateral deep brain stimulation (DBS) in subthalamic nucleus (STN) versus globus pallidus interna (GPI) on perceived Speech Severity in Parkinson's disease.

Methods: 12 individuals with STN-DBS and 8 individuals with GPI-DBS were audio-recorded with DBS ON and OFF while reading an excerpt from the Rainbow Passage and producing a conversational monologue. Using a within-speaker, paired comparison paradigm, 10 listeners judged Speech Severity for pairs of stimulation ON-OFF (and OFF-ON) reading passages and monologues masked to stimulation status and speaker group. The proportion of trials for which ON versus OFF stimuli in a given pair was judged to be less severe was calculated.

Results: There was a task effect, with significant results for Rainbow Passage but not conversational monologue. Perceived Speech Severity differed with stimulation status for GPI-DBS but not STN-DBS, with a greater proportion of ON stimulation speech samples judged to be less severe versus OFF samples. At the participant level, response to ON/OFF stimulation was highly variable in STN-DBS group.

Discussion: DBS stimulation differentially impacts perceived speech severity for STN-DBS and GPI-DBS. Results further suggest the perceptual benefit of DBS stimulation may be task specific.

Keywords: speech language pathology, Parkinson's disease, deep brain stimulation

Accepted manuscript of the following research output: Tjaden, K., Greenlee, J., van Brenk, F. J., Silverman, S., & Corcos, D. (2018). *Perceptual and acoustic correlates of DBS of subthalamic nucleus versus globus pallidus interna for IPD: a comparative pilot study*. Poster session presented at 19th Biennial Conference on Motor Speech, Georgia, United States.