Targeting interhemispheric balance to modulate language processing: a tDCS study in healthy volunteers


* National Research University Higher School of Economics, Moscow, Russia; ** University of Groningen, Groningen, the Netherlands

lerie483@gmail.com

Transcranial direct current stimulation (tDCS) is a non-invasive brain stimulation method that has a high potential to be combined with behavioral aphasia treatment. One theory that can guide the choice of tDCS target areas is the interhemispheric competition hypothesis - namely, the activity of the right hemisphere can be maladaptive in the chronic stage of aphasia (Coqcuyt et al., 2017).

Previous research shows that inhibitory stimulation of the right hemisphere is beneficial (e.g., Kang et al.) but there are few studies where it is combined with excitatory stimulation of the left hemisphere. Moreover, no study has yet compared it to both necessary control conditions (separate stimulation of the left and right hemispheres).

The aim of our study was to examine the effects of bilateral tDCS, compared to left excitatory and right inhibitory stimulation. The study used two linguistic tasks, namely, lexical decision and sentence comprehension because they may be lateralized to a different extent and thus show different effects of stimulation targeting the interhemispheric balance. The participants were 49 healthy young Russian speakers.

We found no significant effect of stimulation: no improvement in accuracy or reaction times in either task, compared to sham (placebo). Thus, the study lends no support to the interhemispheric competition hypothesis or to beneficial effects of tDCS in the healthy population. Still, a follow-up study is necessary to test whether the same tDCS settings might still be effective in patients with aphasia.

Data collection is currently in progress; data of 72 participants will be available by the time of presentation.

Keywords: tDCS, interhemispheric competition.