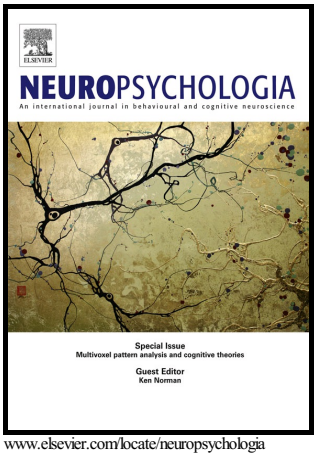

www.elsevier.com/locate/neuropsychologia

What is difficult for you can be easy for me Effects of increasing individual task demand on prefrontal lateralization: a tDCS study

A. Vergallito, Leonor J. Romero Lauro, Rolando Bonandrini, Laura Zapparoli, Laura Danelli, Manuela Berlingeri

PII: S0028-3932(17)30511-0
DOI: https://doi.org/10.1016/j.neuropsychologia.2017.12.038
Reference: NSY6629

To appear in: *Neuropsychologia*

Received date: 2 September 2017
Revised date: 22 November 2017
Accepted date: 23 December 2017

Cite this article as: A. Vergallito, Leonor J. Romero Lauro, Rolando Bonandrini, Laura Zapparoli, Laura Danelli and Manuela Berlingeri, *What is difficult for you can be easy for me* Effects of increasing individual task demand on prefrontal lateralization: a tDCS study, *Neuropsychologia,* https://doi.org/10.1016/j.neuropsychologia.2017.12.038

What is difficult for you can be easy for me. Effects of increasing individual task demand on prefrontal lateralization: a tDCS study.

A. Vergallito[1], Leonor J. Romero Lauro[1,2], Rolando Bonandrini[3], Laura Zapparoli[3], Laura Danelli[1,2], Manuela Berlingeri[4,2]

[1]Department of Psychology, University of Milano-Bicocca, Milan Italy
[2]NeuroMI - Milan Center for Neuroscience
[3]fMRI Unit, IRCCS Istituto Ortopedico Galeazzi, Milan, Italy
[4]Department of Humanistic Studies (DISTUM), University of Urbino Carlo Bo, Urbino, Italy

***Corresponding Author, Manuela Berlingeri,** Dipartimento di Studi Umanistici, DISTUM, Universita` degli Studi di Urbino Carlo Bo, Palazzo Volponi, Via Saffi, 15, 61029 Urbino (PU), Italy

Abstract

Neuroimaging studies suggest that increment of the cognitive load associated with a specific task may induce the recruitment of a more bilateral brain network. In most studies, however, task **demand** has been manipulated in a static and pre-specified way, regardless of individual cognitive resources.

Here we implemented a new paradigm based on a pre-experimental assessment to set up **subject-specific** levels of task demand and applied tDCS (transcranial direct current stimulation) to assess each hemisphere involvement in task performance.

24 young participants performed a digit span backward (DSB, complex cognitive function) and a paced finger tapping task (pFT, basic motor function) at 3 levels of **subject-specific task demand** ("low" 5/5 correct answers, "medium" 3/5, "high" 1/5). Anodal tDCS (20 min, 1.5 mA) was delivered through a target electrode (5x5cm) positioned to stimulate both the inferior frontal gyrus and the primary motor area over left and right hemisphere and in sham condition in three different days.

A 3 (left, right, sham) x 3 (low, medium, high) mixed-model with random intercepts for subjects was run with R software.