Methods: Nineteen healthy ageing participants were tested on two different days with a VWM retro-cueing paradigm (Yoni et al., 2009) which assesses VWM precision and the ability to ignore task-irrelevant stimuli. The retro-cueing task was coupled with EEG before and after participants received either 10 Hz parietal (P3 and P4) alpha-tACS or sham (in different sessions counterbalanced across all participants) while performing the same task.

Results: Relative to sham, Alpha-tACS modulated participants' ability to ignore task-irrelevant stimuli, an improvement maintained for 6–10 min during the following EEG recording. This change corresponded to a significant positive correlation with the absolute amplitude of the N200 peak recorded at a left parietal site (P3).

Conclusions: Inhibitory control abilities in VWM are causally linked to alpha frequency in healthy ageing participants who become better at suppressing task-irrelevant stimuli following Alpha-tACS0. The improved performance positively correlated with the absolute amplitude of N2 component at the P3. This effect may correspond to increased attentional resources directed to a stimulus, due to Alpha inhibiting the allocation of attentional resources to distracting stimuli.

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Physiologic artifacts when combining EEG and tDCS—**N. Gebodh [a,*], D. Adair [b], K. Chelette [c], Z. Esmaeilpour [a,d], M. Bikson [a], J. Dmochowski [a] ([a] The City College of New York, Department of Biomedical Engineering, New York, NY, United States, [b] The Graduate Center at City University of New York, Department of Psychology, New York, NY, United States , [c] ANT Neuro, Madison, WI, United States, [d] Amirkabir University of Technology, Biomedical Engineering Department, Tehran, Iran)**

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The field of non invasive brain stimulation (NIBS) has benefited from integration with imaging including magnetic resonance imaging (MRI) and electroencephalography (EEG). Several studies have reported on concurrent tDCS and EEG, and used signal processing of varying complexity (e.g. high-pass filtering to ICA) to remove "non-physiologic stimulation artifacts" – namely artifacts arising from non-ideal stimulation and recording amplifier performance. None has addressed "physiologic artifacts" which are defined here as non-stationary changes in artifacts resulting from interactions between the stimulation induced voltage and body. We identified and systematically characterized a series of tDCS induced physiologic and non-physiologic artifacts during concurrent EEG and High Definition (HD)-tDCS, and adapted subject-specific computational modeling to corroborate physiological EEG findings. Physiologic artifacts include (1) cardiac distortion; (2) ocular motor distortion; (3) movement (myogenic) distortion. In each case, the artifact was montage, intensity, and polarity specific; as such contamination from these physiologic artifacts cannot be accounted for by typical control experiments (e.g. EEG changes that are dose specific). High resolution finite element models explained artifact based on specific impedance changes. Importantly (a) physiologic artifacts are universal, they are nominally independent of device and so exist regardless of devices; (b) the broad-band nature of contamination may confound a broad range of experiments (e.g. oscillations, ERP); (c) removal of artifacts requires recognition of their peculiar dynamic and individualized nature.

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Prefrontal cortical excitability enhancement after cathodal tDCS: A multimodal study—**C. Rodella [a,b,*], J. Cespon [b], C. Miniussi [b], P.M. Rossini [a], M.C. Pellicciari [b] ([a] Policlinico A. Gemelli, Catholic University of Sacred Heart, Rome, Italy, [b] IRCCS Centro San Giovanni di Dio Fatebenfratelli, Cognitive Neuroscience Section, Brescia, Italy)**

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Introduction: Transcranial direct current stimulation (tDCS) is a non-invasive technique that is increasingly used in neuroscience, as it has the potential to induce cortical excitability changes (Nitsche et al., 2008; Woods et al., 2016). Specifically, tDCS has been widely applied to study cognition. Nevertheless, differently from motor system, applying tDCS in cognitive domains does not allow to have a direct physiological measure able to monitor polarity-dependent effects on cortical excitability. Event related potentials (ERPs) and TMS-evoked potentials (TEPs) could represent valuable surrogate markers of cortical excitability changes (Kesser et al., 2011; Miniussi and Thut, 2010).

Objective: The purpose of the present study was verifying the capability of tDCS to modulate cortical reactivity (using TEPs) of prefrontal cortex and characterizing the electrophysiological correlates (using ERPs) of cognitive processes underlying a working memory task.

Materials & methods: A sample of healthy young participants performed a 3-back task while EEG was recording before and after applying 13 min of tDCS (anodal, cathodal and sham sessions) over the left dorsolateral prefrontal cortex (DLPFC). TEPs were also collected before and after the tDCS.

Results: Results showed no tDCS polarity-dependent differences in task performance. However, increased prefrontal activity was observed at 150–200 ms over the stimulated region after cathodal tDCS. Furthermore, parietal activity underlying P3 component, which was typically related to working memory processes (Kesser et al., 2011), was larger after cathodal tDCS. Surprisingly, differences were found only after cathodal tDCS. These results were consistent with TEPs, which were modulated by tDCS in a polarity-dependent manner.

Conclusion: Our findings demonstrate that tDCS is able to induce prefrontal cortical activity and reactivity changes, which can be assessed by EEG and TMS-EEG measures, even when behavioral data are not sensitive enough to reveal functional modifications. Overall, these results suggest potential clinical application of tDCS and utility of ERPs and TEPs to monitor cortical excitability modifications induced by the stimulation protocols.

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Assessing the roles of inferior parietal lobule and ventral premotor cortex in emotion body processing: a combined cTBS-fMRI study—**T. Engelen [*], M. Zhan, A. Sack, B. de Gelder (Maastricht University, Cognitive Neuroscience, Maastricht, Netherlands)**

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Introduction: The perception of emotion stimuli in the environment prepares our bodies for action, and especially when confronted with whole body expressions of an emotion like anger, action-related areas in the brain are triggered. Previously, parietal dorsal stream and premotor areas have been linked as crucial areas for processing of such stimuli, but questions about their contributions and specificity within the body processing network remain.