Using a double blind, sham-controlled crossover design, 68 individuals with AUD were randomized to receive 10Hz TMS to the left dlPFC, continuous theta burst stimulation (cTBS) to the mPFC (EEG 10-20: FP1), and sham stimulation on three separate days. Brain reactivity to alcohol cues and non-alcoholic beverage cues was collected immediately following each TMS session. Functional connectivity within the reward network (mPFC seed-based to cingulate, insula, dorsal and ventral striatum) was compiled for each participant at each of the 3 visits. Fisher's transformed correlation coefficients associated with alcohol cue blocks were extracted for each mPFC to region of interest (ROI) pair. Calculated difference scores for each ROI were entered into a univariate general linear model.
Relative to sham, the 10Hz TMS to the left dlPFC protocol had a larger attenuating effect on alcohol cue reactivity than cTBS to the mPFC ($F=14.82$, $p=0.000123$). These data suggest that 10Hz stimulation to the left dlPFC may be a valuable tool for dampening alcohol cue sensitivity in younger adults with AUD.

Research Category and Technology and Methods
Clinical Research: 10. Transcranial Magnetic Stimulation (TMS)
Keywords: Transcranial Magnetic Stimulation, fMRI, Alcohol Use Disorder, cTBS

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Abstract key: PL- Plenary talks; S- Regular symposia oral; FS- Fast-Track symposia oral; OS- On-demand symposia oral; P- Posters

P1.064

"ELECTRICISE" THE BRAIN - EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION COMBINED WITH HIGH-INTENSITY INTERVAL TRAINING ON THE ELECTROCORTICAL ACTIVITY OF THE MOTOR CORTEX

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Abstract
Introduction: Recently, it has been proposed that combining transcranial direct current stimulation (tDCS) with cardiovascular exercise (CE) may lead to positive synergies in motor and cognitive performance due to assumed synergistic mechanisms on several brain levels (Steinberg, Pixa & Fregni, 2019). However, the neurophysiological effects of a combined application are currently unknown. Hence, this is the first study investigating differences in electrocortical activity due to tDCS during cardiovascular high-intensity interval training (HIIT).
Methods: Twenty healthy, right-handed volunteers (mean age 22.65, ±2.83; six males) participated in the cross-over-design study at two experimental sessions with a one-week wash-out phase. Following a three minutes resting state EEG ($rsEEG_{pre}$), the participants performed, based on their individual VO_{2max} (spiroergometry) data, a HIIT on a stationary bicycle ergometer (5 min warm-up at 40% VO_{2max}, 3 x 3 min at 90% VO_{2max} interspersed with 2 x 2 min at 60% VO_{2max}, and 5 min cool-down at 20% VO_{2max}), during which either anodal HD-tDCS (1.5 mA, 20 min) or sham was applied in a counterbalanced and randomized order over the left primary motor cortex (C3 surrounded by FC1, FC5, CP1, CP5 as return). In addition, post rsEEG was assessed six times for up to 30 minutes after the intervention ($rsEEG_{post1-6}$).
Results: Scalp maps showed a stronger decrease of rsEEG alpha power (8-13 Hz) within the active stimulation area delayed to 20 and 25 min after the intervention. However, that observation was not supported by a Bayesian rmANOVA (TIME x GROUP $BF_{incl} = .056$).
Discussion: The preliminary results revealed no statistical evidence for an additive effect on the left motor cortical activity induced by anodal HD-tDCS combined with HIIT. Further analyses are required to disentangle local and possible remote effects. Since this is the first study in this direction, the effects of different CE protocols need to be investigated further.

Research Category and Technology and Methods
Basic Research: 9. Transcranial Direct Current Stimulation (tDCS)
Keywords: EEG, Cardiovascular Exercise, Synergies, Neuromodulation

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P1.065

STATE DEPENDENT EFFECTIVENESS OF CATHODAL TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS)

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Abstract
The coupling of tDCS polarity-dependent opposite effect is well established in the sensorimotor domain but is still controversial when higher cognitive functions are targeted. Previous studies from our group showed that at resting state anodal tDCS (a-tDCS) over the right parietal cortex (rPPC) elicited a widespread increase of cortical excitability, whereas cathodal stimulation (c-TDCS) failed to modulate cortical excitability, being indistinguishable from sham stimulation.
Here we assessed whether the active state of the targeted region might change the picture. We applied c-tDCS over the rPPC while our participants were performing a visuo-attentional task, namely Posner Cueing task (PCT). TDCS neurophysiological aftereffects were tracked performing TMS-EEG recordings pre- and post- either sham or real stimulation. In particular, single pulses TMS were delivered over the left PPC and TMS evoked potentials were recorded with a 64ch cap. Analyses were then performed both at the sensors and at the cortical source level.
Behavioral results showed that c-tDCS significantly slowed down PCT performance in comparison to sham condition. Crucially, at a neurophysiological level, c-tDCS but not Sham significantly reduced cortical excitability in the brain areas involved in task execution, namely in a fronto-parietal network. Therefore, c-TDCS neurophysiological effects over rPPC resulted depending on the background activity. These results hold relevant implications for tDCS set up both in cognitive neuroscience experiments and rehabilitation protocols.

Research Category and Technology and Methods
Basic Research: 9. Transcranial Direct Current Stimulation (tDCS)
Keywords: tDCS, TMS-EEG, Cortical Excitability, Cathodal tDCS

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Abstract key: PL- Plenary talks; S- Regular symposia oral; FS- Fast-Track symposia oral; OS- On-demand symposia oral; P- Posters

P1.066

INVESTIGATING THE ELECTRICAL STIMULATION OF THE SUBTHALAMIC NUCLEUS FOR THE TREATMENT OF CORTICAL STROKE

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Abstract
Stroke remains a leading cause of long-term disability in developed countries and the second leading cause of death worldwide. Recent decades have witnessed substantial progress in understanding the pathophysiology of ischemic stroke and the treatment of stroke-related motor deficit. However, current therapies fail to offer patients satisfactory improvements. Therefore, a more effective approach for treating stroke-related motor deficit is still needed.
Here we investigated the effect of electrical stimulation of the subthalamic nucleus (ES-STN) on motor deficit induced by photothrombotic lesion in the motor cortex (MC). We hypothesized that ES-STN can reduce motor deficit in stroke rats.
First, The Sprague-Dawley rat (SD rat) was included in this pilot study. We trained SD rat with the single pellet reaching task (SFPRT) and determined the baseline performance before surgery. We then induced a photothrombotic ischemic lesion in the forelimb region of the MC. After stroke induction we implanted a stimulation electrode into the STN. 4 days after stroke we performed ES-STN while evaluating SFPRT performance. We performed 100 Hz stimulation where rat showed improved performance during