

Appendices:

Appendix 1: Informed Consent and Description of Research

Title: Neuromodulation of Executive Functions Using Frontal Theta tACS: Effects on Working Memory and Inhibitory Control Across BMI

You are about to participate in a research study coordinated by Dr. Alexander Logemann (ELTE PPK, Institute of Psychology, alexander.logemann@ppk.elte.hu) and Freij Joelle (PhD Student).

The study is conducted by qualified researchers and trained assistants.

The aim of this study is to investigate whether working memory and inhibitory control interact, and whether brain stimulation (transcranial alternating current stimulation, tACS) can affect these functions temporarily. We are particularly interested in how these effects vary as a function of body mass index (BMI).

Participation is voluntary and can be paused or discontinued at any time without consequences. There is no monetary compensation for participation.

During the study, you will be requested to fill out a number of questionnaires, and before and after the main computer task brain activity will be recorded for 10 minutes per assessment using EEG. For this purpose, we apply a minimal amount of conducting gel between the scalp and electrodes that are fitted in a cap, so that brain activity can be recorded. After the EEG recording, you will perform a computer task that is tailored to measure working memory and inhibition (impulse control). During this task you will receive either tACS (low intensity current directed at modulating one component of brain activity), or you will be assigned to the control group. The control group will undergo the same set of procedures, with the exception of the application of tACS for the full duration. The procedures are safe, painless, and widely used in neuroscience research. The computer task involves identifying letter sequences and inhibiting (withholding) responses in specific trials.

Your data will be handled confidentially. Consent forms containing identifying information (e.g., your name and email) will be stored in a locked cabinet. Task and questionnaire responses will be stored separately under anonymous codes. Only authorised researchers will have access. No individual results will be shared publicly. The findings may be published or presented at scientific conferences.

Please sign below if you agree to participate under these conditions.

I, (**undersigned**), confirm that I received detailed information about this study. I consent to participate and to allow the use of the anonymised data for research purposes. I understand I may withdraw at any time and request that my data be deleted. I declare that I am not diagnosed with a psychological disorder, that I am not using drugs currently, that I do not meet any of the contraindications for tACS (frequent headaches/migraines/metallic implants/epilepsy/past significant head trauma/recent head trauma/pacemaker)

ELTE PPK, as data controller, will treat my personal data confidentially, in line with the Privacy Notice (attached).

Budapest,

Signature: