The role of theta (5 Hz) oscillations on gambling: a transcranial alternating current study

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To investigate the effects of in-phase and anti-phase bilateral frontal theta tACS (5 Hz) on gambling behaviour and endogenous frontal theta activity.

Ethical review	Approved WMO
Status	Suspended
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON43184

Source
ToetsingOnline

Brief title
Theta oscillations on gambling

Condition

- Other condition

Synonym
niet van toepassing

Health condition

niet van toepassing - onderzoek bij gezonde vrijwilligers

Research involving
Human

Sponsors and support

Primary sponsor: Radboud Universiteit Nijmegen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Gambling, Theta oscillations, Transcranial alternating current stimulation

Outcome measures

Primary outcome

TACS induced effects on gambling behaviour as measured by the *certainty

equivalent*.

Secondary outcome

TACS-induced changes in EEG resting state activity.

Study description

Background summary

EEG studies have provided evidence for a relationship between frontal theta activity and gambling behaviour. However, direct evidence is lacking. Using transcranial alternating current stimulation (tACS) at 5 hz endogenous theta oscillatory activity can be modulated. Here, we will used bilateral frontal theta tACS compared to sham tACS to test its effects on a sequential gambling task. This study will therefore shed more light on the direct role of theta in gambling.

Study objective

To investigate the effects of in-phase and anti-phase bilateral frontal theta tACS (5 Hz) on gambling behaviour and endogenous frontal theta activity.

Study design

Placebo controlled double-blind within subjects design.

Intervention

Online in-phase and anti-phase transcranial alternating current stimulation (tACS) will be delivered by a battery-driven electric current stimulator (Eldith DC Stimulator (CE 0118), Ilmenau) using two pair of electrodes over left and right frontal cortex (5x3 cm each). In-phase and anti-phase stimulation will be applied at a frequency of 5 Hz and an intensity of 1 mA peak to peak (current density for each electrode: 0.067 mA/cm^2). These conditions will be compared to a placebo condition in which sham tACS is applied.

Study burden and risks

The currently proposed tACS procedure and experiment does not carry any significant risks. Stimulation will be performed in line with the Standard Operating Procedure Non-Invasive Brain Stimulation of the Donders Institute for Brain, Cognition and Behaviour. Potential side-effects of tACS are perception of light tingling, itching or burning sensations on the under the electrodes, light headache and/or fatigue. These are mild discomforts that respond promptly to common analgesics. Volunteers can withdraw from the study at any given time and there are no direct benefits for the participants. The novel insights will broaden our understanding of the brain and may be a basis for future fundamental and clinical research.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Between 18-35 years of age years; Right-handed; Non-smoking; Normal or corrected-to-normal vision; Willingness and ability to give written informed consent and willingness and ability to understand the nature and content, to participate and to comply with the study requirements.

Exclusion criteria

(1) Average use of more than 3 alcoholic beverages daily; (2) Use of psychotropic medication or recreational drugs; (3) Skin disease; (4) Pregnancy; (5) Serious head trauma or brain surgery; (6) Neurological or psychiatric disorders; (7) Large or ferromagnetic metal parts in the head (except for a dental wire); (8) Implanted cardiac pacemaker or neurostimulator; (9) Participation in a NBS study in the past 28 days; (10) Previous participation in 10 or more NBS studies.

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo
Primary purpose:	Other

Recruitment

NL
Recruitment status: Suspended

Start date (anticipated):	29-11-2016
Enrollment:	30
Type:	Actual

Ethics review

Approved WMO Date:	14-11-2016
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL59225.091.16