Effects of transcranial magnetic stimulation (TMS) of rostral cingulate zone on social conformity

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Primary Objective: Current project will study effects of TMS of the RCZ on social conformity. A modulation the conformal behavior by TMS (Studies N 1&3) would indicate the essential role of RCZ in social influence.Secondary Objective(s):...

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

Summary

ID

NL-OMON32990

Source
ToetsingOnline

Brief title
The role of rostral cingulate zone in social conformity

Condition

- Other condition

Synonym
healthy subjects

Health condition

We achten het gerechtvaardigd om het onderzoek uit te voeren op gezonde controles, omdat de resultaten die uit dit onderzoek extrapoleerbaar zullen zijn naar patienten met een breed scala van neurologische aandoeningen.

Research involving

Human

Sponsors and support

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

Intervention

Keyword: conformity, cortex, persuasion, TMS

Outcome measures

Primary outcome

The primary measure of outcome is the size of conformal behavioral adjustments

measured as mean changes of perceived facial attractiveness in line with *group

opinion*

Secondary outcome

none

Study description

Background summary

Recently we showed (Klucharev et al., 2009), using functional magnetic resonance imaging, that social conformity is based on mechanisms that comply with principles of reinforcement learning. Here we hypothesize that transcranial magnetic stimulation (TMS) of the rostral cingulate zone - RCZ (involved in reinforcement learning) could modulate the conformal behavioral adjustments.

Study objective

Primary Objective: Current project will study effects of TMS of the RCZ on social conformity. A modulation the conformal behavior by TMS (Studies N 1&3) would indicate the essential role of RCZ in social influence.
Secondary Objective(s): Additionally (Study N2) we will check is the role of RCZ in conformity transient and limited to the time of the social conflict

between subject and group opinion.

Study design

To test our hypothesis, we designed a paradigm in which subject*s initial judgments of facial attractiveness are open to influence by group opinion. In the Study N1 we will show that 40-190 sec of off-line TMS of the RCZ will change subjects* susceptibility for social conformity as compared to TMS of the control area. In the Study N2 we will demonstrate that online TMS (2 sec) of the RCZ applied at the different time-windows of the trials will have differential effects on conforming behavior. In the Study N3 we hypothesize that excitatory and inhibitory TMS of the RCZ will have opposite effects on conforming behavioral adjustments.

Intervention

Subjects* rostral cingulate zone (RCZ) or precuneus (control site) will be stimulated by the figure-eight TMS coil (Magstim Super Rapid, Magstim Co., Whitland, Dyfed, UK) using the BrainSight Frameless Stereotactic System (Rogue Research, Montreal, Canada).
A standard short version of TMS will be used for off-line stimulation (Study N1&3), i.e. thetaburst stimulation (TBS) (Di Lazzaro et al., 2005; Huang et al., 2005). Two standard protocols will be used: the intermittent theta burst stimulation pattern (iTBS), a 2 s train of TBS is repeated every 10 s for a total of 190 s (600 pulses) or cTBS - the continuous theta burst stimulation paradigm, a 40 s train of uninterrupted TBS is given (600pulses) (for details see (Huang et al., 2005)).
The online continuous TMS stimulation (Study N2) will consist of a 2 seconds biphasic pulse train at 10Hz (for similar protocol see (Rushworth et al., 2002). The TMS intensity will be set to: in Study N1&3 to of 80% Active motor threshold (AMT) and in Study N2 to 110% AMT. All protocols follow safety TMS guidelines (Anderson et al., 2006; Wassermann, 1998).

Study burden and risks

TMS is not painful at the level of intensity used at the project. From the previous literature we know that some subjects could report a (light) headache. Paracetamol is sufficient to treat these symptoms. On In the current investigation we use stimulation parameters strictly within the aforementioned guidelines. All subjects will be prescreened for relevant medical history. All participants will give a written informed consent according to the Declaration of Helsinki. All subjects will be explicitly informed that they could stop their participation at any time without having to give any explanation. Furthermore during all studies will be conducted in contact with a physician (Prof. Dr. Jan Buitelaar, Department of Psychiatry, Radboud University Nijmegen Medical Centre) for the treating of a possible epileptic attack.

Better understanding of reinforcement learning mechanisms brings new perspective in the treatment of various behavioral disorders (e.g. treatment of compulsive behaviors or development of an effective behavioral therapy). Social conformity is one of the fundamental psychological phenomena underlings social influence (Asch, 1951). Understanding of social conformity together with group norms are important for an effective control of obesity, criminal behavior, teenage alcohol abuse, and even for pro-environmental behavior (Cialdini and Goldstein, 2004; Keizer et al., 2008). Overall, the topic of the study is scientifically and socially important.

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

Healthy right-handed females (aged 18-35 years)

Exclusion criteria

Contraindications for trans-cranial magnetic stimulation

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)

Primary purpose: Other

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-04-2009
Enrollment:	210
Type:	Anticipated

Ethics review

Approved WMO

Date:	23-06-2009
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	NL26972.091.09