# Inhibitory sensory-motor links in the human brain

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

# Summary

#### ID

NL-OMON47324

**Source** ToetsingOnline

#### **Brief title** Inhibitory sensory-motor links in the human brain

## Condition

• Other condition

#### Synonym

but rather focuses on a fundamental question regarding mechanisms of inhibition., The aim of the current research does not pertain to a specific pathology

#### **Health condition**

Geen aandoening maar onderzoek richt zich op inhibitiemechanismen bij gezonde deelnemers

#### **Research involving**

Human

## **Sponsors and support**

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

#### Intervention

Keyword: EEG, Inhibition, SST

#### **Outcome measures**

#### **Primary outcome**

The following electrophysiological correlates of inhibition are of interest:

Stop N1: This is the modulation of the N1 (electrophysiological negative peak) by stopping success. Or more specifically, the degree to which the N1 is larger for successful as opposed to failed stops. This modulation is interpreted as characterizing the potentiated inhibitory link between sensory (auditory or visual cortex, depending on the specific SST variant) and motor cortex (under control of a tonically active right frontal cortex).

Stop N2: This is the modulation of the N2 by stopping success. More specifically, the degree to which the N2 is larger for successful as opposed to failed stops. This modulation is interpreted as characterizing inhibition related activity within the right frontal cortex.

#### Secondary outcome

not applicable

# **Study description**

#### **Background summary**

Several studies have investigated inhibitory mechanisms by combining the so called Stop Signal Task (SST) with EEG. In the typical SST, participants are required to respond to go-stimuli (typically letters) by means of a button press. In a small percentage of trials, a stop signal is presented after the go-stimulus. The stop stimulus requires the prepotent response to be withheld. Two specific variants of the SST have been reported in the literature, the auditive and the visual SST. In the visual SST, stop stimuli are presented in the same domain (stop stimuli are often letters) as the go-stimuli. In the auditive SST, the stop stimuli are presented in the auditive domain (stop stimulus is a tone). The specific inhibitory mechanism that is activated differs between variants of the SST. In the auditive variant, a potentiated inhibition link between sensory (auditory) cortex and motor cortex is active, which is under control of the right frontal cortex. In the visual variant, however, the right frontal inhibition mechanism is active only after onset of the stop-stimulus.

#### **Study objective**

The specific mechanism of inhibition differs between SST variants, it remains the question why. Our envisaged study focuses on this question. We expect that the difference is caused by the amount of perceptual overlap between the go stimulus and the stop stimulus (for a complete overview of the rationale, see protocol). Hence, we expect that by reducing perceptual overlap between the go and stop stimulus in the visual SST, a similar inhibition mechanism is in effect as in the auditory SST. That is, a potentiated link between sensory cortex (in this case visual cortex) and motor cortex will be evident.

#### Study design

The design is a randomized within-subjects design. More specifically, participants will perform in three variants of the SST, the auditive, visual overlap (sizeable perceptual go/stop-stimulus overlap), and visual non-overlap (low perceptual go/stop-stimulus overlap) variant, while EEG is recorded. The order of SST variants will be counterbalanced accross participants, and participants will be randomly attributed a specific order (with optimal balancing as a prerequisite).

#### Intervention

not applicable

#### Study burden and risks

Risks are negligible, EEG is a non-invasive measurement. The burden for participants is estimated to be minimal. There is ample opportunity for short breaks and between SST variants there is room for a 10 minute break. Particants are informed that they can withdraw from the study at any time and that it is not necessary to explain the reason for withhdrawing from the experiment.

# 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 18-45 years old.

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## **Exclusion criteria**

(History of) epilepsy psychopathology

# Study design

## Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

## Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	08-11-2013
Enrollment:	50
Туре:	Actual

# **Ethics review**

Approved WMO Date:	11-06-2013
Application type:	First submission
Review commission:	METC NedMec
Approved WMO Date:	04-03-2015
Application type:	Amendment
Review commission:	METC NedMec
Approved WMO Date:	28-01-2016

Application type:	Amendment
Review commission:	METC NedMec
Approved WMO Date:	25-09-2018
Application type:	Amendment
Review commission:	METC NedMec
Approved WMO Date:	30-10-2018
Application type:	Amendment
Review commission:	METC NedMec

# **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 CCMO ID NL42200.041.12