# The function of brain lateralization

Published: 15-06-2012 Last updated: 01-05-2024

The main goal is to investigate the function of cerebral lateralization through an analysis of the relations between lateralization, CC-size and dual-task performance.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Observational non invasive

# **Summary**

### ID

**NL-OMON37907** 

**Source** ToetsingOnline

**Brief title** Function of lateralization

### Condition

• Other condition

**Synonym** not applicable

#### **Health condition**

geen, het betreft gezonde proefpersonen en een theoretische vraagstelling

**Research involving** Human

### **Sponsors and support**

**Primary sponsor:** Rijksuniversiteit Groningen **Source(s) of monetary or material Support:** Ministerie van OC&W,mogelijk ook van NWO-PhD projekt toegekend aan principle investigator

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### Intervention

Keyword: corpus callosum, dual-task performance, mental tasks, MRI

### **Outcome measures**

#### **Primary outcome**

Outcome of the study: The leading theory predicts a positive correlation between strength of lateralization and dual task efficiency and a negative correlation with CC-size, for subjects classified as contra-lateral.

Primary study parameters: The blood flow velocity in the middle cerebral artery of both hemispheres is measured with fTCD during a single language task and a single visuospatial task. This way, pattern and strength of cerebral lateralization in the subjects can be assessed. The relationship between pattern and strength of lateralization and dual-task performance.

#### Secondary outcome

Secondary study parameters: The size of the corpus callosum is measured with MRI and will be related to dual-task performance and pattern and strength of lateralization.

# **Study description**

#### **Background summary**

The function of cerebral lateralization is unknown. The few existing studies in animals and humans suggest better information processing with stronger lateralization. Lateralization might allow parallel processing. In tasks with little interference we did not find significant differences in dual-task performance between subjects with different lateralization patterns and inconclusive negative relationships with strength of lateralization. We now will increase dual-task interference and put the relationship between dual-task performance with strength and pattern of lateralization to a more stringent test. There are strong indications for the involvement of the corpus callosum (CC) in dual task performance and lateralization.

#### **Study objective**

The main goal is to investigate the function of cerebral lateralization through an analysis of the relations between lateralization, CC-size and dual-task performance.

### Study design

Study design: Subjects perform a language task and a visuospatial task that typically load the left and the right hemisphere, respectively. Before and during these tasks Functional Transcranial Doppler sonography (fTCD) is used to measure differences between left and right hemispheres in blood flow change (relative to baseline) in the Middle Cerebral Arteries (MCA). This provides a reliable index of individual task related lateralization. Subjects are then classified as being typically or atypically, and as contra-laterally or ipsi-laterally lateralized. This yields four \*pattern of lateralization\* groups in the study design. Strength of lateralization is a continuous independent variable.

The size of the CC will be measured by an MRI scan.

Dual-task efficiency will be measured during simultaneous performance of two tasks relative to the performance of the single tasks. Lateralization pattern or strength and CC-size are analyzed as predictors of dual task efficiency.

#### Study burden and risks

Lateralization patterns will be assessed with fTCD - an established reliable and non-invasive and safe technique. The anatomical MRI scan will take 8 minutes and is performed in an 3 Tesla MRI scanner. No effects on health are known, provided that the requirements for MRI are fulfilled. The cognitive tasks are no burden. The subjects are healthy students; there is no benefit for them (except for study points or financial reward).

# 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**

- 18-30 years- native Dutch speakers

## **Exclusion criteria**

General:

- Poor vision despite glasses or lenses
- Poor health as self-reported;MRI-related:
- presence of metal implants
- presence of electronic implants (eg cardiac pacemakers)
- use of medications / drugs that can affect performance during the tasks
- claustrophobia
- (possible) pregnancy

# Study design

# Design

Study type: Observational non invasive	
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	01-03-2013
Enrollment:	50
Туре:	Actual

# **Ethics review**

Approved WMO	
Date:	15-06-2012
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

# **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** NL40358.042.12

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