Exploring the role of cognitive inhibition in concept learning: a fMRI study in medical students

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

Summary

ID

NL-OMON48048

Source
ToetsingOnline

Brief title
Cognitive inhibition in concept learning

Condition

- Other condition

Synonym
n.v.t.

Health condition

n.v.t.

Research involving
Human

Sponsors and support

Primary sponsor: Leids Universitair Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Cognitive inhibition, Concept learning

Outcome measures

Primary outcome

Physiology Concept Test scores will be used to determine the presence or

absence of the misconception. The functional MRI scan will give information

about task-related brain activity during the misconception task.

Secondary outcome

N/A.

Study description

Background summary

Few pedagogical strategies have been put forward to address students* misconceptions in medical physiology. Despite the integration of physiology courses in the medical curricula worldwide, alleviating misconceptions through effective instructional designs remains a challenge, likely because the underlying mechanisms remain poorly understood. Based on previous neuroimaging research, we hypothesize that cognitive inhibition plays a key role in overcoming misconceptions. Exploring this potential mechanism may provide future directions for effective conceptual change instructions.

Study objective

The main objective of the study is to investigate the differences in brain activation between novices and experts (i.e. between persons with and without the misconception) when they are asked to judge a statement regarding a related displayed physiological situation.

Study design

This is a non-interventional, observational MRI study. Prior to the MRI phase, participants fill in a Physiology Concept Test. Based on these outcomes, participants will be assigned to the *experts* or *novices* group. Inside the MRI scanner, we will measure brain activation using functional MRI (fMRI) while the participant is performing tasks related to misconception. In addition, we will perform a standardized structural MRI of the brain for analyses purposes (e.g., registration to standard space) to allow generalizability. All measurements are non-invasive.

Study burden and risks

The MRI acquisition is non-invasive and there are no known risks associated with participating in a MRI study. Some subjects may feel claustrophobic in the restricted space of the MRI scanner. Claustrophobia from the MRI scan will be reduced by explaining the nature of the scanner in detail before enrollment. At all times, the subjects can request to be removed from the scanner. Participants will be carefully screened for all contra-indications (e.g. metal parts, pregnancy etc.). The investigator, physician and MRI safety team will assess whether there are contra-indications for MRI, and decide whether or not the participant is allowed to go into the scanner. Participants will be asked to invest a maximum 1h of their time for the MRI procedure. All participants will be allowed to withdraw from the study at any point in time. There is no direct benefit to the participants. All participants will receive a reimbursement of 20 euros for completion of this study.

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

- Higher education level student
- Age 18-25 years

Exclusion criteria

- Participants with a history of neurological or psychiatric disorder or current use of psychotropic medications;- MRI * contraindication (e.g. cardiac pacemaker, implants not approved for MRI, claustrophobia or pregnant (or a chance of being pregnant (as reported by the participant). ;- Consumption of alcohol or any other drugs 24 hours prior to scanning.

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):	15-07-2019
Enrollment:	55

Type:	Actual

Ethics review

Approved WMO Date:	04-06-2019
Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

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	NL68949.058.19