Measuring brain activity during visual object recognition

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

Summary

ID

NL-OMON38699

Source
ToetsingOnline

Brief title
Brain activity during visual recognition

Condition

- Other condition

Synonym
n.v.t.

Health condition

n.v.t.

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W,NWO,CONICYT (Chileense organisatie voor wetenschap)

Intervention

Keyword: eye movements, fMRI, object recognition

Outcome measures

Primary outcome

We will investigate in which regions of the brain activity is correlated with

object recognition. The functional coupling between *later* visual areas in the

brain in the temporal lobe and *earlier* visual areas in the occipital lob will

be considered based on task-related as well as resting-state activity.

Secondary outcome

Eye-movements will be analysed in order to investigate which specific parts of

the objects are most important for object recognition and whether they can

explain possible differences in brain-activity in the participants.

Study description

Background summary

Investigations of the human visual system are carried out at the Laboratory of Experimental Ophthalmology in Groningen. Visual information processing and the underlying neural mechanisms are studied by employing psychophysics and *brain imaging* (functional MRI (fMRI)) techniques. This field of research is relevant because it contributes to the understanding of how humans are able to perceive the environment, how the brain works, and how human behavior arises.

Study objective

The specific goal of this research is to achieve a better understanding of

visual object recognition. Object recognition is an important part of visual perception. There is a still controversy around the manner in which object information is processed in the brain and there are currently several contradicting theories. Our research will lead to new insights about how sensory input from the eye is processed in the brain, grouped, and recognised as objects. This can be used to test the existing theories, and develop new ones if necessary.

The techniques developed and the results of this research will contribute to the understanding of disturbed perception, for instance caused by eye disease, cerebral haemorrhage, neurological disorders or neurodegenerative diseases. Another example is apperceptive agnosia; people with this condition are not able to link individual parts of a visual stimulus together as a whole, which cause problems with recognition in a lot of situations. Our results and methods may also be applied in order to develop more efficient training- and revalidation methods.

Study design

Participants are presented with visual stimuli during fMRI experiments, focused on the measurement of brain activity, and they are requested to make a decision about what they have perceived. Eye-movements are recorded during the recognition task. Additionally, recordings of brain activity in the absence of a task (resting state measurements) are carried out.

Study burden and risks

There are no risks involved in this research. Participants will be exposed to a magnetic field of 3 Tesla and rapidly switching magnetic gradients and radio frequency fields. This strength of field is standard for fMRI and MRI research. At this moment, there have not been any reported side effects. In rare cases, stimulation of a peripheral nerve (abdomen) can take place due to the switching magnetic gradients. This can cause a tickling sensation, which is harmless.

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

Age: 18 - 35 years
Right-handed
Normal or corrected to normal eyesight
Healthy
Written consent

Exclusion criteria

1. MR incompatible implants
2. Neurological disorders current and/or past
3. Claustrophobia
4. Current ophtalmic or psychiatric disorder
5. The wish not to be informed in case of a possible brain abnormality that could be detected during the experiment.
6. Pregnancy or suspected pregnancy
7. Tattoos containing red pigments
8. Use of medication that can influence task results

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):	10-02-2014
Enrollment:	23
Type:	Actual

Ethics review

Approved WMO

Date:	20-01-2014
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	ID
CCMO	NL46052.042.13