Population Receptive Filed (pRF) mapping during reaching and saccades

No registrations found.

Ethical review	Not applicable
Status	Pending
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON24211

Source
NTR

Brief title
pRF_EyeHand

Health condition

The participants to this study are healthy adults with no history of neurological diseases

Sponsors and support

Primary sponsor: University of Groningen
Source(s) of monetary or material Support: University of Groningen

Intervention

Outcome measures

Primary outcome

The main outcome is a new measure of receptive field properties during eye and hand movements using a new method of analysis

Secondary outcome

not applicable

Study description

Background summary

Rationale: To plan and execute directed movements, such as reaching for a cup or looking at a traffic light, our brain needs to compute the exact location of the target and transform it into the appropriate movement trajectory. Numerous topographical maps representing the spatial location of the target have been reported in human parietal cortex for eye (Konen & Kastner, 2008; Sereno, Pitzalis, & Martinez, 2001) and hand movements (Hagler, Riecke, & Sereno, 2007; Levy, Schluppeck, Heeger, & Glimcher, 2007). The neurons in these maps carry out the transformations necessary to plan the direction of the movement of the specific effector. However, the precise role of each map, and the exact computations taking place are not well understood yet.

Objective This project aims at identifying and characterizing these maps and their properties and roles in the human brain. To this end, we will employ pRF mapping (Dumoulin & Wandell, 2008) which provides a biologically plausible means to characterize properties of the neuronal populations in each voxel. In this study, we will use this method to measure pRF properties for different effectors (i.e. eye and hand). This approach will allow assessing the visual field map, the size of the RF and RF tuning characteristics in much greater details, compared to previous studies on eye and hand topographical maps. This project will greatly improve our understanding of the functional contribution of different cortical (and subcortical) areas to the planning and generation of hand and eye movements.

Study design: The study consists of 2 observational studies. Each study will consist of an (f)MRI experiment. During these experiments, observers will see visual stimuli on a display, to which they will have to respond by making a movement with the eyes or the hands. The movements with the hand will be made on a plastic device attached to participants' abdomen. Meanwhile, the behavior of the observers is measured using an eye-tracker and an in-bore camera.

Study population: For each of the 2 studies healthy adult observers are required for the imaging experiments. For this reason, we ask permission to recruit up to 40 healthy adult observers for the experiments

Main study parameters/endpoints: The main study parameters are the eye and hand movements and the cortical activation (commonly referred to as the BOLD response) associated with processing visual information.

Nature and extent of the burden and risks associated with participation, benefit and group relatedness: There is no increase in risk associated with this study, nor do observers benefit from participation. Observers will view images on a screen and respond to them, and be exposed to (f)MRI experiments with a magnetic field of 3 Tesla and fast fluctuating

magnetic gradients and radio-frequency fields. These field strengths are commonly in use in fMRI and MRI research. Until now no side effects have been reported or described in the literature. In very rare cases, observers may experience a harmless, tickling feeling, the result of an abdominal peripheral nerve being stimulated because of the fluctuating magnetic fields.

Study objective

Our primary objective is to gain more insight on the neural mechanisms underlying goal-directed movements, taking advantage of the high sensitivity of the pRF mapping method in measuring spatial and non-spatial properties of receptive fields. For the first time we will apply this method to the investigation of the motor system, shading light on pRFs properties during movement of different effectors (eye and hand). We do not have specific hypotheses about the properties of these maps, since no other studies had the sensitivity to measure them before. Therefore, these exploratory studies simply aim to measure the properties of topographical maps using the recently available advance method of pRF mapping.

Study design

This study collects the blood-oxygen level dependent (BOLD) using an MRI scanner

Intervention

not applicable

Contacts

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Eligibility criteria

Inclusion criteria

In order to be eligible to participate in this study, a subject must meet all of the following criteria:
• ≥ 18 years old
• Neurologically healthy
• Right handed
• Signed written informed consent
• Normal or corrected-to-normal visual acuity

Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:
• not willing to be informed about abnormalities found during the (f)MRI experiment.
• visual impairment (defined as a visual acuity < 1.0 and/or visual field defects),
• (suspecting to be) pregnant (females)
• claustrophobia,
• MRI incompatible implants,
• tattoos containing metal (tattoos older than 20 years and/or with red color)

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non controlled trial

Control: N/A , unknown

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-10-2019
Enrollment:	40
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Not applicable
Application type: Not applicable

Study registrations

Followed up by the following (possibly more current) registration

ID: 48811
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL7548
CCMO	NL66874.042.19
OMON	NL-OMON48811

Study results