Distinguishing neural activity patterns in action identification

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

Summary

ID

NL-OMON33347

Source
ToetsingOnline

Brief title
Neural activity patterns in action identification.

Condition

- Other condition

Synonym
Niet van toepassing

Health condition

heeft geen betrekking op aandoeningen

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Marie Curie Excellence Grant of the European Commission to Christian Keysers

Intervention

Keyword: action-recognition, action-understanding, mirror neurons, social cognition

Outcome measures

Primary outcome

The dependent variable for fMRI data is the percent signal change in every voxel of the brain during performance to the tasks. We will perform a classification analysis on the data from specific brain regions to look for similarities in brain activations when the subjects were performing and observing the same actions, actions with the same goal, and actions with the same movement.

Further details are contained in the Protocol.

Secondary outcome

Not applicable.

Study description

Background summary

Witnessing an action performed by someone else is associated with activation of the motor and premotor cortices in the brain of the observer, areas considered to be part of the putative mirror neuron system in humans. Several lines of evidence suggest that such automatic mental simulation (or *mirroring*) of

other people*s actions may allow us to understand their intentions. Simulation and common coding models of action perception propose that we understand the how and what of other people*s actions because perceiving their actions activates certain brain circuits in much the same way as if we were executing the actions. *Cross-modal classification analysis* is a way to test simulation and common coding models in humans using fMRI data.

Study objective

Our experiment has two objectives. First, it is designed to determine whether cross-modal classification is possible, and so resolve the different conclusions reached in Etzel, Gazzola et al. (2008) and Dinstein, Gardner et al. (2008). Second, the experiment will evaluate whether the purpose of an action is represented in the mirror neuron system, irregardless of motor actions needed to achieve the purpose.

Dinstein, I., J. L. Gardner, et al. (2008). "Executed and Observed Movements Have Different Distributed Representations in Human aIPS." J. Neurosci. 28(44): 11231-11239.

Etzel, J. A., V. Gazzola, et al. (2008). "Testing Simulation Theory with Cross-Modal Multivariate Classification of fMRI Data." PLoS One 3(11): e3690.

Study design

We will use functional magnetic resonance imaging (fMRI) to test our hypotheses. During the imaging the subjects will be asked to watch short movies of actors performing goal-directed hand actions and to perform short goal-directed hand actions themselves.

Further details are contained in the Protocol.

Study burden and risks

The experiment will not entail more than minimal risk to the participants, although participation may be considered a burden, since participants have to lie still in a confined space while performing the task.

There are no benefits to the subject for participation in 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

• Physically healthy individuals.
• Normal or corrected-to-normal vision.
• Between 18 and 35 years old.
• Right-handed. Using right handed subjects only allows a focus on left-hemispheric activity and the use of only one (right-handed) set of movies.

Exclusion criteria

Subjects with a history of psychiatric or neurological disorders (including epilepsy) and subjects that use drugs that may influence the task performance will be excluded from participation. For MRI, several additional criteria apply and the participant will have to fill out

a detailed questionnaire covering safety aspects of the research in relation to the 3 Tesla magnetic field and the MRI environment (see document E2 Toestemmingsformulier). ;Criteria preventing participation due to the MRI are:
• MRI-incompatible implants in the body.
• Any risk of metal particles in the eyes or body (such as manual work without eye protection or shrapnel injuries).
• Tattoos containing red pigments.
• (Suspected) pregnancy.
• Claustrophobia.
• The refusal to be informed of structural brain abnormalities detected during the experiment.

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	12-01-2009
Enrollment:	24
Type:	Anticipated

Ethics review

Approved WMO

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	NL26341.042.09