Functional MRI of food reward in food stimuli ranging in perceived healthiness

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Primary objective 1) To determine how modulating the perceived healthiness of a food alters the neural response to pictures of food packagesSecondary objectives1) To determine how modulating the perceived healthiness of a food alters the skin…

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON33457

Source
ToetsingOnline

Brief title
Functional MRI of food reward

Condition

- Other condition

Synonym
N.v.t.

Health condition

geen aandoening

Research involving
Human

Sponsors and support

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

Intervention

Keyword: brain, food stimuli, functional MRI, reward

Outcome measures

Primary outcome

Neural activation (percentage signal change) induced by the presentation of

pictures of food packages.

Secondary outcome

- Skin conductance during the presentation of pictures of food packages in the

fMRI task.

- Heart rate during the presentation of pictures of food packages in the fMRI

task.

- Pulse amplitude during the presentation of pictures of food packages in the

fMRI task.

- Reaction times during execution of the fMRI task.

- Reported expected tastiness, purchase intention and perceived healthiness.

Study description

Background summary

Although many people have the intention to eat healthy or to abstain from eating unhealthy foods, people often find it difficult to put this into practice. When someone is often not able to resist the temptation of unhealthy foods this can result in weight gain and thus overweight or obesity on the long term. Why is it so hard for people to make a healthy food choice and can the

neural response associated with the healthiness of food explain this? The brain mechanisms involved in the regulation of food intake and the motivation to consume or abstain from eating healthy or unhealthy foods are complex and yet poorly understood.

Several brain structures, for example the basal ganglia, the insular cortex, the prefrontal cortex, the hippocampus, the hypothalamus and the amygdala have been shown to respond to presentation of food pictures. Previous studies showed that individuals show different neural responses to visual presentation of unhealthy (high energy/fat) versus healthy (low energy/fat) foods. A drawback of the aforementioned studies is that the food categories healthy/unhealthy differed in many characteristics. Therefore it is unknown whether it is the difference in perceived healthiness that caused the differential neural response or e.g. the difference in fat level, sugar level, or the tastiness of the food.

In the study described here, we functional MRI is used to measure the brain responses to pictures of packaged foods solely differing in perceived healthiness. Perceived healthiness is modulated by means of packaging cues while intrinsic properties of the food are kept constant. In addition to neural activation, also behavioral reaction times and psychophysiological measures of skin conductance, heart rate, and finger pulse amplitude are measured to investigate the influence of perceived healthiness on these more indirect measures of arousal and (autonomous) nervous system response.

Study objective

Primary objective
1) To determine how modulating the perceived healthiness of a food alters the neural response to pictures of food packages

Secondary objectives
1) To determine how modulating the perceived healthiness of a food alters the skin conductance, the pulse amplitude and the heart rate response to pictures of food packages
2) To determine how modulating the perceived healthiness of a food alters the (behavioral) reaction time to pictures of food packages
3) To determine how modulating the perceived healthiness of a food alters the following self-reported expected tastiness, and purchase intention

Study design

Randomized intervention study.
Upon arrival on the study day, subjects fill in a questionnaire on hunger and satiety and date of last menstruation. Subsequently, subjects will undergo a 30 minute MRI scan. During the functional MRI scan subjects will carry out a food

choice task with pictures of food packages ranging in two levels of perceived healthiness (healthy and unhealthy). During the task consecutively a picture of a healthy and a unhealthy food package are presented and after that the subject is asked to choose which of the two she would most like to eat now. After leaving the scanner subjects again fill in a questionnaire on hunger and satiety. After that, subjects will rate the pictures of food packages on expected tastiness, perceived healthiness and purchase intention. At the end of the study session, subjects receive and eat one of the foods chosen in the food choice task.

Intervention

MRI during the presentation of pictures.
Eating a cookie.

Study burden and risks

The intervention is non-therapeutic to the subjects. Subjects fast for three hours before the investigation. Subjects are scanned for 30 minutes while viewing pictures of food packages. This type of paradigm poses almost no risk. Functional MRI is an invasive technique but the risks can be controlled.

Despite of the screening on claustrophobia it is possibly that subjects experience claustrophobia symptoms during the MRI scan. However, this is very rare in people that are scanned voluntarily (without medical neccesity).
In summary, the risk associated with participation is assessed as very low and the burden as minimal.

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

1. Healthy (self-reported)
2. Body Mass Index (BMI) between 20 and 25 kg/m2
3. Right-handed
4. Gender: female

Exclusion criteria

1. Smoking
2. Having a food allergy
3. Having an eating disorder
4. Having a history of medical or surgical events that may significantly affect the study outcome, such as metabolic or endocrine disease, or any gastro-intestinal disorder
5. Use of medication, except aspirin/paracetamol and oral contraceptives
6. MRI exclusion criteria
a) Claustrophobia
b) Having metal implants (i.e. pacemaker, metal joints, prostheses, etc.) or metal objects on the body which cannot be removed (i.e. piercing, hearing aid, brace, etc.
c) Being pregnant.

Study design

Design

Study type: Interventional

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	14-12-2009
Enrollment:	20
Type:	Actual

Ethics review

Approved WMO

Date:	27-10-2009
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)

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	NL28960.041.09