Brain patterns of anticipatory and consummatory reward.

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

Summary

ID

NL-OMON38600

Source
ToetsingOnline

Brief title
Neuron

Condition

- Other condition

Synonym
niet van toepassing

Health condition

niet van toepassing

Research involving
Human

Sponsors and support

Primary sponsor: Wageningen Universiteit
Source(s) of monetary or material Support: EFRO (FOCOM project)

Intervention

Keyword: Anticipatory reward, Brain activation, Consummatory reward

Outcome measures

Primary outcome

The main study parameters/endpoints are (1) the difference in brain activation between an anticipatory reward and a consummatory reward and (2) the difference in brain activation between a consummatory reward labeled as light versus labeled as regular.

Secondary outcome

The 1st secondary study parameter/endpoint is the correlation between brain activation in response to exposure to an anticipatory or a consummatory reward and reaction times and errors (push/pull measure). In addition, two groups will be made based on the product choice outcome and anticipatory reward responses and consummatory reward responses are compared between those groups (i.e. there is looked at the group*reward response interaction).

The 2nd secondary study parameter/endpoint is the correlation between brain activation in response to exposure to an anticipatory or a consummatory reward and subject characteristics like reward sensitivity, delayed discounting, impulsivity, health attitude, stress, executive functioning and food neophobia.

Study description

Background summary

Food reward consist of an anticipatory component often related to the presentation of a cue and a consummatory component related to reward receipt. Little research has been conducted about the differences in brain patterns associated with anticipatory and consummatory reward though in one study, they were found to be dissociable. However, this study had numerous drawbacks. First, only 8 participants were included. Second, instead of building on an existing association between an *off the shelf* food label and a stimulus, participants were conditioned to arbitrary visual stimuli. And last, it was not possible to disentangle reward responses from salience responses and no link between reward in the brain and behavioral reward could be made due to absence of a behavioral task. In the current study we intent to investigate the difference in brain patterns associated with anticipatory (visual cue) and consummatory (taste) reward taking into account above mentioned drawbacks. *Off the shelf* labels of a light and regular beverage will be used as anticipatory reward cues in order to give more inside on the acceptance of light products/labels.

Study objective

The primary objectives of this study are (1) to assess how anticipatory reward related brain patterns differ from consummatory reward related brain patterns and (2) to assess how presentation of an anticipatory reward cue alters brain responses associated with a consummatory reward.

The 1st secondary objective of this study is to assess whether anticipatory and consummatory reward responses (brain) can be linked to behavioral reward responses i.e. motivation to obtain food and product choice.

The 2nd secondary objective of this study is to establish in how far subject characteristics like reward sensitivity, delayed discounting, impulsivity, health attitude, stress, executive functioning and food neophobia correlate with anticipatory and consummatory reward related brain responses.

Study design

On the study day participants engage in an fMRI task in which they are alternately exposed to one of three visual cues (a light label, a regular label or a label signaling a neutral stimulus), accordingly work for the product signaled by the cue by pushing or pulling a joystick and finally taste the corresponding product (sweet regular beverage or neutral stimulus), while their brain responses are measured using functional MRI. There are three task

conditions: a) presentation of a light label - push/pull - consumption of a regular beverage (incongruent) b) presentation of a regular label - push/pull - consumption of a regular beverage (congruent) c) presentation of a *neutral* label - push/pull - consumption of a neutral stimulus. At the end of the session (outside the scanner) participants are asked to make a choice between a light and a regular juice box to take home.

Intervention

Participants are exposured to three different labels, a light label a regular label and a 'neutral' label, and two tastants, a regular beverage and a neutral control stimulus.
There are three task conditions:
a) presentation of a light label - consumption of a regular beverage
b) presentation of a regular label - consumption of a regular beverage
c) presentation of a *neutral* label - consumption of a neutral control stimulus
These three task conditions are randomized and counterbalanced.

Study burden and risks

The study will consist of an information meeting (approx. 45 min), a training session (approx. 60 min) and a scan session (approx. 110-135 min). Participants will visit the university once for an information meeting (Biotechnion, Wageningen). After this, participants will visit the dummy scanner to complete the training session (Restaurant of the Future, Wageningen). For the scan session, participants will visit the MRI facility in Hospital Gelderse Vallei (Ede). During the scan session subjects will be exposed to visual cues, push or pull a joystick, taste the stimuli, rate among other things the pleasantness (liking), desirability (wanting) and sweetness for the stimuli and make a product choice. The study is non-therapeutic to the participants. The risk associated with participation is negligible.

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

See page 10 and 11 of the protocol:
-Gender: female
-Age: 18-35 year
-BMI: 18.5 - 25.0 kg/m2
-Healthy (as judged by the participant)
-Being right handed

Exclusion criteria

See page 11 and 12 of the protocol:
-Restraint eating (score > 2.80)
-Lack of appetite
-Having difficulties with swallowing/eating
-Usage of an energy restricted diet during the last two months
-Weight loss or weight gain of 5 kg or more during the last two months
-Stomach or bowel diseases
-Diabetes, thyroid disease, kidney disease and other endocrine disorders
-Having a history of neurological disorders
-Having taste or smell disorders
-Having schizophrenia or another serious mental illnesses
-Usage of daily medication other than oral contraceptives, Paracetamol or hay fever tablets
-Pregnancy during the last 6 months, having the intention to become pregnant or lactating
-Smoking on average more than one cigarette/cigar a day
-Being allergic/intolerant for products under study

-Exclusive consumption of *light* versions of beverages
-Avoidance of *light* versions of beverages
-Disliking the beverages under study
-Working or doing an internship/thesis at the group Sensory science and eating behavior (WUR)
-Current participation in other nutrition related or medical research
-Having a history of or current alcohol consumption of on average more than 28 units per week
-Having a contra-indication to MRI scanning

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	12-12-2013
Enrollment:	26
Type:	Actual

Ethics review

Approved WMO

Date:	18-10-2013
Application type:	First submission
Review commission:	METC Wageningen Universiteit (Wageningen)

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	NL45977.081.13