Variability in decision strategy use studied with eyetracking and fMRI

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

Summary

ID

NL-OMON48133

Source
ToetsingOnline

Brief title
VARDE

Condition

- Other condition

Synonym
no diseases, this research utilizes brain imaging techniques with healthy participants only

Health condition

standard MRI research without direct medical applications

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Leiden
Source(s) of monetary or material Support: European Commission (Marie Sklodowska-Curie Action)

Intervention

Keyword: arousal, decision making, locus coeruleus, noradrenalin

Outcome measures

Primary outcome

Brain activation as measured by fMRI, particularly the difference between

participants prefer-ring a complex vs. simple decision strategy. Prestimulus

pupil size, and pupil size changes to task stimuli, particularly the

differences in these measures between participants preferring a complex vs.

simple decision strategy.

Secondary outcome

n/a

Study description

Background summary

Research shows that for many of decision problems, people often use simple decision heuris-tics in order to overcome limitations in time, knowledge and cognitive abilities Previously, we showed that decision strategy preference is associated with electrodermal and EEG measures of arousal, which is governed primarily by brainstem nucleus locus coeruleus (LC). It is thus viable to link the use of decision strategies in multi-attribute choice with LC activity.

Study objective

We expect to find links between the preference for simple vs. complex choice strategies and the activity of LC, evident in pupil size and fMRI signal. The study aims to provide novel evidence that 1) pupil dilation to decision cues is

linked to strategy preference, 2) the LC nor-adrenergic system is involved in strategy preference, 3) the strategy preference and its relation to the neural indices is stable over time.

Study design

We will look for the association between strategy use and arousal-related brain activity in the context of both 1) stable individual differences and 2) situational manipulation of arousal. Therefore, the study will have two separate sessions, focused on these two aspects. Session 1 will employ a within-subject manipulation of decision task structure (compensatory vs. non-compensatory structure, see full description of the project). Based on the preference for either the complex or simple decision strategies, participants will be divided into two groups * these groups will be compared on relevant fMRI measures. Session 2 will be aimed at 1) providing data on stability of the strategy preference and 2) providing data on strategy use under condi-tions of arousal heightened by the presentation of arousing affective stimuli. This part of the study will employ a 2x3 within-subject design, with the task structure manipulated again at 2 levels (compensatory vs. noncompensatory structure) and emotional arousal manipulated at 3 levels (high negative, neutral and high positive). Also, based on the preference for either the complex or simple decision strategies, participants will be divided into two groups * these groups will be compared on relevant fMRI measures.

Study burden and risks

n/a

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

Healthy young adults (18-30 years old) with normal vision.

Exclusion criteria

Significant history of head trauma, premature birth, learning disabilities, neurological or psychiatric illness. Heart arrhythmia, glaucoma, congenital eye diseases, hyperopia, myopia, hypertension and use of anti-depressants or psychotropic medication and possible pregnancy (in adult females). MRI contra-indications, including metal implants and claustrophobia. Smoking more than five cigarettes a day * to avoid nicotine withdrawal effects during the study. Alcohol consumption < 24 hours before study, caffeine consumption < 3 hours before study. These criteria will be assessed by a self-report questionnaire administered during pre-screening.

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):	01-09-2019
Enrollment:	60
Type:	Anticipated

Ethics review

Approved WMO

Date:	17-10-2019
Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

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	NL68401.058.19