Is the adolescent brain in advantage when it comes to creative cognition?

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The main objective of this study is to investigate whether the immature neural circuitry of the adolescent brain is an advantage when it comes to creative cognition.

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

Summary

ID

NL-OMON32741

Source
ToetsingOnline

Brief title
CAB

Condition

- Other condition

Synonym
nvt

Health condition

geen

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Leiden
Source(s) of monetary or material Support: NWO (open competitie)

Intervention

Keyword: creativity, development, divergent thinking, neuro-imaging

Outcome measures

Primary outcome

Age-related changes in functional brain activation, functional connectivity,

grey matter maturation, and their relatedness to creative thinking performance.

Secondary outcome

nvt

Study description

Background summary

The adolescent brain is still maturing. White matter myelinization, grey matter pruning, and neural networks specialization have not reached adult levels yet. These changes in brain structure are accompanied by important changes in brain function, with slowly maturing cognitive control functions. Cognitive control is thought to be important for structured planning, goal maintenance, and the ability to keep irrelevant information out of mind. However, one of the consequences of immature cognitive control is the ability to think creatively, and to come up with unpredicted solutions. It has been suggested that adolescence is a period in life associated with important advancements in reasoning, but also flexibility in the ability to think creatively. The goal of the current study is to test this hypothesis, by measuring functional brain activation during creative problem solving tasks, with the goal of investigating whether slow brain maturation in adolescents brings them in advantage when it comes to creative problem solving.

Study objective

The main objective of this study is to investigate whether the immature neural circuitry of the adolescent brain is an advantage when it comes to creative cognition.

Study design

This is a between-subjects design (adolescents versus adults) with

within-subject comparisons (creative versus common problem solving).

Study burden and risks

There are no risks associated with behavioural testing. There is an occasional possibility of some frustration with poor performance or fatigue, testing will stop if a subject displays frustration or appears tired. There are no known risks associated with participating in an fMRI study. Subjects with intracranial or intraocular metal, a pacemaker, possible pregnancy and claustrophobia will be excluded because of potential contraindications of MRI in such subjects. The Nederlands Vereniging voor Kindergeneeskunde (NVK) code of conduct; Gedragscode verzet bij minderjarigen die deelnemen aan medisch-wetenschappelijk onderzoek will be applied to this study.

Considering the minimal risks involved in this research, the importance of the benefits gained from this research far outweighs the costs. This study aims to acquire knowledge about the capability of creative cognition in relation to maturation of neural circuitry. This knowledge about normal development is critical to aid in the understanding of cases of abnormal cognitive development, as seen in children with ADHD or early onset schizophrenia. The results will also be of great importance to educational service. Knowledge about the capabilities of the adolescents* brain systems concerning creative cognition enables to design education that makes optimal use of the adolescents* potentials.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adolescents (12-15 years)
Adolescents (16-17 years)
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Participants between 12 and 35 with no history of neurologocal disorder/disease and no counterindications to MRI will be included in this study. All particpants will be right-handed native Dutch speakers with normal or corrected to normal vision.

Exclusion criteria

Potential participants will be prescreened for contraindications for MRI, which include metal implants, a pacemaker, claustrophobia, and possible pregnancy. They will additionally be prescreened for head trauma, premature birth, learning disabilities, and history of neurological or psychiatric illness and/or use of psychotropic medications. Because of the difficulties in interpreting cognitive studies in subjects with Dutch as a second language, only native-Dutch speakers will be asked to participate in the study. Finally, left-handed individuals will be excluded from the study because some left-handers have substantially different brain organization relative to right-handers.

Study design

Design

Study type: Observational non invasive

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

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	14-03-2010
Enrollment:	50
Type:	Actual

Ethics review

Approved WMO

Date:	12-03-2010
Application type:	First submission
Review commission:	METC Leids Universitair Medisch Centrum (Leiden)

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	NL30003.058.09