Adaptation and Serial Dependence in the Perception of Line Orientation in Autism Spectrum Disorder

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Developmental disorders NEC
Study type	Observational non invasive

Summary

ID

NL-OMON43340

Source
ToetsingOnline

Brief title
Adaptation of Line Orientation in Autism

Condition

- Developmental disorders NEC

Synonym
autism, Autism Spectrum Disorder (ASD)

Research involving
Human

Sponsors and support

Primary sponsor: Radboud Universiteit Nijmegen
Source(s) of monetary or material Support: European Research Council grant

Intervention

Keyword: adaptation, autism, hypo-priors, perception

Outcome measures

Primary outcome

the primary study parameters are the responses of participants to a computer

task where adaptation and serial dependence of line orientation are evoked, and

the experimental group that the participant is in (autism or control).

Secondary outcome

We also collect data about age, gender, verbal and non-verbal IQ, dominant

hand, sensory profile, and (social) behavior of the participants.

Study description

Background summary

Although the emphasis in the description and diagnosis of Autism Spectrum Disorder often lies with the social and behavioral characteristics of the disorder, autism is also characterised by atypical perception. It has even been suggested that the atypical perception could partly explain the other symptoms of autism.

Sensory information, such as visual input, is noisy. A lot of input is ambiguous and can be interpreted in many different ways. In normal perception, the brain resolves this ambiguity by means of 'priors' - an internal model of the world that is constantly calibrated by experience and expectation. Through priors the brain finds the best interpretation for ambiguous input.

According to a recent hypothesis, the perceptual atypicalities may be caused by "hypo-priors"; the internal model used to process sensory information, such as visual input, is too broad. Because of hypo-priors, the integration of the model and visual information is less successful. Ambiguous input is therefore more difficult to interpret. This could explain why many people with autism indicate they experience the world as stressful, and why many of them prefer routine.

Adaptation is closely connected to priors: input recalibrates the prior, which has an influence on how the input that follows is interpreted. If there are indeed hypo-priors in autism, the prior should be refined less adequately. Consequently, there should be less adaptation. By measuring adaptation, we can therefore say something about the priors.

A number of published studies indeed find less adaptation in autism. However, others studies do not find this effect. Based on the findings it has been suggested that low-level adaptation is intact while high-level perceptual effects are affected in autism.

Study objective

In this study we use a unique paradigm which can be used to examine both high-level (serial dependence) effects as low-level (adaptation) effects. By doing so we hope to resolve the discrepancy in the previous findings.

We expect that low-level adaptation is intact in autism, while on a high level of processing there are differences between individuals with and without autism, specifically that in autism there is less integration of current and previous input.

The results of this study may bring clarity about hypo-priors in autism, and therefore possibly about the nature of atypical perception in autism. This could lead to the development of interventions and therapies that target sensory processing in children and adolescents in autism. If the atypical perception indeed contributes to the other symptoms in autism, these therapies could affect these symptoms as well.

Study design

This observational study uses a cross-sectional design in which two groups are compared to each other.

Study burden and risks

The burden that comes with this study is relatively low. Participants will come to the Donders Insitute for an appointment that lasts a few hours (approximately 3 hours). During this appointment they will do a few tasks of the WISC or WAIS IQ tests and will do a computer task on the computer. Both last approximately an hour and are doable for the study population.

If the participant has autism, an Autism Diagnostic Interview is conducted with their parent. This interview takes 1 to 1.5 hours. The interview does not require the participation of the adolescent themselves.

Participants will fill in 2 questionnaires (max 30 minutes total). Their parents will fill in 3 or 4 questionnaires (approx. 1-2 hours). The questionnaires are standardised questionnaires that are used in scientific research. These questionnaires participants and their parents may fill in at home, when it suits them (but before a set deadline). This will allow participants more freedom.

The risk of this study is negligible. There is no intervention, and no medical substances or apparatuses are used. None of the procedures come with any risk.

This study uses underage participants, because the sensory characteristics of Autism Spectrum Disorder are especially prominent during development. It are these characteristics that we want to investigate, which is why it is necessary to approach adolescents for this study. Although these adolescents do not directly benefit from participation, the knowledge acquired with this study could be used to develop neuropsychological treatments that would be specifically helpful for this population, who are still in development. Adults are a less suited study population, as 1) the sensory characteristics of autism are likely less or not present in this population and 2) treatment methods that could be developed would likely have less effect on a post-development population.

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

Age 12-18
IQ > 85
Normal or corrected-to-normal vision
Native Dutch speakers

Exclusion criteria

Significant difficulties with hearing that cannot be corrected for
Diagnosis of a neurological condition

Study design

Design

Study type: Observational non invasive

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	24-11-2017
Enrollment:	72
Type:	Actual

Ethics review

Approved WMO Date:	18-05-2017
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

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	NL60040.091.16