Growing Up Together in Society: Amsterdam High-risk Antisocial Cohort

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The current study describes the Antisocial High-Risk Cohort (i.e., WP3, a sub-project) of the larger Growing Up Together in Society Project (see appendix A), which has the aim to predict and understand behaviour that negatively affects society:...

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

Summary

ID

NL-OMON57240

Source
ToetsingOnline

Brief title
GUTS High-Risk Antisocial Youth

Condition

- Other condition
- Personality disorders and disturbances in behaviour

Synonym
Antisocial behavior, risk behavior, rule-breaking behavior

Health condition

antisociaal gedrag, hersenontwikkeling en gedragsontwikkeling

Research involving
Human

Sponsors and support

Primary sponsor: Amsterdam UMC
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Antisocial behavior, High-risk Youth, Neuroscience, Self-regulation

Outcome measures

Primary outcome

The neural basis of self-regulation, age-related changes in brain function and structure related to self-regulation, and outcomes for self and others in adolescence and adulthood (e.g., contributions to society, antisocial behaviour, academic outcomes, social outcomes).

For self-regulation, we calculate the area under the curve (AUC) for various task conditions using a 3 (target: self, friend, stranger) by 2 (choice: now vs. later) design. Subsequently, we employ a repeated measures ANOVA to investigate differences in AUC depending on task conditions. In terms of brain activity, the brain contrast [self-regulation vs. control] will be assessed, and an ANOVA will be conducted with a 3 (target: self, friend, stranger) by 2 (choice: now vs. later) design. This enables us to measure neural activity in brain areas related to self-regulation for oneself and others.

For empathy, neural activity is examined while watching a film clip (The Champ). The participants will be given no further instructions other than to pay attention to the movie. This naturalistic fMRI offers the opportunity to

obtain and identify patterns of brain activity and functional connectivity of spontaneous (affective) empathy across different brain regions. Behavioural data and eye-tracking will be used to correlate with the neural responses and validate participants* responses. Additionally, at the behavioral level, participants are asked about 'bodily sensation,' where they must indicate on an image where the emotion is felt in the body.

Trust is operationalized as the percentage of trust choices in a dichotomous trust game (for example, a trust game in which participants can choose to trust another person or not) relative to different targets (for example, friends and strangers). Regarding neural activity, we will explore contrasts assessing trust > no trust and compare different targets (for example, friend > stranger), as well as a repeated-measures ANOVA with both the trust vs. no trust conditions and the target condition. This allows us to measure neural activation related to trust in different individuals.

To measure aggression on a behavioral level, we will use a modified version of the SNAT (Achterberg et al., 2016), in which a prosocial condition will be added. Regarding neural activity (EEG), we will investigate (a)valence effects on neural activity during responses to social feedback and (b) to test whether individual differences in neural activity were meaningfully related to behavioural aggression, (c) how this prosocial addition differentiates behaviour in individuals. Aggressive responses will be measured by the intensity of playing a (fictitious) sound towards their (fictitious) opponents.

Participants are instructed beforehand to fill out a personal page in a friendship book, after which they receive positive and negative feedback from (fictitious) peers during the study. They can respond by increasing or decreasing the volume of the sound, this response is seen as a retaliatory response (measure of aggression).

Secondary outcome

This study includes a wide range of secondary outcomes, which include structural MRI; self-regulation, empathy, trust, aggression, background measures, parenting measures, behavioural measures, and outcome measures as assessed by questionnaires (see Table 2); hormone data collected with saliva and hair; genetic data collected via saliva (see below); ERPs measured by EEG related to delay discounting, empathy, trust and aggressive responses. All data are continuous data, except for background measures which can also be categorical data (e.g. gender, family situation).

Background measurements include questions requesting sensitive data, such as age, income, and ethnicity. We request this sensitive information because one of the objectives of the current study is to obtain a sample that covers a wide range of different backgrounds, in terms of, for instance, income and ethnicity. The lack of information scientists have about participants' backgrounds, and that certain marginalized groups are underrepresented in scientific studies, poses a problem for the generalizability of findings on brain-behavior mechanisms, as well as for the validity, reliability, and reproducibility of results. By asking for sensitive data such as income and ethnicity, we aim to make the current study representative and to communicate

transparently about the generalizability of the findings in scientific publications.

For participants, the research burden in waves 1, 2, 3 (years 1, 3, 5) consists of the following components: Online questionnaires (1 hour), 1 visit to the Spinoza Center for fMRI and behavioral tasks (2 hours). In waves 1A, 2A (years 2 and 4), the burden consists of: Online questionnaires (1 hour) and a visit to AmsterdamUMC for EEG (2 hours). - This totals to 5 visits, lasting 3 hours per year. In total, 15 hours of burden per participant if they complete all waves. (See Figure 1, 2, 3 in the protocol for an overview).

Study description

Background summary

How do young people successfully grow up in an increasingly complex society, and what are the main causes for differences in contributing to society? Society becomes more resilient when its members contribute to common goals (Masten, 2018; Masten & Motti-Stefanidi, 2020). With the Growing Up Together in Society (GUTS) research program we study the vital question: How do neurobiological and social-cognitive development interact with social (relations with family and peers) and societal (families* social-economic status) opportunities? How can we understand and predict the extent to which young people develop into socially contributing citizens?

We hypothesize that successfully developing self-regulation will be a key factor that explains (i.e., mediates) or compensates and exaggerates (i.e., moderates) the relation between inequalities in social and societal opportunities, neurobiological development, and contributions to society (Hofmann et al., 2012). People with better self-regulation, defined as effective goal setting, goal motivation, and goal capacity, are better at balancing immediate and delayed gratification, and balancing their own and others* needs (Carver & Scheier, 2012; Hofmann et al., 2012). Understanding the role of self-regulation, its developmental trajectory, and individuals* adaptation to environmental challenges may therefore also provide solutions to

decrease the effect of social inequalities on young individuals* potential.

Adolescence is a vital period in the development of self-regulation and societal contributions, given that this is the transition phase from childhood - characterized by strong dependency on parents and caregivers - to adulthood, in which one is expected to function as a mature, independent individual (e.g., politically, financially, and socially), and commit to social norms of society (Crone & Dahl, 2012; Crone & Fuligni, 2020; Steinberg & Morris, 2000). Adolescence is defined as the period between ages 10-24 years, starting with the biological onset of puberty (Crone & Dahl, 2012). The end of adolescence is often described as the time when individuals adopt mature social and societal norms (Crone & Dahl, 2012). Researchers have described a prolonged period of adolescent development, also referred to as emerging adulthood, during which individuals, when provided with opportunities, show further advancement in education and social development, with longer dependency on parents (Arnett, 2000; Willoughby et al., 2014). Despite important insights in the general developmental patterns in the last two decades, there is an urgent need to clarify the impact of diverse societal contexts on development. New insights from the field of social neuroscience hold the promise of providing fundamentally new insights in the role of diversity in societal contextual domains on adolescents* transition into adulthood, either in interaction with or through the effects of self-regulation.

Specifically for our Amsterdam High-risk cohort:

Societal contributions are defined as the capacity to contribute to goals of self (well-being and mental health) and other individuals or groups (contribution to others). Contributing to goals for self and others can occur in various societal domains, including educational achievements, such as investing in the future and staying committed to school success, as well as social contributions, such as cooperation, sharing, and helping others, and refraining from antisocial behaviors, while balancing personal well-being.

Individual traits can have a large impact on how individuals develop into socially and societally adaptive citizens. A key process that may influence how individuals with diverse opportunities develop into socially adaptive human beings is self-regulation. Recent psychological and neuroscience research shows that the sensitivity to the needs of others is under self-regulatory control in the general population as well as in individuals with antisocial behaviours. Based on these previous studies, we hypothesize that:

Antisocial adolescents have problems with setting long-term goals, rather than short-term goals.

Adolescents showing persistent antisocial behaviour have fundamental problems with setting societal goals rather than self-centred goals (social-affective goal regulation) that remain throughout development, and that the lack of

empathy is a determining factor in severe and persistent antisocial outcomes.

Adolescents with better self-regulation are expected to more often desist from antisocial behaviour in spite of adverse social or societal background.

Study objective

The current study describes the Antisocial High-Risk Cohort (i.e., WP3, a sub-project) of the larger Growing Up Together in Society Project (see appendix A), which has the aim to predict and understand behaviour that negatively affects society: antisocial behaviour. In WP3, we will connect brain science at the individual level with the societal context to identify why some high-riskwhether and which self-regulatory mechanisms make some adolescents deviate from expected societal norms and engage in antisocial behaviour. The primary objectives of the current Antisocial High-Risk cohort are to examine 1) delay discounting and the associated neural correlates (using fMRI; dependent variables) and possible effects of the beneficiary, age, and social economic status (independent variables), 2) the neural correlates of empathy (using fMRI; dependent variables) and possible effects of age and social economic status, sleep, intelligence, stress, genetics and externalizing behaviours (independent variables), 3) examining aggression, both internalizing and externalizing (dependent variables) and possible effects of the beneficiary, age, and social economic status (independent variables),4) trust towards community members, institutions and close others, and the associated neural correlates (using fMRI, dependent variables) and possible effects of the beneficiary, age, and social economic status (independent variables), 5) how adolescents* behaviour, in terms of affect, empathy and stress (dependent variables) fluctuates over time.

Study design

This cohort-sequential longitudinal study aims to include 400 children across ages 10-12 years, with early signs of antisocial behaviour. In addition, we include a pilot sample of 10-15 adolescents (10-18 y/o) to validate the paradigms. The pilot measurement will take place in spring 2024. The first measurement wave of the longitudinal project is scheduled to take place in early summer 2024, after which participants will be followed up in 2027 (when they are 13-15 years old) and 2030 (when they are 6-18 years old). This GUTS-Antisocial High-Risk study will include neuroimaging, behavioural experiments, questionnaires, and hormone data to study developmental changes across adolescence and young adulthood. Neural activation will be measured using functional Magnetic Resonance Imaging (fMRI). Resting-state fMRI will be used to assess functional connectivity. We will use structural MRI to measure underlying brain anatomical processes. In addition, we will measure social and cognitive functioning on a battery of questionnaires and experimental tasks outside of the scanner. Hormone data will be collected through hair and saliva.

All measurements are non-invasive.

Study burden and risks

There are no known risks associated with participating in the proposed measurements, apart from fatigue or other feelings of burden related to the number of measurements in the current study. MRI and EEG are non-invasive techniques involving no catheterizations or introduction of exogenous tracers. Numerous children and adults have undergone magnetic resonance and EEG studies without apparent harmful consequences. Some people become claustrophobic while inside the MRI magnet and in these cases the study will be terminated immediately at the subject's request. The only absolute contraindications to MRI studies are the presence of intracranial or intraocular metal, or a pacemaker. Relative contraindications include pregnancy and claustrophobia. Subjects who may be pregnant, who may have metallic foreign bodies in the eyes or head, or who have cardiac pacemakers will be excluded because of potential contraindications of MRI in such subjects. Contraindications for EEG include seizure disorders, individuals with recent stroke, cerebrovascular or respiratory diseases, and sickle cell anaemia. Although there is no direct benefit to the participants from this proposed research, there are greater benefits to society from the potential knowledge gained from this study. This knowledge will aid in our understanding of how self-regulation interacts with environmental and individual differences in typical development and how this might contribute to beneficial or detrimental outcomes later in life.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adolescents (12-15 years)
Adolescents (16-17 years)
Children (2-11 years)

Inclusion criteria

Dutch speaking: able to communicate in Dutch without mediation by an interpreter
10-13 years of age at start of first measurement
Already had police contact, or there is a rule-breaking, risk behavior present.

Exclusion criteria

Current use of anti-psychotics, steroid hormone medication.
If participants use psychotropic medication for ADHD, they will be asked to not take their medication in the morning before coming to the scanner-day
Contraindications for MRI and EEGI, including metal implants, heart arrhythmia, claustrophobia and females who are pregnant.
Participants should be able and willing to provide informed consent (and for participants under age 16, their legal representatives should also be able and willing to do so)

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active

Primary purpose:	Other

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	15-05-2024
Enrollment:	400
Type:	Anticipated

Ethics review

Approved WMO

Date:	20-12-2024
Application type:	First submission
Review commission:	METC Amsterdam UMC

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	NL86613.018.24