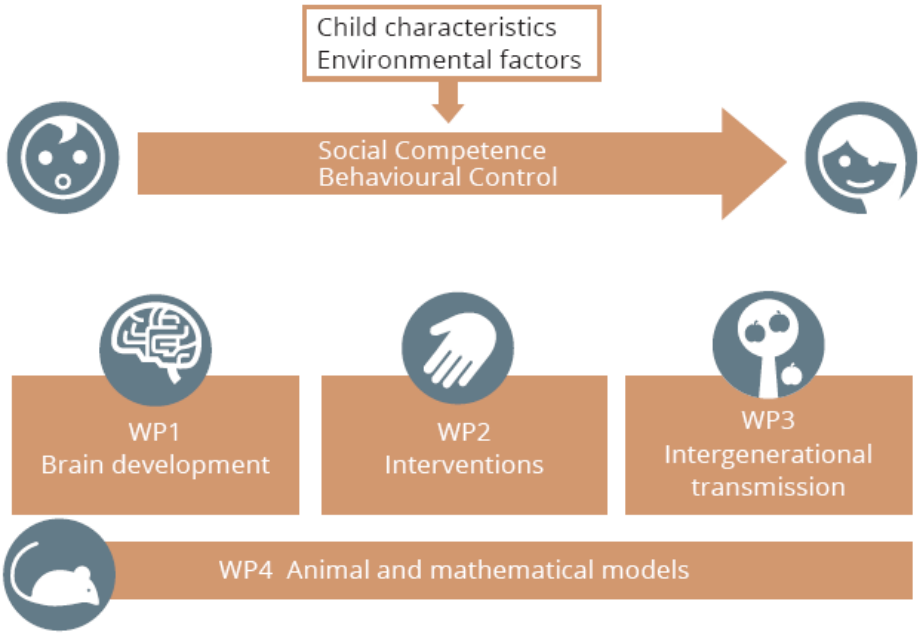
Consortium on Individual Development

CID project updates 2019/2020



Consortium on Individual Development

Preface

This booklet contains an updated overview of all Consortium on Individual Development (CID) research projects as of 31 August 2020.

Of the 82 projects, 43 are ongoing and 39 are finished. We asked CID researchers on ongoing projects for their 2019/2020 highlight and 2020/2021 plans.

Taken together, this provides insight into our vibrant research community and a sense of what is coming up for CID in 2020/2021.

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Content

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WP1 The role of brain development

Work package 1, rooted in the Utrecht YOUth cohort, focuses on longitudinal changes in brain structure and the way these changes relate to genetic and environmental factors, and how this brain development in turn mediates behavioural development.

Overview ongoing WP1 projects

16 ongoing projects		
Title	Project of	Page
Attention as a building block of social competence	Yentl de Kloe	6
Longitudinal effects of parenting and brain development on the early development of self-regulation: A combined micro and macro approach	Marissa Hofstee	7
Socioeconomic status and adolescent psychosocial development	Ties Fakkel	8
Socio-Economic Health Disparities (SEHD) in adolescence: social causation and social selection	Heiko Schmengler	9
Gaze behaviour during parent-child interaction	Gijs Holleman	10
Life events and MRI brain measures	Elizabeth Buimer	11
How do environmental factors impact the development of cognitive control and its neural circuitry?	Bram Gooskens	12
Emotion recognition and linguistic development	Anika van der Klis	13
The development of infant brain networks	Bauke van der Velde	14
How language and social development interact and affect social interaction across development: Comparing typical and atypical trajectories	Zsofia Belteki	15
Fine-grained face-scanning patterns during parent-child interaction – a dual eye tracking approach	Niilo Valtakari	16
The effect of prenatal exposures on brain development in children	Sonja de Zwarte	17
Environmental influences on structural and functional brain connectivity during adolescence	Yoran Caspi	18
Media use, parenting, and behavioural control: An experience sampling study	Irene van Driel	19
Media use, parenting, and behavioural control: An experience sampling study	Ine Beyens	20
Connected and in control II: Development of functional connectivity underlying behavioural control	Dienke Bos	21

Yentl de Kloe
PhD candidate, UU
WP1, Kemner

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Attention as a building block of social competence

1 October 2018 – 1 October 2022

Brief description

Currently I am working on three projects, described in prioritized order. The first is a methodological paper on eye tracking data quality which is almost finished. The second is on whether eye tracking measures relate to social competence and behavioural control as measured with questionnaires. The third is on automatic detection of infant posture in parent-child interaction videos.

Highlight 2019/2020

It was an exciting year. I supervised my first master thesis students, had my first intern student and I also started measuring R9 kids in the YOUth cohort. Then Corona hit and I am glad I still got to work on my papers described above.

Plans 2020/2021

I soon hope to publish my first paper. I also planned to publish my second and third paper (as described above) this year.

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Marissa Hofstee
PhD candidate, UU
WP1, Deković

Longitudinal effects of parenting and brain development on the early development of self-regulation: A combined micro and macro approach

1 March 2019 – 1 March 2023

Brief description

The aim of this project is to better understand the effects of parenting behaviours and brain development on the development of self-regulation. We will examine a longitudinal mediation model of self-regulation with a multi-method approach including both behavioural and neuroimaging measures of the YOUth cohort study.

Highlight 2019/2020

- Started working on a meta-analysis and an empirical paper, leading to interesting collaborations
- Presented our meta-analysis at the (virtual) ICIS congress
- Co-authored a review paper about self-regulation for CID's special issue in DCN

Plans 2020/2021

I plan to submit the meta-analysis and the empirical paper. Furthermore, I will continue working with the YOUth cohort data and start data collection again.

Ties Fakkel
PhD candidate, UU
WP1, Vollebergh

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Socioeconomic status and adolescent psychosocial development

1 October 2018 – 1 October 2022

Brief description

Within CID we have a treasure of information about psychosocial development from childhood to early adulthood. My aim is to better understand how socioeconomic status impacts this development, and how in turn psychosocial competencies impact the development of socioeconomic status.

Highlight 2019/2020

I have been exploring the available data within our CID-cohorts, and have renewed my appreciation for the extent with which adolescent data has been collected for decades – and still is being collected so meticulously. Similarly, in my first year I have had the pleasure of being introduced to many experts from different research areas within CID, which has greatly broadened my perspectives.

Plans 2020/2021

I plan to assess the 10th wave of new RADAR-data in order to better understand whether socioeconomic status is intergenerationally transmitted through adolescent psychosocial competencies.

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Heiko Schmengler
PhD candidate, UU
WP1, Vollebergh

Socio-Economic Health Disparities (SEHD) in adolescence: social causation and social selection

1 October 2018 – 1 October 2022

Brief description

The goal of my project is to explore the mechanisms that contribute to the development and maintenance of socioeconomic health inequalities in adolescence and young adulthood. To do so, I run longitudinal models on the TRAILS dataset, investigating how health-related characteristics influence adolescents' educational trajectories (i.e. developing SES), and vice versa.

Highlight 2019/2020

1. Presenting my work at the European Public Health Congress 2019 in Marseille
2. Submitting the first paper of my PhD on educational differences in adolescents' alcohol use
3. Collaborating with fellow CID researchers on the special issue

Plans 2020/2021

1. Presenting our research on alcohol and education at the 16th World Congress on Public Health and at the CAS Research Days
2. Finishing our second paper on educational inequalities in externalizing problems in TRAILS
3. Developing skills/ideas for the longitudinal modelling of non-normal data for the investigation of health inequalities in youths

Gijs Holleman
PhD candidate, UU
WP1, Kemner

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Gaze behaviour during parent-child interaction

May 2017– May 2021

Brief description

The goal of my project is to better understand how gaze behaviour supports social interaction between parents and children, and how gaze in interaction is related to social competence and behavioural control. I use a state-of-the-art dual eye-tracking setup and I am currently collecting data within the YOUth *Child & Adolescent* cohort.

Highlight 2019/2020

1: Me and my colleagues published several articles, among which one commentary article in the journal *Perspectives on Psychological Science*.

2: I have finished the data collection for the parent-child dual eye-tracking study and I am now writing up the article. There are some interesting results here!

Plans 2020/2021

My goal for this year is to get the most out of the parent-child eye-tracking data which hopefully result in several interesting papers. Furthermore, I aim to complete my PhD thesis this academic year.

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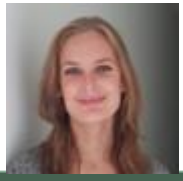
Elizabeth Buimer
PhD candidate, UMCU
WP1, Hulshoff Pol



Life events and MRI brain measures

June 2018 – May 2022

Brief description

The aim of my PhD project is to investigate the relation between (resilience to) negative life experiences and structural and functional brain development in YOUth: Child & Adolescent.

Highlight 2019/2020

First, our paper on the test-retest reliability of the YOUth MRI protocol was published in CID's special issue in DCN. Second, I performed quality control for different YOUth data domains (MRI, IQ, Penn and COVID-19 data) and started data processing of MRI and life events data. Last, I made a vlog for adolescents about my research ("Slimme Gasten") and translated our preliminary COVID-19 data to an infographic for the public.

Plans 2020/2021

After resubmitting a paper on de-identification methods for MRI, I will continue working on my first study with YOUth data on childhood life events and structural brain measures. Furthermore, I plan to write a paper on the effects of the COVID-19 pandemic on the wellbeing of teenagers with and without a history of childhood adversity.

Bram Gooskens
PhD candidate, UMCU
WP1, Durston

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How do environmental factors impact the development of cognitive control and its neural circuitry?

June 2018– June 2021

Brief description

Within the YOUth 'Kind & Tiener' cohort, my aim is to determine whether, and which, environmental factors affect self-regulation abilities. We performed an exploratory factor analysis, to find interpretable and informative factors underlying environmental influences on self-regulation. Secondly, we investigated if different environmental factors have distinct effects on brain activation underlying self-regulation.

Highlight 2019/2020

My personal highlight was giving a Flash– and poster talk at the FLUX congress last September, where I briefly outlined the main results of our project.

Plans 2020/2021

In the coming months I will prepare my first CID manuscript, which will hopefully be submitted this year. I will then continue with my second project, in which we will add DTI data to our first project, to investigate possible relations between functional and structural MRI.

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Anika van der Klis
PhD candidate, UU
WP1, Kager

Emotion recognition and linguistic development

May 2019 – May 2023

Brief description

This project investigates the influence of different parental styles on infants' emotion recognition and linguistic development. Parental styles will be analysed regarding coordinated use of voice, face, gaze, and gestures – containing overlapping cues for emotion and referentiality. This project also examines the relationship between emotion recognition and linguistic development.

Highlight 2019/2020

I started working on my first project with the YOUth dataset. I am examining different types of caregiver responses (e.g. labelling an object, showing an object, smiling) to infants' gestures and their individual effects on vocabulary development. I also started exploring to what extent automatic speech recognition systems can correctly transcribe speech used by adults when addressing infants.

Plans 2020/2021

I plan to finish the first project. Then, I would like to continue exploring the overlapping effects of parental referential and affective body language on infants' language and emotion recognition skills. I also aim to improve the automatic recognition of infant-directed speech.

Bauke van der Velde
PhD candidate, UU
WP1, Kemner

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The development of infant brain networks

1 December 2015 – 31 October 2020

Brief description

The aim of this project is to better understand how networks in the infant brain develop during the first year of life. We will focus on the optimization of brain network communication and whether individual differences in the development of communication optimization explain or will be explained by behavioural development.

Highlight 2019/2020

Our paper on data quality was published in the CID special issue in developmental cognitive neuroscience. Stressing the importance of better understanding which factors influence data quality in infant EEG research. Additionally, exciting results were found in our YOUth infant data set, underlining the importance of the theta network in the development of social behaviour.

Plans 2020/2021

1) Submission paper on theta network and social behaviour
2) Submission paper development networks in infant brain
3) Finishing PhD and start of Postdoctoral research on the relationship between social behaviour and brain networks

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Zsofia Belteki
PhD candidate, UU
WP1, Kemner

How language and social development interact and affect social interaction across development: Comparing typical and atypical trajectories

April 2019 – March 2023

Brief description

My research explores the relationship between attention to faces and early language development in infants by working with the Youth-Cohort and EU-AIMS datasets. The aim of the project is to extend our understanding of when and why typical and atypical developmental trajectories diverge in language and social abilities.

Highlight 2019/2020

I submitted the first version of my review paper to a special edition of 'Infant Behaviour and Development'. The review is an overview of the existing literature that links infants' attention to faces to their word learning.

Plans 2020/2021

I am now working with the EU-AIMS dataset, which assesses the social and cognitive development of infants who have a higher likelihood (HL) of receiving an autism diagnosis. I am working with the language measures within the dataset and looking at differences in the content of the vocabularies of HL infants compared to their typically developing peers.

Niilo Valtakari
PhD candidate, UU
WP1, Kemner

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Fine-grained face-scanning patterns during parent-child interaction – a dual eye tracking approach

July 2019– July 2023

Brief description

I will be using dual eye-tracking to investigate the role of gaze behaviour to faces of infants interacting with their parent or a stranger. The focus of the project is to understand the idiosyncrasy of face-scanning patterns and how they are affected by factors such as individual traits and the familiarity of the interacting partner.

Highlight 2019/2020

The highlights of 2020 for me were to visit the Babylab at Uppsala University in February and collaborate with them on some projects, and to finally finish and submit the review paper I had been working on (a review of the possibilities and limitations of using eye tracking to investigate looking behaviour during human interaction).

Plans 2020/2021

Now that testing at the university has started again, I am looking forward to finally being able to start conducting pilots with infants using my experimental setup, and to eventually move on to collecting some actual data for my project.

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Sonja de Zwarte Postdoc
(1/4/20 – 1/2/23)
Tamara Wieles PhD candidate
(1/8/18 - 1/4/19)
UMCU, WP1, Kahn

The effect of prenatal exposures on brain development in children

1 August 2018 – 1 February 2023

Brief description

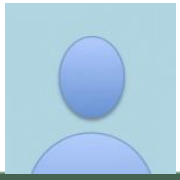
The human brain is developing throughout life, influenced by both genetic and environmental factors. However, the majority is formed very early life, namely before birth. Within the YOUth baby & child cohort we aim to investigate i) prenatal brain development using 3D-ultrasonography on a large scale by developing an automated pipeline, ii) the influence of the prenatal exposures on the developing fetal brain, and iii) the link between prenatal brain development with postnatal outcome.

Highlight 2018/2019

That I started this new postdoc position in April (even though that meant I had to start from home).

Plans 2019/2020

On a personal level, I am really looking forward to defend my thesis on October 30th, as my PhD defense was originally scheduled for mid-March and cancelled last minute due to Covid-19 restrictions. As for my project, we will continue the development of an automated pipeline for brain segmentation and I will be writing several grant proposals in collaboration with TU/e this coming fall.



Yoran Caspi
(1/9/19 – 1/1/20 and 15/8/20 - 15/2/21)
Postdoc, UMCU
WP1, Hulshoff Pol

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Environmental influences on structural and functional brain connectivity during adolescence

1 September 2019 – 1 June 2021

Brief description

Based on our studies in the first tranche of CID it was found that functional connectivity shows considerable development during puberty. The main aims of the current project are one, to assess to which extent functional and structural brain development relate and how this implicates self-control and cognitive development; and two, to which extend daily living environment influences structural and functional brain connectivity development.

Highlight 2018/2019

Developed automated processing pipeline for analysis of diffusion tensor images. Will improve processing of the YOUth DTI scans.

Plans 2019/2020

Process YOUth DTI scans. In addition, develop automated segmentation procedure to measure intracranial volume in 3D ultrasound images based on software for structural MRI images.

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Irene van Driel
Postdoc, UvA
WP1, Valkenburg

Media use, parenting, and behavioural control: An experience sampling study

15 September 2019 – 15 February 2022

Brief description

To investigate the effects of adolescents' social media use on their behavioural control and well-being, and the role of parental monitoring in shaping these effects . The project employs a person-specific approach to examine the micro-processes that take place within each adolescent, by analyzing intensive longitudinal data, collected through Experience Sampling Method (ESM) studies.

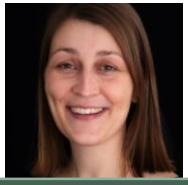
Highlight 2018/2019

We published the report 'Posten, scrollen, appen en snappen', which provides insights in today's adolescents' social media use.

We published the findings of our first ESM study in *Scientific Reports*, which show that the effect of social media on well-being differs from adolescent to adolescent.

Plans 2019/2020

We are currently analysing the ESM data that we collected, using Dynamic Structural Equation Modeling (DSEM), to understand the co-fluctuations between adolescents' social media use and behavioural control, and the role that parents' media monitoring plays.



Ine Beyens
Assistant professor, UvA
WP1, Valkenburg

Consortium on Individual Development

Media use, parenting, and behavioural control: An experience sampling study

15 September 2019 – 30 April 2023

Brief description

To investigate the effects of adolescents' social media use on their behavioural control and well-being, and the role of parental monitoring in shaping these effects . The project employs a person-specific approach to examine the micro-processes that take place within each adolescent, by analyzing intensive longitudinal data, collected through Experience Sampling Method (ESM) studies.

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Plans 2020/2021

We are currently analysing the ESM data that we collected, using Dynamic Structural Equation Modeling (DSEM), to understand the co-fluctuations between adolescents' social media use and behavioural control, and the role that parents' media monitoring plays.

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Dienke Bos
Assistant Professor, UMCU
WP1, Durston

Connected and in control II: Development of functional connectivity underlying behavioural control

October 2018 – March 2022

Brief description

Dynamic cross-network interactions between large-scale functional brain networks are thought to underlie individual differences in cognitive functioning. In this project, we investigate functional interactions during task and rest between these large-scale functional networks and how they relate to individual differences in the maturation of behavioural control.

Highlight 2019/2020

My main highlights this year were the Flux Congress symposium presentation together with Michelle Achterberg (WP2) and Bram's Flash Talk on our first results from the Rondom 9 cohort. I also did a podcast interview with the UK Association for Child and Adolescent Mental Health, and we published the WP1 self-regulation review in DCN.

Plans 2020/2021

I am finalizing my data request, and hope to start analyzing the Rondom 9 resting-state data soon. I further plan to help Coosje with some future CID plans (e.g. add-on studies), but first and foremost I hope we can start recruiting participants for the DoY Invigoration Grant project that I work on with Eva van de Weijer-Bergsma.

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WP2 Effects of interventions

Work package 2 aims to dissect the reason why not all children are equally responsive to variations in the social environment. It is based on the Leiden – CID Intervention Cohort, where large-scale experimental-longitudinal interventions of parent and peer behaviour allow for testing of which child characteristics shape the effect of (manipulated) environmental factors.

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Overview ongoing WP2 projects

7 ongoing projects (see WP4 for 2 additional collaborative projects)		
Title	Project of	Page
Neural mechanisms involved in the VIPP-SD	Laura Kolijn	24
Variations in the social environment and the neurocognitive development of social competence	Simone Dobbelaar	25
The relation between variations in social environment and structural brain development	Lina van Drunen	26
Long-term effects of a Video-feedback Intervention to Promote Positive Parenting on children's behavioural control and social competence	Jana Runze	27
Nature, nurture and neural mechanisms of social emotion regulation in childhood	Michelle Achterberg	28
Prosocial development in childhood and emerging adolescence	Mara van der Meulen	29
Multimodel brain imaging approach to test the relation between brain development, behavioural control and social competence	Lara Wierenga	30

Laura Kolijn
PhD candidate, VU
WP2, Bakermans-Kranenburg

Consortium on Individual Development

Neural mechanisms involved in the VIPP-SD

April 2016 – December 2020

Brief description

The Leiden Consortium on Individual Development (L-CID) aims to understand the influences of a parenting intervention on child development. I focus on maternal neurocognitive processes that may be involved in the effects of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) on parenting behaviour.

Highlight 2019/2020

In 2019, I focused on writing grant applications to fund a three-month collaboration with dr. Rutherford on an EEG project at Yale University in New Haven (USA). Fortunately, three applications were approved and I left for the USA in February 2020. The experience abroad was very rewarding as it expanded my (international) academic network and my experience with EEG. Furthermore, I submitted my third and fourth paper in 2020.

Plans 2020/2021

Currently, I am finishing my dissertation and plan to have the defence early in 2021.

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Simone Dobbelaar
PhD candidate, LU
WP2, Crone

Variations in the social environment and the neurocognitive development of social competence

1 January 2019 – 31 December 2022

Brief description

In my PhD project, I study the relationship between variations in the social environment (induced by a parenting intervention) and the neurocognitive development of social competence in middle childhood and early adolescence. To investigate this, I use and help collecting the longitudinal data of the L-CID twin study.

Highlight 2019/2020

This summer, I submitted my first paper on the co-occurrence of prosocial behaviour and self-protective aggression. Also, we finished the MRI data collection of the 5th visit of the early childhood cohort (N=360) and continued with the MRI data collection of the middle childhood cohort (N=400). Another highlight: since April this year, I have the opportunity to continue my PhD at two inspiring universities: Leiden University and Erasmus University Rotterdam!

Plans 2020/2021

In the upcoming year, we aim to finish the MRI data collection of the middle childhood cohort. Furthermore, I will start working on (the preregistration of) my second paper which includes a replication study on neural correlates of aggression following social feedback.

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Lina van Drunen
PhD candidate, LU
WP2, Crone

Consortium on Individual Development

The relation between variations in social environment and structural brain development

1 August 2019– 30 April 2023

Brief description

Lina studies individual differences in environmental and genetic effects on structural brain development. Since there are pubertal changes, she wants to find out how these variations are sensitive to puberty and sex. Furthermore, she aims to unravel individual differences in sensitive periods of brain development. To do so, she will work on a large twin sample aged 7-13 years old, including three longitudinal measures.

Highlight 2019/2020

I was able to finish my first paper regarding the heritability of self-concept, which I plan to submit soon. I will present these results in a flash talk at the Flux Congress 2020. Furthermore, we started the fifth wave of data collection of the L-CID middle childhood cohort. Before the COVID-shutdowns, we collected data of 100 children. Recently, we resumed testing the remaining 300 children.

Plans 2020/2021

For the remainder of 2020 I will be working on the pre-registration of my second paper in which I will investigate the sensitive window of musical training as a model of brain plasticity

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Consortium on Individual Development

Jana Runze
PhD candidate, VU
WP2, Bakermans-Kranenburg

Long-term effects of a video-feedback intervention to promote positive parenting on children's behavioural control and social competence
1 August 2019– 30 April 2023

Brief description

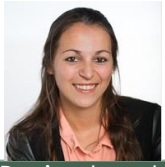
I work as a PhD candidate at the VU on the Samen Uniek Twin study. I investigate long-term effects of parenting support and the role of differential susceptibility. Within this context, I am especially interested in focusing on the combination of behavioural and biological aspects, above all the role of cortisol in children.

Highlight 2019/2020

After having started the data collection of the early childhood cohort, covid happened. We successfully adapted our home visits to digital visits. After re-programming, re-organizing and testing our digital alternative, we already collected data from more than 20 families via video-calls. I was also able to present my first (preliminary) results of my sleep and cortisol paper at the ISPNE.

Plans 2020/2021

In the remainder of 2020, I will focus on coordinating the data collection and processing data. Further, I hope to finish my first paper on sleep and cortisol and start with the second paper in the beginning of 2021.



Michelle Achterberg
Postdoc, LU
WP2, Crone

Consortium on Individual Development

Brain development from childhood to emerging adolescence: Individual differences in maturation of neural mechanisms underlying behavioural control

1 January 2020 – 31 December 2022

Brief description

The goal of this postdoc project is to provide a better understanding of why some individuals are more sensitive to social evaluation than others. The project will examine this question from a neurocognitive development perspective and will track development using longitudinal analyses.

Highlight 2019/2020

I had several personal highlights these year, including my cum laude promotion in March! In April, I started my Postdoc at Erasmus University Rotterdam as part of the new Society, Youth and Neuroscience Connected (SYNC) lab. During the COVID-19 lockdown, we collected an additional wave of questionnaire data to investigate the effects of the pandemic on child development within our twin sample.

Plans 2020/2021

I am currently working on a resting state study to look at different facts of behavioural control, which I will present at (virtual) flux 2020. Moreover, I am analysing the COVID-19 data, which I am planning to present at SRCD 2021.

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Mara van der Meulen
Postdoc, LU
WP2, Crone

Neural development of prosocial behaviour from middle childhood to early adolescence

1 January 2020 – 31 December 2021

Brief description

As a postdoctoral researcher at L-CID (CID WP2) I will focus on investigating the neural en behavioural development of prosocial behaviour from middle childhood into early adolescence (ages 7-13). I will do so by combining functional and structural neuroimaging with behavioural measures across three time points of the L-CID middle childhood cohort.

Highlight 2019/2020

My personal highlights of 2019 were the defence of my dissertation on December 10th, and the start of the fifth wave of data collection of the L-CID middle childhood cohort, which I coordinated. Our motivated team of researchers and assistants managed to collect data in 25% of the participants before the COVID-shutdowns, but they have recently resumed testing the remaining participants.

Plans 2020/2021

For the remainder of 2020 I will be absent on maternity leave. Upon my return in January 2021 I plan to start working on (pre-registration) of longitudinal analyses to better understand longitudinal trajectories of prosocial behaviour.

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Lara Wierenga
Assistant professor, LU
WP2, Crone

Consortium on Individual Development

Multimodel brain imaging approach to test the relation between brain development, behavioural control and social competence
January 2019 – April 2023

Brief description

The Leiden – Consortium on individual development studies why not all children are equally responsive to variations in the environment. To do so we annually follow **990 twins** aged between 3 and 13 years for 6 years. As an assistant professor on this project I am involved in planning and supervising the data collection. Furthermore, I am developing an open science frame work. My research interests are to gain a better understanding of sensitive periods in brain development in relation to sex differences and male biased disorders.

Highlight 2019/2020

This year we started data collection of the last and second last waves (out of 6 in total). Yet, we had a break during the COVID-19 measures, when about 25% of the participants were assessed. We decided to move on with the home visits in a digital fashion, which took a lot of reprogramming of tasks and planning. I am proud that we managed to do so with the efforts and flexibility of the team. We have also started up MRI data collection, where all COVID-19 measures are taken into account.

Plans 2020/2021

Within the next year we have collected three waves of MRI sessions. We will work on data quality assessment and data processing, and have planned a number of developmental projects that focus on sex differences in brain development to understand male biased vulnerability to developmental disorders. With this longitudinal dataset we are able to not only understand ***where*** in the brain but also ***when*** individuals are most susceptible to vulnerability factors.

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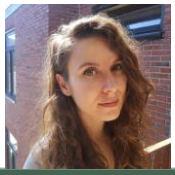
WP3 The role of generational transmission in families

Work package 3 focuses on the continuity of thriving (or failure to thrive) across three generations, and uses information available in large existing Dutch cohorts. The aim is to determine which factors are involved in transmission of behaviour between grandparents, parents, and children.

Overview ongoing WP3 projects

12 ongoing projects		
Title	Project of	Page
Social withdrawal and social relationships in adolescence and early adulthood	Stefania Barzeva	34
The impact of the home environment on academic skills and educational achievement	Sofieke Kevenaar	35
The genetic and environmental influences on academic skills and behavioural control	Zenab Tamimy	36
Intergenerational transmission of psychopathology and relationships	Susanne Schulz	37
On the development and intergenerational transmission of social competence across adolescence and young adulthood	Andrik Becht	38
Postdoc on the ERC funded Consequences of Adolescent Peer Experiences (CAPE) project of Tina Kretschmer	Charlotte Vrijen	39
Social influences on mental health, control, and social competence from adolescence to young adulthood and parenthood	Jennifer Klop - Richards	40
Intergenerational transmission of parenting processes	Sanne Geeraerts	41
Intergenerational transmission of psychopathology risk: what is the role of social competence and friendship?	Nikita Setiamen Elize Verhoeff	42
The impact of parental genes on offspring health: nurture via nature	Hekmat Alrouh	43
Consequences of adolescent peer experiences across social contexts and generations	Maria Wiertsema	44
The development of self-regulation across time, generations, and cultures: A biopsychological approach	Yugyun Kim	45



Stefania Barzeva
PhD candidate, UMCG
WP3, Oldehinkel

Consortium on Individual Development

Social withdrawal and social relationships in adolescence and early adulthood

September 2017 – September 2021

Brief description

My PhD research focuses on social withdrawal and social relationships in adolescence and early adulthood. I'm particularly interested in exploring this topic longitudinally and bi-directionally.

Highlight 2019/2020

This year, I completed a study that investigated the effects of friendship network characteristics on the discontinuity of social withdrawal during late adolescence. I presented it at the EARA 2020 digital conference, where I also received an EARA conference award for young scholars! During the summer, I supervised two medical students' theses which examined educational outcomes and health care utilization of withdrawn and shy youth.

Plans 2020/2021

I am currently conducting a study on the romantic relationships of withdrawn adolescents, including their partners' perceptions. Since I am entering my final PhD year, I will soon be on the look out for postdoc positions or other interesting research opportunities.

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Consortium on Individual Development

Sofieke Kevenaar
PhD candidate, VU (NTR)
WP3, Boomsma

The impact of the home environment on academic skills and educational achievement

September 2018 – September 2022

Brief description

In my PhD project, the aim is to study the intergenerational transmission of academic skills, educational achievement and factors that play a role in school success, like self-control and grit. I aim to disentangle the contribution of genetic and cultural transmission to study individual differences in children regarding the skills above.

Highlight 2019/2020

This year, I submitted a paper together with Zenab Tamimy about multilevel twin modelling with geographic region as a third level variable. I also submitted a collaborative CID paper, in which we applied Bayesian research syntheses in case of partial hypotheses regarding informant differences in self-control scores. I am currently still working on a project about individual differences in self-control and grit across socioeconomic backgrounds.

Plans 2020/2021

In the upcoming academic year, I plan to finish the project I'm currently working on and to start a new project. Furthermore, I will continue data collection for the NTR.

Zenab Tamimy
PhD candidate, VU
WP3, Boomsma

Consortium on Individual Development

The genetic and environmental influences on academic skills and behavioural control

May 2019 – April 2023

Brief description

My PhD project focusses on (the methods to unravel) genetic and environmental influences on educational achievement and behavioural control. I plan to investigate the intergenerational transmission of educational achievement and behavioural control, the direction of causation between behavioural control and educational achievement, and methods that can be used to answer these questions.

Highlight 2019/2020

In February I preregistered my first study on the shared etiology of self-control and educational achievement in 7 year old twins. For this preregistration I performed an extensive power study which I presented at the workshop for statistical genetics in Boulder, CO. In addition, I submitted my first methodological paper in July. In this paper we investigated and illustrated the use of multilevel twin studies when data is nested in a third level variable (e.g. region in NL).

Plans 2020/2021

I aim to submit my paper on the shared etiology of SC & EA in November. And continue with my initial first paper on the intergenerational transmission of BC & EA using a Children of Twins and molecular genetics design.

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Consortium on Individual Development

Susanne Schulz
PhD candidate, UU
WP3, Meeus/Branje

Intergenerational transmission of psychopathology and relationships

November 2017 – November 2021

Brief description

Using a longitudinal approach, this project (1) investigates the reciprocal associations between parental and adolescent psychopathology and relationships across adolescence, and (2) examines the mechanisms underlying these associations, such as the mediating role of emotional states or parenting and the moderating role of polygenic risk scores.

Highlight 2019/2020

I have been working on the third study of my PhD project and started the fourth study, which I hope to preregister soon. Furthermore, I organized a pre-conference workshop on Advanced Structural Equation Modelling for the digital EARA 2020 conference.

Plans 2020/2021

Currently, I am finishing my third study and am working on a new project in which I will investigate whether the interplay between mother and adolescent daily affect predicts adolescent psychopathological symptoms. As part of the core team for the CID meta-data project CD^2, I will also work on harmonizing cohort data.

Andrik Becht
Postdoc, UU/LU
WP3, Branje

Consortium on Individual Development

On the development and intergenerational transmission of social competence across adolescence and young adulthood
1 January 2019 – 30 September 2021

Brief description

This project focuses on the quality of and commitment to relationships across various contexts (i.e., family, peers, intimate partners) to capture a multi-informant perspective on the development of social competence.

Highlight 2019/2020

- Since April 2020, I've moved with Prof. Eveline Crone to work at her SYNC-lab at the EUR. This means I am now working 50/50 at Utrecht University and Erasmus University Rotterdam.
- In February 2020 I was awarded the Society for Research on Adolescence (SRA) Hershel B. Thornburg Dissertation Award 2020: https://www.biennialmeeting.s-r-a.org/award-winners.

Plans 2020/2021

- Finish a paper on the role of identity and intimacy as a predictor of depressive symptoms in adolescence and young adulthood.
- Write a paper on the mediational role of the social brain in the longitudinal association between attachment and identity development. This will paper will use multiple longitudinal datasets, including RADAR data and longitudinal brain data from Leiden University & Erasmus University.

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Consortium on Individual Development

Charlotte Vrijen
Postdoc, RUG
WP3, Kretschmer

Postdoc on the CAPE project
1 August 2018 – 1 February 2023

Brief description

In the ERC-CAPE project (PI: Tina Kretschmer) we investigate the **C**onsequences of **A**dolescent **P**eer **E**xperiences across social contexts and generations. This project is closely affiliated with TRAILS NEXT (PI: Catharina Hartman). My main focus within the project is on genetic mechanisms in the intergenerational transmission of social development.

Highlight 2019/2020

My highlights include (1) organising the buccal cell collection of TRAILS NEXT; (2) writing a systematic review and meta-analysis on prospective associations between bullying perpetration and substance use; (3) designing a pilot study on optimism, reward-responsiveness, and mental and social functioning in children aged 6-7, which, unfortunately, had to be postponed due to corona. The study protocol is available as a preprint.

Plans 2020/2021

In the coming year I will work with genetic data from multiple generations and submit a VENI proposal.

Jennifer Klop - Richards
Postdoc, UMCG
WP3, Oldehinkel

Consortium on Individual Development

Social influences on mental health, control, and social competence from adolescence to young adulthood and parenthood
1 October 2018 – 15 February 2022

Brief description

This project is a continuation of the tranch-1 project "Examining the complex interplay between relationship experiences and individual factors to understand adolescent development". The focus lies on elucidating how social experiences shape development, and, in particular, how influences of such experiences reach into the next generation.

Highlight 2019/2020

A very interesting research visit to the department of Psychobiology of the Universidad Federal de São Paulo in Brazil. Here, I presented my work on TRAILS, TRAILS Next and gave a lecture on the role of parents in resilience development. This led to many interesting discussions and plans to study resilience development from an intercultural perspective.

Plans 2020/2021

Right now I am busy finalizing different papers, as I will be going on maternity leave From October to January. After this, I look forward to picking up work again (hopefully with more visits to the office!).

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Consortium on Individual Development

Sanne Geeraerts
Postdoc, UU
WP3, Branje

Intergenerational transmission of parenting processes

1 September 2019– 28 February 2022

Brief description

I examine intergenerational transmission of parenting practices using the RADAR study. RADAR is a longitudinal multimethod multi-informant study that includes three generations.

Highlight 2019/2020

In March, I defended my PhD thesis entitled: In control, early precursors and development of self-regulation. We published articles on precursors and the development of self-regulation, as well as an article on problems related to self-regulation. I am a co-author on two articles in the DCN special issue, on self-regulation and intergenerational transmission.

We administered an extra wave in RADAR to assess corona related issues.

Plans 2020/2021

I am currently writing a meta-analysis, and I am working on the RADAR data to examine intergenerational transmission of parenting.

Elize Verhoeff (1/10/19 - 1/9/20)
Nikita Setiamen (15/6/19 – 30-11-19 and 1/9/20 - 30/4/23)
Postdocs, Erasmus MC
WP3, Hillegers

Consortium on Individual Development

Intergenerational transmission of psychopathology risk: what is the role of social competence and friendships?

15 June 2019 – 30 April 2023

Brief description

This project will focus on the intergenerational transmission of psychopathology across three generations, with the youngest generation being assessed in adolescence – the peak period for onset of psychiatric disorders. We are interested in how social competence potentially mediates or moderates the intergenerational transmission of psychopathology. This project aims to map risk across multiple generations and obtaining a better understanding of risk and resilience factors.

Highlight 2019/2020

Elize: This year I finished my PhD thesis, which I will defend in September 2020.

Nikita : My paper got published in European Psychiatry and I started a new job as post-doctoral researcher/project-coordinator with Generation R.

Plans 2020/2021

In September 2020 we will start with our new data collection wave in Generation R. We will invite the now 17-year-old participants to participate in a psychiatric interview (KSADS).

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Consortium on Individual Development

Hekmat Alrouh
Junior researcher, VU
WP3, Boomsma

The impact of parental genes on offspring health: nurture via nature
1 February 2020 – 31 January 2022

Brief description

My research project aims to study the genetic nurturing effects of educational attainment of parents on lifestyle related health outcomes in children, mainly smoking and BMI. I plan to further investigate whether those effects extend further to the grandparents generation.

Highlight 2018/2019

In February 2020 I started my CID project at the Vrije Universiteit. As a first step of the project I learned how to use structural equation modeling to map the interactions on the phenotypic level between educational attainment and BMI in parents and offspring using a sample from the Dutch Twin Register. I plan to follow a similar approach for smoking behaviour.

Plans 2019/2020

In the upcoming year I plan to use two polygenic scores for educational attainment for each parent – one for transmitted alleles and one for non-transmitted alleles – to study the contribution of parental genes to the offspring environment, and their effect on the target health outcomes.

Maria Wiertsema
PhD candidate, RUG
WP3, Kretschmer

Consortium on Individual Development

Consequences of adolescent peer experiences across social contexts and generations

1 September 2019 – 31 January 2023

Brief description

My research is part of the ERC-funded project "Ghosts from the past: **C**onsequences of **A**dolescent **P**eer **E**xperiences across social contexts and generations" (CAPE; PI: Tina Kretschmer). Within this project, my main interest is to know whether the social experiences of parents shape the social experiences of their offspring. CAPE is closely affiliated with TRAILS NEXT (PI: Catharina Hartman).

Highlight 2018/2019

My highlights include working on my first paper: investigating the intergenerational transmission of bullying perpetration. In addition, I have become experienced in conducting the Berkeley Puppet Interview, an interactive interview technique with hand puppets to obtain self-reports from young children concerning their social relations, mental functioning, home life, and school life.

Plans 2019/2020

In the coming weeks I will start my home visits to collect data for TRAILS NEXT. Next to this, I aim to finish my second paper in the upcoming academic year.

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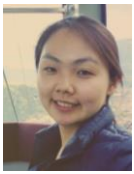
Yugyun Kim
PhD candidate, UMCG
WP3, Oldehinkel



The development of self-regulation across time, generations, and cultures: A biopsychosocial approach

9 September 2019 – 9 September 2022

Brief description

My PhD project focuses on the development of self-regulation from childhood to young adulthood. My interest lies in investigating longitudinal, intergenerational, and cross-cultural aspects of self-regulation development.

Highlight 2018/2019

I started my PhD in September 2019 under the supervision of Jennifer Klop – Richards and Tineke Oldehinkel. I presented the research plan at the 8th International Meeting of the FWO Research Community in Leuven where I received fruitful suggestions for my PhD research. A paper based on my master's thesis, which is about the role of mental health problems in the intergenerational transmission of young parenthood, is under review in Social Science Research.

Plans 2019/2020

Currently, I am working on a study investigating the longitudinal reciprocal associations between self-control, family functioning, and mental health problems in adolescents by disentangling the within- and between-person effects.

WP4 Animal and mathematical models of development

Work package 4 complements the studies in work packages 1-3 with advanced mathematical modelling and animal research. Both behavioural rodent and avian models of social and adaptive behaviour are used, with the additional possibility of detailed analyses focusing on development of involved brain structures. Mathematical models allow better description of longitudinal effects and ensure better data quality.

Consortium on Individual Development

Overview ongoing WP4 projects
(including 2 WP2 collaborations)

8 ongoing projects (including 1 WP2 collaborations)		
Title	Project of	Page
Impact of early-life adversity in rodents on networks: pathways, neurotransmitters, cognitive domains	Valeria Bonapersona	48
Concerning Causes: Evaluation of methods to study causes and their effects in developmental processes	Jeroen Mulder	49
Twitter evolution: Comparative linguistics of birdsong and child language acquisition	Carien Mol	50
Critical factors of early life influences on impulsivity and social competence	Katerina Kalamari	51
A neurogenetic analysis of birdsong learning as a model for infant development	Chiel Vellema	52
Longitudinal multi-cohort research synthesis	Mariëlle Zondervan	53
A neurogenetic analysis of birdsong learning as a model for infant development	Gabriël Beckers	54
WP2 collaboration: Influence of early life environment on later life social behaviour in animal models	Rixt van der Veen	55

Valeria Bonapersona
PhD candidate, UMCU
WP4, Joëls & Hoijtink

Consortium on Individual Development

Impact of early-life adversity in rodents on networks: pathways, neurotransmitters, cognitive domains

1 September 2017 – 31 August 2021

Brief description

The aim of my PhD is to provide a global overview on the effects that early life adversity has on the brain. After >40 years of research in animals from molecules to behaviour, which findings are consistent and which aren't? I thrive to provide a new life to old animals' data, to better inform our "human" knowledge.

Highlight 2019/2020

- I still love working on my PhD – despite a broken femur and a global pandemic.
- I have been focusing on improving my science communication skills. These have so far been applied to create interactive visualization of scientific data (web apps)
- We published 2 papers (including one for the CID special issue), presented my work at one conference and one symposium, and won two travel grants for two conferences that were cancelled due to corona.

Plans 2020/2021

Finalizing a project on methodologies to analyse active cells in see-through mice brains, finalizing the development of a database containing data of humans who performed an acute stress test in a laboratory setting, analysing a massing meta-analysis of >300 papers.

Finding out what type of postdoc I would like to work on.

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Consortium on Individual Development

Jeroen Mulder
PhD candidate, UU
WP4, Hamaker

Concerning Causes: Evaluation of methods to study causes and their effects in developmental processes

1 May 2019 – 30 April 2023

Brief description

This project is concerned with the development and evaluation of statistical models to study developmental processes. How and when can different designs and models, like mediation and instrumental variable models, be used to allow for causal inferences? This issue merits serious consideration since there is a fundamental interest in causality in all work packages of the CID.

Highlight 2019/2020

- My first paper was published: Mulder, J. D., & Hamaker, E.L. (2020). *Three Extensions of the Random-Intercept Cross-Lagged Panel Model*. Structural Equation Modeling: A Multidisciplinary Journal. doi:10.1080/10705511.2020.1784738
- A collaborative CID-paper with Hamaker and Van IJzendoorn is under review.
- Perhaps more of a "lowlight", but an idea that Hamaker and I have been working on turned out to be practically useless.

Plans 2020/2021

I hope to finish 2 subprojects: (1) a paper about the practicality of the Common and Unique Trait State model, (2) a conceptual / theoretical paper about the role of time within causal inference.

Carien Mol
PhD candidate, UU
WP4, Bolhuis/Kager

Consortium on Individual Development

Twitter Evolution: Comparative linguistics of birdsong and child language acquisition

October 2015 – July 2023

Brief description

Previous research has shown parallels between human speech and birdsong. The aim of this project is to investigate the role of specific acoustic features in birdsong memory and recognition and compare this to human speech acquisition. A secondary aim is to develop methods to improve behavioural analysis of birds during experiments.

Highlight 2019/2020

My focus last year was to improve my knowledge of statistics and especially linear (mixed) models. And apply these techniques to analyze behavioural data (collected from song playback experiments with zebra finches) using Python (library: statsmodels) and R.

Plans 2020/2021

Before the end of this year, we hope to finish and submit the research article, in which we investigate the role of syllable order for song recognition in zebra finches. After that, I can start my new project, in which we will develop methods to use computer vision to study bird behaviour.

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Katerina Kalamari
PhD candidate, UMCU
WP4, Joëls

Environment and development of pro-social behaviour

1 January 2019 – 15 October 2020

Brief description

My project focuses on the way varying environmental conditions during adolescence affect the pro-social behaviour during adulthood. To study this question I am working with animal models. Animal models allow a more controlled environment that will hopefully help us gain a better understanding of the mechanisms that affect the development of pro-social behaviour.

Highlight 2019/2020

The publication of our first paper on this project in the special issue of the Developmental Cognitive Neuroscience journal.

Plans 2020/2021

To complete the second set of experiments we started on pro-social behaviour and finalize (and hopefully publish) two more papers on the subject.

Chiel Vellema
Postdoc, UU
WP4, Bolhuis

Consortium on Individual Development

A neurogenetic analysis of birdsong learning as a model for infant development

September 2019 – August 2021

Brief description

Birdsong is a complex vocal behaviour learned by imitation through a process that parallels infant speech learning. Statistical learning plays an important role during vocal learning. With this project I will identify the neural processes that enable the detection of statistical cues in vocal sequences in a songbird model and translate the findings to human language acquisition.

Highlight 2019/2020

Completed the setup to perform electrophysiological recordings in birds and conducted the first *in vivo* pilot measurements.
Developed the artificial language stimuli used in this study.
Created a data analysis pipeline in Python to analyse and compare the human and songbird brain measurements.

Plans 2020/2021

Electrophysiological brain recordings in zebra finches during playback of artificial language. EEG recordings in young adults using the same language cues used in the songbird study.

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Consortium on Individual Development

Mariëlle Zondervan
Postdoc, UU
WP4, Hoijtink

Longitudinal multi-cohort research synthesis

April 2019 – May 2021

Brief description

The aim of this project is to combine longitudinal CID cohort data on behavioural control and social competence. We will transform and impute the data, and apply Bayesian updating of informative hypotheses. A simulation study will be conducted to find the optimal longitudinal model for the data and research question at hand.

Highlight 2019/2020

One of my highlights was my new collaboration with L-CID (WP2)! We have been working on a multivariate random-intercept cross-lagged panel model with multiple measures of prosocial skills and problem behaviours. Furthermore, I enjoyed to present in the NICHE lab, and I'm very proud of my first longitudinal Bayesian research project published in our DCN special issue!

Plans 2020/2021

I will finish the RI-CLPM project and delve deeper into the possibilities of Bayesian research synthesis. I will be open to new challenges to find robust answers to important questions about child development!

Gabriël Beckers
Assistant Professor, UU
WP4, Bolhuis

Consortium on Individual Development

Mechanisms of vocal sequence learning in a songbird

Augustus 2018 – April 2023

Brief description

Language development shows strong individual differences, with disorders at one end of the range, affecting social competence. One factor that is linked to specific language impairment (SLI) is 'statistical learning', which enables infants to learn how the sounds of their language are structured into larger units such as words. I study this process mechanistically in the song bird model system.

Highlight 2019/2020

Continued work on computational model for word segmentation, in collaboration with colleagues in the Linguistics Department. Starting word segmentation neural recordings in zebra finches, in collaboration with René Kager and Michiel Vellema. Exploring comparative EEG recording in humans. Continued work on machine vision for later behavioural study (BirdWatcher).

Plans 2020/2021

Continue neural recordings during Saffran-like word segmentation (i.e. /padiba/kudori/lotafe/) learning in zebra finches and comparing those to EEG recordings in humans. Pilot machine vision.

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Rixt van der Veen
Assistant Professor, UL
WP2/4, CID PI

Influence of early life environment on later life social behaviour in animal models

October 2013 – October 2021

Brief description

In this project we bridge WP2 (human) and WP4 (animal models) by studying early life influences on the development of the social brain in rodents. In rats, we model a complex environment during adolescence and study later life (pro) social behaviour. In mice, heterozygous for either MR or DRD4 receptor, we test differential susceptibility to a challenging or enriched postnatal environment.

Highlight 2019/2020

A lot of our research saw the light in very nice journals. Jelle Knop published his work on differential susceptibility with the heterozygous dopamine receptor 4 mice in Genes, Brain and Behaviour. Moreover, we contributed to the CID special issue In DCN with 2 papers; an overview paper of our rodent contribution to the CID consortium and work of Jiska Kentrop and Katarina Kalamari on pro-social behaviour in an operant 2- two-choice task developed in our lab. Very proud!

Plans 2020/2021

We are continuing to work with an adapted pro-social task that measures the motivation to liberate a partner. The first results are now put to paper and in the coming experiments we will be implementing the complex housing conditions in different life periods.

WP1 The role of brain development

Work package 1, rooted in the Utrecht YOUth cohort, focuses on longitudinal changes in brain structure and the way these changes relate to genetic and environmental factors, and how this brain development in turn mediates behavioural development.

Consortium on Individual Development

Overview finished WP1 projects

11 finished projects		
Title	Project lead	Page
3D-ultrasonograpy of foetal brain development	Marieke Albers	58
Imaging genetics of brain development in healthy adolescent twins	Jalmar Teeuw	60
The effects of social stimulation/interaction on perceptual and social development	Roy Hessels	62
Developmental trajectory of the human connectome in health and disease	Fraukje Coopmans Guusje Collin Nikita Setiamen	64
Behavioural control and reward sensitivity as predictors of adolescents' substance use	Margot Peeters	66
Connected and in control: What puts the development of neural networks underlying behavioural control at risk?	Dienke Bos	68
The power of stories: exploring the effects of (self) narrative on the development of social competence and behavioural control	Hannah de Mulder	70
Understanding children's and adolescent's differential use of and susceptibility to media entertainment	Karin Fikkers	72
Development of infant self-regulation within the early caregiver relationship: A cascade model	Sanne Geeraerts	74
The relationship between media use and ADHD-symptoms: A differential susceptibility perspective	Ine Beyens	76
The development of parenting and parent-adolescent relationships during adolescence	Stefanos Mastrotheodoros	78

Marieke Albers
PhD candidate, UMCU
WP1, Kahn

Consortium on Individual Development

3D-ultrasonograpy of fetal brain development

January 2015 – January 2019

Project summary

Aim: (1) to assess the reliability of the measurement of the volume of several foetal brain structures in 3D ultrasound images and (2) to assess the influence of prenatal environmental factors (such as maternal smoking) on foetal brain development.

Methods: For this project we used ultrasound and questionnaire data from the first 2 YOUth-study visits (around 20 weeks and around 30 weeks of pregnancy). The volume of several brain structures was measured in the ultrasound images with the VOCAL (Virtual Organ Computer-aided AnaLysis) technique.

Main findings: First, Marieke tested the reproducibility of a tool to measure the volume of foetal brain structures in 3D-ultrasound images. Once it was clear that the tool reliably measured intracranial, cerebellar and frontal lobe volume, she examined the impact of maternal caffeine consumption on the volume and growth of these foetal brain structures. She also published growth curves for the prenatal growth of frontal lobe volume.

Project output on the next page

Consortium on Individual Development

Marieke Albers
PhD candidate, UMCU
WP1, Kahn

3D-ultrasonograpy of fetal brain development

January 2015 – January 2019

Publications

Albers, M. (2019) Do maternal habits echo into Youth? Using 3D-ultrasound to show the intermediating role of the fetal brain. Persistent identifier URN:NBN:NL:UI:10-1874-380428
Marieke's PhD defence on 16 June 2019.

Albers M.E.W.A., Buisman E.T.I.A., Kahn R.S., Franx A., Onland-Moret N.C. & de Heus R. (2018) Intra-and interobserver agreement for fetal cerebral measurements in 3D-ultrasonography. Human Brain Mapping. 39(8):3277-3284. doi: 10.1002/hbm.24076.

Other output

Marieke's work on the YOUth cohort and first publication were featured on the YOUth website:
YOUth tijdens de zwangerschap, 22 December 2016
Eerste YOUth-publicatie is een feit, 3 July 2018

Jalmar Teeuw
PhD candidate, UMCU
WP1, Hulshoff Pol

Consortium on Individual Development

Imaging genetics of brain development in healthy adolescent twins

July 2015 – July 2019

Project summary

Aim: To disentangle the (epi)genetic and environmental influences on brain development in healthy adolescent twins and their siblings.

Methods: We used MRI scans, cognitive test batteries and genetic material from monozygotic and dizygotic twins and their older sibling at the ages of 9, 12, and 17 years old, acquired as part of the longitudinal BrainSCALE study.

Main findings Three main findings: 1. We established that thinning of the cerebral cortex is influenced by additive genetics, with indications of distinct gene pools influences cortical thickness at different ages throughout childhood and adolescence. 2. We identified "stable" components of functional connectivity throughout adolescence for connections within and between canonical cortical resting-state networks that are influenced by genetic and common environment. 3. We have found no indication that accelerated aging of the brain in schizophrenia patients is associated with accelerated aging predicted by DNA methylation in blood.

Project output on the next page

Jalmar Teeuw
PhD candidate, UMCU
WP1, Hulshoff Pol

Imaging genetics of brain development in healthy adolescent twins

July 2015 – July 2019

Publications

Currently finishing up his dissertation. Published two CID articles (see https://individualdevelopment.nl/research/publications/):

1. Teeuw J., et al (2019) Genetic and environmental influences on functional connectivity within and between canonical cortical resting-state networks throughout adolescent development in boys and girls. Neuroimage. doi: 10.1016/j.neuroimage.2019.116073

2. Teeuw J., Brouwer R.M., Koenis M., Swagerman S., Boomsma D.I., Hulshoff Pol H.E. (2018) Genetic influences on the development of cerebral cortical thickness during adolescence in a Dutch longitudinal twin sample: the BrainScale study. Cerebral Cortex, 2018 Jan 25. doi: 10.1093/cercor/bhy005

Other output

Project findings were presented at several international conferences, including OHBM 2017 and OHBM 2019.

Jalmar also spent three months at Prof. Roel Ophoff's lab at UCLA to contribute to the ENIGMA-Plasticity project.

Roy Hessels
PhD, UU
WP1, Kemner

Consortium on Individual Development

The effects of social stimulation/interaction on perceptual and social development

1 January 2014- 1 January 2017

Project summary

Aim: This project investigated the effects of social interaction (a critical aspect of social competence) on perceptual and social development.

Methods: First, by investigating face-scanning behaviour of individuals diagnosed with autism, we can model face scanning during abnormal development. If abnormal looking behaviour evokes reactive abnormal looking behaviour in controls, this can shed light on the role of social interaction in abnormal development. Second, the development of infant face scanning will be investigated in an interactive eyetracking setup.

Main findings He explored two possible early markers of Autism Spectrum Disorder (ASD) using eye-tracking technology: visual search superiority and gaze behaviour during face perception.

Project output on the next page

Consortium on Individual Development

Roy Hessels
PhD, UU
WP1, Kemner

The effects of social stimulation/interaction on perceptual and social development

1 January 2014- 1 January 2017

Publications

Dissertation: Hessels, R.S. (2017) Toward early markers for Autism Spectrum Disorder using eye tracking. Persistent identifier URN:NBN:NL:UI:10-1874-350883

Roy was awarded his PhD with distinction on 7 July 2017.

Articles: Besides the eight articles in his dissertation, Roy published two other papers as part of his CID PhD project:

Niehorster, D. C., Cornelissen, T. H. W., Holmqvist, K., Hooge, I. T. C., & Hessels, R. S. (2017). What to expect from your remote eye tracker hen participants are unrestrained. Behaviour Research Methods. 396

Cousijn, J., Hessels, R. S., Van der Stigchel, S., & Kemner, C. (2017). Evaluation of the psychometric properties of the gap-overlap task in 10-month-old infants. Infancy.

Other output

Roy's dissertation attracted the attention of Dutch newspaper Algemeen Dagblad and tv-programme EditieNL

Fraukje Coopmans
Guusje Collin
Nikita Setiamen
UMCU, WP1, Kahn

Consortium on Individual Development

Developmental trajectory of the human connectome in health and disease

Project summary

Aim: The aim of this project is twofold:

(1) map the developmental changes to the brain's wiring architecture during adolescence

(2) examine whether, and if so how, deviating connectome development forms a vulnerability for the development of psychiatric symptoms later in life.

Methods: Compare the brain connectome in offspring of bipolar disorder (BDo) and schizophrenia SZo) patients to offspring of community (Co) control subjects.

Sample: 28 SZo, 60 BDo and 39 Co, average age 13 yo.

Main findings:

1. Lower structural connectivity among brain hubs in SZ-offspring

➢ Connectome signature of familial risk for schizophrenia

2. Rich club deficits impact functional connectome organization

3. No rich club deficits in BD-offspring

➢ Differential effect of familial predisposition for SZ vs BD on developmental formation of the connectome

FINISHED PROJECT

Fraukje Coopmans
Guusje Collin
Nikita Setiamen
UMCU, WP1, Kahn

Developmental trajectory of the human connectome in health and disease

Publications

Collin G, Kahn RS, de Reus MA, Cahn W, van den Heuvel MP. (2014) Impaired rich club connectivity in unaffected siblings of schizophrenia patients. Schizophrenia Bulletin, 40(2):438-48. doi:10.1093/schbul/sbt162

Collin G, Scholtens LH, Kahn RS, Hillegers MHJ, van den Heuvel MP (2016). Schizophrenia in the Era of Brain Complexity. Journal Nervous Mental Disease, 204(8):561-3. doi: 10.1097/NMD.0000000000000545.

Collin G, Scholtens LH, Kahn RS, Hillegers MHJ, van den Heuvel MP. (2017) Affected Anatomical Rich Club and Structural-Functional Coupling in Young Offspring of Schizophrenia and Bipolar Disorder Patients. Biol Psychiatry, 15;82(10):746-755. doi:10.1016/j.biopsych.2017.06.013.

Other output

Several conference presentations by Guusje Collin, including co-organizer and presenter at 2017 American Academy for Child and Adolescent Psychiatry (AACAP) and 2017 International Conference on Schizophrenia Research.

Margot Peeters
Postdoc, UU
WP1, Vollebergh

Consortium on Individual Development

Behavioural control and reward sensitivity as predictors of adolescents' substance use

January 2015 – April 2017

Project summary

Aim: Neurocognitive studies indicate different motivational and cognitive processes underlie risk-taking among adolescents, in particular a heightened sensitivity for reward and impaired behavioural control. This project focused on the way these two processes interact with each other in impacting developmental trajectories of risk behaviour in adolescence.

Methods: Both a variable-centered and person-centered approach were used on data from the TRAILS cohort (total sample N = 2223; and data from a high risk focus cohort used in this study N = 715).

Main findings: Self-reported behavioural control at age 11 predicts initiation of alcohol use at age 16. Both effortful control and cognitive control at age 11 predict the initiation of cannabis use at age 16. For smoking no such effects were found. In addition, interaction analyses suggest that lower levels of control in early adolescence combined with higher sensitivity for reward in mid adolescence predict alcohol and cannabis use.

FINISHED PROJECT

Margot Peeters
Postdoc, UU
WP1, Vollebergh

Behavioural control and reward sensitivity as predictors of adolescents' substance use

January 2015 – April 2017

Publications

Peeters, M., Oldehinkel, A.J., & Vollebergh, W.A.M. (2017). behavioural control and reward sensitivity in adolescents' risk taking behaviour: A longitudinal TRAILS study. Front Psychol, 8, 231. Doi: 10.3389/fpsyg.2017.00231

Peeters, M., Zondervan-Zwijnenburg, M., Vink, G., & Van de Schoot, R. (2015). How to handle missing data: A comparison of different approaches. European Journal of Developmental Psychology, 12 (4), 377-394.

Zondervan-Zwijnenburg, M.A.J., Peeters, M., Depaoli, S., & Van de Schoot, R. (2017). Where do priors come from? Applying guidelines to construct informative priors in small sample research. Research in Human Development, 14:4, 305:320, doi: 10.1080/15427609.2017.1370966

Zondervan-Zwijnenburg, M.A.J., Depaoli, S., Peeters, M., & Van de Schoot, R. (2019). Pushing the Limits: The performance of ML and Bayesian estimation with small and unbalanced samples in a latent growth model. Methodology, 15, 31:43, doi: 10.1027/1614-2241/a000162

Other output

Several conference presentations, including at the Research Society on Alcoholism (RSA), 2016, New Orleans and Lisbon Addictions 2015, Lisbon, Portugal.

Dienke Bos
Postdoc, UMCU
WP1, Durston

Consortium on Individual Development

Connected and in control: What puts the development of neural networks underlying behavioural control at risk?

March 2015 – September 2018

Project summary

Aim: The aim of this project is to investigate the neurobiological processes underlying (a)typical development of behavioural control networks in a large cohort of children.

Methods: Participants will be profiled on a broad, multimodal array of characteristics, including several MRI-based measures, neurocognition and psychophysiology. This project will consist of two phases. In the first phase, a pilot study using existing data will be conducted as a proof of concept before phase 2, where we will conduct a multimodal study of the development of behavioural control.

Main findings: Using a novel paradigm, I showed that healthy adults had a slight attentional bias towards images that reflected their interests, together with activation in salience neural circuitry, implicating salience as an important factor in behavioural control[1]. In children with autism, I used an adapted version of the task on an iPad to show that reduced behavioural control to personalized affective cues was related to increased behavioural rigidity[2]. Finally, extant literature shows that in typical development adolescence is characterized by heightened sensitivity to motivating (e.g. social or emotional) cues. In a large sample of typically developing children, adolescents and adults, I showed that young adulthood (around 18-23 years of age) is characterized by protracted sensitivity to negative emotional stimuli[3]. In addition, my most recent work suggests that adolescents with autism do not show an increase in sensitivity to social and non-social cues, suggesting marked differences in the adolescent period in autism versus typical development[4]. The pilot projects investigating structural and functional connectivity in typical and atypical development are currently being analyzed and prepared for publication (2 publications).

FINISHED PROJECT

Consortium on Individual Development

Dienke Bos
Postdoc, UMCU
WP1, Durston

Connected and in control: What puts the development of neural networks underlying behavioural control at risk?

March 2015 – September 2018

Publications

1. **D.J. Bos**, E.L. Ajodan, M.R. Silverman, J.P. Dyke, S. Durston, J.D. Power, R.M. Jones, Neural Correlates of preferred activities: development of in interest-specific go-nogo task. *Social Cognitive and Affective Neuroscience,* 2017, 12 (12), 1890-1901
2. **D.J. Bos**, M.R. Silverman, E.L. Ajodan, C. Martin, B.M. Silver, G. Brouwer, A. Di Martino, R.M. Jones, Rigidity coincides with reduced cognitive control to affective cues in children with autism, *Journal of Abnormal Psychology*, 2019, 128 (5), 431
3. **D.J. Bos** & M. Dreyfuss, N. Tottenham, T.A. Hare, A. Galvan, B.J. Casey, R.M. Jones, Vulnerabilities in emotional processing extend into young adulthood. *PsyArXiv*, 2019 (revised version submitted)
4. **D.J. Bos**, B.M. Silver, E. Barnes, E.L. Ajodan, M.R. Silverman, E. Clark-Whitney, T. Tarpey, R.M. Jones. Adolescent-specific motivation deficits in autism versus typical development. *PsyArXiv*, 2019 (revised version submitted)

Other output

2019 Poster presentation at Flux Congress 2019, New York, USA - **D.J. Bos**, D. Dobos, B. Oranje, S. Durston. *Behavioural inflexibility and inattention in Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorders: more similarities than differences*.

2019 **D.J. Bos** & S. Durston. Book chapter, Hersenscans bij ADHD en autisme, *Brein in de Groei,* Stichting Biowetenschappen en Maatschappij

2018 Poster presentation at Eunethydis Conference 2018, Edinburgh, United Kingdom - **D.J. Bos**, E.L. Ajodan, C. Martin, B. Silver, A. Di Martino, R.M. Jones. *Cognitive control to affective cues across neurodevelopmental disorders*,

Hannah de Mulder
Postdoc, UU
WP1, van Berkum

Consortium on Individual Development

The power of stories: exploring the effects of (self) narrative on the development of social competence and behavioural control

1 January 2014– 1 May 2017

Project summary

Aim: The project consists of two subprojects:

1: From book smart to street smart: does exposure to fictional narrative enhance social competence?

2: What to say when you talk to yourself: the role of verbal reappraisal in behavioural control

Methods: Dedicated questionnaires and experimental tasks assess the various relevant constructs (e.g. exposure to various types of fiction, perspective-taking competence, moral profile, social competence, behavioural control, emotion regulation).

Main findings In subproject 1 we a) created fiction exposure questionnaire for YOUth, b) created measures for fiction exposure (Author Recognition Test for 8-17 year olds), c) created Bayesian analysis plan for YOUth adolescent cohort and d) gathered data about reading and adults' social competence (to be modified for adolescents at a later stage). In subproject 2 we a) gathered data in an intervention study about reappraisal strategies on adults' ability to deal with verbal insults and with social exclusion (to be modified for use with adolescents at a later stage).

FINISHED PROJECT

Consortium on Individual Development

Hannah de Mulder
Postdoc, UU
WP1, van Berkum

The power of stories: exploring the effects of (self) narrative on the development of social competence and behavioural control

1 January 2014– 1 May 2017

Publications

Mulder H.N.M. De, Hakemulder F., Berghe M.A.J. van den & Berkum J.J.A. van (2017), Effects of exposure to literary narrative fiction: From book smart to street smart?, Scientific Study of Literature 7(1): 129-169.

Other output

Reading behaviour tasks for the YOUth cohort (see here).

Karin Fikkers
Postdoc, UvA
WP1, Valkenburg

Consortium on Individual Development

Understanding children's and adolescent's differential use of and susceptibility to media entertainment

January 2015 – January 2019

Project summary

Aim: To understand (1) individual differences in children's and adolescents' emotional, cognitive, excitative, and behavioural responses to media entertainment, and (2) the role of parents in this process.

Methods: We use survey data on youths' media (violence) exposure, temperament, and self- and parent-reported behaviour. In addition, data collected in an observational within-subjects experiment conducted in the Nemo Science Museum (August 2016) were used to inform the aim of our study.

Main findings The data collected at Nemo (August 2016) describe children's individual differences in their emotional, cognitive, and arousal responses to positive and negative media entertainment, based on both child self-report, parent-report, and physiological data. Based on the current data set of Valkenburg's ERC-funded project on individual differences in media use and effects, analyses for a manuscript on the longitudinal relationship between parental media mediation and teens' entertainment use are currently underway. The results of these manuscripts will inform questions that can be answered using data of the YOUth cohort.

Consortium on Individual Development

Karin Fikkers
Postdoc, UvA
WP1, Valkenburg

Understanding children's and adolescent's differential use of and susceptibility to media entertainment

January 2015 – January 2019

Publications

Fikkers, K.M., Piotrowski, J. T., & Valkenburg, P. M. (2017). A Matter of Style? Exploring the Effects of Parental Mediation Styles on Early Adolescents' Media Violence Exposure and Aggression. Computers in Human behaviour, 70, 407-415. doi:10.1016/j.chb.2017.01.029.

Fikkers, K.M., Piotrowski, J.T., & Valkenburg, P.M. (2017). Assessing the reliability and validity of television and game violence exposure measure. Communication Research, 44, 117-143. doi:10.1177/0093650215573863

Fikkers, K.M., & Piotrowski, J.T. (2019). Content and person effects in media research: Studying differences in cognitive, emotional, and arousal responses to media content. Media psychology, doi:10.1080/15213269.2019.1608257

Fikkers, K.M., Piotrowski. J.T., & Valkenburg, P.M. (2019). Child's play? Assessing the Bidirectional longitudinal relationship between gaming and intelligence in early childhood. Journal of Communication, 69(2), 124-143. doi:10.1093/joc/jqz003

Other output

Several conference presentations. Also, organizer of and speaker at preconference "Moving beyond self-report: Measuring arousal, emotional, and cognitive responses to media through physiological measures". January 2017 Etmaal van de Communicatiewetenschap, Tilburg, The Netherlands.

Sanne Geeraerts
PhD candidate, UU
WP1, Deković

Consortium on Individual Development

Development of infant self-regulation within the early caregiver relationship: A cascade model

October 2014 – September 2019

Project summary

Aim: (1) examine the mean-level development and early markers of self-regulation; (2) identify family factors that might play a role in the development of self-regulation, including parental characteristics, parenting practices, and features that define the broader rearing context; and (3) examine problems related to self-regulation that manifest in the preschool years.

Methods: We relied on four multi-method longitudinal datasets spanning the first years of life. Measurements included observations (micro and macro coded), questionnaires, eye-tracking, daily diaries, and lab tasks.

Main findings Together, the results demonstrate that both child (visual attention and negative reactivity), parent (sensitivity, non-intrusiveness and reactive negative parenting), and family factors (household chaos) contribute to the early development of self-regulation. These factors can already be assessed in infancy and toddlerhood, which comes with relevant implications for prevention strategies aimed at promoting healthy self-regulation development.

FINISHED PROJECT

Consortium on Individual Development

Sanne Geeraerts
PhD candidate, UU
WP1, Deković

Development of infant self-regulation within the early caregiver relationship: A cascade model

October 2014 – September 2019

Publications

Five articles are part of Sanne's dissertation (2 published, 2 revised and resubmitted, 1 submitted):

Geeraerts, S. B., Hessels, R. S., Van der Stigchel, S., Huijding, J., Endendijk, J. J., Van den Boomen, C., ... & Deković, M. (2019). Individual differences in visual attention and self-regulation: A multimethod longitudinal study from infancy to toddlerhood. Journal of Experimental Child Psychology, 180, 104-112.

Geeraerts, S. B., Deutz, M. H. F., Deković, M., Bunte, T., Schoemaker, K., Espy, K. A.,... & Matthys, W. (2015). The child behaviour checklist dysregulation profile in preschool children: a broad dysregulation syndrome. Journal of the American Academy of Child & Adolescent Psychiatry, 54, 595-602.

Sanne also published two other articles:

Deutz, M. H., Geeraerts, S. B., van Baar, A. L., Deković, M., & Prinzie, P. (2016). The Dysregulation Profile in middle childhood and adolescence across reporters: factor structure, measurement invariance, and links with self-harm and suicidal ideation. European Child & Adolescent Psychiatry, 25, 431-442

Deutz, M. H., Geeraerts, S. B., Belsky, J., Deković, M., van Baar, A. L., Prinzie, P., & Patalay, P. (2019). General Psychopathology and Dysregulation Profile in a Longitudinal Community Sample: Stability, Antecedents and Outcomes. Child Psychiatry & Human Development, 1-13.

Other output

Gave a family lecture on coping strategies

Ine Beyens
Postdoc, UvA
WP1, Valkenburg

Consortium on Individual Development

The relationship between media use and ADHD-symptoms: A differential susceptibility perspective

15 November 2015 – 15 September 2019

Project summary

Aim: The aim of the project is to investigate (1) how and why certain types of screen media entertainment may influence children's ADHD-related behaviours (attention problems, hyperactivity, impulsivity) and (2) which children are particularly susceptible to the effects of media entertainment on ADHD-related behaviours.

Methods: F.

Main findings Our review of the association between screen media use and ADHD was published in *PNAS*. Our study of transactional relationships between children's violent media use and ADHD-related behaviours was published in *Communication Research*. Our recent work on parental media monitoring was published in *Human Communication Research* and *Journal of Broadcasting & Electronic Media.*

FINISHED PROJECT

Consortium on Individual Development

Ine Beyens
Postdoc, UvA
WP1, Valkenburg

The relationship between media use and ADHD-symptoms: A differential susceptibility perspective

15 November 2015 – 15 September 2019

Publications

Beyens, I., Piotrowski, J., & Valkenburg, P.M. (2020). Which came first? Assessing transactional relationships between children's violent media use and ADHD-related behaviours. *Communication Research, 47*, 1228-1245. doi:10.1177/0093650218782300

Beyens, I., & Valkenburg, P.M. (2019). Parental media mediation in adolescence: A comparative study of parent and adolescent reports. *Journal of Broadcasting and Electronic Media, 63*, 716 736. doi:10.1080/08838151.2019.1680071

Beyens, I., Valkenburg, P.M. & Piotrowski, J. (2019). Developmental trajectories of parental mediation across early and middle childhood. *Human Communication Research, 45*, 226-250. doi:10.1093/hcr/hqy016

Beyens, I., Valkenburg, P.M., & Piotrowski, J. (2018). Screen media use and ADHD-related behaviours: Four decades of research. *Proceedings of the National Academy of Sciences (PNAS), 115*, 9875-9881. oi:10.1073/pnas.1611611114

Other output

Beyens, I., & Valkenburg, P.M. (2019). *Parental monitoring of media in adolescence: A parent-child study*. ICA, May 24-28, Washington, USA.

Beyens, I., Piotrowski, J., & Valkenburg, P.M. (2017). *Which came first? Assessing transactional relationships between children's violent media use and ADHD-related behaviours.* ICA, May 25-29, San Diego, USA.

Stefanos Mastrotheodoros
PhD, UU
WP1/3, Branje

Consortium on Individual Development

The development of parenting and parent-adolescent relationships during adolescence

December 2015 - December 2019

Project summary

Aim: 1. To investigate how parenting and parent-adolescent relationships develop throughout adolescence; 2. To investigate how parent-adolescent discrepancies develop across adolescence; 3. To investigate how the dynamics of the marital relationship might affect the mother-adolescent and the father-adolescent dyad.

Method: We used multi-informant, annual, and daily diary longitudinal data of adolescents aged 13-18, and their parents.

Main findings:

1. Regarding the behavioural aspects of parenting (parental support, parental behavioural control), both parents and adolescents perceive changes in a similar way, even though they start at different points during early adolescence. However, regarding the emotional aspects of the parent-adolescent relationship (conflict intensity), parents and adolescents perceive development in markedly different ways.

2. The strong and negative associations between marital conflict and parenting or parent-adolescent relationship quality are mainly located at the between-family level, indicating that marital conflict is most probably not causally linked to parenting and parent-adolescent relationship. Other factors, possibly indicators of individual differences (e.g., social skills, personality, genetic makeup, or a combination thereof), might be responsible for the strong between-family correlations.

FINISHED PROJECT

Consortium on Individual Development

Stefanos Mastrotheodoros
PhD, UU
WP1/3, Branje

The development of parenting and parent-adolescent relationships during adolescence

December 2015 - December 2019

Publications

Dissertation: Mastrotheodoros, S. (2020) Development and Transformation: Parenting, Parent-Adolescent Relationships, and Family Dynamics Across Adolescence. Persistent identifier URN:NBN:NL:UI:10-1874-397058

1. **Mastrotheodoros, S.,** Van Lissa, C.J., Van der Graaff, J., Deković, M., Meeus, W.H.J., & Branje, S.J.T. (2020). Day-to-Day Spillover and Long-term Transmission of Interparental Conflict to Mother-Adolescent Conflict: The Role of Mood. Journal of Family Psychology. DOI: 10.1037/fam0000649
2. **Mastrotheodoros, S.,** Van der Graaff, J., Deković, M., Meeus, W.H.J., & Branje, S.J.T. (2019). Parent-Adolescent Conflict Across Adolescence: Trajectories of Informant Discrepancies and Associations with Personality Types. Journal of Youth and Adolescence. DOI: 10.1007/s10964-019-01054-7
3. **Mastrotheodoros, S.,** Van der Graaff, J., Deković, M., Meeus, W.H.J., & Branje, S.J.T. (2019). Interparental Conflict Management Strategies and Parent–Adolescent Relationships: Disentangling Between-Person from Within-Person Effects Across Adolescence. Journal of Marriage and Family, 81(1). pp. 185-203. DOI: 10.1111/jomf.12528
4. **Mastrotheodoros, S.,** Van der Graaff, J., Deković, M., Meeus, W.H.J., & Branje, S.J.T. (2019). Coming closer in adolescence: Convergence in mother, father, and adolescent reports of parenting. Journal of Research on Adolescence, 29(4). pp. 846-862. DOI: 10.1111/jora.12417
5. **Mastrotheodoros, S.,** Papp, L., Van der Graaff, J., Deković, M., Meeus, W.H.J., & Branje, S.J.T. (revise and resubmit). Explaining Heterogeneity of Daily Conflict Spillover in the Family: The Role of Marital Conflict Configurations. Family Process.

Other output

1. Received the 2020 Paul van Geert Best Article Award from the VNOP, for the article published in the *Journal of Family Psychology* in 2020; DOI:10.1037/fam0000649
2. Co-organized a preconference workshop on advanced SEM in R and Mplus for the 17th Biennial conference of EARA (September 2020).
3. Co- organized a 1-day symposium on "Family Dynamics and Psychopathology of Parents and Children: Implications for Prevention and Intervention"

WP2 Effects of interventions

Work package 2 aims to dissect the reason why not all children are equally responsive to variations in the social environment. It is based on the Leiden – CID Intervention Cohort, where large-scale experimental-longitudinal interventions of parent and peer behaviour allow for testing of which child characteristics shape the effect of (manipulated) environmental factors.

Overview finished WP2 projects

9 finished projects		
Title	Project lead	Page
Neural correlates of social rejection and aggression in young children	Ilse van Wijk	82
The way to success: Identifying factors related to individual differences in behavioural control and prosocial behaviour	Claudia Vrijhof	84
Hormonal correlates of social and behavioural development in childhood	Elisabeth Bilo	86
Parenting and prosocial development in childhood	Rani Damsteegt	87
Integrating behavioural genetics across cohorts in longitudinal perspective	Jizzo Bosdriesz	88
Integrating neural intervention effects in a longitudinal twin study with a sequential cohort design	Bianca van den Bulk	90
Nature, nurture and neural mechanisms of social emotion regulation in childhood	Michelle Achterberg	92
Prosocial development in childhood and emerging adolescence	Mara van der Meulen	94
Intervention effects of video feedback on social competence and behavioural control in early childhood and early adolescence: The role of children's daily experiences	Saskia Euser	96

Ilse van Wijk
PhD, LU
WP2, Bakermans

Consortium on Individual Development

Neural correlates of social rejection and aggression in young children

1 February 2014- 1 May 2018

Project summary

Aim: Within the L-CID study (a randomized controlled trial with longitudinal brain imaging), I focused on brain activity differences in frontal asymmetry and the relation with social behaviour (i.e. social rejection and aggression, temperamental factors like fear and effortful control and prosocial behaviour).

Methods: Frontal asymmetry was measured during a resting state EEG. Ilse also examined two new tasks to measure social behaviour in reaction to social exclusion and social judgments: Prosocial Owl Game (POG) and Social Network Aggression Task for Early Childhood (SNAT-EC). In the POG, two cartoon owls exclude a third owl, and the participant can compensate for this exclusion by giving the excluded owl the next turn. In the SNAT-EC participants react to peer feedback by pressing a button that destroys the peer's balloons. Balloon bursts (duration of button press) were used as a behavioural index of aggression.

Main findings Ilse validated the two new tasks for use in the L-CID early childhood cohort. Using the POG, she showed that children compensate for social exclusion.

FINISHED PROJECT

Ilse van Wijk
PhD, LU
WP2, Bakermans

Neural correlates of social rejection and aggression in young children

1 February 2014- 1 May 2018

Publications

Dissertation: Wijk, I. van (2019) Social behaviour in young twins. Are fearfulness, prosocial and aggressive behaviour related to frontal asymmetry? Handle: http://hdl.handle.net/1887/73910
Ilse successfully defended her dissertation on 12 June 2019.

Articles: Besides the articles in her dissertation, co-author:
Euser, S. et al (2016). Efficacy of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline in Twin Families (VIPP-Twins): Study protocol for a randomized controlled trial. BMC Psychology, 4:33.

Other output

Several (inter)national conference presentations:

Social judgments, frontal asymmetry and aggressive responses in young children: A replication study using EEG. Oral presentation 2016 VNOP/ISED. Poster 2016 Donders Discussion, 2017 SRCD, 2017 ECDP.

The social network aggression task – Early Childhood: a new task to measure aggression in response to social judgments in young children. Poster 2017 SRCD

Claudia Vrijhof
PhD, LU
WP2, van IJzendoorn

Consortium on Individual Development

The way to success: Identifying factors related to individual differences in behavioural control and prosocial behaviour

1 November 2013 – 1 April 2018

Project summary

Aim: To explore the relations between child characteristics and children's social, physical and economic environment on the one hand and children's behavioural control (preschool period) and prosocial behaviour (early to mid-adolescence) on the other hand.

Methods: Different aspects of behavioural control were assessed, including the ability to internalize and follow rules, even when tempted (cheating game), inhibitory control (stop-signal task), and delay of gratification (marshmallow test). We also used parental reports of children's behavioural control (Child Behaviour Questionnaire). Prosocial behaviour was assessed with the Prosocial Cyberball Game.

Main findings Individual differences in effortful control were associated with the social environment, whereas differences in cheating behaviour were related to the physical environment. There is also evidence for social environment influencing children's delay of gratification and response inhibition. Finally adolescents' prosocial behaviour, child characteristics, and factors were related to the social environment of the child.

FINISHED PROJECT

Claudia Vrijhof
PhD, LU
WP2, van IJzendoorn

The way to success: Identifying factors related to individual differences in behavioural control and prosocial behaviour

1 November 2013 – 1 April 2018

Publications

Dissertation: Vrijhof C.I. (2018) The way to success: Identifying factors related to individual differences in behavioural control and prosocial behaviour. Handle: http://hdl.handle.net/1887/61151

Claudia successfully defended her dissertation on 28 February 2018.

Articles: Besides the articles in her dissertation, co-author:

Euser, S. et al (2016). Efficacy of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline in Twin Families (VIPP-Twins): Study protocol for a randomized controlled trial. BMC Psychology, 4:33.

Van Wijk, I.C. et al (2019). Behavioural genetics of temperament and frontal asymmetry in early childhood. Journal of Experimental Child Psychology, 179,348 -361

Other output

Several (inter)national conference presentations, including:

The relation between a stressful family environment and children's behavioural control: A multimethod test and replication study with twins. Presentation 2016 VNOP-ISED-CAS.

The Prosocial Cyberball Game: Compensating behaviour in typically and atypically developing children after observing social exclusion. Poster 2017 SRCD

Parenting effects on children's hot and cool behavioural control: the role of sensitivity and sensitive discipline. Poster 2017 ECDP.

Elisabeth Bilo
PhD candidate, LU
WP2, van IJzendoorn

Consortium on Individual Development

Hormonal correlates of social and behavioural development in childhood

1 April 2015 – 31 December 2019

Project summary

Aim: To explore the hormonal correlates of social competence and behavioural control of twins in childhood, with special emphasis on diurnal cortisol.

Methods: We collected various measures for behavioural and hormonal development. To assess cortisol development, saliva and hair samples will be used.

Progress Elisabeth Bilo transferred to another research project at the institute of Education and Child Studies of UL.

Publications

Van der Meulen, M., Steinbeis, N., Achterberg, M., Bilo, E., Van den Bulk, B.G., Van IJzendoorn, M.H., & Crone, E.A. (2017). The neural correlates of dealing with social exclusion in childhood. Neuropsychologia, 103, 27-39.

Other output

Contributed to data collection of the L-CID study. Specifically, processing and analysing salivary cortisol data from the first pre-test home visit.

FINISHED PROJECT

Consortium on Individual Development

Rani Damsteegt
PhD candidate, LU
WP2, Bakermans

Parenting and prosocial development in childhood

1 May 2013 – 1 August 2016

Project summary

Aim: To examine the effects of an intervention focused on positive parenting and sensitive discipline on prosocial behaviour (a hallmark of social competence) of preschoolers.

Methods: In 3 or 4-year-old twins, prosocial behaviour was measured annually with the Owl task (non-costly prosocial behaviour), the Donating task (costly prosocial behaviour) and Strengths and Difficulties questionnaire.

Progress Rani Damsteegt left the L-CID project to pursue her career as a teacher in higher vocational education.

Publications

Damsteegt, R.C. et al (2014). Tympanic membrane temperature in adopted children associated with sleep problems and pre-adoption living arrangements: an exploratory study. BMC Psychology. doi:10.1186/s40359-014-0051-2.

Euser, S., et al (2016). Efficacy of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline in Twin Families (VIPP-Twins): Study protocol for a randomized controlled trial. BMC Psychology,

Other output

Owl task: Measuring prosocial behaviour in early childhood.

Presentation March 2015 CID meeting

Jizzo Bosdriesz
Postdoc, VU
WP2, Bakermans

Consortium on Individual Development

Integrating behavioural genetics across cohorts in longitudinal perspective

1 March 2018 – 1 June 2019

Project summary

Aim: To investigate the behavioural genetic aspects of child behavioural control and social competence across age and cohorts, and determine the relative influence of genetic and environmental factors.

Methods: Structural equation modelling to assess to what extent individual differences in behavioural control and social competence can be explained by genetic (A), shared environmental (C), or unique environmental (E) factors. Outcomes are derived from MRI, EEG, observational, and questionnaire data taken from two partially overlapping cohorts of same-sex monozygotic and dizygotic twins, starting at age 3-4, and 7-8.

Main findings Several papers are currently in progress, one published and three submitted (revised and resubmitted). The topics of these papers are in order: the associations between fear, effortful control, and frontal asymmetry; hot and cool behavioural control; heritability of sleep quality and sleep variability; heritability of parenting; and genetic and environmental influences on a broad range of neurobiological, cognitive, and social outcomes.

Consortium on Individual Development

Jizzo Bosdriesz
Postdoc, VU
WP2, Bakermans

Integrating behavioural genetics across cohorts in longitudinal perspective

1 March 2018 – 1 June 2019

Publications

Van Wijk, I.C., Huffmeijer, R., Bosdriesz, J.R., Bakermans-Kranenburg, M.J., Kolijn, L., Van IJzendoorn, M.H., Vrijhof, C.I., Van den Bulk, B.G. (2019). Behavioural genetics of temperament and frontal asymmetry in early childhood. Journal of Experimental Child Psychology, 179:348-361. Doi:10.1016/j.jecp.2018.11.015

Other output

Jizzo supported analyses for several papers. He also provided statistical support and consultation for other L-CID researchers. Moreover, he supervised bachelor and master thesis students.

He presented his findings with an oral presentation at the 49th BGA annual meeting of the Behaviour Genetics Association, Stockholm, Sweden, 26-29 June 2019. Genetic and environmental influences on neurobiological, cognitive, and social outcomes in pre-school and school-age twins.

Bianca van den Bulk
Postdoc, LU
WP2, Crone

Consortium on Individual Development

Integrating neural intervention effects in a longitudinal twin study with a sequential cohort design

21 August 2014 – 1 January 2019

Project summary

Aim: To investigate the effect of the intervention on neurobiological measurements like EEG/ERP in both parents and children and the relation to the development of social competence and behavioural control in early childhood.

Methods: Parent-child observation, behavioural data in social competence and behavioural control in children and several neurophysiological measures like rest EEG and ERP's.

Main findings Data collection for wave five (early childhood cohort) and wave four (middle childhood cohort) will be finished by November 2019. In both cohort about 200 families are still participating. Several papers are recently accepted (1), under revision (3) or in preparation (3). The topics of these papers are: intervention effects on parental EEG activation, prosocial behaviour in early childhood, hot and cool behavioural control in children, heritability of parental sensitivity and intervention effects on parental sensitivity. PhD supervision: Ilse van Wijk (PhD defence June 12 2019) and Laura Kolijn (expected end date summer 2020)/

Progress Since January 2019 Bianca fulfils the role of project manager within L-CID

Consortium on Individual Development

Bianca van den Bulk
Postdoc, LU
WP2, Crone

Integrating neural intervention effects in a longitudinal twin study with a sequential cohort design

21 August 2014 – 1 January 2019

Publications (2019)

Kolijn, L., Huffmeijer, R., Van Den Bulk, B.G., Vrijhof, C.I., Van IJzendoorn, M.H., & Bakermans-Kranenburg, M.J. (2019). Effects of the Video-feedback intervention to promote positive parenting and sensitive discipline on mothers' neural responses to child faces: A randomized controlled ERP study including pre- and post-intervention measures. *Social Neuroscience, 9, 1-15.*

Van Wijk, I.C., Huffmeijer, R., Bosdriesz, J.R., Bakermans-Kranenburg, M.J., Kolijn, L., Van IJzendoorn, M.H., Vrijhof, C.I., Van den Bulk, B.G. (2019). Behavioural genetics of temperament and frontal asymmetry in early childhood. Journal of Experimental Child Psychology, 179:348-361. Doi:10.1016/j.jecp.2018.11.015

Other output

Bianca supervised two PhD students (Ilse van Wijk and Laura Kolijn) and several BSc and MSc students. She also provided consultation for other L-CID researchers and coordinated the L-CID project on a daily basis.

Michelle Achterberg
PhD, LU
WP2, Crone

Consortium on Individual Development

Nature, nurture and neural mechanisms of social emotion regulation in childhood

September 2015 – December 2019

Project summary

Aim: My PhD project was part of the Leiden Consortium on Individual development and is focussed on the development of emotion and behaviour regulation in a social context.

Methods: Specifically, I studied aggression regulation following social feedback using a longitudinal twin fMRI design in children aged 7-13 years old.

Main findings The studies show that the brain is prone to signal for socially relevant information. The network of social saliency is already present in childhood, indicating that this might be a core social mechanism. Also, social rejection is often followed by behavioural aggression, and regulation of these retaliation emotions is related to control mechanisms of the dorsolateral prefrontal cortex. Moreover, the results show that the vast architecture of functional subcortical-prefrontal brain connectivity is already in place in middle childhood and suggest fine tuning of (social evaluation) brain networks across childhood. These findings highlight the need to incorporate childhood into developmental models of social emotion regulation.

FINISHED PROJECT

Consortium on Individual Development

Michelle Achterberg
PhD, LU
WP2, Crone

Nature, nurture and neural mechanisms of social emotion regulation in childhood

September 2015 – December 2019

Publications

Dissertation: Achterberg M. (2020) Like me, or else… Nature, nurture and neural mechanisms of social emotion regulation in childhood. Handle: http://hdl.handle.net/1887/86283

Michelle received her PhD Degree with distinction on 12 March 2020.

Articles: Besides the articles in her dissertation, co-author:

- Crone, E.A. et al., (2020). Neural and behavioural signatures of social evaluation and adaptation in childhood and adolescence: The Leiden consortium on individual development (L-CID). *Developmental Cognitive Neuroscience*,
- Konijn, E.A., &Achterberg, M. (2020) Neuropsychology of Emotional Responsiveness to Media. In J. van den Bulck (Ed.), The International Encyclopedia of Media Psychology. John Wiley & Sons.

For the complete list, see Michelle`s personal website

Other output

Several conference presentations, including at Flux 2015, 2016, 2018, 2019, NVP 2017, 2019, SANS 2018, SRCD 2017, 2019. Michelle has also contributed to a children's tv programme (TopDoks). Wrote several blogs and regularly gives lectures for layman audience.

FINISHED PROJECT

Mara van der Meulen
PhD, LU
WP2, Crone

Consortium on Individual Development

Prosocial development in childhood and emerging adolescence

January 2015 – December 2019

Project summary

Aim: The goal of this project is to study the neural correlates of prosocial behaviour from middle childhood into emerging adolescence.

Methods: Using a combination of functional and structural neuroimaging, in addition to behavioural genetic analyses, I aim to investigate the interplay of personal and environmental factors that influence prosocial development.

Main findings Adults and children display social competence by showing helping behaviour as a response to observed social exclusion. Neuroimaging results indicate that the neural architecture underlying social competence is already well established in middle childhood.

In terms of heritability, individual differences in prosocial tendencies and brain structure might be partly influenced by genetic factors, but neural and behavioural responses in a specific social context are largely shaped by an individual's experiences in the (social) environment.

FINISHED PROJECT

Consortium on Individual Development

Mara van der Meulen

PhD, LU
WP2, Crone

Prosocial development in childhood and emerging adolescence

January 2015 – December 2019

Publications

Dissertation: Meulen M. van der (2019) The social brain in middle childhood: a neurobiological perspective on individual differences in social competence. Handle: http://hdl.handle.net/1887/81816
Mara successfully defended her dissertation on 10 December 2019.

Articles: Besides the articles in her dissertation, co-author:

- Crone, E.A. et al., (2020). Neural and behavioural signatures of social evaluation and adaptation in childhood and adolescence: The Leiden consortium on individual development (L-CID). *Developmental Cognitive Neuroscience*, 45, 100805.
- Achterberg, M. & **van der Meulen, M.** (2019). Genetic and environmental influences on MRI scan quantity and quality. *Developmental Cognitive Neuroscience*, 38

Other output

Several conference (poster) presentations, including at Flux 2015, Flux 2016, Flux 2017, NVP 2017, SANS 2018, Flux 2018, SRCD 2019 and NVP 2019. Mara has also contributed to a children's tv programme (TopDoks) and a podcast for the LOI.

Saskia Euser
Postdoc, LU
WP2, Crone

Intervention effects of video feedback on social competence and behavioural control in early childhood and early adolescence: The role of children's daily experiences

November 2013 – January 2023

Project summary

The Leiden Consortium on Individual Development (L-CID) is an intervention study in which we aim investigate the underlying mechanisms of differential susceptibility within and between families. In this project, I will focus on the role of children's daily life experiences in the intervention effects on children's behavioural outcomes. I have worked on several papers about intervention effects and about genetic and environmental influences on parenting and children's sleep quality with L-CID e-diary, sleep and intervention data, using longitudinal analyses.

Consortium on Individual Development

Saskia Euser
Postdoc, LU
WP2, Crone

Intervention effects of video feedback on social competence and behavioural control in early childhood and early adolescence: The role of children's daily experiences
November 2013 – January 2023

Publications

Euser, S. et al (2016). Efficacy of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline in Twin Families (VIPP-Twins): Study protocol for a randomized controlled trial. BMC Psychology, 4:33.

Euser, S., Bosdriesz, J.R., Vrijhof, C.I., van den Bulk, B.G., Van Hees, D., De Vet, S.M., Van Ijzendoorn, M.H., & Bakermans-Kranenburg, M.J. (2020). How Heritable are Parental Sensitivity and Limit-Setting? A Longitudinal Child-Based Twin Study on Observed Parenting. Child Development, in press.

Other output

Several conference (poster) presentations.

WP3 The role of generational transmission in families

Work package 3 focuses on the continuity of thriving (or failure to thrive) across three generations, and uses information available in large existing Dutch cohorts. The aim is to determine which factors are involved in transmission of behaviour between grandparents, parents, and children.

Overview finished WP3 projects

10 finished projects		
Title	Project lead	Page
The epigenetics of intergenerational transmission	Alexander Neumann	100
Why some pupils thrive and others do not. The role of genes and the environment	Sabine Veldkamp	102
Why some adolescents thrive and others don't: The role of uncertainty dynamics	Andrik Becht	104
Longitudinal development and intergeneration transmission of psychopathology versus wellbeing	Eveline de Zeeuw	106
Development of internalizing symptoms in adolescence and early adulthood: Over-time links with biological, psychological, and social factors	Stefanie Nelemans	108
Examining the complex interplay between relationship experiences and individual factors to understand adolescent development	Tina Kretschmer & Jennifer Klop-Richards	110
Developmental models of psychopathology an life outcomes	Odilia Laceulle & Anoek Sluiter-Oerlemans	112
Parental characteristics and its effect on behavioural control in childhood	Eveline de Zeeuw	114
Developmental models of psychopathology and turning points in mental health trajectories	Anoek Sluiter-Oerlemans	116
Determinants and consequences of (low) cognitive control	Annelene Bloemen	118

Alexander Neumann
PhD candidate, Erasmus MC
WP3, Tiemeier

Consortium on Individual Development

The epigenetics of intergenerational transmission

August 2014 – January 2018

Project summary

Aim: Co-occurrence of mental disorders is commonly observed, but the etiology underlying this observation is poorly understood. The aim of the project was to study and distinguish general and specific (epi-)genetic risk factors to develop psychological problems, as well as related hormonal and brain profiles in school-aged children.

Methods: This project utilized data from the population based Generation R cohort, as well as multiple cohorts from the EAGLE, PACE and CORNET consortia. Children's psychopathology was measured with questionnaires, genome and methylome with genome-wide microarrays, white matter with diffusion tensor imaging and physiological stress with hair cortisol measurements.

Main findings General psychopathology was substantially SNP heritable and was associated with three specific loci. Higher global white matter co-occurred with lower general but higher specific externalizing psychopathology levels. DNA methylation at birth, but not school-age, was associated with ADHD development (9 genome—wide significant probes).

FINISHED PROJECT

Consortium on Individual Development

Alexander Neumann
PhD candidate, Erasmus MC
WP3, Tiemeier

The epigenetics of intergenerational transmission

August 2014 – January 2018

Publications

Dissertation: Neumann A. (2019) General Psychopathology in Children: Epidemiological studies of Biological Mechanisms. Persistent URL hdl.handle.net/1765/117365
Successful PhD defence on 21 June 2019.

Articles: In addition to the eight articles part of the dissertation:

- Viuff, A., …, Neumann A., … , & Relton, C. (2018). Maternal depression during pregnancy and cord blood DNA methylation: Findings from the Avon Longitudinal Study of Parents and Children. Translational Psychiatry. DOI: 10.1038/s41398-018-0286-4.
- Vojinovic D, …, Neumann A., … , & Fornage. (2018). Genome-wide association study of 23,500 individuals identifies 7 loci associated with brain ventricular volume. Nature Communications. DOI:10.1038/s41467-018-06234-w
- Cortes Hidalgo, A., Neumann, A., Bakermans-Kranenburg, M., Jaddoe, V., Rijlaarsdam, J., Verhulst, C., … & Tiemeier, H. (2018). Prenatal Maternal Stress and Child IQ. Child Development. DOI: 10.1111/cdev.13177
- Cardenas A., … Neumann A., … & Burris H.H. (2019) Prenatal maternal antidepressants, anxiety, and depression and offspring DNA methylation: epigenome-wide associations at birth and persistence into early childhood. Clinical Epigenetics. DOI: 10.1186/s13148-019-0653-x

Other output

Presentations at various conferences, such as World Congress of Psychiatric Genetics (2015), Society for Research in Child Development (2017), International Society for Research in Child and Adolescent Psychopathology (2017).

Sabine Veldkamp
PhD candidate, VU
WP3, Boomsma

Consortium on Individual Development

Why some pupils thrive and others do not. The role of genes and the environment

1 May 2015 – 30 April 2019

Project summary

Aim: Two main research questions:
1) What are the causes of individual differences in bullying/victimization? Is variation caused by genetics or the environment? And what are the influences of twin specific factors on the prevalence of bullying perpetration and bullying victimization? More specifically: Are twins - having a co-twin by their side - at higher, equal, or lower risk than non-twin children (called singletons)? Should twins share a classroom in primary school? The last question is an important question, also in the light of the policy of many schools to separate twins and not allow them to be in the same classroom
2) To what extent is a children's development influenced by parental age at birth? We focused on the influences of parental age on the children's socio-emotional and cognitive development
Methods: Cross-sectional and/or longitudinal multiple rater data and school-test scores from twin pairs and their non-twin siblings in the Netherlands Twin Register (NTR). The second part of my research project was a collaboration with all four large CID cohorts of WP3 (Gen-R, RADAR-Y, and TRAILS).
Main findings *For bullying*, there are general risk factors (i.e. being a boy) as well as general protective factors (i.e. classroom sharing for girl-girl twins). After accounting for these general factors, large individual differences remained that were mainly due to genetics. *For parental age*, offspring of older parents tend to have fewer behavioural- and neurodevelopmental problems and higher cognitive functioning. This effect was mostly due to parental socioeconomic status (SES).

FINISHED PROJECT

Consortium on Individual Development

Sabine Veldkamp
PhD candidate, VU
WP3, Boomsma

Why some pupils thrive and others do not. The role of genes and the environment

1 May 2015 – 30 April 2019

Publications

PhD dissertation '*Childhood individual development: risk and protective factors in twin and population cohorts*' defence on 18 September 2019.

Published four CID articles:

1. Veldkamp, S.A.M., Van Bergen, E., de Zeeuw, E.L., van Beijsterveldt, C.E.M., Boomsma, D.I. & Bartels, M. (2017). Bullying and victimization: The effect of close companionship. Twin Research and Human Genetics, 20 (10), 19-27.
2. Veldkamp, S.A.M.*, Zondervan-Zwijnenburg, M.A.J. *, van Bergen,, E., Barzeva, S.A. , Tamayo Martinez, N., Becht, A.I., van Beijsterveldt, C.E.M., Meeus, W., Branje, S., Hillegers, M.H.J., Oldehinkel, A.J., Hoijtink, H.J.A., Boomsma, D.I.*, & Hartman, C.* (2019). Effect of parental age on offspring's neurodevelopment. Journal Of Clinical Child And Adolescent Psychology. Under review.
   *These authors contributed equally to this work
3. Zondervan-Zwijnenburg M.A.J., Veldkamp S.A.M., Nelemans S.A., Neumann A., Barzeva S.A., Branje S.J.T., Van Beijsterveldt C.E.M., Meeus W.H.J., Tiemeijer H.W., Vollebergh W.A.M., Hoijtink H.J.A., Oldehinkel A.J., & Boomsma D.I. (2019). Parental age and offspring childhood mental health: A multi-cohort, population based investigation. Child development. doi: 10.1111/cdev.13267. * Mariëlle Zondervan and Sabine Veldkamp shared first authorship
4. Veldkamp, S. A.M, Boomsma, D. I., de Zeeuw, E. L., van Beijsterveldt, C. E., Bartels, M., Dolan, C. V., & van Bergen, E. (2019). Genetic and environmental influences on different forms of bullying perpetration, bullying victimization, and their co-occurrence. Behaviour genetics, 49(5), 432-443.

Other output

Several conference presentations including:
2019: poster presentation, Behaviour Genetics Association, Stockholm, Sweden
2017: presentation, European Conference on Developmental Psychology, Utrecht, the Netherlands
2016: poster presentation, International Statistical Genetics Workshop, Boulder, Colorado.

Media attention related to the 2019 paper on bullying, including:
Television interview on the heritability of bullying behaviour, EditieNL, RTL4
Radio interview, De Ochtendspits, BNR
'Genen hebben invloed op pestgedrag' in the Metro (national Dutch newspaper)'Pestgedrag in de genen' in the Telegraaf (national Dutch newspaper)

Andrik Becht
PhD, UU
WP3, Meeus/Branje

Consortium on Individual Development

Why some adolescents thrive and others don't: The role of uncertainty dynamics.

September 2014 - August 2018

Project summary

Aim: There is massive evidence that uncertainty is a major risk factor in adolescent development. However, information on the development of uncertainty, the transmission of uncertainty in parent-adolescent relationships and how uncertainty predicts adaptive development is lacking. Aim of this CID-project is to overcome these limitations.

Methods: An intensive longitudinal design is used including 75 between day measures across five years to tap into certainty-uncertainty dynamics across adolescence.

Main findings

Findings in this dissertation reveal that establishing a strong identity is a complex developmental task that is embedded in adolescents' daily lives. Also, results indicate that the adolescent brain is involved in the development of a strong identity over time. Finally, findings highlight that establishing a strong identity can buffer against the development of psychopathology and improves social relationships. Hence, a strong identity serves as an important psychological resource that guides adolescents in their daily lives.

FINISHED PROJECT

Consortium on Individual Development

Andrik Becht
PhD, UU
WP3, Meeus/Branje

Why some adolescents thrive and others don't: The role of uncertainty dynamics

September 2014 - August 2018

Publications

Dissertation: Becht A.I. (2019) Becoming certain of the self: Longitudinal studies into the dynamics of (daily) identity development. Persistent identifier URN:NBN:NL:UI:10-1874-378080 Cum laude PhD defence on 12 April 2019.

Articles: In addition to the eight articles part of the dissertation:

- Becht, A. I., Prinzie, P., Deković, M., van den Akker, A., & Shiner, R. L. (2016). Child Personality Facets and Overreactive Parenting as Predictors of Aggression and Rule-Breaking Trajectories from Childhood to Adolescence. Development and Psychopathology, 28, 399-413. doi:10.1017/S0954579415000577
- Hawk, S., Becht, A. I., & Branje, S. J. T. (2016). "Snooping" as a Distinct Parental Monitoring Strategy: Comparisons With Overt Solicitation and Control. Journal of Research on Adolescence, 26, 443-458. doi:10.1111/jora.12204

Other output

The result were presented at several (inter)national conferences, including SRCD 2017 (chair), ISRI 2017 (chair and presenter), ECPD 2017, SRA 2018 and FLUX 2019.

Eveline de Zeeuw
UD, VU
WP3, Boomsma

Consortium on Individual Development

Longitudinal development and intergeneration transmission of psychopathology versus wellbeing

December 2014 - November 2017

Project summary

Aim: To collect intergenerational genetically informative data, to disentangle in a multi-rater design genetic and environmental influences on psychopathology and to investigate intergenerational transmission of psychopathology.

Methods: The mechanisms were investigated using multigenerational and genetically sensitive designs. Four types of intergenerational data were collected in the Netherlands Twin Register: 1) parents of young twins who are twins themselves, 2) sisters who are mothers of twins, 3) young twins who become parents themselves and 4) adult twins with adult offspring.

Main findings 1) Differences between children in academic skills, arithmetic, reading and writing were to a large extent due to genes across all primary school grades. The influence of the home environment on individual differences in academic skills was negligible. 2) The negative association between ADHD and lower educational achievement was mainly driven by inattention and not hyperactivity. The link between ADHD and school performance could at least partly be explained by a causative relationship. 3) Heritability of autistic traits was already very high in preschoolers when taking rater bias (mothers and fathers) into account. One third of the identical twin pairs was discordant for high autistic traits possibly due to resilience. 4) Children from a higher SES background had on average a higher genetic propensity for learning and scored better on an educational achievement test (CITO). Children from lower SES families had a lower educational achievement even when taking part of the genetic differences between children into account.

FINISHED PROJECT

Consortium on Individual Development

Eveline de Zeeuw
UD, VU
WP3, Boomsma

Longitudinal development and intergeneration transmission of psychopathology versus wellbeing

December 2014 - November 2017

Publications

- de Zeeuw, EL, et al. (2019). The moderating role of SES on genetic differences in educational achievement in the Netherlands. *npj Science of Learning, 4,* 13.
- Willems, YE, et al. (2018). Genetic and environmental influences on self-control: Assessing self-control with the ASEBA self-Control scale. *Behaviour Genetics, 48 (2),* 135-146.
- van Bergen, E, et al.(2018). Why do children read more? The influence of reading ability on voluntary reading practices. *Journal of Child Psychology and Psychiatry, 59 (11),* 1205-1214.
- de Zeeuw, EL, & Boomsma, DI (2017) Country-by-genotype-by-environment interaction in childhood academic achievement. *PNAS, 114 (510),* 13318-13320.
- de Zeeuw, EL, et al. (2017). The etiology of autistic traits in preschoolers: A population-based twin study, *Journal of Child Psychology and Psychiatry, 58 (8),* 893-901.
- de Zeeuw, EL, et a. (2017). Attention Deficit Hyperactivity Disorder symptoms and low educational achievement: Evidence supporting the causal hypothesis. *Behaviour Genetics, 47 (3),* 278-289.
- de Zeeuw, EL, et al. (2016). Arithmetic, reading and writing performance has a strong genetic component: A study in primary school children. *Learning and Invididual Differences, 47,* 156-166.

Other output

- *Socioeconomic status, genes and children's educational achievement* on npj Science of Learning community channel.
- *Twin tots reveal autism traits arise mostly from genes* on Spectrum News.
- *Research shows possible link ADHD and low educational achievement* on Open Forest.

Stefanie Nelemans
Postdoc, UU
WP3, Meeus

Consortium on Individual Development

Development of anxiety symptoms in adolescence and early adulthood: over/time links with biological, psychological, and social factors

September 2014 – December 2018

Project summary

Aim: To gain insight in the development of anxiety and depressive (i.e., internalizing) symptoms from adolescence to emerging adulthood, including over-time links with individual characteristics (e.g., genetics and stress reactivity) and social relationships (e.g., parenting and the parent-adolescent relationship).

Methods: Longitudinal questionnaire data, physiological and cognitive data during a laboratory setting, and genetic data from RADAR (UU), CONAMORE (UU), and potentially TRAILS RUG/UMCG). Analysesinclude a combination of person-centered and variable-centered longitudinal modelling techniques.

Main findings From 2017 onwards, the focus was on biological correlates and predictors of adolescent depressive and anxiety (particularly Social Anxiety) symptom development from early to late adolescence, as well as interactions between biological and psychosocial factors (particularly parenting of parent-adolescent relationship quality) or a more in-depth focus on the relevance of the parental context in predicting this development. Resulting in several papers (see next page).

FINISHED PROJECT

Consortium on Individual Development

Stefanie Nelemans
Postdoc, UU
WP3, Meeus

Development of anxiety symptoms in adolescence and early adulthood: over/time links with biological, psychological, and social factors

September 2014 – December 2018

Publications

Nelemans, S. (2017). The role of stress reactivity in the long-term persistence of adolescent social anxiety symptoms. Biological Psychology, 125, 91-104.

Nelemans, S. (2017). Social anxiety scale for adolescents (SAS-A) short form: Longitudinal measurement invariance in two community samples of youth. Assessment. Advance online publication.

Nelemans, S. (2019). Transactional links between social anxiety symptoms and parenting across adolescence: Between- and within-person associations. Child development. Advance online publication. doi:10.1111/cdev.13236

Nelemans, S. (2017). Individual differences in anxiety trajectories from grades 2 to 8: Impact of the middle school transition. Development and Psychopathology.

Nelemans, S. (2016). Discrepancies between perceptions of the parent-adolescent relationship and early adolescent depressive symptoms: An illustration of polynomial regression analysis. Journal of Youth and Adolescence, 45, 2049-2063.

Nelemans, S.A. (2016). Longitudinal associations between social anxiety symptoms and cannabis use throughout adolescence: The role of peer involvement. European Child & Adolescent Psychiatry, 25, 483-492.

Nelemans, S.A. (2014). Maternal criticism and adolescent depressive and Generalized Anxiety Disorder symptoms: A 6-year longitudinal community study. Journal of Abnormal Child Psychology, 42, 755-766. doi: 10.1007/s10802-013-9817-x

Nelemans, S.A. (2014). Heterogeneity in development of adolescent anxiety disorder symptoms in an 8-year longitudinal community study. Development and Psychopathology, 26, 181-202. doi: 10.1017/S0954579413000503

Nelemans, S.A. (2014). Persistent heightened cortisol awakening response and adolescent internalizing symptoms: A 3-year longitudinal community study. Journal of Abnormal Child Psychology, 42, 767-777. doi: 10.1007/s10802-013-9820-2

Nelemans, S. A. (2018). Parenting interacts with oxytocin polymorphisms to predict adolescent social anxiety symptoms: A novel polygenic approach. Journal of Abnormal Child Psychology. Advance online publication. doi:10.1007/s10802-018-0432-8

Other output

Several conference presentations, including at SRCD 2015 and SRCD 2017. Also chaired the session '*Biological underpinnings of internalizing symptoms in childhood and adolescence*' at ECPD 2017.

Tina Kretschmer(until 1/12/15)
Jennifer Klop-Richards(since 1/12/15)
Postdocs, UMCG
WP3, Oldehinkel

Consortium on Individual Development

Examining the complex interplay between relationship experiences and individual factors to understand adolescent development

1 December 2015 – 30 September 2018

Project summary

Aim: Project component #1 asked whether experiences in parent-child relationships are associated with experiences in relationships with peers and intimate partners and project components #2 and #3 focus on the interplay between relationship experiences and individual factors in predicting positive and negative outcomes.

Methods: Data from all waves of the Tracking Adolescents' Individual Lives Survey (TRAILS) have been used, though the focus was on measures of social relationships with parents, peers, and romantic partners and measures of adjustment.

Main findings In December 2015 Jennifer succeeded Tina Kretschmer on this project who has published a number of articles on the subject. Since then, an article on the social predictors of young adult's wellbeing and functioning has been published in Psychological Medicine. Papers in-progress include a paper on the developmental stability of the p-factor and a review on parenting and resilience in children. Jennifer also coordinated the TRAILS Next data-collection, including developing a micro-coding scheme for parent-child interactions. Jennifer continues to work on the same topic in a follow-up project.

Tina Kretschmer(until 1/12/15)
Jennifer Klop-Richards(since 1/12/15)
Postdocs, UMCG
WP3, Oldehinkel

Examining the complex interplay between relationship experiences and individual factors to understand adolescent development

1 December 2015 – 30 September 2018

Publications

Richards JS et al (2018). Beyond not bad or just okay: Social predictors of young adults' wellbeing and functioning (a TRAILS study). *Psychological Medicine* 1-11.

Kretschmer, T. et al (2018). How competent are adolescent bullying perpetrators and victims in mastering normative developmental tasks in early adulthood? Journal of Abnormal Child Psychology, 46, 41-56.

Kretschmer, T. et al (2017). Bullying development across adolescence, its antecedents, outcomes, and gender-specific patterns. Development and Psychopathology, 29, 941-955.

Kretschmer T. et al (2016). Configurations of adolescents' peer environments: Associations with parent-child relationship quality and parent problem behaviour. Journal of Research on Adolescence, 26, 474-491.

Kretschmer, T. et al (2015) Parent-child positivity and romantic relationships in emerging adulthood – Congruence, compensation, and the role of social skills. International Journal of Behavioural Development, doi: 10.1177/0165025415612228.

Other output

The above work has been presented at several conferences, including oral presentations at the European Congress of Psychology (ECP, Amsterdam 2017), International Society for Research in Child and Adolescent Psychopathology (ISRCAP, Amsterdam 2017), and European Association for Research on Adolescence (EARA, Cadiz, 2016).

Odilia Laceulle(until 1/9/15)
Anoek Sluiter-Oerlemans(since 1/9/15)
Postdocs, ICPE/UMCG
WP3, Prof. J. Ormel

Consortium on Individual Development

Investigating developmental models of psychological distress

15 October 2013 – 1 November 2018

Project summary

Aim: In addition to work related to the enrichment of TRAILS study with measurements of a third generation (TRAILS Next), we started to investigate developmental models of psychopathology. The main aim was to use longitudinal data to disentangle the structure of psychopathology, the complex interplay between individuals and their environments (transactional models) in the prediction of psychopathology and life outcomes.

Methods: Data from all six waves of the Tracking Adolescents' Individual Lives Survey (TRAILS) are used, though the focus to date has been on measures of mental health, temperament/personality, social relationships, life events and early adult life outcomes.

Main findings Seven papers have been published, reporting on temperament/personality and stress/stressful situations, (negative) social interactions, psychopathology and outcomes, the relationship between psychopathology and personality and autism symptoms and prosocial skills. In addition, we identified individuals who have experienced long-term, persistent change in their mental health development and found that they differ from those who do not report such a change in terms of genetic vulnerability, temperamental characteristics and experienced life events (work in progress).

Consortium on Individual Development

Odilia Laceulle (until 1/9/15)
Anoek Sluiter-Oerlemans (since 1/9/15)
Postdocs, ICPE/UMCG
WP3, Prof. J. Ormel

Investigating developmental models of psychological distress

15 October 2013 – 1 November 2018

Publications

Ormel, J., Oerlemans, A.M., Oldehinkel, A.J. & Laceulle, O.M. (2019). Mental Disorder during Adolescence: Evidence of Arrested Personality Development – forthcoming in Clinical Psychological Science

Oerlemans, A.M., Rommelse, N.N.J., Buitelaar, J.K. & Hartman, C.A. (2018). Examining the intertwined development of prosocial skills and ASD symptoms in adolescence. European Child & Adolescent Psychiatry, 27(8), 1033-1046

Ormel, J., Oerlemans, A.M., Raven, D., Laceulle, O.M., Hartman, C.A., Veenstra, R., Verhulst, F., Vollebergh, W.A.M., Rosmalen, J.G.M., Reijneveld, S.A. & Oldehinkel, A.J. (2017). Functional outcomes of child and adolescent mental disorders. Current disorder most important but psychiatric history matters as well. *Psychological Medicine, 47*(7), 1271-1282

Ormel, J., Laceulle, O.M., & Jeronimus, B.J. (2015). Why personality and psychopathology are correlated: developmental perspective is a first step but more is needed. European Journal of Personality, 28, 396-398.

Laceulle, O.M., Jeronimus, B.F., van Aken, M.A.G., & Ormel, J. (2015). Why not everybody gets their fair share of stress: Adolescent's perceived relationship affection mediates associations between temperament and stressful social events. European Journal of Personality, 29: 125–137.

Laceulle, O.M., Nederhof, E., van Aken, M.A.G. & Ormel, J. (2015). Adolescent personality: associations with basal, awakening and stress-induced cortisol responses. Journal of Personality, 83, 262–273.

Laceulle, O.M., Vollebergh, W.A.M. & Ormel, J. (2015). The Structure of Psychopathology in Adolescence: Replication of a General Psychopathology Factor in the TRAILS Study. Clinical Psychological Science 3, 850–860.

Other output

Since 2018: two (invited) presentation at (inter)national conferences (2018), publication of a Dutch translation of the 2017 paper on functional outcomes of child and adolescent mental disorders in *Kind en Adolescent* (2018).

Eveline de Zeeuw
UD, Vrije Universiteit
WP 3, Dorret Boomsma

Consortium on Individual Development

Parental characteristics and its effect on behavioural control in childhood

1 May 2018-31 August 2020

Project summary

Aim: To study the effect of parental characteristics, amongst others psychopathology and education level, on behavioural control in their offspring

Methods: A classical twin, a direction-of-causation and a (non-) transmitted polygenic score (PRS) design to correct for genetic and environmental confounding

Main findings:

1) The Achenbach Self-Control Scale (ASCS) for parent, teacher and self-reports of 7-to-16-year-olds demonstrated good validity and reliability. Differences in self-control were for ~50-75 per cent due to genetic influences and self-control was associated with well-being, educational achievement and substance use. 2) Adolescents who experienced family conflict were at risk for problems with self-control through a combination of a common genetic liability and a direct causal influence of family conflict on self-control. 3) Parental socioeconomic status (SES) accounted for a small, but significant, proportion of the differences between children in academic achievement at the end of primary school. Children from a lower SES background scored on average lower even when taking part of the genetic differences into account. 4) The association between parental ADHD and educational level and offspring ADHD and academic achievement at age 12 was mainly due to shared genes and was not mediated by the home environment that parents created based on their own genetic predisposition.

Eveline de Zeeuw
UD, VU
WP3, Dorret Boomsma

Parental characteristics and its effect on behavioural control in childhood

1 May 2018-31 August 2020

Publications

- de Zeeuw, EL, et al. (2020). Intergenerational transmission of education and ADHD: Effects of parental genotypes. *Behaviour Genetics,* preprint published online.
- Willems, YE, *et al. (2020)*. Out of control: Examining the association between family conflict and self-control in adolescence in a genetically sensitive design. *Journal of the American Academy of Child and Adolescent Psychiatry, 59 (2), 254-262.*
- de Zeeuw, EL, et al. (2019). The moderating role of SES on genetic differences in educational achievement in the Netherlands. *npj Science of Learning, 4,* 13.
- Willems, YE, et al. (2018). Genetic and environmental influences on self-control: Assessing self-control with the ASEBA self-Control scale. *Behaviour Genetics, 48 (2),* 135-146.

Other output

- Genes of parents shape children's environment, impacting school success in adulthood, but not yet in childhood at *Learn symposium (poster)*
- Educational level offspring partly determined by genes that are not passed on by parents in *Verus (article)*
- Achievement: genes versus environment in *Didactief (article)*
- The impact of parental genes on offspring health: nurture via nature from *NWO Hestia impuls (grant)*
- Does socioeconomic status affect the influence of genetic differences on educational achievement? on *npj Science of Learning behind the paper channel (blog)*

Anoek Sluiter-Oerlemans
Postdoc, UMCG
WP3, Ormel

Consortium on Individual Development

Developmental models of psychopathology and life outcomes

November 2018 – February 2020

Project summary

Aim: Examine the influence of life experiences in the development of turning points in mental health trajectories (i.e., persistent changes, for good, or for bad). The experience of becoming a parent may facilitate a turning point which is one of my next research foci along with how this influences offspring development when combining TRAILS and TRAILS NEXT.

Methods: Data from the first 6 waves of TRAILS (focus on measures of mental health, polygenic risk, temperament/personality, social environment, potential turning point life events, and early adult life outcomes were used. Statistical analyses involved regression analytic techniques.

Main findings A small subsample was identified of individuals who experienced a (positive or negative) turning point in their mental health trajectory based on six waves of self-reported YSR/ASR symptoms. Those who reported a negative turning point reported more negative life experiences, increased polygenic risk, disinhibition, negative affectivity and childhood adversity compared to controls. Individuals with low polygenic risk were more likely to experience a positive turning point. Life events with turning point potential did not moderate main effects of personal susceptibility and early environmental risk (unpublished).

FINISHED PROJECT

Consortium on Individual Development

Anoek Sluiter-Oerlemans
Postdoc, UMCG
WP3, Ormel

Developmental models of psychopathology and life outcomes

November 2018 – February 2020

Publications

-**Oerlemans, A.M.,** Wardenaar, K.J., Raven, D., Hartman, C.A. & Ormel, J. (2020). The association of developmental trajectories of adolescent mental health with early-adult functioning. *PLoS ONE, 15*(6): e0233648

-Ormel, J.**, Oerlemans, A.M.**, Oldehinkel, A.J. & Laceulle, O.M. (2020). Mental Disorder during Adolescence: Evidence of Arrested Personality Development. Clinical Psychological Science, 8(3), 395-411

- Branje, S., Geeraerts, S., de Zeeuw, E.L., **Oerlemans, A.M.**, Koopman-Verhoeff, M.E., Schulz, S., Nelemans, S., Meeus, W., Hartman, C.A., Hillegers, M.H.J., Oldehinkel, A.J. & Boomsma, D.I. (2020). Intergenerational transmission: theoretical and methodological issues and an introduction to four Dutch cohorts. Developmental Cognitive Neuroscience, 45, 100835

- **Oerlemans, A.M.,** Hartman, C.A. & Ormel, J. Why are some individuals more susceptible to a turning point in their mental health trajectory during adolescence and early adulthood? [in progress]

-Rommelse, N., Langerak, I., Van der Meer, J., de Bruijn, Y. & **Oerlemans, A.** (2020). Neuropsychologische profielen van kinderen met een autismespectrumstoornis in relatie to hun intelligentie. *Kind en Adolescent, 41*, 98-121 [in Dutch]

Other output

-Developed training packages and coordinated multiple student projects for micro-coding parent-infant interaction video material (TRAILS-Next)

- Visited Prof. Meins in York, England and presented my work at a staff meeting.

- Organized a successful public outreach event about intergenerational transmission at the Groningen Noorderzon festival together with Dr. Jennifer Klop-Richards and Dr. Charlotte Vrijen.

Annelene Bloemen
PhD, UMCG
WP3, Oldehinkel

Consortium on Individual Development

Determinants and consequences of (low) cognitive control

December 2014 – December 2017

Aim

Adolescence is characterized by extensive neurodevelopmental changes. It has been hypothesized that disorders with a high incidence during adolescence, such as depression and anxiety, are neurodevelopmental disorders that result from premorbid vulnerabilities of the brain. Low cognitive control is an often-used marker of such brain vulnerabilities. Within the context of CID, cognitive control is highly relevant because it is a prerequisite for behavioural control, one of the two core outcomes. Whereas prior research suggests that low cognitive control is not a strong predictor of depression and anxiety in general, it may still do so in particular subgroups, e.g. youth with a vulnerable temperament. Cognitive control is important in regulating our behaviours and emotions, which may be particularly relevant in the context of specific risk factors. The central aim of this project is to examine the role of cognitive control in relation to the question why some individuals develop psychiatric problems while others do not, and why some remit while others have chronic and even worsening psychopathology. Insight will be gained by investigating how cognitive (behavioural) control may provide a buffer in the context of a vulnerable temperament, stress exposure, comorbid childhood psychopathology, and a high familial presence of psychopathology.

Methods

Existing (multiwave) cohort data were used from TRAILS (TRacking Adolescents' Individual Lives Survey), LifeLines, ARIADNE, and NeuroIMAGE. Cognitive control was measured using either paper-and-pencil or computerized tasks. All other variables were measured by interviews or questionnaires.

Output

Bloemen AJP et al. The association between executive functioning and psychopathology: general or specific? Psychol Med. 2018 Aug;48(11):1787-1794. doi: 10.1017/S0033291717003269.

FINISHED PROJECT

WP4 Animal and mathematical models of development

Work package 4 complements the studies in work packages 1-3 with advanced mathematical modelling and animal research. Both behavioural rodent and avian models of social and adaptive behaviour are used, with the additional possibility of detailed analyses focusing on development of involved brain structures. Mathematical models allow better description of longitudinal effects and ensure better data quality.

Overview finished WP4 projects

9 finished projects		
Title	Project lead	Page
Formalization and evaluation of prior knowledge	Mariëlle Zondervan	122
Challenging early life environments: Impact on behavioural inhibition and (pro-)social behaviour in rats	Jiska Kentrop	124
Intervention at puberty after early life adversity	Manila Loi	126
Genetic resilience in a combined model of stress early in life and later in adulthood on behaviour and neurogenesis in mice	Sofia Kanatsou	127
Genetic resilience to early life stress effects on the behavioural trajectory in mice	Angela Sarabdjitsingh	128
A neurogenetic analysis of birdsong learning as a model for infant development	Sita ter Haar	129
Tracking sleep slow waves during avian vocal development	Gabriël Beckers	130
WP2 collaboration: Testing the differential susceptibility theory in mice	Jelle Knop	132
New paradigm to predict susceptibility to PTSD	Milou Sep	134

Mariëlle Zondervan
PhD, UU
WP4, Hoijtink

Consortium on Individual Development

Formalizing and evaluating prior knowledge

July 2014 – March 2019

Project summary

Aim: The aim of this dissertation was to explore, propose, and demonstrate several ways in which information other than the data at hand can be used to strengthen analyses.

Methods: A simulation study was used to evaluate the impact of prior information. A procedure was developed to search for prior information systematically, and an elicitation procedure was developed to elicit prior knowledge from experts. The prior predictive *p*-value was introduced as a method to test replication while using the deviance from an informative hypothesis as a test-statistic. Finally, Bayesian research synthesis was used to combine results over cohort studies.

Main findings: Prior information promotes convergence and the non-null detection rate. The prior predictive *p*-value is a useful addition to the meta-scientific toolbox, and by using informative hypotheses, new replication research questions can be answered. Bayesian research synthesis can combine different operationalisations of the same construct and leads to robust evidence.

FINISHED PROJECT

Consortium on Individual Development

Mariëlle Zondervan
PhD candidate, UU
WP4, Hoijtink

Formalizing and Evaluating Prior Knowledge

July 2014 – March 2019

Publications

Zondervan-Zwijnenburg, M.A.J.*, Veldkamp, S.A.M.*, Neumann, A., Barzeva, S.A., Nelemans, S.A., Van Beijsterveldt, C.E.M. Branje, S., Meeus, W.H.J., Hillegers, M.H.J., Tiemeier, H., Hoijtink, H.J.A., Oldehinkel, A.J., & Boomsma, D.I. (2019). The impact of parental age on child behaviour problems: Updating evidence from multiple cohorts. *Child Development*. doi: 10.1111/cdev.13267

* These authors contributed equally.

Zondervan-Zwijnenburg, M.A.J., Depaoli, S., Peeters, M., & Van de Schoot, R. (2019). Pushing the Limits: The performance of ML and Bayesian estimation with small and unbalanced samples in a latent growth model. *Methodology, 15*, 31-43. doi: 10.1027/1614-2241/a000162

Zondervan-Zwijnenburg, M.A.J., Peeters, M., Depaoli, S., & Van de Schoot, R. (2017). Where do priors come from? Applying guidelines to construct informative priors in small sample research. *Research in Human Development, 14*(4), 305-320. doi: 10.1080/15427609.2017.1370966

Zondervan-Zwijnenburg, M.A.J., Van de Schoot-Hubeek, W., Lek, K., Hoijtink, H., & Van de Schoot, R. (2017). An expert judgment elicitation procedure for correlations. *Frontiers in Psychology, 8*, 90. doi: 10.3389/fpsyg.2017.00090

Zondervan-Zwijnenburg, M.A.J., & Rijshouwer, C.D.N. (2020). Testing Replication with Small Samples: Applications to ANOVA. In: R. van de Schoot, M. Miocević (Eds.), *Small sample size solutions: A guide for applied researchers and practitioners. Routledge*

Other output

Zondervan-Zwijnenburg, M.A.J. (2019). How to Test Replication for Structu- ral Equation Models. *PsyArXiv*. doi: 10.31234/osf.io/uvh5s

Zondervan-Zwijnenburg, M.A.J. (2015). Ontwikkeling van jonge cannabisge-bruikers vergeleken met leeftijdsgenoten: Een Bayesiaans avontuur. *STAtOR, 15* (2), 4-9.

Zondervan-Zwijnenburg, M.A.J. (2019). Replication: Test Replications by Means of the Prior Predictive p-Value. R-package version 0.1.0. https://CRAN. R-project.org/package=Replication

Zondervan-Zwijnenburg, M.A.J. (2018). ANOVAreplication: Test ANOVA Replication by Means of the Prior Predictive p-Value. R-package version 1.1.3. https://CRAN.R-project.org/package=ANOVAreplication

FINISHED PROJECT

Jiska Kentrop
PhD, UMCU
WP4, Marian Joëls

Consortium on Individual Development

Challenging early life environments: Impact on behavioural inhibition and (pro-)social behaviour in rats

1 July 2014 – 1 November 2018

Project summary

Aims:

1) to determine the effects of early life stress on behavioural control, social competence and pro-social behaviour in rats in adolescence and adulthood

2) to investigate the possibility of reversing these behavioural effects using either environmental or pharmacological interventions in early adolescence

Methods: A rat model was used to study how early life stress, through 24h deprivation of maternal care on the third day after birth, affects adult behaviour. She also examined whether the potential negative effects of maternal deprivation could be normalized with two adolescent interventions (enriched housing conditions or administering glucocorticoid receptor antagonist mifepristone).

Main findings: Early life stress has a negative impact on behavioural inhibition and social behaviour. However, because the effects are modest, it is difficult to interpret the results of the two tested interventions. Therefore further research is necessary to draw more solid conclusions.

FINISHED PROJECT

Jiska Kentrop
PhD, UMCU
WP4, Marian Joëls

Challenging early life environments: Impact on behavioural inhibition and (pro-)social behaviour in rats

1 July 2014 – 1 November 2018

Publications

Dissertation: Kentrop, J. (2019) Challenging early life environments: Impact on behavioural inhibition and (pro-)social behaviour in rats. Persistent identifier URN:NBN:NL:UI:10-1874-380350

Bonapersona V., Kentrop J. et al (2019). The behavioural phenotype of early life adversity: A 3-level meta-analysis of rodent studies. Neuroscience & Biobehavioural Reviews. doi: 10.1016/j.neubiorev.2019.04.021

Van der Veen R., Kentrop J. et al (2015) Complex living conditions impair behavioural inhibition but improve attention in rats. Front. Behav. Neurosci. doi: 10.3389/fnbeh.2015.00357.

Kentrop, J. et al (2016). Mifepristone Treatment during Early Adolescence Fails to Restore Maternal Deprivation-Induced Deficits in Behavioural Inhibition of Adult Male Rats. Frontiers in Behavioural Neuroscience. doi:10.3389/fnbeh.2016.00122

Kentrop J et al (2018) Effects of Maternal Deprivation and Complex Housing on Rat Social Behaviour in Adolescence and Adulthood. Front. Behav. Neurosci. doi: 10.3389/fnbeh.2018.00193

Other output

Organisation of the 2016 CID Tour the Consortium day in Utrecht and 2018 CID symposium and retreat for CID researchers.

Several conference presentations for the Dutch Neuroscience Meeting (2016, 2018) and European Brain and Behaviour Society conference (2017)

Manila Loi
PhD, UMCU
WP4, Joëls

Consortium on Individual Development

Intervention at puberty after early life adversity

September 2013 – September 2015

Aim

Early life adversity is a risk factor for the development of psychopathology in humans. This project aimed to understand how early life stress in a well-controlled rodent model affects various cognitive domains and whether this can be reversed by pharmacological intervention during a critical peri-pubertal developmental stage.

Method

Wistar rat pups were removed from the mother for 24 h on postnatal day (PND) 3. Weaning was at PND21. Between PND26 and 28 the pups were treated twice daily with a glucocorticoid receptor antagonist (mifepristone), since this receptor is known to exacerbate damage to the brain. In adulthood (after PND90), rats were tested for spatial memory and decision-making.

Main findings

We observed that particularly in male rats (much more than in females), cognitive function was disturbed by maternal deprivation. This was normalized by brief peri-pubertal treatment with mifepristone. A very similar pattern was observed for glutamatergic transmission in key areas involved in these behaviours. Given the rapid but lasting reversal due to mifepristone treatment, we tested the possibility that this compound works through epigenetic programming. Indeed, the efficacy of mifepristone to restore cognitive function disturbed by maternal deprivation was hampered by co-treatment with a methyl-donor and facilitated by a histone deacetylase inhibitor infused into the area of interest.

FINISHED PROJECT

Consortium on Individual Development

Sofia Kanatsou
Postdoc, UMCU
WP4, Joëls

Genetic resilience in a combined model of stress early in life and later in adulthood on behaviour and neurogenesis in mice

August 2015 – April 2016

Aim

The general aim of this project is to model the neurodevelopmental aspects of behaviour (social competence and behavioural control) and structural plasticity after stress early in life and later in adulthood in male mice. Mineralocorticoid receptor (MR) function is considered important in mediating stress resilience. We therefore aim to study whether combined exposure of early life stress and stress in adulthood affects memory and neurogenesis and whether these effects can be prevented by increased transgenic overexpression of MR's.

Method

We have used a novel approach for developmental behavioural and structural analysis in which mice are assessed in adulthood on a series of behavioural tasks measuring neuroendocrinological markers, locomotor activity, anxiety, learning and memory and adult hippocampal neurogenesis.

Main findings

1) We have established and validated (neuroendocrine and behaviourally) the limited nesting and bedding model (ELS) to induce early life stress in mice through fragmented mother care. 2) We have established and validated (neuroendocrine and behaviourally) the chronic unpredictable stress model (CUS) to induce stress in adulthood in mice through a combination of physical and psychological stressors. 3) We have successfully imported the genetically modified mouse lines necessary to generate the forebrain specific overexpression mice.
Recently we have shown that increased MR functionality partially prevents chronic-stress induced reductions in hippocampal memory and structural plasticity in male mice (Kanatsou et al., 2015). Moreover overexpression of MRs protects against the consequences of early life stress on spatial memory, cell maturation and synaptic function in the dentate gyrus in male mice (Kanatsou et al., in preparation). Based on these findings, it is important to further explore the genetic resilience of MRs on behavioural and structural domains in a combined model of stress early in life and later in adulthood.

Angela Sarabdjitsingh
Assistant Professor, UMCU
WP4, Joëls

Consortium on Individual Development

Genetic resilience to early life stress effects on the behavioural trajectory in mice

November 2013 – September 2018

Aim

The general aim of this project is to model the neurodevelopmental aspects of behavioural and cognitive domains after early life stress (ELS) in male and female mice. Mineralocorticoid receptor (MR) function is considered important in mediating stress resilience. We therefore aim to study the contribution of high/low brain-specific MR expression to ELS and the behavioural trajectory.

Method

We have used a novel approach for developmental behavioural analysis in which mice are assessed at different developmental stages on a series of behavioural tasks (behavioural control) measuring general health, neurological reflexes, locomotor activity, anxiety, short- and long-term memory and cognitive flexibility (Molenhuis et al., 2014). We use this longitudinal testing battery to assess the effects of early stress in males and females. Additionally we look at acute stress reactivity in these mice

Main findings

All experimental work has been concluded and data analysis is ongoing for the behavioural assessments. Several manuscripts are being drafted in which we discuss the effect of MR and ELS on the development of behavioural domains in male and female mice. Another paper will address acute stress reactivity in this experimental setup. Additionally, one final paper will discuss the effects of MR and ELS on neuronal excitability and morphology in the mPFC (in collaboration with dr Henk Karst).

FINISHED PROJECT

Consortium on Individual Development

Sita ter Haar
Postdoc, UU
WP4, Bolhuis

A neurogenetic analysis of birdsong learning as a model for infant development

March 2015 – January 2016

Aim

This research aims to study the neurogenetic mechanisms behind song learning in zebra finches, which is extensively used as a model for speech and language acquisition in human infants. The first question to be answered is whether individual differences in learning performance are associated with differences in gene expression.

Method

We perform neurobehavioural research in combination with innovative genetic techniques: song analyses, behavioural responses and RNA-sequencing or microarray.

Main findings

An ethical proposal has been written for the animal experimentation committee to be able to start the research on animals. The plans have been discussed with a genetic birdsong expert collaborator (Prof. Claudio Mello). Before we can start genetic analyses we need to develop methods to quantify individual differences in development. In order to be able to distinguish gene expression patterns in good and poor learners, it is necessary to find precursors in vocal development that indicate good or poor learning. Therefore I have started to analyze vocal development of already existing song recordings during development. I investigate whether specific song elements or syllables (the units of which song consists) are acquired early in development and if this acquisition is more accurate and/or faster in good learners than poor learners. Also, I study if fast development (i.e. early song stabilization) leads to better or worse song performance as an adult. Once we know the developmental precursors, we can start measuring genetic variation associated with individual differences.

Gabriël Beckers
Assistant Professor, UU
WP4, Bolhuis

Consortium on Individual Development

Tracking sleep slow waves during avian vocal development

October 2015 – January 2018

Project summary

Aim: Sleep is strongly involved in learning, including vocal learning in songbirds and grammar learning in human infants. We studied the phenomenology and role of cortical oscillations that occur during deep sleep in perception and learning of vocalizations in birds that are used as model system for speech acquisition in human infants.

Methods: We record neuronal action potentials and local field potentials in cortex at 32 and 64 sites in parallel (under anesthesia in zebra finches, and natural sleep in pigeons, respectively).

Main findings

* Slow oscillations are involved in learning of simple 'artificial grammars', at a level comparable to human phonology.

* REM and NREM travelling sleep waves in humans and birds are phenomenologically comparable, including how they are organized in overall sleep architecture.

* Hippocampal sharp-wave-ripples and thalamocortical spindles, implicated in memory consolidation in humans, appear to be absent in birds.

FINISHED PROJECT

Consortium on Individual Development

Gabriël Beckers
Assistant Professor, UU
WP4, Bolhuis

Tracking sleep slow waves during avian vocal development

October 2015 – January 2018

Publications

- Van der Meij, J.*, Ungurean, G., Rattenborg, N.C., **Beckers, G.J.L.*** (submitted) Evolution of sleep in relation to cognition – A birds' brain view, *Current Opinion in Behavioural Sciences*.

- Van der Meij, J., Rattenborg, N.C.*, **Beckers, G.J.L.*** (in revision) Divergent neuronal activity patterns in the avian hippocampus and nidopallium. *European Journal of Neuroscience*.

- Van der Meij, J., Martinez-Gonzalez, D., **Beckers, G.J.L.*** and Rattenborg, N.C.* (2019) Intra-'cortical' activity during avian non-REM and REM sleep: variant and invariant traits between birds and mammals. *SLEEP*, 42:2.

- Van der Meij, J., Martinez-Gonzalez, D., **Beckers, G.J.L.*** and Rattenborg, N.C.* (2019) Neurophysiology of avian sleep: comparing natural sleep and isoflurane anesthesia. *Frontiers in Neuroscience, Sleep and Circadian Rhythms*, 13, 262--

- Rattenborg, N.C., van Der Meij, J., **Beckers, G.J.L.**, and Lesku, J.A. (2019) Local aspects of avian non-REM and REM sleep. *Frontiers in Neuroscience, section Sleep and Circadian Rhythms,* 13, 567--

- Tisdale, R.K., Lesku, J.A., **Beckers, G.J.L.***, Rattenborg, N.C.* (2018) Bird-like propagating brain activity in anesthetized Nile crocodiles. *SLEEP*, 41(8), zsy105.

- Tisdale, R.K., Tieri, L., Rattenborg, N.C., **Beckers, G.J.L.**, and Lesku, J.A. (2018) Spectral properties of brain activity under two anesthetics and their potential for inducing natural sleep in birds. *Frontiers in Neuroscience, Sleep and Circadian Rhythms*, 12.

- Tisdale, R.K., Lesku, J.A., **Beckers, G.J.L.**, Vyssotski, A.L, Rattenborg, N.C. (2018) The low-down on sleeping down low: Pigeons shift to lighter forms of sleep when sleeping near the ground. *Journal of Experimental Biology*, 221 (19).

- Bolhuis, J.J., **Beckers, G.J.L.**, Huybregts, M.A.C., Berwick, R.C., Everaert, M.B.H. (2018) The slings and arrows of comparative linguistics. *PLoS Biology*.

- Bolhuis, J.J., **Beckers, G.J.L.**, Huybregts, M.A.C., Berwick, R.C., Everaert, M.B.H. (2018) Meaningful syntactic structure in songbird vocalizations? *PLoS Biology*.

Other output

Data science tool: **Darr**, a Python science library for memory-mapped numeric arrays, based on a format that is self-explanatory and tool-independent. See: https://github.com/gbeckers/Darr

Jelle Knop
PhD, UMCU
WP2/4, Joëls

Consortium on Individual Development

Testing Differential Susceptibility in an animal model

April 2016 – August 2020

Project summary

Aim: The differential susceptibility theory states that individuals who suffer more from the detrimental effects of (early-life) adversity may also benefit more from the positive effects of enriched environments. In this project we aimed to study this in a controlled manner using a mouse model.

Methods: We exposed male and female mice to a negative, neutral or positive rearing environment early during postnatal development. In addition, half of the mice carried a genetic heterozygous knock-out of the mineralocorticoid receptor or the dopamine receptor D4, while the other half functioned as controls. Sexual development and adult behaviour linked to socialibility were tested.

Main findings Decreased expression of the mineralocorticoid receptor altered adult maternal care of female mice towards their own offspring, but did not interact with rearing conditions. However, while decreased expression of the dopamine receptor D4 itself did not affect maternal care, it showed an interaction with rearing conditions in line with the differential susceptibility theory.

FINISHED PROJECT

Consortium on Individual Development

Jelle Knop
PhD, UMCU
WP2/4, Joëls

Testing Differential Susceptibility in an animal model

April 2016 – August 2020

Publications

- Knop, J, Joëls, M, van der Veen, R (2017) The added value of rodent models in studying parental influence on offspring development: opportunities, limitations and future perspectives. Current opinion in psychology 15: 174-181.
- Knop, J., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Joëls, M., & van der Veen, R. (2019). The effects of different rearing conditions on sexual maturation and maternal care in heterozygous mineralocorticoid receptor knockout mice. Hormones and Behaviour: 112, 54-64.
- Knop, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Joëls, M., & Van Der Veen, R. (2019). Maternal care of heterozygous Dopamine Receptor D4 knockout mice: Differential susceptibility to early-life rearing conditions. Genes, Brain and Behaviour, 2020;e12655. doi:10.1111/gbb.12655

Other output

The effects of different early-life rearing conditions on sexual maturation and maternal care in mineralocorticoid receptor knockout mice. Poster presentation at FENS Berlin, Germany, 2018.

The effects of different early-life rearing conditions on adult behaviour and maternal care in heterozygous dopamine receptor D4 knock-out mice. Poster presentation at Munich Winter Conference on Stress, Garmisch- Partenkirchen, Germany, 2019

The effects of different early-life rearing conditions on adult behaviour and maternal care in heterozygous dopamine receptor D4 knock-out mice. Poster presentation at Dutch Neuroscience Meeting, Lunteren, The Netherlands, 2019. **Won poster prize*

Testing the Differential Susceptibility Theory in an animal model. Oral presentation at the Gravitation Consortium on Individual Development symposium, The Netherlands, 2018.

Scientific outreach video:
https://scientistwanted.nl/home/filmpjes-van-wetenschappers/jelle-knop/

Milou Sep
PhD, UMCU
WP4, Joëls

Consortium on Individual Development

New paradigm to predict susceptibility to PTSD

January 2020 – June 2020

Project summary

Aim: We hypothesize that people that contextualize poorly under stressful conditions are more likely to develop PTSD in the face of a traumatic event. However, this is difficult to test in humans in a prospective manner. This project aims to develop a rat model where our hypothesis can be tested under controlled conditions, including the early life environment.

Methods: Prospective longitudinal animal study, using the cut-off behavioural criteria model for PTSD (Cohen, et. al. 2012) in rats.

Main findings In this 5 months' project we optimized all aspect of this paradigm in the animal cohort. As part of other CID WP4 projects we can now test the strength of individuals' characteristics (early life environment, trait-anxiety and the ability to contextualize) to predict susceptibility to develop PTSD-like symptoms.

FINISHED PROJECT

Consortium on Individual Development

Milou Sep
PhD, UMCU
WP4, Joëls

New paradigm to predict susceptibility to PTSD

January 2020 – June 2020

Publications

Sep, MSC, Sarabdjitsingh, A, Geuze, E, Joëls, Predictive value of trait anxiety and memory contextualization. Thesis chapter. *In preparation*

Other output

* Sep, MSC, Individual differences in the encoding of contextual details under stress and vulnerability to PTSD, Talk at the seminar of Translational Neuroscience, UMC Utrecht.

Consortium on Individual Development

Colofon

ORGANIZATION

CID involves researchers from Utrecht University (UU, applying university), University of Amsterdam (UvA), Leiden University (LU), University Medical Centrum Groningen (UMCG), Erasmus Medical Center (Erasmus MC), University Medical Center Utrecht (UMCU), Vrije Universiteit Amsterdam (VU).

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GRAPHICS

Taluut Utrecht

VU Vrije Universiteit Amsterdam · UMC Utrecht · Utrecht University · umcg · Universiteit Leiden The Netherlands · Erasmus MC Universitair Medisch Centrum Rotterdam · University of Amsterdam