6th Annual Flux Congress

Aug 30 – Sept 1, 2018
Berlin, Germany

Program



flux
THE SOCIETY FOR DEVELOPMENTAL COGNITIVE NEUROSCIENCE

Harnack-Haus, Berlin

The Conference Venue of the Max Planck Society

www.fluxsociety.org

Program-at-a-Glance

6th Annual Flux Congress • August 30–September 1, 2018

	Thursday 30 Aug	Friday 31 Aug	Saturday 1 Sept
8:00 AM	Coffee (8:00-8:30am)	Coffee (8:00-8:30am)	Coffee (8:00-8:30am)
8:15 AM			
8:30 AM	Welcome Remarks (8:30-9:00am)	Oral Session 2 Abstract session (8:30-10:00am)	Oral Session 5 Motivation (8:30-10:00am)
8:45 AM			
9:00 AM	Local Symposium *Plasticity: Integrating microgenetic and ontogenetic perspectives* (9:00-11:00am)		
9:15 AM			
9:30 AM			
9:45 AM			
10:00 AM		Break (10:00-10:20am)	Break (10:00-10:20am)
10:15 AM		Oral Session 3 Early experience (10:20-12:00pm)	Oral Session 6 Plasticity and sensitive windows (10:20-12:00pm)
10:30 AM			
10:45 AM			
11:00 AM	Science Of Learning (11:00-12:15pm)		
11:15 AM			
11:30 AM			
11:45 AM			
12:00 PM		Lunch (12:00-1:00pm)	Lunch (12:00-1:00pm)
12:15 PM	Lunch (12:15-1:00pm)		
12:30 PM			
12:45 PM			
1:00 PM	Oral Session 1 Learning and plasticity (1:00-2:15pm)	Oral Session 4 Mechanisms (1:00-2:30pm)	Oral Session 7 Developmental Processes (1:00-2:30pm)
1:15 PM			
1:30 PM			
1:45 PM			
2:00 PM			
2:15 PM	Huttenlocher Lecture (2:15-3:00pm)		
2:30 PM		Young Investigator Award Talk (2:30 - 3:00pm)	Break (2:30-2:50pm)
2:45 PM			Oral Session 8 Social learning (2:50-4:30pm)
3:00 PM	Flash Talks (3:00-3:45pm)	Flash Talks (3:00-3:45pm)	
3:15 PM			
3:30 PM			
3:45 PM	Poster Session (3:45-6:00pm)	Poster Session (3:45-6:00pm)	
4:00 PM			
4:15 PM			
4:30 PM			Closing Ceremony (4:30-5:00pm)
4:45 PM			
5:00 PM			
5:15 PM			
5:30 PM			
5:45 PM			
6:00 PM	Welcome Reception (6:00-7:00pm)		
6:15 PM			
6:30 PM		Flux Fun Night Hofbräu Wirtshaus Berlin (6:30-10:00pm)	
6:45 PM			
7:00 PM			
7:15 PM			
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8:00 PM			
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9:30 PM			
9:45 PM			
10:00 PM			

Thursday: Registration /Information Desk Open 7:30am-6:00pm; Exhibits on Display

Friday: Registration /Information Desk Open 8:00-6:00pm; Exhibits on Display

Saturday: Registration /Information Desk Open 8:00am-5:00pm; Exhibits on Display

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About the Flux Congress

The aim of the congress is to provide a forum for developmental cognitive neuroscientists to share their findings on the development of brain processes that support cognition and motivation from an integrative neuroscience perspective. Thus, it provides an opportunity for scientists in the field to expand their knowledge base, and also be better informed of translational approaches.

The Flux Society was launched in June 2014, and has seen growth in its membership each year. To learn more about the Flux Society, please visit **www.fluxsociety.org**.

Program Contents

Welcome
to Flux Congress attendees

Welcome to our sixth meeting of Flux, the International Congress for Integrative Developmental Cognitive Neuroscience, at the Max Planck Institute in Berlin, Wow! The enthusiasm keeps increasing with **219 abstract submissions and 335 memberships**, so far this year. Over 100 more than last year!!

We are very thankful for being hosted in Berlin by the **Max Planck Institute for Human Development** and to the invaluable support from our Chair of the Local Organizing Committee **Prof. Ulman Lindenberger** (Director of Developmental Psychology at Max Planck Institute for Human Development) and the host committee in securing this unique and prestigious opportunity to have Flux at such a scientifically important and historic venue!

A special thank you to **Eveline Crone**, Program Chair (Leiden University) and **Silvia Bunge**, Co-Chair (University of California at Berkeley), and the insightful initiator for Flux Berlin, for the fantastic job developing a truly impactful program! Thank you also to the great intellectual support of their team of illustrative developmental cognitive neurosciencetists: **Ulman Lindenberger** (Max Planck Institute for Human Development), **J. Bruce Morton** (University of Western Ontario), **Nim Tottenham** (Columbia University), **Eva Telzer** (University of North Carolina at Chapel Hill), **Wouter van den Bos** (Max Planck Institute for Human Development), and **Linda Wilbrecht** (University of California at Berkeley). Thank you!

We are particularly grateful for the continued support from the **Jacobs Foundation** enabling us to enhance our scientific aims, including the ability to provide student travel awards and our Young Investigator Award. We were thrilled to have awarded **6 International student travel awards** and **7 local travel awards** along with **3 Awards** for speakers in the Jacobs Foundation Symposium on the Science of Learning.

We are also thankful to **Elsevier** for their continued significant support of Flux and, importantly, publishing Developmental Cognitive Neuroscience, the Official journal of Flux.

Thank you to the **2018 Huttenlocher Awardee Uta Frith** for her outstanding and pioneering work in Developmental Cognitive Neuroscience providing important discoveries on the neurocognitive underpinnings of autism and for opening the meeting by enlightening us with her view of the field.

Thank you to the **2018 Young Investigator Award Leah Somerville** for her impactful insights on the brain basis of cognitive, motivational, social, and emotional behavior through the important transition through adolescence and for sharing with us your innovative approaches.

We are particularly grateful for the support from the **German Research Foundation** (DFG) enabling us to enhance our scientific aims, including the support for the conference venue and the travel of international speakers.

A special thank you to **Podium Conference Specialists Marischal DeArmond** and **Pam Prewett** who have worked tirelessly organizing every detail and supporting the effective execution of our conference.

Finally, a warm thank you to the **members of the Flux society** and conference participants for making the time to attend the Flux conference and making it such an exciting event! Welcome new Fluxers and a special thank you to those who have been supporting Flux through its emerging development, your contributions are noted and greatly appreciated!

A reminder of the bond that brings us together is that "**Flux**" is not an acronym but rather a term used to highlight that, as developmental cognitive neuroscientists, we are distinct in our investigations of the **dynamic** nature of cognition through development as stated in the aim of the Flux society "*To advance the understanding of human brain development by serving as a forum for professional and student scientists, physicians, and educators to: exchange information and educate the next generation of developmental cognitive neuroscience researchers; make widely available scientific research findings on brain development; encourage translational research to clinical populations; promote public information by discussing implications on the fields of education, health, juvenile law, parenting, and mental health, and encourage further progress in the field of developmental cognitive neuroscience*." The Flux Society strives to support Flux meetings going forward, but also to expand our ability to provide venues for scientific discussion and translational application.

We have received tremendous positive feedback from previous Flux meetings as well as great suggestions on improvements that have been incorporated into the design of this meeting as we continue to make this unique event serve the needs and ambitions of our growing society. We are actively considering ways that we can expand as a Society, finding new and interesting ways to enhance discussion and dissemination. We are always looking for those who want to **become involved** in extending venues for us as a field to advance our science through discussions and collaborations. We have an open search for those who want to head the organization of Webinars to hold discussions on current topics in DCN as well as a newsletter. If you are interested please approach a board member or conference organizer at the meeting. We are happy to hear any suggestions from members regarding either the conference or ways in which the Flux Society can best serve our field.

We want to remind you of our ever growing **job bank** where there are postings for every level of career development for those looking for a position and those looking to hire.

Finally, we are delighted to invite you to plan on attending **Flux 7, August 29 – 31, 2019**, in **New York City** hosted by **Nim Tottenham** (Columbia University) and the **host committee** including: **Xavier Castellanos** (New York University), **Michael Millham** (Child Mind Institute), **Rita Goldstein** (Mount Sinai Institue), and **Adrianna DiMartino** (New York University) in Midtown Manhattan. The scientific program promises to be extraordinary as it is being led by Chair **Deanna Barch** and her **Program Committee**: **Damien Fair** (Oregon Health & Science University), **Jiska Peper** (Leiden University), **Daniel Ansari** (University of Western Ontario), **Gregoire Borst** (Université Paris - Sorbonne), **Catherine Hartley** (New York University), **Sean Deoni** (Brown University), **Christos Constantinidis** (Wake Forest University), **Jocelyne Bachevalier** (Emory University), **Linda Wilbrecht** (University of California, Berkeley), **Iroise Dumontheil** (Birkbeck, University of London).

We are looking forward to expanding our understanding of developmental cognitive neuroscience and interacting with attendees and are confident that you will leave with greater understanding, new friends, and enhanced creativity in your approach.

Sincererly,

Beatriz Luna
President

Brad Schlaggar
Vice-President

Bruce McCandliss
Executive Treasurer

Eveline Crone
Executive Board Member

Damien Fair
Board Member

Nim Tottenham
Board Member

PHOTO BY SVEN PRZEPIORKA ON UNSPLASH

Welcome
to the sixth meeting of Flux

On behalf of the Flux Board and the Scientific Program Committee, we welcome you enthusiastically to Berlin for Flux 2018! This year's local host is the Max Planck Institute for Human Development.

Scientific Program

This year, the conference's overarching theme is Plasticity. Our program features an all-star cast of speakers, ranging from rising stars to senior investigators– and our honored speaker Uta Frith, from University College London, will deliver the Huttenlocher Lecture. We will also present Leah Somerville as the 2018 winner of the Flux Young Investigator Award-winner. The schedule includes symposia, special lectures, flash talks, and poster sessions, not to mention various opportunities to catch up with friends and network.

We will kick off the first day, August 30th, with the Local Symposium, which brings together researchers from around Europe who are doing cutting-edge research on brain plasticity at the levels of systems and cognitive neuroscience. This session will be followed by our Annual Science of Learning Symposium, supported by the Jacobs Foundation.

The program includes eight Oral Sessions. These are loosely organized around broad topics such as Early Experience, Motivation, Plasticity & Sensitive Windows, and Learning, although there are sure to be many connections across sessions.

Conference Venue: The Harnack Haus in Dahlem

Berlin is a fascinating and historically significant city, with many different types of neighborhoods spanning what was once were separated into West and East Berlin.

The conference venue is in Dahlem, at the southwest corner of the city. The Seminaris hotel, where many of you will be staying, is within walking distance of Harnack Haus – or one stop away via subway. Dahlem has long been a scientific hotbed (read: quiet district). It boasts not only the Max Planck Institute for Human Development but also the Freie University, one of the city's three major universities. Many luminaries have lived or worked in Dahlem for over one hundred years. In the lobby of the Harnack Haus, you will find a wall of photos – don't miss the opportunity to lift up some of them to reveal the names and histories of the VIPs who stayed there over the years.

For history buffs: Harnack House was built in 1929 to provide guest accommodation and a conference venue for the Kaiser Wilhelm Society, the Max Planck Society's predecessor organization. Scientists from all over the world, artists, politicians and captains of industry stayed here or came to attend events. When the National Socialists seized power, senior Nazi Party officials visited the house, as did the members of various resistance groups. At the end of WWII, the US Armed Forces confiscated the building. Harnack House was used as an officers' club until the withdrawal of the Allied Forces from Berlin in 1994. It was subsequently handed over to the Max Planck Society as the Kaiser Wilhelm Society's legal successor. As in 1929, it has become a meeting place for the international scientific community of the Max Planck Society and its guests from all over the world.

You will get a taste for a few of Berlin's neighborhoods during the evening activities (see below), but we hope that you will have time to explore more of it on this trip… not during the conference sessions, of course! Note that Berlin has excellent public transportation, and that the subway gets you directly into the city center.

Evening activities

On the first evening, the Max Planck Institute for Human Development will host the Opening Reception at the Harnack Haus. On the following night, the official Flux Fun Night will be held at a beer garden in the hip district of Alexanderplatz in the eastern part of Berlin. And stay tuned for details regarding Karaoke Night, an unofficial Flux tradition!

We look forward to meeting you in a great city for an exciting conference!

Sincerely,

Program Co-Chair and **Local Organizing Committee** member
Silvia Bunge, University of California at Berkeley

Flux Congress Local Host Chair
Ulman Lindenberger, Max Planck Institute for Human Development

Program Chair
Eveline Crone, Leiden University

Congress Scientific Program Committee
Nim Tottenham, Columbia University
Eva Telzer, Unversity of North Carolina, Chapel Hill
Wouter van den Bos, Max Planck Institute for Human Development
J. Bruce Morton, University of Western Ontario
Linda Wilbrecht, University of California, Berkeley
Bruce McCandliss, Stanford University

Flux Leadership

Society Executive Committee

Beatriz Luna President	University of Pittsburgh, USA
Brad Schlaggar Vice President	Washington University in St. Louis, USA
Eveline Crone Executive Board Member	Leiden University, Netherlands
Bruce McCandliss Executive Treasurer	Vanderbilt University, USA
Damien Fair Board Member	Oregon Health & Science University, USA
Nim Tottenham Board Member	Columbia University, USA

Congress Local Organizing Chair

Silvia Bunge	University of California, Berkeley, USA

Congress Local Host Chair

Ulman Lindenberger	Max Planck Institute for Human Development

Congress Scientific Program Committee

Eveline Crone, Chair	Leiden University
Nim Tottenham	Columbia University
Eva Telzer	Unversity of North Carolina, Chapel Hill
Wouter van den Bos	Max Planck Institute for Human Development
J. Bruce Morton	University of Western Ontario
Linda Wilbrecht	University of California, Berkeley
Bruce McCandliss	Stanford University

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Flux Congress Management

Podium Conference Specialists
Marischal De Armond
Pam Prewett

PHOTO BY RICARDO GOMEZ ANGEL ON UNSPLASH

General Congress Information

Meeting Venue

Harnack-Haus
Ihnestrasse 16-20
14195 Berlin, Germany
Tel: +49 30 8413-3800
Fax: +49 30 8413-38

All congress sessions and the Welcome Cocktail Reception will take place at this location, and the Flux Fun Night will take place at an offsite venue.

Registration

Congress registration fees include access to all sessions including the welcome reception, speaker presentations, grazing lunches, coffee breaks, and poster sessions.

Name Badges

Your name badge is your admission ticket to all conference sessions, reception, lunch, and coffee breaks. Please wear it at all times. At the end of the conference we ask that you recycle your name badge at one of the name badge recycling stations, or leave it at the Registration Desk.

Registration and Information Desk Hours

The Registration and Information Desk, located in the **Planck Lobby**, will be open during the following dates and times:

Thursday, August 30	8:00 AM – 6:00 PM
Friday, August 31	8:00 AM – 6:00 PM
Saturday, September	8:00 AM – 5:00 PM

If you need assistance during the meeting, please visit the Registration Desk.

Staff

Congress staff from **Podium Conference Specialists** can be identified by orange ribbons on their name badges. For immediate assistance, please visit us at the registration desk in the lobby.

Complimentary WIFI Information:

Complimentary Wifi is available in the hotel lobby on the ground floor and in your hotel guestroom. Please note there is no wifi available in the meeting rooms.

Network: HH-Guest   Password: Helium-02

Going Local Berlin App

Experience Berlin like a Berliner! Download the "Going Local Berlin" app to get instant access to more than 700 selected Berlin tips. The app is free, and after downloading the app to your phone, the pictures, maps and tips can be accessed without a data connection. You'll get tips and information for Berlin's 12 districts and their distinct neighbourhoods, including "Hidden Places", "Must-Sees" and "Food & Drink" as well as annual event highlights. Available for iPhone and Android.

Flux Social Functions

Opening Reception

The Opening Reception will take place at the **Planck Lobby & Terrace** from 6:00 – 7:00 PM. Light refreshments will be served, and there will be a cash bar.

Flux Fun Night

This year's Flux excursion will take place at **Hofbräu Wirtshaus Berlin** located at the Alexanderplatz in down-town Berlin. Advance ticket purchase is required for this event. Hofbräu Wirtshaus Berlin is a 30-minute drive from Harnack-Haus. If you prefer to take transport, buses from the Harnack-Haus will depart at 6:30 PM from the Planck Lobby main entrance. Shuttles will return to Harnack-Haus starting at 9:30 PM. *See map on page 8 for directions*.

Poster Information

Information on Poster Authors, Poster Numbers and Poster Titles begins on page 27. For a complete list of all poster abstracts visit the Flux website **www.fluxsociety.org**

Easy reference **Poster Floor Plans** for each session can also be found on pages 44-47 of this program.

Set-Up / Removal

There are two Poster Sessions during the Meeting and posters have been allocated to one of the sessions based on poster themes. Poster presenters must set-up and remove their posters during the following times.

Poster Session 1 – Thursday, August 30

Poster Set-up:
Thursday, August 30: 7:30 – 8:30 AM

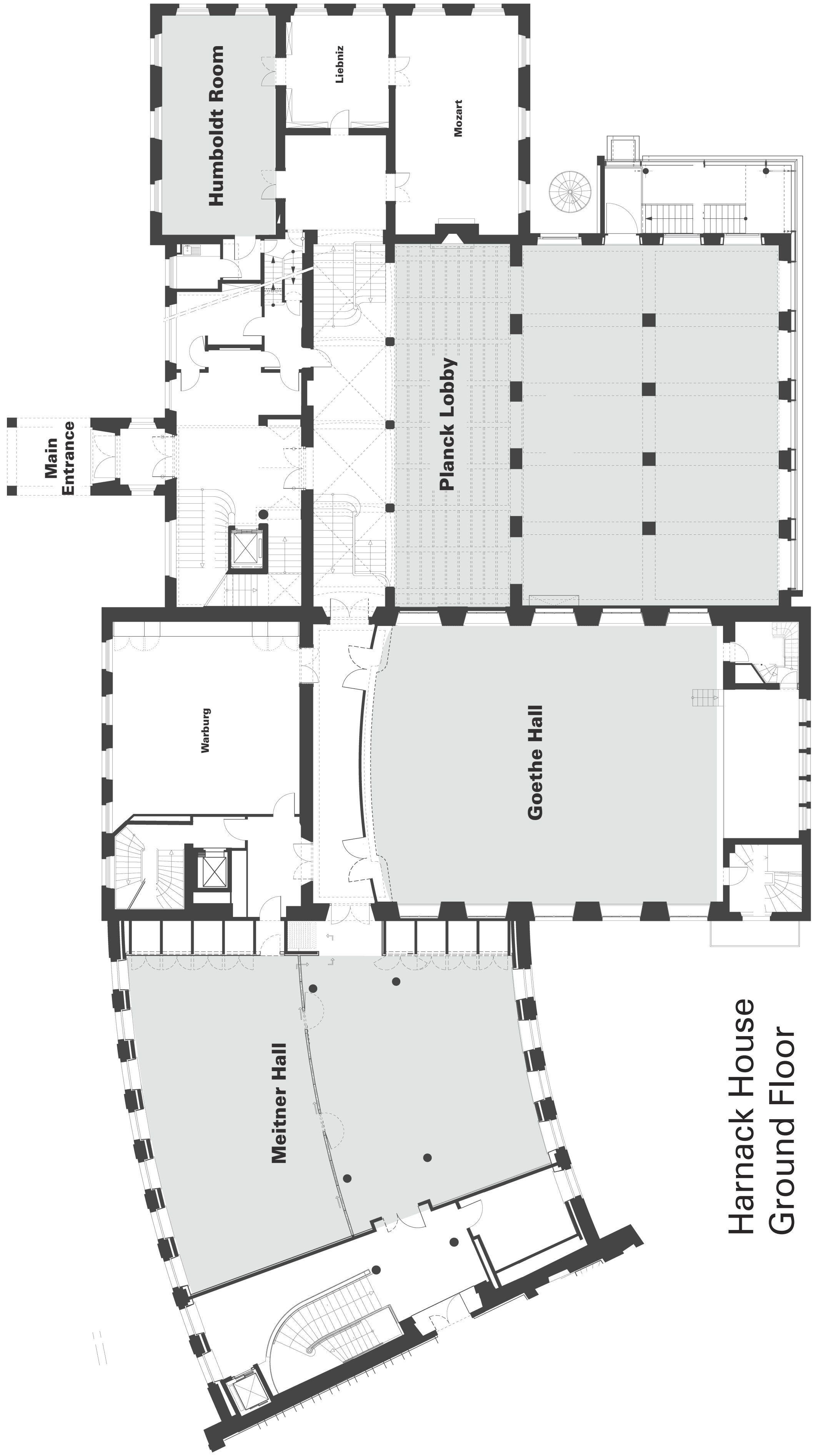
Poster Hours:
12:15 – 1:00 PM   Lunch Break
3:45 PM – 6:00 PM   Poster Session
Removal of all posters by: **7:00 PM** on August 30

Poster Session 2 – Friday, August 31

Poster Set-up:
Friday, August 31: 7:30am – 8:30 AM

Poster Hours:
12:00 – 1:00 PM   Lunch Break
3:45 PM – 6:00 PM   Poster Session
Removal of all posters by: **6:00 PM** on August 31

Congress Venue Floor Plan



Flux Social Functions

Opening Reception
Thursday, August 30

The Opening Reception will take place at the **Planck Lobby & Terrace** from 6:00 – 7:00 PM. Light refreshments will be served, and there will be a cash bar.

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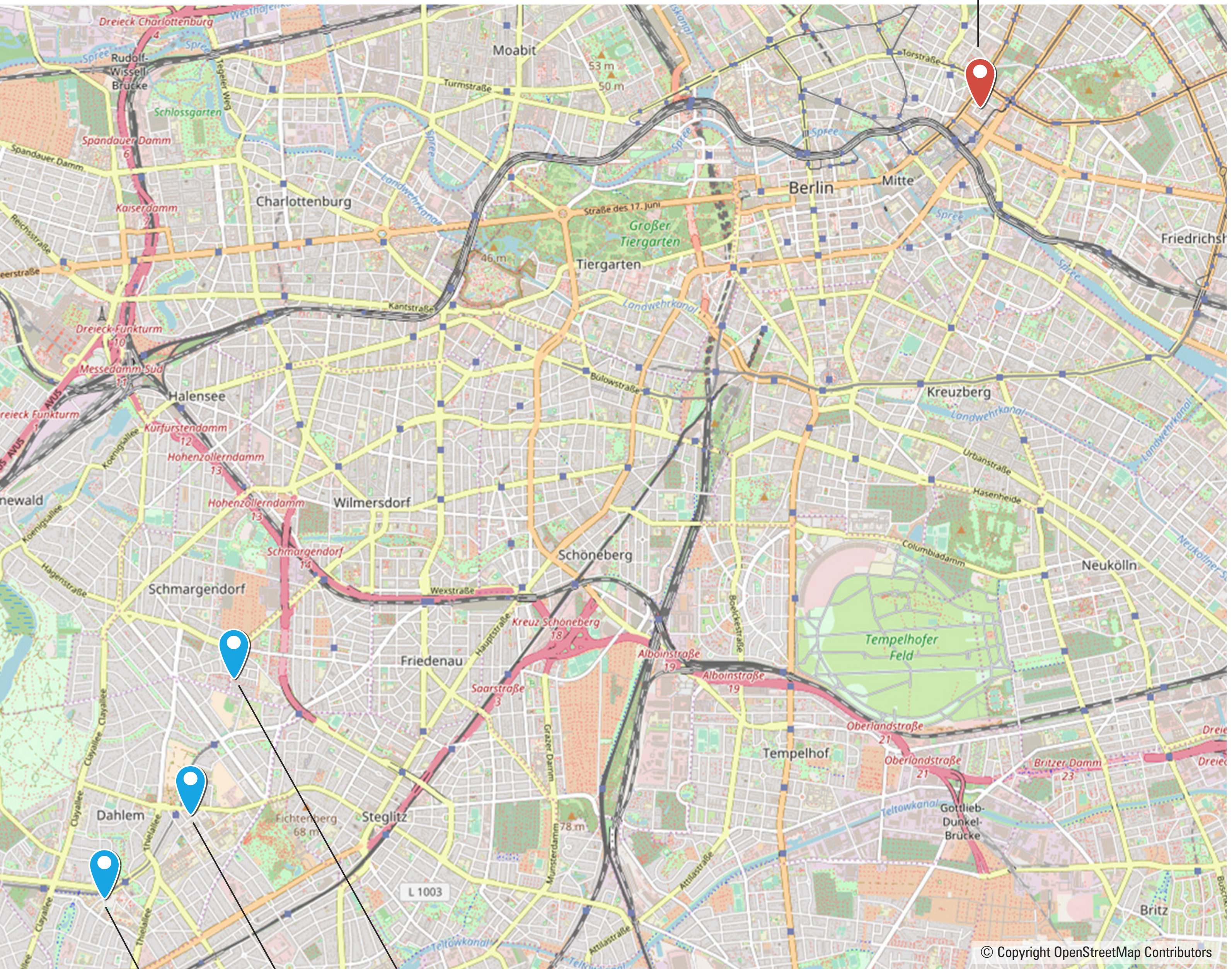
Berlin Venue / Accomodation Locations

Hofbräu Berlin
Karl-Liebknecht-Str. 30



Max Planck Institute for Human Development • Lentzeallee 94

Seminaris Campus Hotel • Takustraße 39

Harnack-Haus (conference venue) • Ihnestraße 16-20

Flux Congress Program Schedule

Day 1 Thursday, August 30

8:00 – 8:30 AM Coffee

8:30 – 9:00 AM **Welcome Comments**
Beatriz Luna University of Pittsburgh, USA
Silvia Bunge University of California at Berkeley, USA

Local Symposium: Plasticity: Integrating microgenetic and ontogenetic perspectives

Chair: **Ulman Lindenberger** Max Planck Institute for Human Development
Discussant: **Martin Lövdén** Karolinska Institutet, Sweden

9:00 – 9:30 AM **The evolution and development of memory engrams**
Tomás Ryan Trinity College Dublin, Ireland

9:30 – 10:00 AM **Set to change? Lifespan factors influencing neurocognitive trajectories and plasticity**
Kristine Walhövd University of Oslo, Norway

10:00 – 10:30 AM **Plasticity during skill acquisition: The expansion–renormalization model**
Elisabeth Wenger Max Planck Institute for Human Development, Germany

10:30 – 11:00 AM Q&A

Jacobs Foundation Symposium on the Science of Learning

Co-chair: **Silvia Bunge** University of California at Berkley, USA
Co-chair: **Bruce McCandliss** Stanford University, USA

11:00 – 11:20 AM **The science of learning mathematics: neurocognitive markers of heterogeneity**
Teresa Iuculano Université Paris - Sorbonne

11:20 – 11:40 AM **Altering developing neural synchrony with cognitive training: mechanisms and transfer**
Duncan Astle University of Cambridge

11:40 – 12:00 PM **Cognitive training and mathematics – the role of interindividual differences**
Torkel Klingberg Karolinska Institutet, Sweden

12:00 – 12:15 PM Q&A

12:15 – 1:00 PM Lunch

Oral Session 1: Learning and plasticity

Chair: **Xiaoqian Chai** Johns Hopkins University

1:00 – 1:30 PM **Cognitive control contributions to learning and memory development in childhood and adolescence**
Yana Fandakova Max Planck Institute for Human Development, Germany

1:30 – 2:00 PM **Environmental effects on learning and memory**
Yee Lee Shing Goethe University Frankfurt

2:00 – 2:15 PM Q&A

Huttenlocher Lecture

2:15 – 3:00 PM **What autism has taught us about mentalising**
Uta Frith University College London

Flash Talks

Chair: **Niko Steinbeis** University College London

3:00 – 3:05 PM **Investigating shared and nonshared factors contributing to variation in temperament development in MZ twins**
Eloise Cameron Murdoch Childrens Research Institute/University of Melbourne

3:05 – 3:10 PM **Attenuated Pavlovian learning biases in adolescence**
Juliet Davidow Harvard University

3:10 – 3:15 PM **Leveraging neural topographies of inhibition and disinhibition to predict trial-by-trial risk taking in adolescence**
Joao Guassi Moreira University of California, Los Angeles

3:15 – 3:20 PM **IQoala-T: A supervised-learning tool for quality control of automatic segmented MRI data**
Eduard Klapwijk Leiden University

3:20 – 3:25 PM **Developmental trajectories of hubness and functional connectivity of the Prefrontal Cortex**
Katherine Lopez Washington University in St Louis

3:25 – 3:30 PM **The bio-behavioral impact of poverty on executive function: A cross-species study**
Rosemarie Perry New York University

3:30 – 3:35PM **Associations between family environment and child brain function and structure are mediated by accelerated pubertal development**
Sandra Thijssen Erasums University of Rotterdam

3:35 – 3:40 PM **Mother-child interactions affect self- and mother-evaluations and self-related brain activation**
Renske van der Cruijsen Leiden University

3:40 – 3:45 PM **Memory development: Complementary roles of the hippocampus and prefrontal cortex**
Qijing Yu Wayne State University

3:45 – 6:00 PM **Poster Session 1**

6:00 – 7:00 PM **Opening Reception**
Planck Lobby & Terrace

Day 2 Friday, August 31

8:00 – 8:30 AM Coffee

Oral Session 2 - Abstract Session

Chair: **Nora Raschle** University Hospital Basel

8:30 – 8:45 AM **Emerging functional specialisation in the ventral occipital cortex of prereaders: An EEG-fMRI study on visual character processing**
Silvia Brem University of Zurich

8:45 – 9:00 AM **The influence of maternal stress during pregnancy on toddlers sleep problems: The role of cortico-cerebellar connectivity in utero**
Marion van den Heuvel Tilburg University

9:00 – 9:15 AM **The role of default network in memory development**
Xiaoqian Chai Johns Hopkins University

9:15 – 9:30 AM **Lifespan developmental differences in the effects of opportunity costs on cognitive effort**
Ben Eppinger Concordia University

9:30 – 9:45 AM **Neural signatures of probablistic reversal learning: a developmental computational modeling approach**
Martin Schulte-Rüther University Hospital RWTH Aachen

9:45 – 10:00 AM **Different developmental trajectories for working memory and reinforcement learning contributions to learning in adolescence**
Linda Wilbrecht University of California, Berkeley

10:00 – 10:20 AM Break

Oral Session 3: Early Experience

Chair: **Moriah Thomason** New York University

10:20 – 10:45 AM **Learning and plasticity across development: Regulation by parents and role of the microbiome**
Bridget Callaghan Columbia University

10:45 – 11:10 AM **Neural plasticity following early-life adversity**
Kate McLaughlin University of Washington

11:10 – 11:35 AM **Characterizing pro-sociality through reward learning**
Youngbin Kwak University of Massachusetts Amherst

11:35 – 12:00 AM Q&A

12:00 – 1:00 PM Lunch

Oral Session 4: Mechanisms

Chair: **J. Bruce Morton** University of Western Ontario

1:00 – 1:20 PM **Neural circuits of working memory and response inhibition in a non-human primate model of adolescence**
Christos Constantinidis Wake Forest University

1:20 – 1:40 PM **Enriched environments and new neurons: The neurobiology of cognitive reserves**
Gerd Kempermann Technische Universität Dresden

1:40 – 2:00 PM **Neuronal mechanisms of performance monitoring and adaptive control**
Markus Ullsperger Otto-von-Guericke-Universität Magdeburg

2:00 – 2:30 PM Q&A

2:30 – 3:00 PM
Young Investigator Award Lecture
A social and cognitive neuroscience approach to understanding adolescents' strengths and vulnerabilities
Leah Somerville Harvard University

My lab's research focuses on the role of neurodevelopment in shaping adolescent-typical behavioral profiles that shed light on their strengths and vulnerabilities. Through the development of new task paradigms, a focus on brain-behavior linkages, and expansion to "big data", we have launched new lines of inquiry that are beginning to explain variability in emotional, social, and decision making behaviors during adolescence. My talk will provide a high-level overview of our aims and approach, and I will highlight key findings from several lines of research spearheaded by talented members of my laboratory.

Flash Talks
Chair: **Jiska Peper** Leiden University

3:00 – 3:05 PM **Restricted and repetitive behavior and brain functional connectivity in infants and toddlers at risk for developing autism spectrum disorder**
Adam Eggebrecht Washington University School of Medicine

3:05 – 3:10 PM **Prosocial behavior is linked to cortical development during adolescence and young adulthood: A longitudinal structural MRI study**
Lia Ferschmann University of Oslo

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3:10 – 3:15 PM **The neurocognitive architecture of fluid ability in children and adolescents**
Delia Fuhrmann University of Cambridge

3:15 – 3:20 PM **Precision functional mapping of an individual child brain**
Scott Marek Washington University in St Louis

3:20 – 3:25 PM **Medial PFC relates to age-related differences in observational reinforcement learning**
Ben Eppinger Concordia University

3:25 – 3:30 PM **Where you lead, I will follow: Observing older sibling risky behavior changes adolescent brain and behavior**
Christina Rogers University of North Carolina at Chapel Hill

3:30 – 3:35 PM **Functional brain connectivity study in children who differ in temperamental self-regulation**
Noelia Sánchez Pérez University of Murcia

3:35 – 3:40 PM **Medial prefrontal cortex supports identification of increasing threat in adolescents**
Sarah Tashjian University of California, Los Angeles

3:40 – 3:45PM **Affective reactivity during adolescence: Differential associations with age, puberty and testosterone**
Nandita Vijayakumar University of Oregon

3:45 – 6:00 PM **Poster Session 2**

7:00 – 10:00 pm **Flux Fun Night** at **Hofbräu Wirtshaus Berlin**.
See General Information section and the map on page 8

Day 3 Saturday, September 1

8:00 – 8:30 AM Coffee

Oral Session 5: Motivation
Chair: **Juliet Davidow** Harvard University

8:30 – 8:55 AM **Changing computations underlying the development of goal-directed behavior**
Cate Hartley New York University

8:50 – 9:20 AM **(under) Representation of cultural diversity and high-risk youth samples in research on adolescent motivational processes**
Eva Telzer University of North Carolina at Chapel Hill

9:20 – 9:45 AM **How multiple memory systems support value-based decisions in adolescence**
Daphna Shohamy Columbia University

9:45 – 10:00 AM Q&A

10:00 – 10:20 AM Break

Oral Session 6: Plasticity and sensitive windows
Chair: **Dylan Gee** Yale University

10:20 – 11:00 AM **Why do sensitive periods exist?**
Willem Frankenhuis Radboud University

11:00 – 11:40 AM **Nature & nurture in neurocognitive development: insights from studies of plasticity in blindness**
Marina Bedny Johns Hopkins University

11:40 – 12:00 PM Q&A

12:00 – 1:00 AM Lunch

Oral Session 7: Developmental Processes
Chair: **Grégoire Borst** Université Paris - Sorbonne

1:00 – 1:35 PM **Plasticity and the plentiful infant learning toolbox**
Dima Amso Brown University

11:35 – 11:40 AM **Mutualistic coupling supports development of cognitive abilities: Findings from three longitudinal cohorts**
Rogier Keivit Cambridge University

1:35 – 2:10 PM Q&A

2:10 – 2:30 PM Break

Oral Session 8: Social Learning

Chair: **Jennifer Silvers** University of California, Los Angeles

2:50 – 3:15 PM **Learning with peers: Neural processing of performance feedback in a social context across adolescence**
Berna Guroglu Leiden University

3:15 – 3:40 PM **Social reward learning: developmental mechanisms and therapeutic opportunities**
Gul Dolan Johns Hopkins University

3:40 – 4:10 PM **How the developing brain comes to understand the mind**
Mark Sabbagh Queens University

4:10 – 4:30 PM Q&A

4:30 – 5:00 PM **Closing Ceremony**

PHOTO BY NATHAN WRIGHT ON UNSPLASH

Flux Congress Oral Presentations

Day 1 Thursday, August 30

Local Symposium

Plasticity: Integrating microgenetic and ontogenetic perspectives

Chair: **Ulman Lindenberger,** Max Planck Institute for Human Development, Berlin, Germany

Discussant: Martin Lövdén Karolinska Institutet, Sweden

Tomás Ryan Trinity College Dublin, Ireland

The evolution and development of memory engrams

How is memory stored in the brain as information? Over the past 5 years, the ability to label, observe, and manipulate specific neuronal ensembles in an activity-dependent manner has allowed us to identify components of specific memory engrams in the rodent brain. This approach has the potential to revolutionize the study of memory, but our knowledge of memory engrams is still in its infancy. I will discuss our research group's ongoing to work to investigate the biology of memory engram formation and information storage. I will describe two recent departures to investigate how engram formation is modulated by development from infancy to adulthood, and how an evolutionary analysis of memory engrams (and their relationship to instincts) may lead to new insights into information storage.

Kristine Walhövd University of Oslo, Norway

Set to change? Lifespan factors influencing neurocognitive trajectories and plasticity

Are we set to change neurocognitively in certain ways? In this presentation, I use magnetic resonance imaging, standardized and experimental cognitive and registry data to show how individual differences in neurocognitive change and plasticity are influenced by factors through the lifespan. A challenge is now to identify the impact of early life factors on later neurocognitive changes and plasticity. Example influences discussed include prenatal environment, genetics and lifestyle variables. Taking factors present at birth into account may further understanding of both the mechanisms at work early in life, and what and how residual variance may be affected by late-life factors.

Elisabeth Wenger Max Planck Institute for Human Development, Germany

Plasticity during skill acquisition: The expansion–renormalization model

Brain volume expansion in task-relevant areas is a common, yet poorly understood finding in studies on human skill acquisition. Lifelong learning is at odds with plasticity as a perpetual process of growth. Drawing on animal models, ontogenetic evidence, and Darwinian theories of neural organization, we propose the expansion-renormalization model of plastic change in humans. The model predicts an initial increase of gray matter, followed by a complete or partial return to volume baseline. We use our own work on motor learning and auditory training to illustrate the model, and discuss its implications for existing evidence and future research

Science of Learning Symposium

Co-chair: **Silvia Bunge** University of California, Berkeley

Co-chair: **Bruce McCandliss** Stanford University

Teresa Iuculano Université Paris - Sorbonne

The science of learning mathematics: neurocognitive markers of heterogeneity

Functional plasticity is a fundamental characteristic of the human brain that lies at the core of its ability to learn new information. Critically, little is known about cognitive- and emotion-related plasticity associated with heterogeneity of mathematical skill acquisition during the early school-years. Here, we combine an intensive 8-week, math cognitive training with task-based functional resonance imaging (fMRI), to assess functional brain plasticity in different cohorts of elementary school children. We show that math training improves performance, and remediates aberrant brain function in a population of 7-9 year olds with Mathematical Learning Disabilities (MLD). Training resulted in significant reduction of over-activation in multiple brain systems important for mathematical cognition encompassing frontal, parietal, and ventral temporal-occipital cortices. Crucially, in typically developing (TD) children, the same training was associated with greater engagement of memory systems anchored in the hippocampus, and concurrent increases in hippocampal-cortical functional connectivity. Finally, in a third study, we show that children with high levels of math anxiety, exhibited significant functional brain changes after the same math cognitive training. Effects were evident in emotion-related circuits anchored in the basolateral amygdala. Together our findings suggest that recruitment of brain systems supporting mathematical learning varies as a function of heterogeneity of cognitive and affective profiles, highlighting potential venues for educational intervention.

Duncan Astle University of Cambridge

Altering developing neural synchrony with cognitive training: mechanisms and transfer

Whether we can enhance cognitive abilities through intensive training is one of the most controversial topics of cognitive psychology. This is particularly controversial in childhood, where aspects of cognition, such as working memory, are closely related to school success and are implicated in numerous developmental disorders. We provide the first neurophysiological account of working memory training using magnetoencephalography (N=27). We borrowed an analysis approach more typically used in other animal models, called phase amplitude coupling. Following training, the coupling between the upper alpha rhythm (at 16 Hz), recorded in superior frontal and parietal cortex, became significantly coupled with high gamma activity (at ~90 Hz) in inferior temporal cortex. This enhancement is consistent with a framework in which slower cortical rhythms enable the dynamic regulation of higher-frequency oscillatory activity related to task-related cognitive processes. We then combined machine learning with a large dataset (N=179) to identify the boundary constraints of this training and subgroups of children with different profiles of response. This multivariate modelling approach highlights that task relationships change following the training - children are recruiting different cognitive mechanisms after the intervention. Furthermore, there are differential response profiles, with different children enhancing different elements of cognition through the training. Importantly group membership is predicted by children's pre-training fluid reasoning skills.

Torkel Klingberg Karolinska Institutet

Cognitive training and mathematics – the role of interindividual differences

Mathematical performance is dependent on learning of maths specific skills, but also correlated with more general cognitive abilities, including non-verbal reasoning, spatial ability and working memory. One would thus assume that enhancing these abilities would improve maths performance. However, working memory training (WMT) studies has shown mixed result, with both negative and positive findings regarding transfer to mathematics.

The explanation for this inconsistency could be that only certain aspects of mathematics benefit from WMT, and/or that inter-individual differences in cognitive performance matter, such that only certain individuals benefit. Support of the latter hypothesis comes from a study of WMT and mathematics, where WMT did not improve maths performance in general, but did so in individuals with higher capacity already at baseline (Nemmi et al. 2016).

In order to investigate the relationship between baseline cognitive performance and the benefit of cognitive training, we analyzed data from 931 children, age 6-8 years, who where randomized into three groups, with training of maths, WMT, non-verbal reasoning or spatial rotation in different proportions. Math tests were performed on the third day of training and after 25 days of training.

Overall, the three groups did not differ in the progress made on the maths tests. However, a cluster analysis on baseline cognitive performance identified four clusters of individuals. These clusters differed significantly in the response to different types of interventions, with lower performing children improving from a mixture of maths+WMT+rotation training and higher performing childrens improving most from a mixture of maths+WMT+non-verbal reasoning.

These results suggests that the effect of cognitive training is dependent on inter-individual differences in cognitive performance. Individual tailoring of cognitive training dependent on traits could lead to substantial improvement in transfer from cognitive training.

Oral Session 1

Learning and plasticity

Chair: **Xiaoqian Chai** Johns Hopkins University

Yana Fandakova Max Planck Institute for Human Development

Cognitive control contributions to learning and memory development in childhood and adolescence

Cognitive control processes play a critical role for scaffolding learning and memory by monitoring and regulating information processing in line with current goals and task demands. These processes are implemented by a core set of frontal and posterior parietal regions and exhibit a relatively protracted development across childhood and adolescence. I will demonstrate how changes in frontal and cingulo-opercular regions support the development of effective monitoring and control, and contribute to improvements in learning and memory performance during development. I will outline ongoing work examining the mechanisms and progression of plasticity in the cognitive control brain network in middle childhood.

Yee Lee Shing Goethe University Frankfurt

Environmental effects on learning and memory

Cognitive and brain development is shaped by individuals' experiences within the environments they live in. I will present two lines of work that aim to better understand the mechanisms through which environmental factors impact children's early development. First, we longitudinally followed children born close to the cut-off date for school entry, who subsequently did or did not enter school that year. With such design, we are examining the effects of formal schooling on neurocognitive development. Second, in the Jacobs longitudinal study, we are investigating the roles of glucocorticoid in translating stress-related social disadvantages into differences in brain and memory development.

Huttenlocher Lecture

Uta Frith University College London

What autism has taught us about mentalising

Some 30 years ago my colleagues and I proposed that the characteristic features of social communication in autistic children could be explained by failure in a cognitive mechanism, termed mentalising - using mental states to predict what an agent is going to do next. We devised strictly matched tasks that do and do not require mentalising, which allowed us and others to identify a mentalising network in the brain. While verbally able autistic adults can perform explicit mentalising tasks using different strategies, their implicit mentalising remains doubtful. The distinction between these two forms of mentalising can inform us about the development of social cognitive abilities.

Flash Talks

Chair: **Niko Steinbeis** University College London

Eloise Cameron Murdoch Childrens Research Institute/University of Melbourne

Investigating shared and nonshared factors contributing to variation in temperament development in MZ twins

Temperament is linked to many other aspects of our lives - educational achievement, mental health conditions, behavior regulation, peer relationships - therefore it's important to investigate how our environments impact this development. However the factors influencing temperament development are largely unknown. Recently, the importance of the nonshared environment on child neurodevelopment has become evident, with the research indicating that an individual's unique environment is important for temperament development. By combining temperament, environmental (such as the twin relationship, parental treatment, unique experiences), and MRI data, we can begin to evaluate how our temperaments/personalities develop and learn what factors are important in brain and temperament development. This study aims to investigate the shared and nonshared contributions of the brain and environment to variation in temperaments of MZ twins aged 9-15 years. Using a co-twin control design, we are collecting self-reported environmental data and MRI data of the brain - specifically structural and diffusion imaging data. We are interested how the properties of neural structures (e.g. gray and white matter volume, cortical thickness or surface area), and diffusion metrics (e.g. white matter microstructure and network connectivity) impact upon both the twin temperaments and variation in twin temperaments.

Juliet Davidow Harvard University

Attenuated Pavlovian learning biases in adolescence

Adolescence is a period rich with new experiences. Learning to engage in rewarding experiences, and avoid punishing ones, relies on multiple systems. Pavlovian learning (cue-outcome) and instrumental learning (cue-action-outcome) are powerful systems for reward and punishment learning. When demands are congruent (approach cue, obtain reward), these systems cooperate; however, when action and outcome valence are opposed (approach cue, avoid punishment), the Pavlovian system can disrupt the instrumental system, reducing learning. The influence of these learning systems under conflict has not been studied over development. N=88 participants 11-22 years old learned from probabilistic reinforcement to execute or withhold a button press (Action) to obtain reward or avoid punishment (Valence). The intersection of these factors is congruent (press to obtain reward, withhold to avoid punishment) or incongruent (press to avoid punishment, withhold to obtain reward). We employed and compared a series of computational models to estimate psychological effects typifying biases in learning. There was an interaction of age on Action-by-Valence learning. To explain, we fit linear and non-linear models of age to a Pavlovian bias model parameter. We found a significant U-shaped fit with lowest Pavlovian influence in late adolescence. This better explained learning than simpler age or computational models, suggesting that during adolescence there is an attenuation of Pavlovian learning biases. This could afford adolescents better instrumental learning when information is in conflict.

Joao Guassi Moreira University of California, Los Angeles

Leveraging neural topographies of inhibition and disinhibition to predict trial-by-trial risk taking in adolescence

While adolescents may differ in their trait risk taking behavior, no one individual takes risks all of the time or none of the time. However, neurodevelopmental studies of risk taking often neglect this intraindividual variability by estimating brain activity averaged over risky & safe decisions. The present study sought to identify what neural computations predict adolescents' moment-to-moment decisions about whether to take risks. 24 youth (Mage=15.8) underwent fMRI while playing the yellow light game (YLG)--an ecologically valid risk-taking task--and the flanker task, an executive function task. Flanker data were used to calculate subject-specific neural patterns of inhibition and disinhibition. Pattern expression analyses were then used to estimate the extent to which trial-by-trial brain activity during the YLG was expressed as patterns of inhibition or disinhibition. We then examined whether such expression could be used to differentiate between trials when a participant made a risky, compared to safe, decision. Results revealed greater neural expression of an inhibition pattern was related to a lower likelihood of making a risky decision ($\gamma=-.61$), whereas greater expression of disinhibition ($\gamma=.93$) was linked with a greater propensity to make a risky decision. Our study is the first to model trial-by-trial fluctuations in risk taking behavior as a function of information expressed in neural topographies. Interestingly, these data suggest the neural code undergirding adolescent risk-taking is best characterized by topographical patterns instead of modular units.

Eduard Klapwijk Leiden University

Qoala-T: A supervised-learning tool for quality control of automatic segmented MRI data

Performing quality control to detect image artifacts and data-processing errors is crucial in structural magnetic resonance imaging, especially in developmental studies. Currently, many studies rely on visual inspection by trained raters for quality control. The subjectivity of these manual procedures lessens comparability between studies, and with growing study sizes quality control is increasingly time consuming. In addition, both inter-rater as well as intra-rater variability of manual quality control is high and may lead to inclusion of poor quality scans and exclusion of scans of usable quality. In the current study we present the Qoala-T tool, which is an easy and free to use supervised-learning model to reduce rater bias and misclassification in manual quality control procedures. First, we manually rated quality of N = 784 FreeSurfer-processed T1-weighted scans. Different supervised-learning models were then compared to predict manual quality ratings. Results show that the Qoala-T tool using random forests is able to predict scan quality with both high sensitivity and specificity (mean area under the curve (AUC) = 0.98). In addition, the Qoala-T tool was also able to adequately predict the quality of a novel unseen dataset (N = 112; mean AUC = 0.95). These outcomes indicate that using Qoala-T in other datasets could greatly reduce the time needed for quality control. More importantly, this procedure could further help to reduce variability related to manual quality control, thereby benefiting the comparability of data quality between studies.

Katherine Lopez Washington University in St Louis

Developmental trajectories of hubness and functional connectivity of the Prefrontal Cortex

The prefrontal cortex (PFC) exhibits a prolonged developmental trajectory extending from childhood to adulthood. Structural and task-based MRI studies have suggested that different PFC regions exhibit distinct age-related changes into adulthood. Less is known about developmental variations in resting-state functional connectivity (RSFC) and network topology of functionally defined PFC subdivisions, with many studies examining select PFC regions (e.g. VMPFC only). We sought to integrate graph theory and seed-based analyses to characterize age-related changes in both hubness and RSFC patterns associated with different PFC regions. Using Power et al. 2010 parcellations, we selected 30 PFC seeds, covering lateral and medial regions of the dorsal, ventral, and orbital PFC. 615 individuals (8-21 years old) from the Philadelphia Neurodevelopmental Cohort dataset were examined to investigate linear and non-linear (e.g. quadratic, cubic) age-related effects of degree centrality (DC), participation coefficient (PC), and RSFC profiles associated with each seed. Findings demonstrated that the DLPFC and VLPFC displayed exponential decreases in hubness ($p<.001$) while the OLPFC exhibited linear decreases. Differences in age-related hubness trajectories were explained by variations in RSFC profile with different networks. All regions, however, consistently exhibited decreasing connectivity with the DMN as a function of age. Of these regions, DC of the DLPFC and VLPFC predicted complex cognition, which itself exhibited exponential improvements throughout development.

Rosemarie Perry New York University

The bio-behavioral impact of poverty on executive function: A cross-species study

Children in high-poverty homes lag behind their higher income peers in neurocognitive indicators of school readiness, such as executive function (EF). However, the mechanisms by which poverty can increase the risk of EF difficulties are unclear. Here we present findings from a cross-species human and rodent study, exploring relations between early-life environments of scarcity-adversity and EF bio-behavioral outcomes in peri-adolescence. Human data come from the Family Life Project, a population-based longitudinal sample (n=1292), which oversampled for impoverished families. In peri-adolescence, EF was assessed using a battery of working memory, inhibition and attention shifting tasks. Rodent data come from a model of early-life scarcity, where rodent mothers were provided with insufficient materials so they could not build a proper nest for their pups. Human results demonstrated a link between early-life poverty exposure and EF impairments in peri-adolescence. Rodent results revealed that scarcity-reared peri-adolescent rodents displayed EF impairments, with evidence of upregulated glucocorticoid receptor levels in the medial prefrontal cortex. Following an intervention in which scarcity-reared rats were co-housed with a control rat, scarcity-reared rats did not demonstrate deficits in EF. Overall, human and rodent results indicate process similarities in terms of scarcity-adversity and EF outcomes. Results provide implications for how early-life adversity disrupts cognitive skills, which are vital to classroom learning and academic achievement.

Sandra Thijssen Erasmus University of Rotterdam

Associations between family environment and child brain function and structure are mediated by accelerated pubertal development

Psychosocial Acceleration Theory suggests that pubertal maturation is accelerated in response to adversity. Evidence suggests that development of the amygdala-medial prefrontal cortex (Am-mPFC) circuit is accelerated following suboptimal care. It is unclear if these findings are related. Here, we assess whether associations of family environment (FamEnv) and Am-mPFC circuit are mediated by pubertal development in 9-10 y.o. children. This study includes 2000+ participants from the Adolescent Brain Cognitive Development Study, a prospective population-based United States cohort (http://dx.doi.org/10.15154/1412097). Using Structural Equation Modeling, three latent variables (LV): demographic and parent information, child reported, and parent reported data on family dynamics were compiled into a higher-level FamEnv LV (RMSEA = 0.04). Image processing and analysis were performed by the ABCD consortium. Cingulo-opercular network (CON)-Am RS functional connectivity (FC), anterior cingulate cortex (ACC) thickness (CT), and fractional anisotropy (FA) were used. Mediation models were controlled for age, race, sex, site, and total brain volume. For left CON-Am FC, ACC CT, and ACC FA, significant indirect effects were found ($p = .012$, $p = .007$, $p = .015$). For right CON-Am FC, a significant total ($p = .041$), but no significant (in)direct effects were found. Despite small effect sizes, structural and functional connectivity of circuits important for emotional behavior are distinct in the context of family environment and associated with accelerated pubertal development.

Renske van der Cruijsen Leiden University

Mother-child interactions affect self- and mother-evaluations and self-related brain activation

Self-concept development in adolescence has been linked to activity in cortical midline areas. Little is known about how these regions are involved in assigning traits to family members: an important question, given that adolescence is characterized by changes in mother-child relationships. Here, we studied the relation between mother-child interactions (warmth, negativity, emotional support) and views of self and mother, and we tested for relations with brain activation for thinking about self and mother. Participants (n=143, 11-20y) performed trait evaluations in an fMRI study, where they indicated to what extent a trait described themselves (self task) or their mother (mother task) on a scale of 1 (not at all) to 4 (completely). Results showed that both mothers and children displayed more negativity and less warmth when the child was 15-16 years old (mid-adolescent dip). Mother-child interactions were not related to positivity of the child about themselves or their mothers. However, mothers were more positive about warm children. Brain activation in adolescents for self- and mother-evaluations versus a control task, overlapped in mPFC, right TPJ and right DLPFC. Follow-up ROI analyses showed that with more negativity in mothers, adolescents engage right DLPFC stronger for mother-evaluations. When mothers show more warmth, adolescents engage less right TPJ for mother-evaluations, and more left DLPFC for self-evaluations. These findings show evidence for a neurobehavioral change in mother-relations and trait evaluations, with a potential role of mother-child attachment.

Qijing Yu Wayne State University

Memory development: Complementary roles of the hippocampus and prefrontal cortex

Episodic memory undergoes robust development during childhood and depends on the function of the hippocampus (HC) and prefrontal cortex (PFC). Only limited evidence specifically links individual differences in HC and PFC structure to memory function in children. Here we examined the relation between individual differences in HC subfields and PFC volumes to measures of episodic memory. We assessed episodic memory using a novel paradigm in which we vary the degree of similarity across stimuli and the type of recognition memory. Thirty-five 5-to-6-year-olds (mean age=6.20, N=35, 40% females) studied stimuli consisting of multiple exemplars from a single category ('within-category') intermixed with single exemplars from different categories ('across-category'), and their memory was later tested by yes/no recognition (Y/N) and 2AFC. Memory tested through Y/N for 'within-category', was related to the volumes of HC subfield CA3-DG ($r=-0.36$, $p=0.04$), but not to other HC subfields or to PFC volumes. Memory tested through Y/N for 'across-category' stimuli was related to CA3-DG, CA1-2, and Subiculum volumes and to PFC volumes. In contrast, memory tested with 2AFC, was uniquely related to volumes of the lateral PFC, for both 'within-category' ($r=-0.43$, $p=0.01$) and 'across-category' ($r=-0.42$, $p=0.02$) stimuli conditions. These findings suggest that in young children, CA3-DG uniquely supports memory that requires representation of fine details, whereas PFC supports memory that relies on successful evaluation and decision-making.

Day 2 Friday, August 31

Oral Session 2

Abstract Session

Chair: Nora Raschle University Hospital Basel

Silvia Brem University of Zurich

Emerging functional specialisation in the ventral occipital cortex of prereaders: An EEG-fMRI study on visual character processing

The ventral occipitotemporal (vOT) cortex serves as a core region for visual processing. Distinct patches show preferential activation for processing different visual categories such as faces, print, or numbers. The emergence of such functional specialization in the human cortex represents a pivotal developmental process, which sets the basis for targeted and efficient information processing. However, it remains largely unclear, how such functional specialisation in the human cortex emerges during child development. Methods Neural correlates of print processing were tracked with simultaneous high-density electroencephalography and functional magnetic resonance imaging in 18 pre-reading children (aged 6.7±0.36y). The effect of varying expertise to characters on neural activation was examined, firstly, by training false font-speech sound associations, and secondly, by comparing characters differing in the expertise acquired through abundant exposure in the everyday environment (digits, letters, false fonts). Results We found a training performance and expertise dependent activation of the visual event-related potential around 220ms (N1) and of the corresponding vOT BOLD response. Furthermore, functional connectivity between the vOT and left inferior parietal regions was increased with regard to better training performance. Conclusion To summarize, our results demonstrate that learning enhances preferential activation for characters in the vOT and emphasize the critical role of the rapidly emerging connectivity during specialisation.

Marion van den Heuvel Tilburg University

The Influence of maternal stress during pregnancy on toddlers sleep problems: The role of cortico-cerebellar connectivity in utero

Background. Child sleep disorders are increasingly prevalent in the USA and identifying early predictors of sleep problems, starting in utero, is of critical importance for early prevention. Here, we investigated whether toddlers prenatally exposed to maternal psychological stress experience increased sleep issues in an at-risk sample from Detroit, MI. Next, we investigated whether altered fetal functional connectivity mediates this association. Since the cerebellum is particularly sensitive to prenatal influences and cerebellar dysfunction is frequently implicated in sleep disorders, we focus on cortico-cerebellar connectivity. Method. Pregnant women (N=64) underwent fetal fMRI and completed questionnaires about psychological stress. Connectivity of three cerebellar hubs that were reported previously (van den Heuvel et al., 2018, DCN) were investigated. At age 3 years, mothers reported on child sleep issues using the CBCL. Results. Higher maternal prenatal stress was associated with increased sleep issues ($r=.295$, $p<0.018$). Additionally, we found a significant association between maternal prenatal stress and decreased cerebellar-insula connectivity for all 3 hubs ($k=15$, $p<0.01$). However, bootstrap analyses did not confirm mediation. Conclusion. Our results indicate that sleep disturbances in early childhood may have fetal origins. However, fetal cortico-cerebellar connectivity did not mediate the association between prenatal exposure to maternal stress and postnatal sleep issues. The search for underlying mechanisms should be continued and extended to other brain areas.

Xiaoqian Chai Johns Hopkins University

The role of default network in memory development

The default network has been shown to be involved in autobiographic memory. Previous research in adults suggest an "encoding-retrieval flip" of the default network in memory. During successful memory encoding, the default network is suppressed. During successful recall, the posterior part of the default network is activated. Hippocampus couples with the default network during recall but not during encoding. We investigated the encoding/retrieval dynamics of the default network during development in participants 8 to 24 years of age in a series of memory experiment. During memory encoding, we found that in adults, items that were later remembered deactivated the default network more than items that were later forgotten. However, default network regions in Children did not differentiate remembered and forgotten trials. This finding was replicated in multiple datasets. In a cued recall experiment, adults showed positive engagement of the default network: the posterior regions were more activated for successfully recalled items compared to forgotten items. Children again did not show different activation levels in these regions between remembered versus forgotten trials. Hippocampal activations in children were similar in children and adults for both encoding and retrieval. Conclusion: These results suggest that the default network in children has not fully come online for episodic memory processes, instead, children might rely on the hippocampal system during successful memory processes.

Ben Eppinger Concordia University

Lifespan developmental differences in the effects of opportunity costs on cognitive effort

Previous work suggests that lifespan developmental differences in cognitive control abilities might be due to maturational and aging-related changes in prefrontal cortex functioning. However, there are also alternative explanations: For example, it could be that children and older adults differ from younger adults in how they balance the effort of engaging in control against its potential benefits. In this work we assume that the degree of engagement in cognitive effort depends on the opportunity cost of time (average reward rate per unit time). If the average reward rate is high, subjects should speed up responding whereas if it is low, they should respond more slowly. Developmental changes in opportunity cost assessments may lead to differences in the sensitivity to changes in reward rate. To examine this hypothesis in children, younger and older adults, we use two well-established cognitive control tasks, an Erikson Flanker and a task-switching paradigm with a reward rate manipulation. Descriptive analyses show impairments in cognitive control in children and older adults compared to younger adults during task switching, but not during conflict monitoring. In both tasks reward magnitude modulates cognitive control. That is, subjects respond faster and are more error-prone when reward is high compared to when it is low. However, these effects don't differ as a function of age. In future computational analyses we will focus on the effects of average reward rate rather than reward magnitude on lifespan age differences in cognitive control engagement.

Martin Schulte-Rüther University Hospital RWTH Aachen

Neural signatures of probablistic reversal learning: a developmental computational modeling approach

Cognitive flexibility is essential to navigate through an ever-changing environment and can be examined using reversal learning (RL) tasks. Although computational modeling is increasingly used to infer psychological mechanisms in cognitive neuroscience, developmental approaches are still scarce. We investigated 18 typically developing (TD) children (8 - 12 years of age) and 18 TD adolescents (13 - 18 years of age) using a probabilistic reversal learning task with either social or individualized feedback during fMRI scanning, and additional runs outside the scanner. Behavioral responses were modeled in two variants of a Hierarchical Gaussian Filter (HGF) model and a simple Rescorla-Wagner learning model. The results suggest that children make more overall and regressive errors, while less perseverative errors than adolescents. Behavioral responses were best explained by an HGF model containing the volatility parameter omega (which was significantly smaller in children than in adolescents). This may indicate that children have a bias towards updating their estimation of the prediction strength for a rewarding outcome slower than adolescents, resulting in less efficient learning in the context of an unstable, switching environment. The decision parameter was correlated with an index of stereotypical behavior (SRS-RBB), suggesting a relation between inflexible behavioral patterns and reduced exploration behavior. Analysis of the fMRI data are currently conducted and will be presented and discussed at the meeting.

Anne Collins University of California Berkeley

Different developmental trajectories for working memory and reinforcement learning contributions to learning in adolescence

Multiple neurocognitive systems contribute simultaneously to human decision making and learning. For example, the striatum uses dopamine signaling to slowly learn from rewards which choices are most valuable, a form of reinforcement learning. Prefrontal cortex (PFC) executive functions contribute other computations, such as actively maintaining single trial information in working memory or signaling a need to switch strategy. How the systems work together is not well understood. We investigate the developmental trajectory of their contributions to learning across adolescence. We predicted that behaviors dependent on striatal function would stabilize earlier than those dependent on PFC. We collected measures of learning in 180 youth (ages 8-17 years) and 53 adults (ages 25-30) using four reward learning tasks, including a task designed to separate out contributions of working memory from reinforcement learning. We used computational modeling to identify individual markers of working memory and reinforcement learning. Contrary to our prediction, we found no effect of age on working memory. However, we found strong effects of age on reinforcement learning processes: learning rates increased linearly with age. Furthermore, younger participants were also significantly more likely to neglect negative feedback. These results shed new light on the developmental science of learning in adolescence: children showed adult level of working-memory contributions to learning, and their weaker overall performance was linked to reinforcement learning, rather than executive processes.

Oral Session 3
Early Experience

Chair: **Moriah Thomason** New York University

Bridget Callaghan Columbia University

Learning and plasticity across development: Regulation by parents and role of the microbiome

Parents, shape the maturation of our brain and body along trajectories that end in health or illness. Understanding the neurobiology of these parental influences is critical for improving child outcomes in physical and mental health domains. Using a cross species translational framework (rodents and humans), I will describe how exposure to parental deprivation influences the development of emotion behavior and related circuitry, as well as the incidence of physical symptoms that are highly comorbid with emotional disorders – gastrointestinal distress. I will then analyze the role of gastrointestinal bacteria (the microbiome) as a regulator of mental and physical distress in development.

Kate McLaughlin University of Washington

Neural plasticity following early-life adversity

Exposure to early-life adversity is associated with altered neural development across multiple networks. Prior work has examined a wide range of adverse early experiences ranging from abuse and neglect to chronic poverty, often implicitly assuming that these different types of experiences influence neural development through the same underlying mechanisms. This talk presents a conceptual model distinguishing between adverse experiences involving threat (e.g., violence) from those involving deprivation (e.g., neglect) and reviews evidence for domains of neural development that are differentially influenced by these types of experiences as well as networks that are impacted similarly by multiple forms of early-life adversity.

Youngbin Kwak University of Massachusetts Amherst

Characterizing pro-sociality through reward learning

Pro-sociality, a behavioral tendency to benefit others, is ubiquitous in humans as well as in the animal kingdom. The nature of pro-sociality has been studied extensively in behavioral economics using single-shot games, which gives an explicit measure of preference. This talk will introduce an implicit measure of pro-sociality expressed during a dynamic card game task during which one can earn monetary rewards for oneself and others. I will talk about how the choice and ERPs during task performance captures the differential sensitivity to rewards directed to self and others.

Oral Session 4
Mechanisms

Chair: **J. Bruce Morton** University of Western Ontario

Christos Constantinidis Wake Forest University

Neural circuits of working memory and response inhibition in a non-human primate model of adolescence

Executive functions mature late in life, in adolescence or early adulthood, and may be enhanced even in adulthood through cognitive training. Little is known about how the activity of the prefrontal cortex is modified so as to mediate such cognitive changes. To address this question, my laboratory has performed a series of experiments recording activity in adolescent and adult monkeys. Comparing neural activity between adolescent and adult animals revealed unchanged representation of visual stimuli, increased activation during working memory, but decreased representation of distracting stimuli. These results reveal the nature of changes in neural activity that underlie cognitive enhancement in development.

Gerd Kempermann Technische Universität Dresden

Enriched environments and new neurons: The neurobiology of cognitive reserves

"Enriched environments" represent an experimental paradigm that allows to dissect the manifold interactions between genes and environment and how these in turn affect brain structure and function over the course of life. The regulation of adult hippocampal neurogenesis by environmental enrichment is a prime example of this interaction. Because individual animal in an enriched environment have a slightly different experiences differences between individuals will arise. Enrichment thus not only provides rich extrinsic stimuli but becomes a trigger of activity-driven individual experience as the basis of brain plasticity.

Markus Ullsperger Otto-von-Guericke-Universität Magdeburg

Neuronal mechanisms of performance monitoring and adaptive control

Monitoring for erroneous and unexpected action outcomes is essential to determine when adaptation is needed to optimize goal achievement. Building on current theories relating performance monitoring to reinforcement learning mechanisms, I will discuss which signals are represented in a key region of performance monitoring, the posterior medial frontal cortex, and how they relate to adaptation. Thereafter, I will present neuroimaging and invasive and non-invasive electrophysiological studies in humans addressing post-error adjustments. Furthermore, based on lateralized beta power over motor cortices which reflects the dynamics of decision formation I will address the currently debated question whether post-error slowing is adaptive or rather disruptive for subsequent performance.

Young Investigator Award Lecture

A social and cognitive neuroscience approach to understanding adolescents' strengths and vulnerabilities

Leah Somerville Harvard University

My lab's research focuses on the role of neurodevelopment in shaping adolescent-typical behavioral profiles that shed light on their strengths and vulnerabilities. Through the development of new task paradigms, a focus on brain-behavior linkages, and expansion to "big data", we have launched new lines of inquiry that are beginning to explain variability in emotional, social, and decision making behaviors during adolescence. My talk will provide a high-level overview of our aims and approach, and I will highlight key findings from several lines of research spearheaded by talented members of my laboratory.

Flash Talks

Co-chair: **Jiska Peper** Leiden University

Adam Eggebrecht Washington University School of Medicine

Restricted and repetitive behavior and brain functional connectivity in infants and toddlers at risk for developing autism spectrum disorder

Restricted and repetitive behaviors (RRBs) are detectable by 12 months (mo) in many infants later diagnosed with autism spectrum disorder (ASD). The aim of this study was to elucidate the brain functional connectivity (fc) underlying the emergence of these key behaviors. Behavioral and resting-state fcMRI data were collected from 167 children at high and low familial risk for ASD at 12 and 24 mo (15 met criteria for ASD at 24 mo). We divided RRBs into four subcategories (restricted, stereotyped, ritualistic/sameness, and self-injurious behavior) and identified functional brain networks associated with the development of each RRB subcategory. Severity of ritualistic/sameness behavior was associated with reduced fc between visual and control networks at both 12 and 24 mo. Ritualistic/sameness and stereotyped behaviors were associated with reduced fc between visual and default mode networks at 12 mo. At 24 mo: 1) stereotyped behavior was associated with increased fc between dorsal attention and subcortical networks; 2) stereotyped and restricted behaviors were each associated with increased fc between default mode and control networks; and 3) restricted behavior was associated with increased fc between default mode and dorsal attention networks. No significant brain-behavior relationships were observed for self-injurious behavior. These observations mark the earliest known description of functional brain systems underlying RRBs, reinforce the construct validity of RRB subcategories in infants, and implicate specific neural substrates for future interventions targeting RRBs.

Lia Ferschmann University of Oslo

Prosocial behavior is linked to cortical development during adolescence and young adulthood: A longitudinal structural MRI study

How prosocial behavior relates to cortical development is a largely unstudied question. Prosociality relates to desirable developmental outcomes (e.g. peer acceptance), while lack of prosociality has been associated with several neurodevelopmental disorders (e.g. ADHD). Mapping the biological foundations of prosociality may thus aid understanding of both normal and abnormal development. Here, relations between prosociality, as measured by the Strengths and Difficulties Questionnaire (self-report), and changes in cortical thickness (CT) were examined using mixed-effects models (controlling for sex) in 169 healthy individuals (92 females) aged 12-26 with repeated MRI from up to 3 time points, at approximately 2-year intervals (301 scans). In right temporal cortices, right angular gyrus and frontal regions in both hemispheres, higher overall scores on prosociality (i.e. across time points) were associated with accelerated thinning at younger ages, followed by attenuation of this process at higher ages. Lower scores related to initially slower cortical thinning, which was followed by pronounced protracted thinning into the second decade of life. This study shows that prosociality is related to regional development of CT in adolescence and young adulthood. The results suggest that the rate of cortical thinning in these regions, as well as its timing, are key factors in the development of prosociality. The temporal characteristics of cortical maturation in these regions may also be implicated in the onset of neurodevelopmental disorders.

Delia Fuhrmann University of Cambridge

The neurocognitive architecture of fluid ability in children and adolescents

Objective: Fluid ability (gf) is the capacity to solve novel problems in the absence of task-specific knowledge. It is highly predictive of outcomes like educational attainment and psychopathology. Despite years of investigation, our understanding of how gf relates to other cognitive functions and brain structure remains limited. Here, we modeled the association between gf, working memory, processing speed, and white matter microstructure (fractional anisotropy) in two large, publicly available samples: CALM (N=551, aged 5-17) and NKI-RS (N=342, aged 6-17). Methods: We used multivariate Structural Equation Modeling (SEM) and SEM Trees to test a preregistered Watershed model of gf, which predicts a hierarchy of partially-independent effects: White matter is proposed to contribute to working memory capacity and processing speed, which, in turn, contribute to gf. Results: We found that the Watershed model fit the data well for both samples. White matter (particularly the superior longitudinal fasciculus), contributed to working memory and processing speed, which, in turn, contributed to gf ($R2$(CALM)=51.2%, $R2$(NKI-RS)=78.8%). SEM Trees showed that the relationship between cognitive abilities and white matter shows a dip in strength around ages 7-12. Speculatively, this age-effect may reflect a reorganization of the neurocognitive architecture in late childhood and early adolescence. Conclusion: These results highlight that gf is not a unitary construct. Instead, gf likely reflects a hierarchical, many-to-one mapping of partially independent neurocognitive building blocks.

Scott Marek Washington University in St. Louis

Precision functional mapping of an individual child brain

Recent studies collecting large quantities of resting state functional connectivity (RSFC) fMRI data (precision functional mapping) have discovered that functional brain networks are dominated by both common organizational principles across individuals, as well as stable individual-specific features, which are obfuscated in group-average studies. Importantly, standard 5-15 minute RSFC data acquisition results in low levels of reliability within individuals, obscuring these stable individual features. Thus, large group-average developmental studies collecting small quantities of data per individual cannot reveal stable individual features of RSFC development. To test feasibility of this precision functional mapping approach in children, and to elucidate similarities and differences in RSFC in development compared to adulthood, we collected 6 hours of RSFC data (12, 30-minute sessions; 3,10 minute runs per session) in a 9yr. old boy. The Midnight Scan Club (MSC) dataset was used as an adult benchmark (n=10 healthy adults, 5 hours of RSFC data per individual). We found reliable, adult-like functional brain networks in an individual child, as well as individual variants. Child RSFC shared common variability with adult RSFC, as well as measurable individual specificity. Accurate characterization of reliable individual RSFC is critical to furthering our understanding of the contribution of functional brain networks to typical and atypical cognitive development.

Julia Rodriguez Buritica Freie Universität Berlin

Medial PFC relates to age-related differences in observational reinforcement learning

Childhood is considered an important phase in life for social development and learning. An important type of social learning is observational learning (OL) that can be beneficial in addition to learning from own outcomes. OL is thought to occur through neurobiological learning signals signaling the difference between expected and observed outcomes. Until now, the developmental changes in these learning signals remain elusive. In a fMRI experiment we investigated the behavioral and neurobiological changes underlying individual and observational learning in thirty 8-10-year-olds and thirty18-20-year-olds using a probabilistic reward-based OL task. Results showed that learning was more optimal for both age groups in the OL (i.e., other's actions and outcomes observable) than the individual learning condition (i.e., neither other's actions nor their outcomes observable), although adults learned better in general. Reinforcement learning models were used to determine prediction-errors (PE's) to own and other's feedback. Model-based parametric fMRI analyses revealed that activity in the striatum and medial PFC predicts learning from observation and signals an observational PE particularly when other's outcomes are worse than expected. Moreover, children showed a less pronounced observational PE in the medial PFC, which mediated an age-related improvement in OL. Here, we thus reveal a computational mechanism driving OL across development. This framework suggests that regions involved in social cognition may help to beneficially incorporate other's outcomes for own behavior.

Christina Rogers University of North Carolina at Chapel Hill

Where you lead, I will follow: Observing older sibling risky behavior changes adolescent brain and behavior

OBJECTIVE: Older siblings can be a salient influence on adolescent risk-taking through deviancy training, a process through which risky behaviors are learned. Although sibling influence predicts adolescent risk-taking behavior above and beyond the effects of parents and peers, no study has examined the neural processes underlying social learning from older siblings on the neurobiology of adolescent risk-taking. METHODS: The sample included 40 families with a focal adolescent (Mage=12.19 years; 22 females) and an older sibling within 4 years of age (Mage=14.63 years; 18 females). Participants completed the Yellow Light Game, a risk-taking task adapted from the Stoplight Game, during fMRI. Older siblings completed the task first, which was recorded. The focal adolescent completed 4 scans: playing two rounds, observing their older sibling's recorded performanced, and playing a final round. RESULTS: After observing their older sibling's risk-taking performance, adolescent's risk-taking behavior became significantly more similar to their older sibling's risk-taking behavior, suggesting that social learning occurred. At the neural level, this social learning process occurred via increased activity in the ventromedial prefrontal cortex. CONCLUSION: This is the first study to show that adolescents socially learn to take risks from older siblings, at the level of behavior and brain, suggesting that social learning engages brain regions associated with valuation and decision-making.

Noelia Sánchez Pérez University of Murcia

Functional brain connectivity study in children who differ in temperamental self-regulation

This study addresses the functional brain connectivity differences in children who differ in temperamental self-regulation. Parents of 71 children (38 boys; age = 9 ± 1.2) reported self-regulatory and reactivity (reversed) scales from the Temperament in the Middle Childhood Questionnaire (Simonds & Rothbart, 2006), and according to their scores children were classified as high or low in self-regulation (SR) skills. Echo-planar neuroimaging at rest was performed within a 1.5 T magnetic scanner. Age-corrected group differences in functional connectivity were observed within two self-regulation related networks: the Orbitofrontal Cortex (OFC), and the anterior default mode network (aDMN). The anterior cingulate cortex (aDMN) and the frontal pole (OFC) clusters resulted more disconnected in low- compared to high-SR children. Seed based functional connectivity analyses showed that the well-stablished anti-correlation between aDMN and task-related areas was reduced in low-SR children. Moreover, low-SR children showed a reduced connectivity between the OFC cluster and secondary visual areas. The results revealed that children who differed in SR showed differences in functional connectivity in areas related to executive attention. The reduced anti-correlation between aDMN cluster and task-related areas in children with poorer SR abilities might be interpreted as a biological marker of their difficulty to control their attention and their behavior. These findings contribute to our knowledge of the neural basis underlying individual differences in temperamental self-regulation.

Sarah Tashjian University of California, Los Angeles

Medial prefrontal cortex supports identification of increasing threat in adolescents

Facial expressions are one of the most salient cues from which we derive social information. During adolescence, cognitive skills that support evaluation of social threat improve due to ongoing neurobiological and socioemotional changes. We examined individual differences in neural activation as participants were presented with face images that morphed from not threatening to increasingly threatening. During functional magnetic resonance imaging (fMRI), 47 adolescents (21 male; MAge=15.87) made binary judgments (threatening or not threatening) for each face image presented in a series. The faces varied along established dimensions of threat (Oosterhof & Todorov, 2008) yielding stimuli ranging in threat valence from 1-7 (least to most threatening). Behavioral discrimination index scores were calculated for each participant representing that participant's tendency to classify faces as threatening or not during the task (threat bias). Participants demonstrated a linear increase in threat bias as faces morphed along the threat continuum, $p < .001$. Analyses using linear parametric modulation along the threat continuum identified significant activation in the medial prefrontal cortex (mPFC) to faces > baseline, $Z > 2.3$, $p < .05$, corrected. These findings demonstrate that the mPFC is sensitive to subtle variations in perceived threat during adolescence. Results expand our understanding of the neural systems related to threat judgments of ambiguous facial stimuli and extend previous research on the mPFC as a relevant hub of social information processing during adolescence.

Nandita Vijayakumar University of Oregon

Affective reactivity during adolescence: Differential associations with age, puberty and testosterone

Along with the biological changes triggered by puberty, adolescence is characterized by significant changes in affective processes and related brain function. The current study is the first in the field to examine nonlinear relationships between puberty and neural responses to affective facial stimuli using a longitudinal sample, with up to three repeated assessments, between early and late adolescence (N=83, Age=9-18 years). At each of the assessments (mean ages: 10, 13 and 16 years), participants completed a fMRI task of passively viewing affective facial stimuli, the Pubertal Development Scale and provided a sample of saliva, which was assayed for testosterone. Changes in neural response were related to age, pubertal stage and testosterone using multilevel modelling. Sex differences in development were examined. We found extensive inverted-U shaped changes in subcortical (amygdala and hippocampus) and prefrontal reactivity with pubertal maturation. Sex differences in age- and puberty-related development were prevalent in regions subserving social and self-evaluative processes. In females, testosterone-related changes exhibited minimal overlap with puberty- and age-related changes. In males, considerable similarities between the three indices were present in motor and occipital cortices, but contrary to hypotheses, testosterone did not appear to drive extensive limbic and prefrontal changes. These findings highlight differential roles of age and puberty on socioemotional development in males and females, suggesting potentially unique biological and environment influences.

Day 3 Saturday, September 1

Oral Session 5
Motivation

Chair: **Juliet Davidow** Harvard University

Cate Hartley New York University

Changing computations underlying the development of goal-directed behavior

Reinforcement learning models have provided a fruitful framework for understanding the different ways in which individuals learn to distinguish rewarding actions from those that are best avoided. To date, these models have primarily been leveraged to better understand reward learning in adults. In this talk, I will present studies characterizing developmental changes from childhood to adulthood in the reinforcement learning processes that support goal-directed behavior. I will propose that the cognitive representations and computations engaged during reward learning exhibit age-related changes and outline a provisional model of the changes in the brain underpinning these developmental shifts.

Eva Telzer University of North Carolina at Chapel Hill

Differential behavioral and neural processes in high-risk youth with conduct problems

Significant neuroimaging work has revolutionized our understanding of risky behaviors in adolescence. However, previous work has primarily examined community samples of relatively low-risk youth, leaving questions about how generalizable these results are to adolescents actively engaging in the high-risk behaviors. In this talk, I will present data from several studies showing that high-risk adolescents show qualitatively different behavioral and neural processing during both cognitive control and risk-taking tasks, underscoring the need to incorporate high-risk samples in our research to better inform our understanding of adolescent neurocognition. These findings suggest that inferences based on research from community samples of adolescents may not reflect the neurobiological processes affecting the most at-risk populations.

Daphna Shohamy Columbia University

How multiple memory systems support value-based decisions in adolescence

Memory is central to adaptive behavior. Much work has focused on the role of maladaptive habits and risky behavior in adolescence, tendencies attributed to heightened activity in the brain's reward systems. It has been suggested that reward sensitivity in adolescence might also be behaviorally adaptive, but evidence of such an adaptive role has been scarce. In this talk, I will present recent work demonstrating that memory plays an important role in guiding reward-driven behavior in adolescents, resulting in better learning. This improved behavioral learning in adolescents is related to greater contributions of the hippocampus during this phase, to greater connectivity between the hippocampus and the striatum, and to enhanced circuit-level dynamic flexibility in the striatum. These findings reveal an important role for both the hippocampus and the striatum in supporting enhanced learning and memory in adolescence, with implications for understanding how changes in brain-wide connectivity during adolescents affect the ability to learn from experience and to make decisions.

Oral Session 6
Plasticity and sensitive windows

Chair: **Dylan Gee** Yale University

Willem Frankenhuis Radboud University

Why do sensitive periods exist?

Sensitive periods are increasingly well-understood at the neural-physiological level. However, we know little about the evolutionary selection pressures that produce sensitive periods. I will present a formal modeling approach to studying the evolution of sensitive periods. We model development as a specialization process during which individuals incrementally adapt to local environmental conditions, while sampling imperfect cues to the environmental state. We first compute optimal developmental systems for a range of ecological conditions. Then we expose these systems to experiences to obtain developmental trajectories and distributions of mature phenotypes. Studying these will illuminate the rise and fall of plasticity across ontogeny.

Marina Bedny John Hopkins University

Nature & nurture in neurocognitive development: insights from studies of plasticity in blindness

How do intrinsic physiology and experience determine cortical specialization? Blindness reveals resilience and flexibility of cortex. Sensory loss leaves conceptual representations unchanged. Even "visual" concepts such as glow are similar in blind and sighted individuals. On the other hand, in congenital blindness cortical systems typically devoted to visual perception undergo large-scale reorganization, taking on higher-cognitive functions, including language, numerical processing and executive control. Resting state data suggest that fronts-parietal networks take over "visual" cortices. During development, cortical networks appear to be extreme functionally flexibility yet highly specific in the kinds of experiences to which they are sensitive.

Oral Session 7
Developmental Processes

Chair: **Grégoire Borst** Université Paris - Sorbonne

Dima Amso Brown University

Plasticity and the plentiful infant learning toolbox

A central tenet of developmental science is that there is increased plasticity early in life. My lab has made novel discoveries regarding learning systems available in the infant toolbox. In this talk, I will explore the idea that plasticity in infancy is, at least in part, supported by the availability of multiple information gathering mechanisms. These include visual attention and memory, hierarchical rule learning, reward learning, and contextual cueing. I will discuss each of these in turn and discuss how having numerous and interactive learning systems in infancy offers plasticity in the presence of risk and opportunity.

Rogier Keivit Cambridge University

Mutualistic coupling supports development of cognitive abilities: Findings from three longitudinal cohorts

A striking feature of individual differences in cognitive abilities is that they are universally positively correlated - a phenomenon known as the positive manifold. The traditional method of analysis yields a g-factor, a single summary metric with considerable predictive power. However, this summary metric ignores the developmental origin of the positive manifold. One developmental mechanism that may explain the positive manifold is mutualism: reciprocal, positive interactions between cognitive abilities during development. Here we present findings that suggest mutualism may help explain cognitive development. Across two traditional cohorts we find that the mutualism model outperformed competing developmental accounts: children with higher scores in a vocabulary showed greater gains in matrix reasoning and vice versa. We replicate these findings in a large adaptive learning sample (N≈12.000) on basic (counting ↔ addition) and more advanced (multiplication ↔ division) math skills. These dynamic coupling pathways are not predicted by other accounts, provide a novel window into cognitive development, and suggest a cognitive mechanism for processes such as gene- environment interactions: Coupling may allow small genetic differences between individuals to amplify during development, reconciling findings of high heritability on the one hand with environmental influences on the other.

Oral Session 8
Social Learning

Chair: **Jennifer Silvers** University of California, Los Angeles

Berna Guroglu Leiden University

Learning with peers: Neural processing of performance feedback in a social context across adolescence

Adequate feedback processing regarding one's performance is crucial for learning. Considering that learning often takes place in a social context, it is striking that very few studies so far have examined context effects on feedback processing. Here I will present preliminary findings from an fMRI study where we investigated the neural correlates of feedback processing in the peer context across adolescence (ages 9-16). I will discuss our findings in relation to the motivational aspects of the peer context and adolescent brain development and will highlight the implications of our findings for learning in a social context with peers such as in the classroom.

Gul Dolan John Hopkins University

Social reward learning: developmental mechanisms and therapeutic opportunities

A critical period is a developmental epoch during which the nervous system is expressly sensitive to specific environmental stimuli that are required for proper circuit organization and learning. The concept of a critical period originated from pioneering descriptions of filial imprinting behaviors in geese and ocular dominance plasticity in cats. Since these early observations, mechanistic characterization of critical periods has revealed an important role for exuberant brain plasticity during early development, as well as constraints imposed on these mechanisms as the brain matures. In disease states, closure of critical periods limits the ability of the brain to adapt even when optimal conditions are restored. Thus, identification of manipulations that reopen critical periods have been an obvious priority for translational neuroscience.To date, these advances have primarily come from studies focused on sensory critical periods. While social critical periods have been appreciated for decades synaptic and circuit mechanisms underlying their establishment and reopening remain largely unknown. Here we will present data describing our characterization of a novel social reward learning critical period, delineation of one underlying mechanism, and identification of a clinically relevant method for reopening this critical period.

Mark Sabbagh Queens University

Selective social learning: Insights from developmental cognitive neuroscience

Children are selective social learners. For instance, they learn well from speakers who are knowledgeable, helpful, and providing obviously relevant information. In contrast, they do not learn well from speakers who are ignorant, unhelpful, or who provide information irrelevant to children's learning. In this talk I will summarize how we have used event-related potentials (ERP) to characterize the mechanisms underlying young children's selective social learning of novel words. In particular, I will review evidence showing that when faced with the opportunity to learn novel word-referent associations from ignorant speakers, they form episodic but not semantic representations of those associations. I will also show evidence that the same pattern of findings did not obtain when children were faced with learning words that were irrelevant to them, thereby suggesting that there may be multiple mechanisms by which selective learning manifests. I will conclude by talking about how this work is ultimately informative about the neurocognitive mechanisms by which children's experience of labeling events become the basis of semantic representations.

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Poster Session 2
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Poster board numbers are indicated as follows:
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Location of the individual poster boards are indicated on poster board floor plans following the poster author index list. Poster set up and removal is the responsibility of the presenter. Please have your poster set up no later than 8:30AM on your scheduled presentation day and removed by 7:00PM each day. Any posters not removed by the designated time will be held at Registration until 5:00PM on Saturday.

Themes

- A Executive Functioning
- B Socioemotional Processing
- C Learning
- D Rewards/Motivation
- E Education
- F Memory
- G Environment (Stress, SES)
- H Brain Structure
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- J Mechanisms (hormones, neurotransmitters, physiology)
- K Methods
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Poster Session 1
Thursday, August 30

1-A-1 BOLD variability during response inhibition as in index of successful performance and behavioral variability: Developmental comparisons

Margot Schel[1], Nikolaus Steinbeis[2]

[1]Leiden University, [2]University College London

1-B-2 Neural correlates of affective and cognitive Theory of Mind: A novel functional neuroimaging cartoon task for children

Réka Borbás[1], Lynn Fehlbaum[1], Ursula Rudin[2], Mirko Schnider[1], Carmina Grob[2], Christina Stadler[1], Nora Raschle[1]

[1]Universtiy Psychiatric Clinic Basel, [2]University of Basel

1-B-3 Heightened reactivity to emotional cues extends into young adulthood

Dienke Bos[1], Michael Dreyfuss[1], B.J. Casey[2], Rebecca Jones[1]

[1]Sackler Institute for Developmental Psychobiology, [2]Department of Psychology, Yale University

1-B-4 The adolescent gut-brain-axis & depressive symptomatology

Jessica Flannery[1], Kathryn Mills[1], Theresa Cheng[1], Lauren Hval[1], Bernie Brady[1], Nandi Vijayakumar[1], Arian Mobasser[1], Benjamin Nelson[1], Sarah Donaldson[1], Samantha Chavez[1], Garrett Ross[1], John Flournoy[1], Michelle Bryne[2], Thomas Sharpton[3], Philip Fisher[1], Nicholas Allen[1], Jennifer Pfeifer[1]

[1]University of Oregon, [2]University of Oreon, [3]Oregon State University

1-B-5 Age-related changes in neural mechanisms of safety signal learning

Paola Odriozola[1], Luise Pruessner[1], Jason Haberman[1], Emily Cohodes[1], Jeffrey Mandell[1], Emma Goodman[1], Hannah Spencer[1], Dylan Gee[1]

[1]Yale University

1-B-6 Age-related changes in cognitive control in affective contexts

Susanne Schweizer[1], Jenna Parker[2], Jovita Leung[1], Cait Griffin[1], Sarah-Jayne Blakemore[1]

[1]UCL Institute of Cognitive Neuroscience, [2]University of Cambridge

1-C-7 Age-specific functional and connectivity changes following inhibitory control training in children and adolescents

Arnaud Cachia[1], Cloélia Tissier[1], Fatemehsadat Arzanforoosh[2], Emilie Salvia[1], Katell Mevel[1], Lisa Delalande[1], Marine Moyon[1], Nicolas Poirel[1], Julie Vidal[1], Stéphanie Lion[2], Pauline Roca[2], Sylvain Charron[1], Catherine Oppenheim[2], Olivier Houdé[1], Borst Grégoire[1]

[1]CNRS LaPsyDE, [2]INSERM IMA-Brain

1-C-8 Asymmetric effects of high-stakes on reinforcement learning across adolescence

Catherine Insel[1], Mahalia Prater Fahey[1], Mia Charifson[1], Gina Falcone[1], Leah Somerville[1]

[1]Harvard University

1-C-9 Adolescents take fewer risks than children or adults when risky outcomes are equiprobable

Gail Rosenbaum[1], Hannah Grassie1, Catherine Hartley[1]

[1]New York University

1-C-10 Explaining explore-exploit trade-off differences between younger and older adults

Job Schepens[1], Wouter van den Bos[2], Ralph Hertwig[2]

[1]Freie Universität Berlin, [2]Max Planck Institute for Human Development

1-C-12 Computational model of anxious mood in adolescence

Paul Sharp[1], Eva Telzer[1], Eran Eldar[2]

[1]University of North Carolina at Chapel Hill, [2]University College London

1-D-15 Economic decision-making across adolescence

Cait Griffin[1], Saz Ahmed[2], Lucy Foulkes[3], Jovita Leung, Jenna Parker[4], Kirsty Griffiths, Darren Dunning[4], Tim Dalgleish[4], MYRIAD Project, Sarah-Jayne Blakemore[5]

[1]Institute of Cognitive Neuroscience, UCL, [2]Institute of Cognitive Neuroscience UCL, [3]University of York, [4]MRC Cognition and Brain Sciences Unit, [5]UCL

1-D-16 Inhibitory control deficits over the immediate impulse for reward in adults with a history of attention deficit hyperactivity disorder: The role of elevated inattention symptoms

Neil Jones[1], Brooke Molina[1], Amelia Versace[1], Rachel Lindstrom[1], Tracey Wilson[1], Elizabeth Gnagy[1], William Pelham[1], Cecile Ladouceur[1]

[1]University of Pittsburgh

1-D-17 Weight status affects anticipatory processing of rewards, food intake, and network integration in adolescents

Nicole Roberts[1], Shana Adise[2], Charles Geier[1]

[1]Pennsylvania State University, [2]The University of Vermont

1-D-18 Affective sensitivity to real-world exploration is heightened in adolescence.

Natalie Saragosa-Harris[1], Travis Reneau[2], William Villano[2], Alexandra Cohen[1], Aaron Heller[2], Catherine Hartley[1]

[1]New York University, [2]University of Miami

1-D-19 Striatal activation to social reward moderates the relationship between peer victimization and increases in depressive symptoms in adolescents

Stefanie Sequeira[1], Rosalind Elliott[1], Cecile Ladouceur[1], Erika Forbes[1], Jennifer Silk[1]

[1]University of Pittsburgh

1-D-20 Age effects on neural reward related reactions to monetary gains for self and charity in adolescence

Jochem Spaans[1], Sabine Peters[1], Eveline Crone[1]

[1]Leiden University

1-D-21 Differential effects of parent and peer presence on neural correlates of risk taking in adolescence

Jorien van Hoorn[1], Ethan McCormick[1], Christina Rogers[1], Susannah Ivory[1], Eva Telzer[1]

[1]University of North Carolina Chapel Hill

1-E-22 Age differences in social preference

Jack Andrews[1], Lucy Foulkes[2], Sarah-Jayne Blakemore[1]

[1]University College London, [2]University of York

1-E-23 Differences in functional connectivity between on-track and under-performing math learners in first grade

Lina Shanley[1], Ben Clarke[1], Jolinda Smith[1], HyeonJin Yoon[1], Jessica Turtura[1], Fred Sabb[1]

[1]University of Oregon

1-F-25 Aversive learning strengthens episodic memory in adolescents and adults

Alexandra Cohen[1], Nicholas Matese[1], Asia Filimontseva[1], Catherine Hartley[1]

[1]New York University

1-F-26 Emotional working memory capacity in adolescents with varying mood

Kirsty Griffiths[1], Darren Dunning[1], Jenna Parker[1], Saz Ahmed[3], Lucy Foulkes[4], Cait Griffin[3], Jovita Leung[3], Sarah-Jayne Blakemore[3], Tim Dalgleish[1]

[1]University of Cambridge, [3]University College London, [4]University of York

1-F-27 Context pattern separation across the lifespan

Chi Ngo[1], Ying Lin[1], Nora Newcombe[1], Ingrid Olson[1]

[1]Temple University

1-F-28 Poor long-term memory in children: A case of mistaken identity?

Rebecca Schwarzlose[1], Sruthi Ramesh[2], Qijing Yu[2], Roya Homayouni[2], Zhijian Chen[2], Noa Ofen[2]

[1]Washington University in St. Louis, [2]Wayne State University

1-F-29 The more you know: Investigating why adults get a bigger memory boost from semantic congruency than children

Wei-Chun Wang[1], Simona Ghetti[2], Garvin Brod[3], Silvia Bunge[1]

[1]University of California, Berkeley, [2]University of California, Davis, [3]German Institute for International Educational Research

1-G-30 Associations between childhood trauma exposure and neural correlates of cognitive emotion regulation in adulthood

Camila Caballero[1], Emily Cohodes[1], Paola Odriozola[1], Jeffrey Mandell[1], Mackenzye Smith[1], Hannah Spencer[1], Hopewell Rogers[1], Brittany Clarke[1], Sophia Rader[1], Dylan Gee[1]

[1]Yale University

1-G-31 Long-term effects of prenatal glucocorticoid exposure on neurophysiological correlates of novelty monitoring and post-novel behavioral adaptations during childhood and adolescence

Liesa Ilg[1], Clemens Kirschbaum[1], Nina Alexander[2], Shu-Chen Li[1]

[1]Technische Universität Dresden, [2]Medical School Hamburg

1-G-33 Attention to emotional faces in 8-month-old infants: The impact of the time-course of maternal depressive symptoms during the pre- and postnatal periods

Eeva-Leena Kataja[1], Linnea Karlsson[2], Jukka Leppänen, Juho Pelto[2], Tuomo Häikiö, Saara Nolvi[2], Henri Pesonen, Christine Parsons, Jukka Hyönä, Hasse Karlsson[2]

[1]The FinnBrain Birth Cohort Study, University of Turku, Finland, [2]The FinnBrain Birth Cohort Study, University of Turku

1-G-34 Early life stress is associated with precocious amygdala development and delayed prefrontal development

Gabriela Manzano Nieves[1], Marilyn Bravo[1], Angelica Johnsen[1], Kevin Bath[1]

[1]Brown University

1-G-35 Resilient brain responses to social exclusion

Laura Moreno-Lopez[1], Ian Goodyer[1], Anne-Laura van Harmelen[1]

[1]University of Cambridge

1-G-36 Modeling early life stress: An in-depth analysis of limited access to bedding and nesting material and behavioral outcomes in mice

Meghan Gallo[1], Aliyah Olaniyan[1], Talia Campbell[1], Kevin Bath[1]

[1]Brown University, [2]Cognitive, Linguistic and Psychological Sciences

1-H-39 Emerging psychopathology and structural brain development in adolescence

Marieke Bos[1], Lara Wierenga[1], Sabine Peters[1], Neeltje Blankenstein[1], Elisabeth Schreuders[1], Christian Tamnes[2], Eveline Crone[1]

[1]Leiden University, [2]University of Oslo

1-H-40 The relationship between affective and cognitive empathy and grey matter density in the anterior insula in late childhood

Kate Bray[1], Christos Pantelis[1], Vicki Anderson[2], Sarah Whittle[1]

[1]University of Melbourne, [2]University of Melbourne and Murdoch Children's Research Institute

11-H-42 Nightmare Math: What specific anxiety can do to the developing brain

Karin Kucian[1], Ursina McCaskey[1], Michael von Aster[2], Ruth O'Gorman Tuura[1]

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1-H-43 Lateralization of the infant brain - a DTI study

Tuomas Lavonius[1], Satu Lehtola[1], Harri Merisaari[1], Jani Saunavaara[2], Riitta Parkkola[3], Tuire Lähdesmäki[1], Noora Scheinin[1], Linnea Karlsson[3], Hasse Karlsson[3], Jetro Tuulari[1]

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1-H-44 Testing the longitudinal links between brain morphology and executive functions in middle childhood with poverty as a moderator

Johannes Mohn[1], Laurel Raffington[1], Attila Keresztes[1], Christine Heim[2], Yee Lee Shing[3]

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1-H-46 Maternal dietary docosahexaenoic acid during pregnancy influences newborn hippocampal functional connectivity

Emma Schifsky[1], Darrick Sturgeon[1], Karen Lindsay[2], David Ball[1], Moosa Ahmed[1], Eric Feczko[1], Elina Thomas[1], Dakota Ortega[1], Sonja Entringer[2], Pathik Wadhwa[2], Jerod Rasmussen[2], Martin Styner[3], Damien Fair[1], Alice Graham[1], Claudia Buss[2]

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1-H-47 The development of interaction-selective "fingerprints" in the brain

Jon Walbrin[1], Kami Koldewyn[1], Ioana Mihai[1], Julia Landsiedel[1], Zeynep Saygin[2]

[1]Bangor University, [2]The Ohio State University

1-H-48 Variation in early life maternal care predicts adolescent prefrontal cortex to amygdala synapse development in mice

A. Wren Thomas[1], Linda Wilbrecht[1]

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1-H-49 White matter extension of the Melbourne Children's Regional Infant Brain (M-CRIB) atlas

Sarah Yao[1], Joseph Yang[2], Michelle Wu[3], Bonnie Alexander[1], Claire Kelly[1], Deanne Thompson[4]

[1]Murdoch Children's Research Institute, [2]Murdoch Children's Research Institute, Royal Children's Hospital, [3]Royal Children's Hospital, [4]Murdoch Children's Research Institute, Florey Institute of Neuroscience and Mental Health, Universit

1-I-51 A graph theoretical analysis of the episodic memory network during early childhood

Morgan Botdorf[1], Fengji Geng[1], Tracy Riggins[1]

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1-I-52 Dimensions of early adversity in resting state functional connectivity among high-risk adolescents

Theresa Cheng[1], Kathryn Mills[1], John Flournoy[1], Jessica Flannery[1], Shannon Peake[1], Arian Mobasser[1], Robert Hermosillo[2], Anders Perrone[2], Darrick Sturgeon[2], Eric Earl[2], Sarah Feldstein-Ewing[2], Dagmar Zeithamova[1], Oscar Miranda Dominguez[2], Kristen Mackiewicz-Seghete[2], Damien Fair[2], Philip Fisher[1], Jennifer Pfeifer[1]

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1-I-54 Reinforcement learning and dynamic network flexibility in adolescence

Chelsea Harmon[1], Raphael Gerraty[1], Juliet Davidow[2], Karin Foerde[3], Adriana Galvan[4], Danielle Bassett[5], Daphna Shohamy[1]

[1]Columbia University, [2]Harvard University, [3]University of Amsterdam, [4]University of California, Los Angeles, [5]University of Pensylvania

1-I-55 Structural development and functional connectivity profiles in childhood executive control: Integrating growth trajectories of morphology and network connectivity in children with executive function and attention deficits across school age.

Elizabeth Hawkey[1], Brent Rappaport[1], Sridhar Kandala[1], Joan Luby[1], Deanna Barch[1]

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1-I-57 Associations between elevated internalizing symptoms during early childhood and integrity of white matter tracts in cortico-limbic circuitry

Ola Mohamed Ali[1], Matthew Vandermeer[1], Haroon Sheikh[1], Sarah Mackrell[1], Marc Joanisse[1], Elizabeth Hayden[1]

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1-I-58 Motion's contribution to resting state correlations

David Montez[1], Beatriz Luna[1]

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1-I-59 Functional networks in term-born infants - a resting-state functional MRI study from FinnBrain Birth Cohort Study

Olli Rajasilta[1], Jetro Tuulari[1], Suvi Häkkinen[1], Satu Lehtola[1], Harri Merisaari[2], Malin Björnsdotter[3], Jani Saunavaara[1], Riitta Parkkola[1], Tuire Lähdesmäki[1], Noora Scheinin[1], Linnea Karlsson[1], Hasse Karlsson[1]

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1-I-60 A functional MRI preprocessing pipeline for neotatal connectomics

Darrick Sturgeon[1], Emma Schifsky[1], Dakota Ortega[1], Elina Thomas[1], Olivia Doyle[1], Mollie Marr[1], Lilla Zollei[2], Eric Feczko[1], Jerod Rasmussen[3], Pathik Wadhwa[3], Tom O'Connor[3], Claudia Buß[3], Oscar Miranda Dominguez[1], Alice Graham[1], Damien Fair[1]

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1-I-61 The relationship between poverty and resting-state functional connectivity in 2-month old Bangladeshi infants

Ted Turesky[1], Sarah Jensen[1], Swapna Kumar[2], Xi Yu[1], Yingying Wang[1], Borjan Gagoski[1], Danielle Silva[2], Joseph Sanfilippo[2], Charles Nelson[1], Nadine Gaab[1]

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1-I-62 Cross-sectional exploration of age-related differences in insular resting state functional connectivity in adolescence

Hannah Weiss[1], Paul Collins[1], Sandra Thijssen[1], Monica Luciana[1]

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1-J-64 Exploring moderators of diurnal cortisol attunement in expectant new fathers and mothers

Stephen Braren[1], Annie Brandes-Aitken[1], Rosemarie Perry[1], Andrew Ribner[1], Meriah DeJoseph[1], Clancy Blair[1]

[1]New York University

1-J-66 Immediate biological embedding of maltreatment in children: Moderating effects of FK506 binding protein 5 (FKBP5) gene on cortisol reactivity and amygdala volume in children aged 3-5 years

Judith Overfeld[1], Claudia Buss[1], Karin de Punder[1], Sybille Winter[1], John-Dylan Haynes[1], Elisabeth Binder[2], Christine Heim[1]

[1]Charité - Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Univers, [2]Department of Translational Research in Psychiatry, Max Planck Insitute of Psychiatry

1-J-68 Stress effects on emotional memory in middle childhood

Laurel Raffington[1], Johannes Falck[1], Christine Heim[2], Mara Mather[3], Yee Lee Shing[4]

[1]Max Planck Institute for Human Development, [2]Charité-University Medicine, [3]University of Southern California, [4]Goethe-Universität Frankfurt am Main

1-K-69 Neuroimaging the prepubertal brain: MRI quality in a large developmental twin sample

Michelle Achterberg[1], Mara van der Meulen[1]

[1]Leiden University

1-K-70 Graph theory approaches to functional network organization in developmental network neuroscience: A critique for a brave new small-world

Michael Hallquist[1], Frank Hillary[1]

[1] Pennsylvania State University

1-K-72 The effect of lifespan age differences in representational similarity on memory performance

Verena Sommer[1], Luzie Mount[2], Sarah Weigelt[2], Markus Werkle-Bergner[1], Myriam Sander[1]

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1-K-73 Visual decoding and preschool-age functional neuroimaging with high density diffuse optical tomography

Kalyan Tripathy[1], Andrew Fishell[1], Tracy Burns-Yocum[1], Zachary Markow[1], Bradley Schlaggar[1], Joseph Culver[1]

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1-K-74 Determining whether individual decision making differences are quantitative or qualitative using a multiple indicators multiple causes (MIMIC) model.

Jacqueline Zadelaar[1], Wouter Weeda[2], Lourens Waldorp[1], Anna Van Duijvenvoorde[2], Hilde Huizenga[1]

[1]University of Amsterdam, [2]Leiden University

1-L-75 Subcortical and cerebellar alterations in boys with pure ADHD and comorbid ADHD with conduct disorder analyzed using FreeSurfer?s volume-based processing stream

Lea Backhausen[1], Judith Buse[1], Franziska Böhme[2], Veit Roessner[1], Michael Smolka[2], Nora Vetter[1]

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1-L-76 Effects of anxiety on risk-taking behaviors and neural activity in typically-developing adolescents

Amanda Baker[1], Namita Tanya Padgaonkar[1], Tara Peris[1], Adriana Galván[1]

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1-L-77 Motor abilities, executive functions and cerebral blood flow in pediatric cancer survivors

Valentin Benzing[1], Andrea Federspiel[2], Janine Spitzhüttl[3], Valerie Siegwart[3], Claus Kiefer[4], Nedelina Slavova[4], Michael Grotzer[5], Maja Steinlin[3], Kurt Leibundgut[3], Mirko Schmidt[1], Regula Everts3

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1-L-78 The late positive potential as a marker of altered emotional processing and regulation in youth at high and low familial risk for depression: Associations with daily life emotional functioning and depression risk trajectories

Lauren Bylsma[1], Jennifer Silk[1], Cecile Ladouceur[1]

[1]University of Pittsburgh

1-L-80 Structural brain connectivity networks differences in children with autism

Olivia Doyle[1], David Grayson[1], Oscar Miranda Dominguez[1], Michaela Cordova[1], Eric Fombonne[1], Joel Nigg[1], Damien Fair[1]

[1]Oregon Health and Science University

1-L-81 Cerebral blood flow and executive functions in children after arterial ischemic stroke

Regula Everts[1], Manuela Wapp, Jasmine Jaros, Salome Kornfeld, Andrea Federspiel, Sebastian Grunt, Claus Kiefer, Maja Steinlin

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1-L-82 Atypical theta connectivity in infants with familial risk for autism in response to social stimuli

Rianne Haartsen[1], Emily Jones[1], Elena Orekhova[2], Tony Charman[3], Mark Johnson[1], The BASIS team[1]

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1-L-83 Neural correlates of safety cue learning in children with and without anxiety disorders

Anita Harrewijn[1], Chika Matsumoto[1], Paola Odriozola[1], Rany Abend[1], Anderson Winkler[1], Ellen Leibenluft[1], Daniel Pine[1], Dylan Gee[1]

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1-L-84 Statistical learning is associated with autism symptoms and verbal abilities in young children with autism

Rebecca Jones[1], Thaddeus Tarpey[2], Amarelle Hamo[1], Caroline Carberry[1], Gijs Brouwer[3], Catherine Lord[1]

[1]Weill Cornell Medicine, [2]Wright State University, [3]New York University

1-L-85 Concordance of self- and collateral-reported ADHD symptoms, anger-irritability, and impairment in a study of neural correlates of adult outcome for children with ADHD

Brooke Molina[1], Rachel Lindstrom[2], Neil Jones[1], Elizabeth Gnagy[3], Amelia Versace[1], Tracey Wilson[2], William Pelham[3], Cecile Ladouceur[1]

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1-L-86 The behavioural phenotype associated with mutations in STXBP1

Sinead O'Brien[1], Elise Ng-Cordell[2], Duncan Astle[1], Gaia Scerif[2], Kate Baker[1]

[1]University of Cambridge, [2]University of Oxford

1-L-87 Development of mixed-strategy decision making in adolescents with and without borderline personality disorder

Ashley Parr[1], Olivia Calancie[1], Brian Coe[1], Sarosh Khalid-Khan[1], Douglas Munoz[1]

[1]Queen's University

1-L-88 A subject-level approach to identify heterogeneous neural substrates of autism

Emmanuel Pua[1], Gareth Ball, Chris Adamson[1], Marc Seal[1]

[1]University of Melbourne

1-L-89 Can we build a neuromarker of behaviorial regulation in children with and without ASD?

Christiane Rohr[1], Signe Bray[1]

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1-L-90 Brain morphology and resting-state connectivity in paediatric cancer survivors

Janine Spitzhüttl[1], Martin Kronbichler[2], Lisa Kronbichler[2], Valentin Benzing, Valerie Siegwart[1], Manuela Pastore-Wapp[3], Claus Kiefer[3], Slavova Nedelina[3], Michael Grotzer[4], Claudia Roebers[5], Maja Steinlin[1], Kurt Leibundgut[4], Regula Everts[1]

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1-M-92 Detection of novelty in infants from low-SES backgrounds: A functional near-infrared spectroscopy study

Annie Brandes-Aitken[1], Stephen Braren[1], Rosemarie Perry[1], Meriah DeJoseph[1], Clancy Blair[1]

[1]New York University

1-M-93 Development of sensory competition in the visual cortex: An fMRI study in school-aged children

Na Yeon Kim[1], Mark Pinsk[1], Sabine Kastner[1]

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1-M-94 Positive reinforcement modulates fronto-limbic systems subserving emotional interference in adolescents

Cecile Ladouceur[1], Neil Jones[1], Michael Schlund[2], Rebecca Kerestes[1]

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1-M-95 Feature integration across the dorsal and ventral streams in childhood

Andrew Lynn[1], Elena Festa[1], William Heindel[1], Dima Amso[1]

[1]Brown University

1-M-97 Rule learning supports the development of attentional biases in 9-month-old infants

Denise Werchan[1], Dima Amso[1]

[1]Brown University

1-N-98 No evidence that foreign language learning in older age improves cognitive ability: A randomized controlled trial

Rasmus Berggren[1], Jonna Nilsson[1], Martin Lövdén[1]

[1]Karolinska Institutet

1-N-99 A naturalistic home observational approach to pre-schoolers' language, cognition, and behaviour

Katrina d'Apice[1], Rachel Latham[2], Sophie von Stumm[1]

[1]London School of Economics and Political Science, [2]Social, Genetic & Developmental Psychiatry Centre, Institute of Psychiatry, Psychology and Neuroscie

1-N-100 No bilingual advantage for executive function: Evidence from a large sample of children in the Adolescent Brain and Cognitive Development (ABCD) study.

Anthony Dick[1], Nelcida Garcia[1], Shannon Pruden[1], Samuel Hawes[1], Wes Thompson[2], Matthew Sutherland[1], Michael Riedel[1], Angela Laird[1], Raul Gonzalez[1]

[1]Florida International University, [2]University of California at San Diego

1-N-101 The developmental trajectory of language and executive functions white matter tracts from infancy to early childhood: a diffusion tensor imaging study

Rola Farah[1], Hagai Tzafrir[1], Tzipi Horowitz-Kraus[1]

[1]Technion- Israel Institute of Technology

1-N-103 Effect of executive-functions triggering with dialogic reading on language processing in children

Tzipi Horowitz-Kraus[1], Rola Farah[1]

[1]Technion and Cincinnati Children's Hospital

1-O-103 Desikan-Killiany-Tourville atlas compatible version of M-CRIB neonatal parcellated brain atlas: The M-CRIB 2.0

Bonnie Alexander[1], Wai Yen Loh[1], Lillian Matthews[2], Andrea Murray[1], Chris Adamson[1], Richard Beare[1], Jian Chen[1], Claire Kelly[1], Peter Anderson[1], Lex Doyle[1], Alicia Spittle[1], Jeanie Cheong[1], Marc Seal[1], Deanne Thompson[1]

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1-O-104 The teenage brain: Public perceptions of neurocognitive development during adolescence

Sibel Altikulaç[1], Nikki Lee[1], Chiel van der Veen[1], Ilona Benneker[2], Lydia Krabbendam[1], Nienke van Atteveldt[1]

[1]Vrije Universiteit Amsterdam, [2]Mencia de Mendozalyceum

1-O-105 Investigating shared and nonshared factors contributing to variation in temperament development in MZ twins

Eloise Cameron[1], Katrina Scurrah[2], Jeffrey Craig[3], Marc Seal[1]

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1-O-106 Functional integration of reward and social-cognitive brain systems during a real-time social interaction

Dustin Moraczewski[1], Yaqiong Xiao[1], Katherine Warnell[2], Elizabeth Redcay[1]

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1-O-108 Sex differences in brain development are apparent in functional connections of the fetal brain

Moriah Thomason[1], Jasmine Hect[1], Muriah Wheelock[2], Claudia Espinoza-Heredia[3], Adam Eggebrecht[2]

[1]Wayne State University, [2]Washington University in St Louis, [3]University of California at Berkeley

1-O-109 What characterizes adolescents who have difficulties with making academic choices? Relations with behavioral and neural correlates of self-concept and self-esteem

Laura van der Aar[1], Sabine Peters[1], Eveline Crone[1]

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Poster Session 2
Friday, August 31

2-B-1 Prosocial and antisocial influence across adolescence

Saz Ahmed[1], Lucy Foulkes[2], Jovita Leung[1], Cait Griffin[1], Jenna Parker[3], Kirsty Griffiths[3], Darren Dunning[3], Tim Dalgleish[3], MYRIAD, Sarah-Jayne Blakemore[1]

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2-B-2 Atypical neural correlates of social attention engagement in the pathway to autism social traits

Anna Gui[1], Charlotte Tye[2], Emily Jones[1], Teodora Gliga[1], Mayada Elsabbagh[3], Mark Johnson[4]

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2-B-3 Age-related neural changes in the effects of emotional context on cognitive control

Orma Ravindranath[1], Sarah Ordaz[1], Aarthi Padmanabhan[1], Finnegan Calabro[1], Beatriz Luna[1]

[1]University of Pittsburgh

2-B-4 Examining individual differences in trusting behavior using social network analysis

Hester Sijtsma[1], Nikki Lee[1], Marlieke van Kesteren[1], Nienke van Atteveldt[1], Lydia Krabbendam[1]

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2-B-6 Middle temporal activity during social cognition moderates the relationship between anxiety symptoms and peer victimization in mid- to late adolescent girls

Veronika Vilgis[1], Kate Keenan, Alison Hipwell, Erika Forbes, Amanda Guyer[1]

[1]University of California, Davis

2-C-7 Lifespan differences in the regulation of learning rates during sequential decisions with uncertainty

Rasmus Bruckner[1], Matthew Nassar[2], Shu-Chen Li[3], Ben Eppinger[4]

[1]Freie Universität Berlin, [2]Brown University, [3]Technische Universität Dresden, [4]Concordia University

2-C-8 Age differences in the neural basis of explicit motor sequence learning

Maike Hille[1], Elisabeth Wenger[1], Yana Fandakova[1]

[1]Max Planck Institute for Human Development

2-C-9 Characterizing patterns of variability related to strategy shifts in learning across development

Rebecca Martin[1], Shraddha Nair[1], Catherine Hartley[1]

[1]New York University

2-C-11 Parental influences on discrimination learning

Jennifer Silvers[1], Nim Tottenham[2]

[1]University of California, Los Angeles, [2]Columbia University

2-C-12 Neurocomputational mechanisms and development of prosocial learning across adolescence

Bianca Westhoff[1], Neeltje Blankenstein[2], Elisabeth Schreuders[2], Eveline Crone[2], Anna van Duijvenvoorde[2]

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2-D-13 Information about others' choices differentially influences adolescent and young adult decision making

Barbara Braams[1], Constanza Vidal Bustamante[1], Katherine Kabotyanski[1], Juliet Davidow[1], Leah Somerville[1]

[1]Harvard University

2-D-14 Using diffusion modeling and pupillometric measures to characterize incentive motivational effects on numerosity discrimination in teens and young adults

Annika Dix[1], Shu-Chen Li[1]

[1]Technische Universität Dresden

2-D-15 Neural correlates of prosocial risk taking during late adolescence

Kathy Do[1], Jorien van Hoorn[1], Joao Guassi Moreira[2], Eva Telzer[1]

[1]University of North Carolina, Chapel Hill, [2]University of California, Los Angeles

2-D-16 The impact of age and puberty on impulse control and sensation seeking in early adolescence in the ABCD study

Lucía Magis-Weinberg[1], Wouter Van den Bos[2], Ron Dahl[1]

[1]University of California, Berkeley, [2]Max Planck Institute for Human Development

2-D-17 Examining the effects of social-emotional contexts on rewarded antisaccade task performance

Daniel Petrie[1], Nicole Roberts[1], Charles Geier[1]

[1]Pennsylvania State University

2-E-20 Brazil youth exposed to persistent poverty: Differential development of executive functions

Pratima Patil[1], Fernanda Campbell[2], Johanna Bick[3], Juliana Porto[4], Rita Lucena[2], Gigi Luk[5], Charles Nelson[6]

[1]Boston University, [2]Universidade Federal da Bahia, [3]University of Houston, [4]Pontifica Catholic University of Rio Grande do Sul, [5]Harvard Graduate School of Education, [6]Boston Children's Hospital Harvard Medical School

2-E-21 Effort versus trait praise differentially influence the neural response to negative feedback during a math task in adolescents

Nienke van Atteveldt[1], Nikki Lee[1], Lydia Krabbendam[1]

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2-F-22 Neural and behavioural impact of WM and self-regulation training in school-aged children

Ana Cubillo[1], Henning Mueller[2], Daniel Schunk[3], Ernst Fehr[1], Todd Hare[1]

[1]University of Zurich, [2]NHH Norwegian School of Economics, [3]Johannes Gutenberg-Universität

2-F-23 Stability and change over 2 years of time: ERP and behavioral correlates of memory retrieval

Daniela Czernochowski[1], André Haese[1]

[1]Technische Universität Kaiserslautern

2-F-24 The value of choice facilitates subsequent memory with age

Perri Katzman[1], Catherine Hartley[1]

[1]New York University

2-F-25 Developmental recruitment of local prefrontal inhibitory circuitry during safety learning in mice

Heidi Meyer[1], Francis Lee[1]

[1]Weill Cornell Medicine

2-F-26 Developmental changes in the use of environmental statistics to strategically modulate memory

Kate Nussenbaum[1], Euan Prentis[1], John Daryl Ocampo[1], Catherine Hartley[1]

[1]New York University

2-G-27 Neural mechanisms of stressor controllability across human development: Preliminary findings

Emily Cohodes[1], Paola Odriozola[1], Jeffrey Mandell[1], Mackenzye Smith[1], Camila Caballero[1], Catherine Hartley[2], Dylan Gee[1]

[1]Yale University, [2]New York University

2-G-28 Exploring the effects of emotional enrichment on components of executive functions in children of varying socioeconomic status

Diego Placido[1], Jazlyn Nketia[1], Denise Werchan[1], Dima Amso[1]

[1]Brown University

2-G-29 Trajectories of parental harshness across childhood predict corticolimbic reactivity to emotional facial expressions in adolescence

Arianna Gard[1], Tyler Hein[1], Colter Mitchell[1], Nestor Lopez-Duran[1], Christopher Monk[1], Luke Hyde[1]

[1]University of Michigan

2-G-30 Maternal psychological stress during pregnancy is associated with neonatal amygdala functional connectivity and negative affect development over the first two years of life

Mollie Marr[1], Alice Graham[1], Eric Feczko[1], Elina Thomas[1], Darrick Sturgeon[1], Emma Schifsky[1], Jerod Rasmussen[2], John Gilmore[3], Martin Styner[3], Steven Potkin[2], Sonja Entringer[2], Pathik Wadhwa[2], Claudia Buss[2], Damien Fair[1]

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2-G-31 Does socioeconomic status impact executive functions similarly in computerized vs. naturalistic testing environments?

Jazlyn Nketia[1], Dima Amso[1]

[1]Brown Univerisity

2-G-32 Developing the ability to assess control over one's environment

Hillary Raab[1], Romain Ligneul[2], Catherine Hartley[1]

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2-G-33 Neighborhood impoverishment relates to inhibitory control performance via inhibition-related brain activation

Rachel Tomlinson[1], Rebecca Waller[1], S. Alexandra Burt[2], Luke Hyde[1]

[1]University of Michigan, [2]Michigan State University

2-G-34 Impact of maternal childhood trauma on child behavioral problems: The role of child frontal alpha asymmetry

Maartje Van de Ven[1], Moriah Thomason[2], Amanpreet Bhogal[2], Piumi Jayatilake[2], Toni Lewis[2], Houda Ajrouche[2], Joshua Hammond[2], Marion van den Heuvel[2]

[1]Merrill Palmer Skillman [2] Institute for Child and Family Development, Wayne State University

2-G-35 Recalling positive memories reduces cognitive and biological vulnerability to depression

Anne-Laura van Harmelen[1], Adrian Dahl Askelund[1], Susanne Schweizer[2], Ian Goodyer[1], Anne-Laura van Harmelen[1]

[1]University of Cambridge, [2]University College London

2-H-36 Parenting-by-brain development interactions as predictors of adolescent depressive symptoms and well-being: Differential susceptibility or diathesis-stress?

Camille Deane[1]

[1]University of Melbourne

2-H-37 Differences in brain development in a high and low economic setting

Sean Deoni[1], Giang-Chau Ngo[1], Vishwajeet Kumar[2], Aarti Kumar[2], Madhuri Tiwari[2]

[1]Care New England, [2]Community Empowerment Lab

2-H-38 Volumetric development of the hippocampal sub-fields and hippocampal white matter connectivity: relationship with episodic memory

Kristafor Farrant[1], Anthony Dick[1]

[1]Florida International University

2-H-41 Longitudinal development of white matter fibre density and morphology in the peri-pubertal period

Sila Genc[1], Robert Smith[2], Charles Malpas[3], Vicki Anderson[1], Jan Nicholson[4], Daryl Efron[1], Marc Seal[1], Timothy Silk[5]

[1]Murdoch Children's Research Institute, [2]The Florey Institute of Neuroscience and Mental Health, [3]University of Melbourne, [4]La Trobe University, [5]Deakin University

2-H-42 Structural brain network deficits in youth born prematurely

Antonia Kaczkurkin[1], Rula Nassar[1], Cedric Huchuan Xia[1], Aristeidis Sotiras[1], Marieta Pehlivanova[1], Tyler Moore[1], Angel Garcia de La Garza[1], David Roalf[1], Adon Rosen[1], Scott Lorch[1], Kosha Ruparel[1], Russell Shinohara[1], Christos Davatzikos[1], Ruben Gur[1], Raquel Gur[1], Theodore Satterthwaite[1]

[1]University of Pennsylvania

2-H-43 The development of the neural basis of social interaction perception

Ioana Mihai[1], Jon Walbrin[1], Julia Landsiedel[1], Kami Koldewyn[1]

[1]Bangor University

2-H-44 Relating individual differences in white matter pathways to children's arithmetic fluency: A spherical deconvolution study

Brecht Polspoel[1], Maaike Vandermosten[1], Bert De Smedt[1]

[1] Katholieke Universiteit Leuven

2-H-45 Maternal pregnancy-related anxiety is associated with sex-specific alterations in amygdala volume in four-year-old children

Henriette Schneider-Hassloff[1], Jetro Tuulari[1], Noora Scheinin[1], Linnea Karlsson[1], Hasse Karlsson[1]

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2-H-46 Differential genetic and environmental influences on social brain structures and prosocial behavior

Mara van der Meulen[1], Lara Wierenga[2], Michelle Achterberg[2], Marinus van IJzendoorn[2], Eveline Crone[2]

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2-H-47 Altered developmental trajectories of stress physiology and subcortical neurobiology following early caregiving adversity

Michelle VanTieghem[1], Marta Korom[2], Jessica Flannery[3], Liliana Varman[2], Tricia Choy[1], Christina Caldera[4], Laurel Gabard-Durnam[5], Bonnie Goff[4], Dylan Gee[6], Kathryn Humphreys[7], Eva Telzer[8], Mor Shapiro[4], Jennie Louie[9], Dominic Fareri[10], Niall Bolger[1], Nim Tottenham[1]

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2-I-48 The development of structure-function coupling in human brain networks during adolescence

Graham Baum[1], Rastko Ciric[1], David Roalf[1], Adon Rosen[1], Richard Betzel[1], Cedric Xia[1], Tyler Moore[1], Monica Calkins[1], Russell Shinohara[1], Kosha Ruparel[1], Ruben Gur[1], Raquel Gur[1], Danielle Bassett[1], Theodore Satterthwaite[1]

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2-I-50 Precision functional network mapping of a pediatric patient with a left thalamic lesion

Jacqueline Hampton[1], Scott Marek[1], Mario Ortega[1], Jordan Shaw[1], Catherine Hoyt[1], Annie Nguyen[1], Andrew Van[1], Deanna Greene[1], Nico Dosenbach[1]

[1]Washington University School of Medicine

2-I-51 Functional connectivity of IPS predicts distance effects in symbolic fraction magnitude comparison task

Priya Kalra[1], Edward Hubbard[1]

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2-I-54 Resting-state functional networks are impacted by ethanol self-administration in the rhesus macaque.

Julian Ramirez[1], Oscar Miranda-Dominguez[1], Marc Rudolph[2], Jennifer Zhu[1], Darrick Sturgeon[1], Muhammed Bah[1], Megan McClintick[3], Nikki Walter[1], Eric Feczko[1], Robert Hitzeman[1], Tamara Phillips[1], Shannon McWeeney[1], Christopher Kroenke[1], Kathleen Grant[1], Damien Fair[1]

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2-I-55 Thalamocortical networks and their relation to cognitive outcome in pediatric stroke patients

Leonie Steiner[1], Andrea Federspiel, Salome Kornfeld, Sandeep Kamal[2], Roland Wiest[2], Sebastian Grunt[2], Maja Steinlin[2], Regula Everts[2]

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2-I-56 Maternal prenatal anxiety associates to infant orbitofrontal cortex functional synchrony

Jetro Tuulari[1], Suvi Häkkinen[1], Olli Rajasilta[1], Satu Lehtola[1], Harri Merisaari[2], Malin Björnsdotter[3], Jani Saunavaara[1], Riitta Parkkola Tuulari[1], Tuire Lähdesmäki[1], Noora Scheinin[1], Linnea Karlsson[1], Hasse Karlsson[1]

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2-J-57 Adrenarcheal timing predicts the development of anxiety symptoms via amygdala functional connectivity during emotion processing: A longitudinal study

Marjolein Barendse[1], Julian Simmons[1], Sarah Whittle[1]

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2-J-58 Cumulative poverty exposure and the moderating role of cortisol on child internalizing problems in preschool

Meriah DeJoseph[1], Eric Finegood[1], Cybele Raver[1], Clancy Blair[1], Family Life Project Key Investigators .

[1]New York University

2-J-59 : Structural connectivity of the striatum during adolescence: a longitudinal DTI connectivity study

Anne-Lise Goddings[1], Eveline Crone[2], Jiska Peper[2]

[1]University College London, [2]Leiden University

2-J-60 MRI tissue-iron and PET as indicators of the development of striatal dopamine neurobiology

Bart Larsen[1], Valur Olafsson[2], Finnegan Calabro[1], Charles Laymon[1], Julie Price[3], Beatriz Luna[1]

[1]University of Pittsburgh, [2]Northeastern University, [3]Harvard Medical School

2-J-61 Limb constraint drives dramatic reorganization of human brain networks

Dillan Newbold[1], Timothy Laumann[1], Derek Miller[1], Catherine Hoyt[1], Jacqueline Hampton[1], Mario Ortega[1], Annie Nguyen[1], Jonathan Koller[1], Andrew Van[1], Deanna Greene[1], Bradley Schlaggar[1], Steven Petersen[1], Abraham Snyder[1], Nico Dosenbach[1]

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2-K-64 Longitudinal development of hippocampal subfields during early to mid-childhood

Kelsey Canada[1], Fengji Geng[1], Gregory Hancock[1], Tracy Riggins[1]

[1]University of Maryland

2-K-65 Characterizing heterogeneity across ASD and ADHD using machine learning and fMRI

Michaela Cordova[1], Eric Feczko[1], Oscar Miranda-Dominguez[1], Damion Demeter[2], Anders Perrone[1], Olivia Doyle[1], Emma Schifsky[1], Kiryl Shada[3], Alice Graham[1], Beth Calame[1], Joel Nigg[1], Eric Fombonne[1], Damien Fair[1]

[1]Oregon Health & Science University, [2]University of Texas Austin, [3]Pacific University

2-K-66 Automated detection of motion artifacts in fMRI data

Danielle Cosme[1], John Flournoy[1], Nathalie Verhoeven[1], Nandita Vijayakumar[1], Jennifer Pfeifer[1]

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2-K-67 Mutualistic coupling supports development of reasoning, vocabulary and mathematical abilities: Findings from two longitudinal cohorts

Rogier Kievit[1], Abe Hofman[2], Kate Nation[3]

[1]University of Cambridge, [2]University of Amsterdam, [3]University of Oxford

2-K-68 Model-based network discovery of developmental and performance-related differences during risky decision-making

Ethan McCormick[1], Kathleen Gates[1], Eva Telzer[1]

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2-L-69 Probing theory of mind in typical development and autism spectrum disorder using a socially interactive fMRI task

Diana Alkire[1], Elizabeth Redcay[1]

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2-L-70 Early childhood depression, emotion regulation, episodic memory and hippocampal development

Deanna Barch[1], Michael Harms[1], Rebecca TIllman[1], Elizabeth Hawkey[1], Joan Luby[1]

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2-L-71 Response inhibition deficits in adolescents showing early signs of borderline personality disorder

Olivia Calancie[1], Ashley Parr[1], Linda Booij[1], Donald Brien[1], Brian Coe[1], Douglas Munoz[1], Sarosh Khalid-Khan[1]

[1]Queen's University

2-L-72 Parsing heterogeneity in autism and attention-deficit/hyperactivity disorder with individual connectome mapping

Dina Dajani[1], Catherine Burrows[2], Mary Beth Nebel[3], Stewart Mostofsky[1], Kathleen Gates, Lucina Uddin[1]

[1]University of Miami, [2]Duke University, [3]Johns Hopkins University

2-L-74 Altered neuronal responses during affective Stroop task performance in adolescents with conduct disorder

Lynn Fehlbaum[1], Nora Raschle[1], Willeke Menks[1], Martin Prätzlich[1], Eva Flemming[2], Letizia Wyss[1], Felix Euler[1], Philipp Sterzer[2], Christina Stadler[1]

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2-L-75 Neurophysiological deficits in the delay period of a Delayed-Match-to-Sample test in children diagnosed of ADHD

Antonio Arjona[1], Elena I. Rodríguez-Martínez[1], Carlos Gómez[1]

[1]University of Sevilla

2-L-76 Remapping the cognitive and neural profiles of struggling learners

Joni Holmes[1], Joe Bathelt[1], The CALM Team[1], Duncan Astle[1]

[1]University of Cambridge

2-L-77 Early detection of motor and participation deficits in children

Catherine Hoyt[1], Andrew Van[1], Elyse Everett[1], Annie Nguyen[1], Mario Ortega[1], Jonathan Koller[1], Brad Schlaggar[1], Catherine Lang[1], Nico Dosenbach[1]

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2-L-78 Functional connectivity indicates distinct development of brain systems supporting motor function and inhibitory control in Tourette syndrome

Ashley Nielsen[1], Jessica Church-Lang[2], Caterina Gratton[1], Nico Dosenbach[1], Steve Petersen[1], Kevin Black[1], Brad Schlaggar[1], Deanna Greene[1]

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2-L-79 Internalizing symptoms during adolescence differentially modulate amygdala functional connectivity in neurotypical males and females

Namita Padgaonkar[1], Katherine Lawrence[1], Leanna Hernandez[1], Shulamite Green[1], Adriana Galvan[1], Mirella Dapretto[1]

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2-L-80 Childhood and current depression symptoms predict blunted corticostriatal response to monetary reward cues in adolescence

Brent Rappaport[1], Joan Luby[2], Deanna Barch[1]

[1]Washington University in St. Louis, [2]Washington University School of Medicine

2-L-81 Atypical neural correlates and eye gaze behavior during emotional face processing in youths with conduct disorder

Nora Raschle[1], Willeke Menks[1], Lynn Fehlbaum[1], Barbara Rütsche[1], Réka Borbás[1], Philipp Sterzer[1], Christina Stadler[1]

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2-L-82 Childhood cancer and its effects on working memory network characteristics

Valerie Siegwart[1], Manuela Pastore-Wapp[2], Valentin Benzing[3], Janine Spitzhuettl[1], Claus Kiefer[2], Nedelina Slavova[2], Michael Grotzer[4], Claudia Roebers[5], Maja Steinlin[1], Kurt Leibundgut[1], Regula Everts[1]

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2-L-83 Thalamic volume and posterior default-mode cortical thickness predict poor sleep quality in youth

Adriane Soehner[1], Lindsay Hanford[1], Michele Bertocci[1], Cecile Ladouceur[1], Simona Graur[1], Alicia Mccaffrey[1], Kelly Monk[1], Lisa Bonar[1], David Axelson[2], Rasim Diler[1], Benjamin Goldstein[3], Tina Goldstein[1], Boris Birmaher[1], Mary Phillips[1]

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2-L-84 Gray matter concentrations in never-depressed children at risk for depression

Matthew Vandermeer[1], Andrew Daoust[1], Ola Mohamed Ali[1], Marc Joanisse[1], Deanna Barch[2], Elizabeth Hayden[1]

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2-L-85 Altered cortical morphology in pure and comorbid adolescent ADHD with conduct disorder

Nora Vetter[1], Lea Backhausen[1], Judith Buse[1], Veit Rößner[1], Michael Smolka[2]

[1]Faculty of Medicine of the TU Dresden, Technische Universität Dresden, Germany, [2]Department of Psychiatry and Neuroimaging Center, Technische Universitaet Dresden, Germany

2-M-86 Beyond clinical classification: Insight into the visual attentional processes underpinning autistic-like traits in fragile X and Down Syndrome

Jennifer Glennon[1], Hana D'Souza[1], Luke Mason[1], Annette Karmiloff-Smith[1], Michael Thomas[1]

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2-M-87 Naturalistic measures of sustained attention moderate the relation between behavioral inhibition and internalizing symptoms in kindergarteners.

Kelley Gunther[1], Xiaoxue Fu[1], Briana Ermanni[1], Koraly Pérez-Edgar[1]

[1]The Pennsylvania State University

2-M-88 Anticipating Touch: Mu Desynchronization during Bodily Attention relates to Executive Function in Children

Staci Meredith Weiss[1], Andrew Meltzoff[2], Peter Marshall[1]

[1]Temple University, [2]University of Washington

2-M-89 A consistent context facilitates infants' orienting in natural scenes

Kristen Tummeltshammer[1], Dima Amso[1]

[1]Brown University

2-M-90 Taking attention back to school: Multisensory processes influence developing visual attention control

Nora Turoman[1], Ruxandra Tivadar[2], Micah Murray[3], Gaia Scerif[4], Pawel Matusz[5]

[1]Lausanne University Hospital Centre (CHUV) and University of Lausanne (UniL), [2]Lausanne University Hospital Centre (CHUV) and University of Lausanne (UniL), Jules-Gonin Eye Hospit, [3]Lausanne University Hospital Centre (CHUV) and University of Lausanne (U

2-M-91 Affect-biased attention moderates the relation between neural sensitivity to rejection and internalizing problems in young children

Alicia Vallorani[1], Santiago Morales[2], Koraly Pérez-Edgar[1]

[1]The Pennsylvania State University, [2]University of Maryland

2-M-92 Altered brain-behavior relationships underlie attention impairments in very preterm children

Muriah Wheelock[1], Rachel Lean[1], Samudragupta Bora[2], Nicola Austin[3], Tracy Melzer[3], Adam Eggebrecht[1], Christopher Smyser[1], Lianne Woodward[4]

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2-N-93 Reading-induced shifts of cortical speech representations in dyslexic and typically reading children

Linda Romanovska[1], Roefje Janssen[1], Milene Bonte[1]

[1]Maastricht University

2-N-94 Brain responses to speech sound changes are associated with familial risk of dyslexia and communication skills in six-month-old infants

Linda Lönnqvist[1], Paula Virtala[1], Eino Partanen[1], Paavo Leppänen[2], Anja Thiede[1], Teija Kujala[1]

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2-N-95 Inter-symptom relationships between executive function-related behavioural problems and communication skills

Silvana Mareva[1], the CALM team[1], Joni Holmes[1]

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2-N-96 The poor do poorer: how coming from a low-income home impacts brain and language development

Julie Schneider[1], Mandy Maguire[1]

[1]University of Texas at Dallas

2-N-97 Neonatal white matter integrity predicts infant language development

Georgina Sket[1], Judith Overfeld[1], Martin Styner[2], John Gilmore[3], Sonja Entringer[1], Pathik Wadhwa[4], Jerod Rasmussen[4], Claudia Buss[1]

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2-O-98 Do children conserve or estimate quantities in Piagets conservation task? A systematic review and meta-analysis

Giacomo Bignardi[1], Maria Copot[1]

[1]University of Cambridge

2-O-99 The impact of depression on post-stroke recovery and disability: A systematic review and meta-analysis of longitudinal studies

Maria Blöchl[1], Sophie Meißner[2], Steffen Nestler[2]

[1]University of Leipzig; International Max-Planck Research School on Neuroscience of Communication: St, [2]University of Leipzig

2-O-100 Pubertal testosterone correlates with adolescent impatience and dorsal striatal activity

Corinna Laube[1], Robert Lorenz[1], Wouter van den Bos[1]

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2-O-101 Persistent structural differences in developmental dyscalculia: a longitudinal morphometry study

Ursina McCaskey[1], Michael von Aster[2], Ruth O'Gorman Tuura[1], Karin Kucian[1]

[1]University Children's Hospital Zurich, [2]German Red Cross Hospitals

2-P-102 Different developmental trajectories for working memory and reinforcement learning contributions to learning in adolescence

Anne Collins[1], Maria Eckstein[1], Sarah Master[1], Ronald Dahl[1], Linda Wilbrecht[1]

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2-P-103 Neural signatures of probablistic reversal learning: a developmental computational modeling approach

Martin Schulte-Rüther[1], Eileen Oberwelland Weiss[1], Jana Kruppa[1], Gereon Fink[2], Beate Herpertz-Dahlmann[1], Kerstin Konrad[1]

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2-P-104 Emerging functional specialisation in the ventral occipital cortex of prereaders: An EEG-fMRI study on visual character processing

Silvia Brem[1], Georgette Pleisch[1], Christian Brauchli[1], Martina Röthlisberger[1], Christoph Hofstetter[1], Philipp Stämpfli[1], Susanne Walitza[1], Iliana Karipidis[1]

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2-P-105 Lifespan developmental differences in the effects of opportunity costs on cognitive effort

Ben Eppinger[1], Florian Bolenz[2], Sean Devine[1], Ross Otto[3], Andrea Reiter[2]

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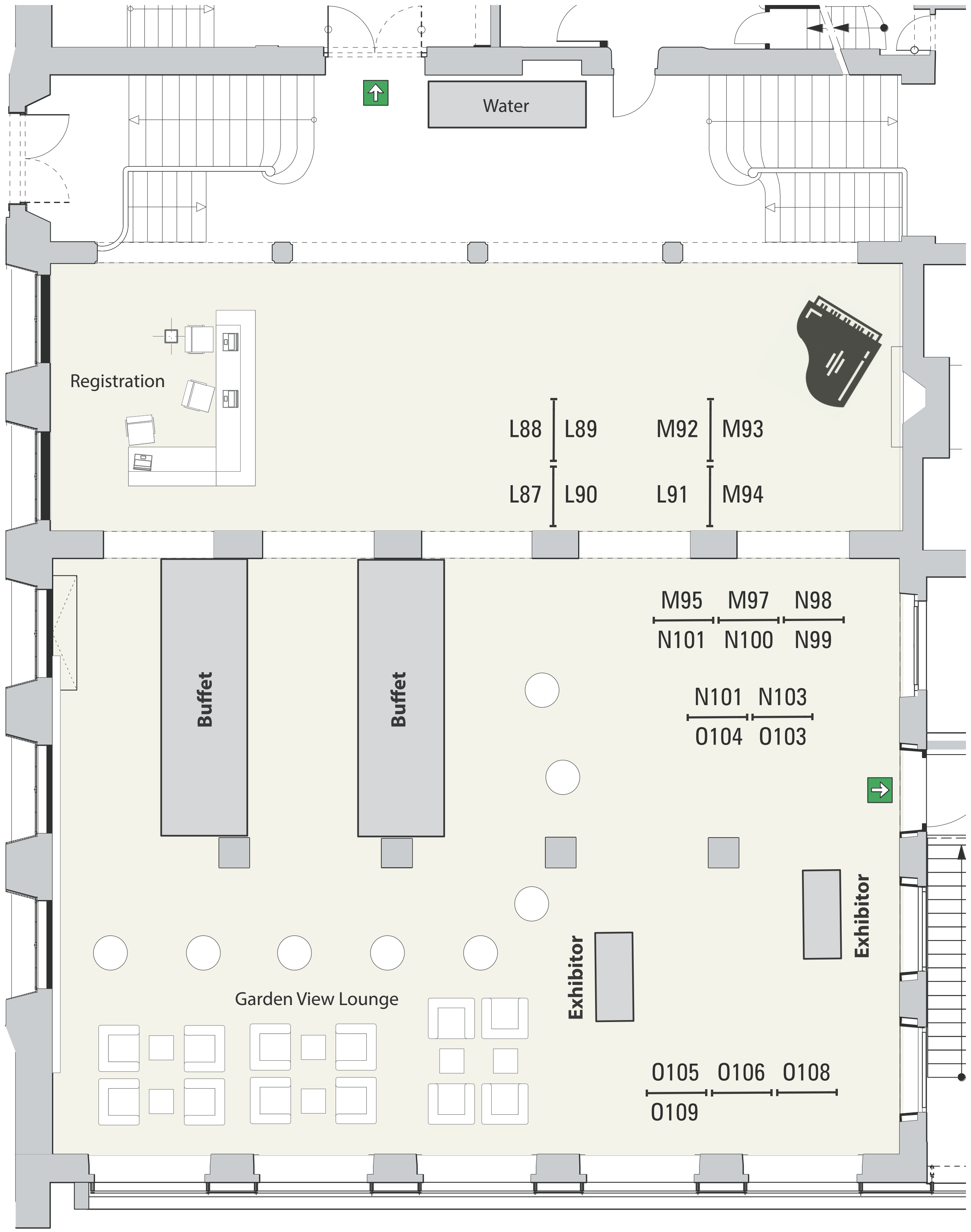

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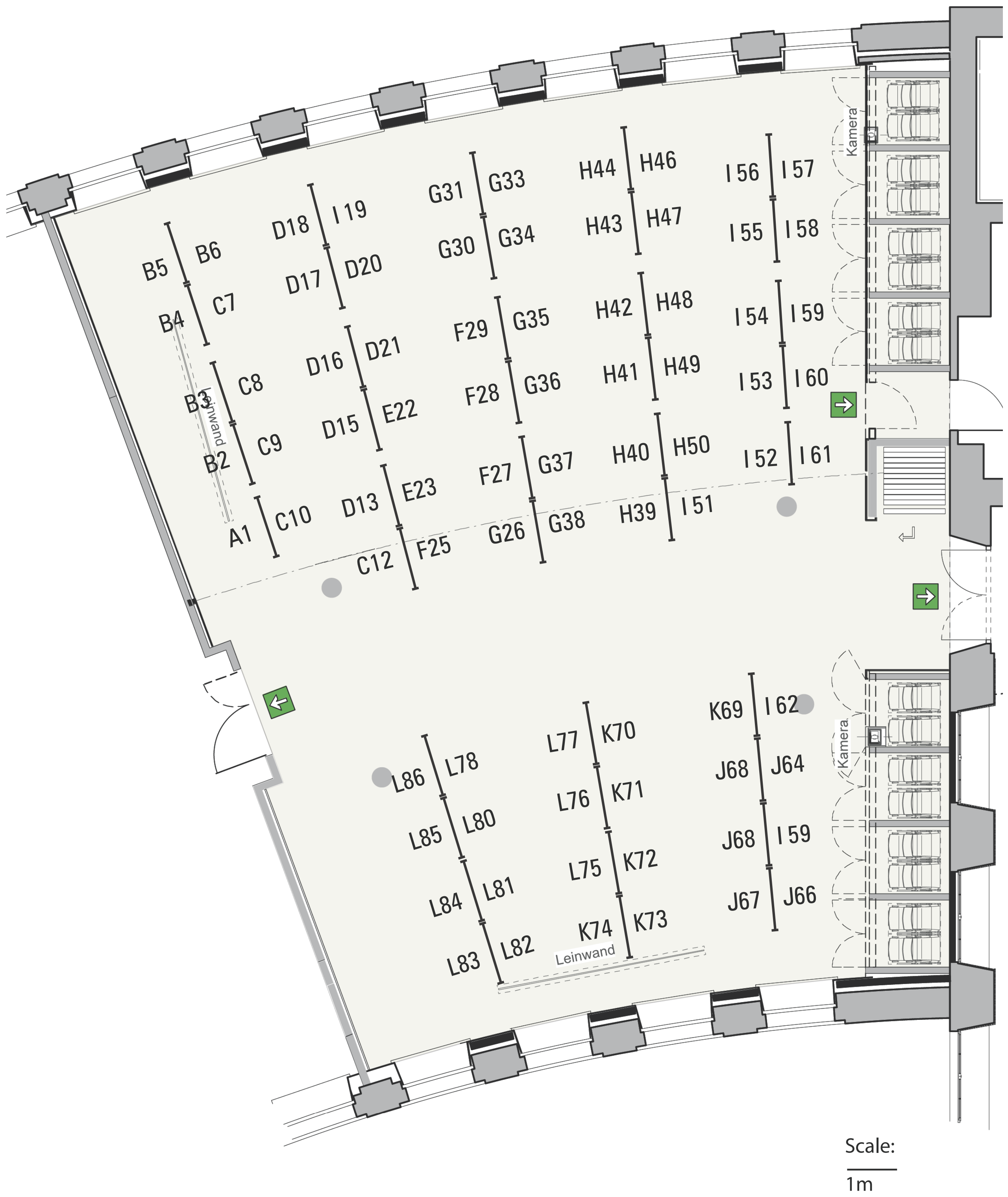

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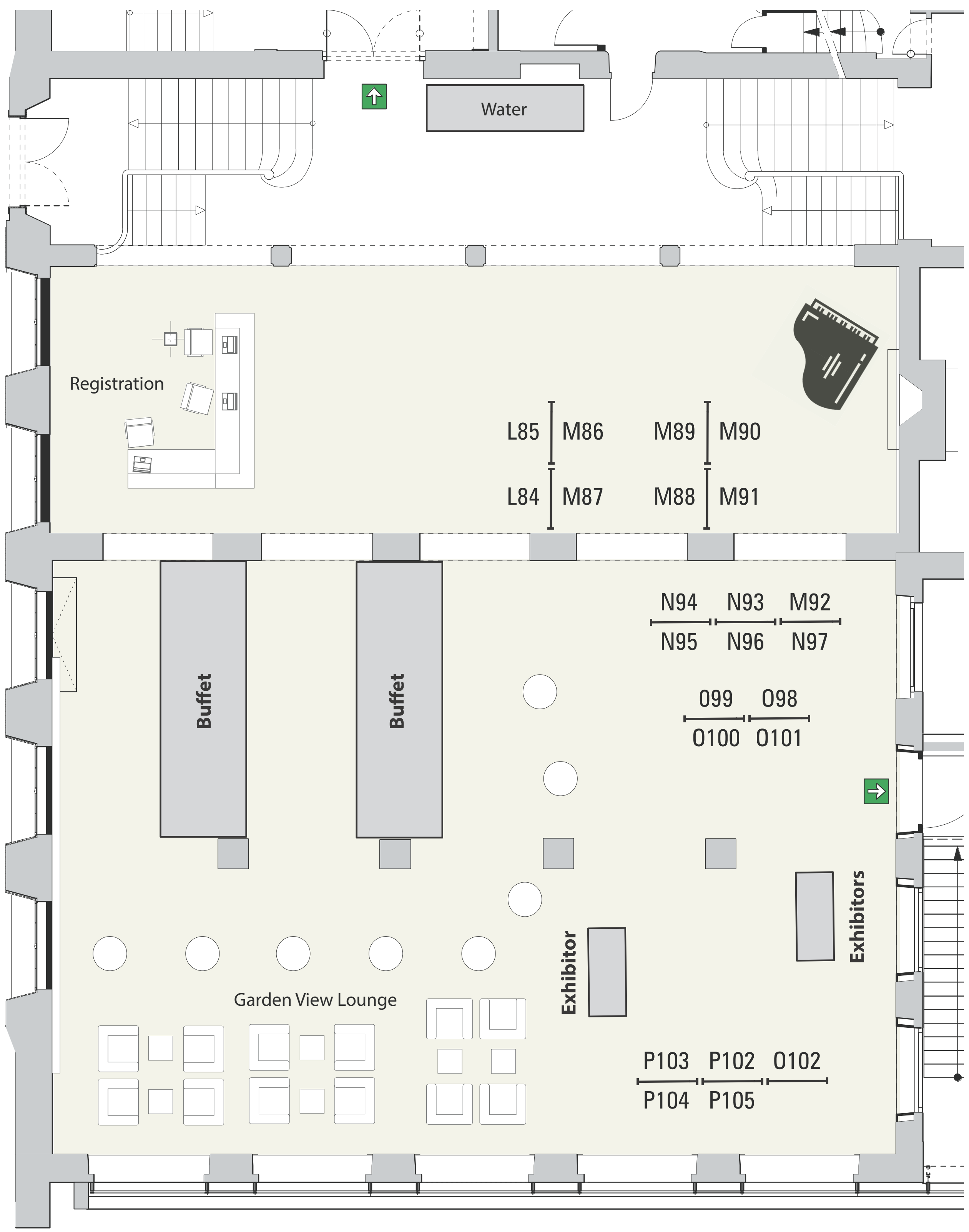

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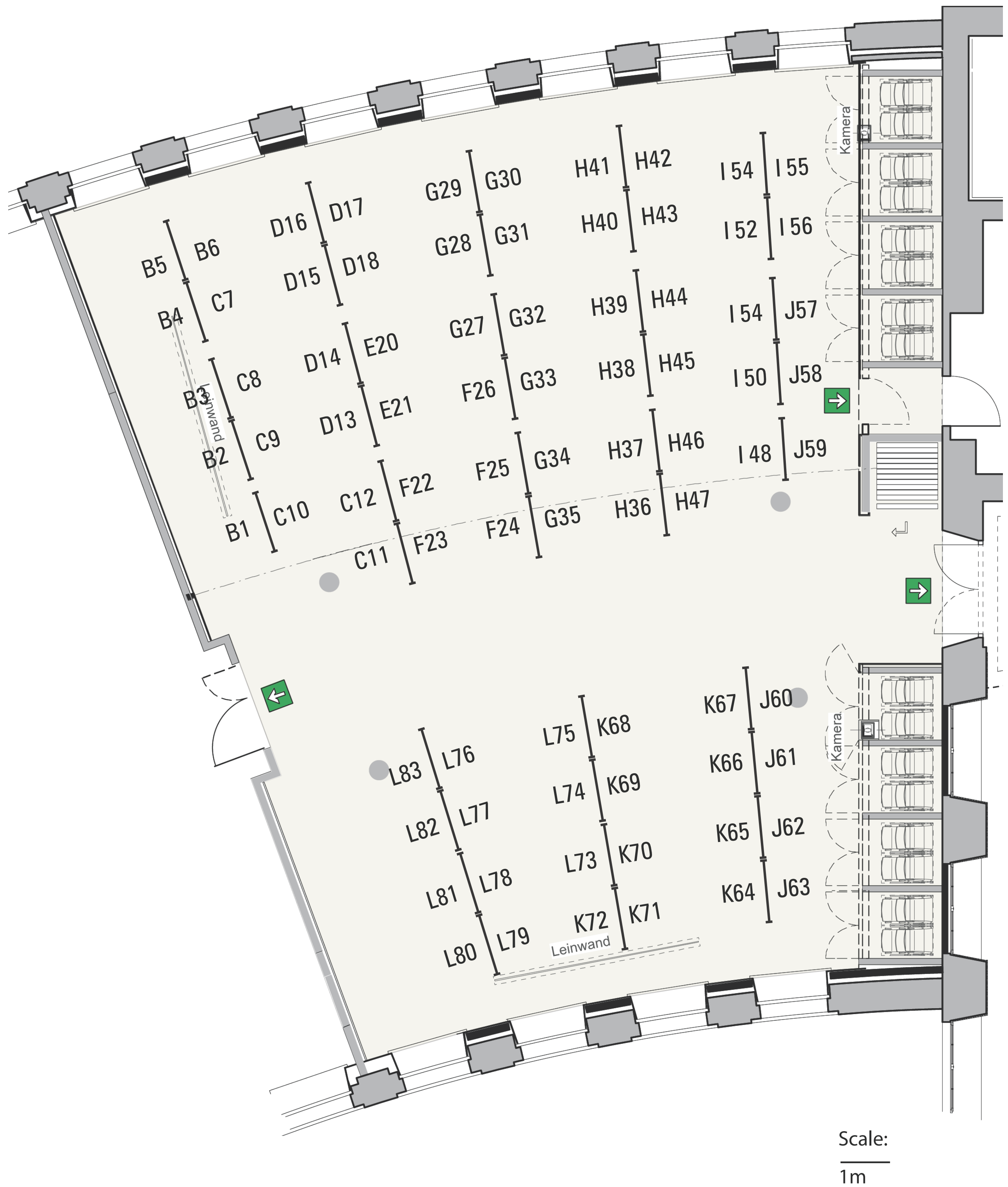
Friday, August 31 • 3:45-6:00 PM • Meitner Hall



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