7th Annual Flux Congress

August 30 - September 1, 2019

Program



flux CONGRESS

The International Congress
for Integrative Developmenta
Cognitive Neuroscience

New Yorker Hotel
New York City, USA

www.fluxsociety.org

Program At-A-Glance

8:30 AM, 8:45 AM, 9:00 AM, 9:05 AM, 9:10 AM, 9:15 AM, 9:20 AM, 9:25 AM, 9:30 AM, 9:35 AM, 9:40 AM, 9:45 AM, 9:50 AM, 9:55 AM, 10:00 AM, 10:05 AM, 10:10 AM, 10:15 AM, 10:20 AM, 10:25 AM, 10:30 AM, 10:35 AM, 10:40 AM, 10:45 AM, 10:50 AM, 10:55 AM, 11:00 AM, 11:05 AM, 11:10 AM, 11:15 AM, 11:20 AM, 11:25 AM, 11:30 AM, 11:35 AM, 11:40 AM, 11:45 AM, 11:50 AM, 11:55 AM, 12:00 PM, 12:05 PM, 12:10 PM, 12:15 PM, 12:20 PM, 12:25 PM, 12:30 PM, 12:35 PM, 12:40 PM, 12:45 PM, 12:50 PM, 12:55 PM, 1:00 PM, 1:05 PM, 1:10 PM, 1:15 PM, 1:20 PM, 1:25 PM, 1:30 PM, 1:35 PM, 1:40 PM, 1:45 PM, 1:50 PM, 1:55 PM, 2:00 PM, 2:05 PM, 2:10 PM, 2:15 PM, 2:20 PM, 2:25 PM, 2:30 PM, 2:35 PM, 2:40 PM, 2:45 PM, 2:50 PM, 2:55 PM, 3:00 PM, 3:05 PM, 3:10 PM, 3:15 PM, 3:20 PM, 3:25 PM, 3:30 PM, 3:35 PM, 3:40 PM, 3:45 PM, 3:50 PM, 3:55 PM, 4:00 PM, 4:05 PM, 4:10 PM, 4:15 PM, 4:20 PM, 4:25 PM, 4:30 PM, 4:35 PM, 4:40 PM, 4:45 PM, 4:50 PM, 4:55 PM, 5:00 PM, 5:05 PM, 5:10 PM, 5:15 PM, 5:20 PM, 5:25 PM, 5:30 PM, 5:35 PM, 5:40 PM, 5:45 PM, 5:50 PM, 5:55 PM, 6:00 PM, 6:05 PM, 6:10 PM, 6:15 PM, 6:20 PM, 6:25 PM, 6:30 PM, 6:35 PM, 6:40 PM, 6:45 PM, 6:50 PM, 6:55 PM, 7:00 PM, 7:05 PM, 7:10 PM, 7:15 PM, 7:20 PM, 7:25 PM, 7:30 PM, 7:35 PM, 7:40 PM, 7:45 PM, 7:50 PM, 7:55 PM, 8:00 PM, 8:05 PM, 8:10 PM, 8:15 PM, 8:20 PM, 8:25 PM, 8:30 PM, 8:35 PM, 8:40 PM, 8:45 PM, 8:50 PM, 8:55 PM, 9:00 PM, 9:05 PM, 9:10 PM, 9:15 PM, 9:20 PM, 9:25 PM, 9:30 PM, 9:35 PM, 9:40 PM, 9:45 PM, 9:50 PM, 9:55 PM, 10:00 PM

Thursday 29-Aug

- **Pre-Conference Workshop1** FIT'NG In: Establishing Best Practices for Infant Neuroimaging *8:00 am - 3:30 pm*
- **Pre-Conference Workshop 2** Beyond the Lab: Translating Developmental Neuroscience *9:00 am - 5:00 pm*
- **Student and Early Career Researchers Evening** *Meet at the entrance to the High Line*

Friday 30-Aug

Registration /Information Desk Open 7:30am-7:00pm

- **Welcome Coffee** *8:30am - 9:00am*
- **Welcome Remarks** *9:00am - 9:15am*
- **Jacobs Foundation Science Of Learning Symposium** *9:15am - 10:30am*
- **Break** *10:30am - 10:50am*
- **Local Symposium: Translational developmental neuroscience: From transcriptomes to connectomes** *10:50am - 12:20pm*
- **Trainee Dissertation Award Talk**
- **Lunch** *12:30pm - 1:50pm*
- **Huttenlocher Lecture** *1:50pm - 2:25pm*
- **Oral Session 1** *NeuroConstruction & the self-organizing brain* *2:25pm - 3:55pm*
- **Break** *3:55pm - 4:15pm*
- **Flash Talks** *4:15pm - 5:00pm*
- **Poster Session** *5:00pm - 7:00pm*

Saturday 31-Aug

Registration /Information Desk Open 8:30am-7:00pm

- **Welcome Coffee** *8:30am - 9:00am*
- **Oral Session 2** *Prenatal influences on brain development and subsquent behaviour* *9:00am - 10:30am*
- **Break** *10:30am - 10:50am*
- **Oral Session 3** Big data and open science: Relevance for developmental cognitive neuroscience *10:50am - 12:30pm*
- **Lunch** *12:30pm - 2:00pm*
- **Young Investigator Award Talk** *2:00pm - 2:30pm*
- **Flash Talks** *2:30pm - 3:15pm*
- **Break** *3:15pm - 3:30pm*
- **Oral Session 4** *Individual differences in brain development: Moving beyond the average developmental trajectory* *3:30pm - 5:00pm*
- **Poster Session** *5:00pm - 7:00pm*
- **Flux Fun Night** *Boat Basin Café* *7:00pm - 10:00pm*

Sunday 1-Sep

Registration /Information Desk Open 8:30am-5:30pmpm

- **Welcome Coffee** *8:30am - 9:00am*
- **Oral Session 5** *New progress in understanding memory development from infancy to childhood* *9:00am - 10:30am*
- **Break** *10:30am - 10:50am*
- **Oral Session 6** Early social markers of social competnecy: Translational studies in primates *10:50am - 12:20pm*
- **Lunch** *12:20pm - 1:35pm*
- **Oral Session 7** *Computational/predictive coding and development* *1:35pm - 2:55pm*
- **Flux Business Meeting** *2:55pm - 3:25pm*
- **Student Skills Exchange** *3:00pm - 3:45pm*
- **Break** *3:25pm - 3:45pm*
- **Oral Session 8** *The effects of pubertal and sex hormones on brain maturation: Current research across different phases of development, and across species* *3:45pm - 5:15pm*
- **Closing Ceremony** *5:15pm - 5:30pm*

**program is subject to slight changes*

Flux Awards

Huttenlocher Lecturer Award

This award is presented to an outstanding researcher in the field of Developmental Cognitive Neuroscience.

2019 Awardee: **BJ Casey** | Fundamentals of the Adolescent Brain (FAB) Lab, Yale University - The Rockefeller University

Dr. BJ Casey is a Professor of Psychology and Director of the Fundamentals of the Adolescent Brain (FAB) Lab at Yale University and Visiting Scientist at The Rockefeller University. Casey pioneered the use of functional magnetic resonance imaging to examine typical and atypical human brain development in the early 1990s and is a world leader in the field of developmental neuroscience. She has received international acclaim for her empirical and theoretical work on the adolescent brain. Her discoveries have provided new insights as to why young people respond to the world in unique ways that have important implications for justice reform.

Young Investigator Award

Supported by the Kennedy Krieger Institute

Kennedy Krieger Institute
KennedyKrieger.org

The Young Investigator Award in Cognitive Neuroscience recognizes outstanding contributions by scientists early in their careers. Award recipients have been working in the area of cognitive neuroscience for no more than 10 years involved in active independent research.

2019 Awardee: **Eva Telzer** | UNC Chapel Hill

Eva Telzer is an Associate Professor of Psychology and Neuroscience at UNC Chapel Hill. She received her Ph.D. in Developmental Psychology from UCLA in 2012. Her research examines how social and cultural processes shape adolescent brain development, with a focus on both prosocial and risk-taking behaviors, family and peer relationships, and long-term psychological well-being. She has authored over 100 publications, and has received numerous awards for her work, including a NARSAD Young Investigator Grant, a Jacobs Foundation Early Career Research Fellowship, an Early Career Award from the Society for Research on Adolescence, the Boyd McCandless Award for Early Career Contribution to Developmental Psychology from the American Psychological Association Division 7, and was named a Rising Star by the Association for Psychological Science. Her research is supported by the National Science Foundation, Brain and Behavior Research Foundation, National Institute of Drug Abuse, and National Institute of Mental Health. In her free time she enjoys drawing biological illustrations, hiking with her dog, and reading.

Flux Dissertation Award **New for 2019**

Sponsored by the Bezos Family Foundation

bezosfamilyfoundation

Flux is pleased to announce the establishment of the Flux Student Dissertation Award, which recognizes an exceptional, rigorous, and meticulous dissertation by one of the Congress' trainee members.

2019 Awardee: **Katie Insel** | Columbia University Zuckerman Institute

Katie received her PhD in Psychology from Harvard University's Cognition, Brain, and Behavior program. During graduate school, she worked in Professor Leah Somerville's Affective Neuroscience and Development Lab in the Department of Psychology and Center for Brain Science. Katie's research examines how adolescent neurodevelopment shapes goal-directed behavior. To answer these questions, her research employs a combination of behavioral, computational, and neuroimaging methods. She is particularly interested in identifying how individuals use incentives to motivate behavior and adjust cognitive effort, and how this ability changes with age during adolescence. Specifically, she investigates how maturing functional brain systems support the integration of motivation and cognition during learning and cognitive control. While most of her work focuses on normative development, she also examines whether adolescents with depression exhibit unique brain and behavioral profiles. This fall, Katie will begin a postdoctoral fellowship working with Professor Daphna Shohamy at Columbia University's Zuckerman Institute. During her postdoctoral training, she plans to study how the multiple brain systems that support learning and memory functionally mature during adolescence.
In addition to conducting research, Katie is committed to scientific outreach, and she has worked with educators, legal scholars, and clinicians to help translate basic science to inform real world applications.

Program Contents

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.**

Welcome
to Flux Congress attendees

Greetings from the Flux Local Host, Program and Board committees! We are excited to bring to New York City a set of diverse speakers that span many important areas in our field. We focused this year's program on "***cutting edge approaches to developmental neuroscience***". Examples include the "*NeuroConstruction & the self-organizing brain*," "*Big data and open science*" and "*Individual differences in brain development: Moving beyond the average developmental trajectory*" sessions, amongst many others. We will continue to have a presentation by our Young Investigator Awardee plus FlashTalk sessions, which will highlight hot topics and young investigators in Developmental Neuroscience. We have worked hard to bring you a diversity of topics, speakers, and session types, and we think that the outstanding science to be presented at Flux will generate lively and productive debates and discussions. These presentations, along with the 266 posters to be presented at this year's meeting, should make for a stimulating and engaging conference. We are also honored to feature **Dr. BJ Casey** at the **Huttenlocher Lecture**, who helped to start the field of developmental cognitive neuroscience and who has mentored so many of the luminaries in our field.

New this year: We have assembled a Trainee Representatives committee, which includes Michelle Achterberg (Leiden University), Alexandra Cohen (NYU), Meriah DeJoseph (UMN), Mollie Marr (OHSU), Jaio Guassi Moreira (UCLA), Kate Nussenbaum (NYU), and Diego Placido (Brown University). This committee has been hard at work implementing many new initiatives, including social media outreach, highlighting "**Trainee of the Month**" releases, starting the Trainee Ideas Exchange, and creating the innagural **Flux Dissertation Award**.

In addition to our excellent scientific program, this year's Flux Congress excursion will be held at Boat Basin Café located in Riverside Park at the end of 79th Street, where beautiful views and great food and drinks can be had by all! Please join us for a New York City experience as part of Flux 2019!

In addition, we will have two **pre-conference workshops** to provide additional avenues for learning and discussion. "*FIT'NG In: Establishing Best Practices for Infant Neuroimaging*" will feature a range of experts in infant neuroimaging who will share their knowledge and expertise for others who may want to learn such approaches or who are already doing infant neuroimaging and want to share tips. The other workshop is "*Beyond the lab: Translating developmental neuroscience*," which will focus on effective approaches for communicating our science to the broader lay community, such an important skill for researchers at all stages of their careers.

New York City – it needs no introduction!

We usually include a description of the city location for Flux, but New York City needs no introduction! It has something for everyone and is home to great art, food, outdoor spaces, indoor spaces, music, theater, science, and anything else you could want. We hope that Flux attendees are able to take advantage of all that the "Big Apple" has to offer.

Flux Congress Venue: The New Yorker

Our host hotel, the aptly named "The New Yorker" is conveniently located in midtown Manhattan. It is walking distance to so many great New York City attractions, including Central Park, the theater district, Radio City Music Hall, MOMA and Rockefeller Center, with easy access to multiple subway lines to take you around the city.

We also wish to thank all of the wonderful sponsors who are helping to make FLUX possible this year, including the Jacobs Foundation, the Bezos Family Foundation, Columbia University Departments of Psychiatry and Psychology, Weill Cornell Department of Psychiatry, Kennedy Krieger Institute, Mount Sinai Adolescent Health Center, NYU Langone Health, Montefiore Medical Center, the Developmental Cognitive Neuroscience journal, Brain Vision LLC, NIRx Medical Technologies, LLC, and the NY Presbyterian Youth Anxiety Clinic.

We look forward to this exciting and engaging meeting and to stimulating discussions with all of the wonderful Flux Congress attendees.

Sincerely,

Deanna Barch
Flux Congress Program Chair

Nim Tottenham
Flux Congress Local Organizing Committee Chair

Moriah Thomason
Xavier Castellanos
Adrianna DiMartino
Bruce McEwen
Rita Goldstein
Michael Milham
Francis Lee
Flux Congress Local Organizing Committee

Welcome
to the seventh meeting of Flux

Welcome to our 7th meeting of Flux: The Society for Developmental Cognitive Neuroscience, in the Big Apple NYC!

Membership to the Flux Society keeps increasing, with over **400 members**.

We are very thankful for being hosted by leaders in the field in NYC including our Host Chair **Nim Tottenham (Columbia University)** and her host committee made up of: **Xavier Castellanos (NYU)**, **Adriana DiMartino (Child Mind Institute)**, **Rita Goldstein (Mt. Sinai)**, **Michael Milham (Child Mind Institute)**, **Moriah Thomason (NYU)**, **Bruce McEwen (Rockefeller University)**, and **Francis Lee (Weill Cornell Medical College)**. They did an amazing job in securing the funding and the logistics in making an NYC meeting possible.

Importantly, they organized the **Flux Fun Night** on Saturday, August 31 on the open air patio of the iconic summertime party spot the **Boat Basin Café** - Located in Riverside Park at the end of 79th Street on the Hudson River which overlooks the Marina and the Hudson River with breathtaking views of the sunsets over New Jersey.

A big thank you to the **Program Chair Deanna Barch (Wash U)** and her program committee including: **Daniel Ansari (University of Western Ontario)**, **Jocelyne Bachevalier (Emory)**, **Gregoire Borst (Université Paris-Sorbonne)**, **Christos Constantinidis (Wake Forest University)**, **Sean Deoni (Brown University)**, **Iroise Dumontheil (BirkBeck, University of London)**, **Damien Fair (OHSU)**, **Catherine Hartley (NYU)**, **Jiska Peper (Leiden University)**, and **Linda Wilbrecht (Berkeley)** for ensuring a remarkable scientific program.

The program committee organized a total of 53 talks including invited and selected Symposiums, Award talks, Flash talks as well as 273 Posters. This year we opened symposium submissions and received a large number of extremely competitive symposiums that we hope to see again as well as new ones for consideration in upcoming years.

We have a prestigious set of awards that we continue to grow!

The **2019 Huttenlocher Awardee is BJ Casey (Yale University)** in recognition of her pioneering efforts playing a major role in establishing the field of Developmental Cognitive Neuroscience by performing impactful scientific work, promoting our area of study, and training many of the leaders in the field. BJ will open the meeting sharing with us her unique vision of the field of DCN.

Eva Telzer (University of North Carolina, Chapel Hill) is this year's **Young Investigator Awardee**, who was selected from a highly competitive set of candidates, for her outstanding and highly productive work characterizing how experience, culture, and motivational context affect neurobehavioral development into adulthood of decision making, social interactions, and emotion regulation.
We thank the **Kennedy Krieger Institute** for supporting the YIA!

We continue to be grateful for the support from the **Jacobs Foundation** enabling us to enhance our scientific aims, including supporting the **Jacobs Science of Learning Synposium (SOL)** and **Student Travel Awards**. We were thrilled to have awarded **4 International student travel awards** and **12 local travel awards** along with **3 Awards** for SOL speakers. Thank you to **Bruce McCandliss (Stanford University)** for leading this effort.

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

NEW The first **Flux 2019 Dissertation Award** was awarded to **Katie Insel (Harvard University – Mentor: Leah Somerville)** for her outstanding dissertation entitled '**Neurodevelopmental shifts in goal directed behavior across adolescence**'

NEW Now that we are a bonafide Society we will start holding a **Business Meeting** for Regular Members, where we will report on the status of the society and open for feedback and discussion on plans going forward. This will take place on Sunday, September 1 at 2:55pm.

NEW At the urging of Nim Tottenham, the next generation has come together and formed a **Flux Student Group** including **Michelle Achterberg (Leiden University)**, **Alexandra Cohen (NYU)**, **Meriah DeJoseph (UMN)**, **Mollie Marr (OHSU)**, **Jaio Guassi Moreira (UCLA)**, **Kate Nussenbaum (NYU)**, and **Diego Placido (Brown University)**! In addition to taking over our social media,they have organized a Student and Early Career Researcher Evening on Thursday, August 29 at 7:00pm. In addition, they also organized a **Student Skills Exchange**, an event for students, by students, to help strengthen their knowledge base.

We want to thank founding members of the Fetal, Infant, Toddler Neuroimaging Group Alice Graham, Dusting Scheinost, Marisa Spann and Lilla Zolleifor organizing this year's preconference **FIT'NG In: Establishing Best**

Practices for Infant Neuroimaging (Supported by BioImage Suite, OHSU School of Medicine, and The Nathaniel Wharton Fund) and **Flux Translational Science Pre-Conference Workshop - Beyond the lab: Translating developmental neuroscience** (Supported by Hopelab and Bezos Family Foundation), organized by Natasha Duell, Lucia Magis-Weinberg, and Jenn Pfeifer

Finally, Karaoke will take place as an informal gathering of those inclined to celebrate in this fashion. Anthony Dick found a great spot at Karaoke City after the Flux Fun Night.

We also want to give a special thank you to **Podium Conference Specialists Marischal DeArmond and especially 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 maturation, 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 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 8, September 10th-13th**, **in Santa Rosa, CA – Wine Country** - hosted by **Bruce McCandliss (Stanford University)** and the host committee including: **Russ Poldrack (Stanford)**, **Linda Wilbrecht (Berkeley)**, **Ronald Dahl (Berkeley)**, **Kaustubh Supekar (Stanford)** and **Weidong Cai (Stanford)**. The scientific program will be chaired by **Jenn Pfeiffer (University of Oregon)** with what promises to be an outstanding invited Program Committee.

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

Damien Fair
Executive Treasurer

Eveline Crone
Executive Board Member

Bruce McCandliss
Board Member

Nim Tottenham
Board Member

Flux Leadership

Society Executive Committee

Beatriz Luna President	University of Pittsburgh, USA
Brad Schlaggar Vice President	Kennedy Krieger Institute, USA
Bruce McCandliss Executive Treasurer	Stanford University, USA
Eveline Crone	Leiden University, Netherlands
Damien Fair	Oregon Health & Science University, USA
Nim Tottenham	Columbia University, USA

Congress Scientific Program Committee

Deanna Barch, Chair	Washington University in St. Louis
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
Chrsitos Constantinidis	Wake Forest University
Jocelyne Bachevalier	Emory University
Linda Wilbrecht	University of California, Berkeley
Iroise Dumontheil	Birkbeck, University of London

Congress Local Host Committee

Nim Tottenham, Chair	Columbia University
Moriah Thomason	New York University
Xavier Castellanos	New York University
Michael Millham	Child Mind Institute
Rita Goldstein	Mount Sinai Institute
Adrianna DiMartino	Child Mind Institute
Bruce McEwen	The Rockefeller University
Francis Lee	Weill Cornell Medical College

Congress Local Host Committee

Podium Conference Specialists

Marischal De Armond
Pam Prewett

General Congress Information

Meeting Venue
The New Yorker Hotel
481 8th Ave
New York, NY 10001 USA
Tel: +1 212-971-0101

All congress sessions 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, speaker presentations, coffee breaks, and poster sessions.

Name Badges
Your name badge is your admission ticket to all conference sessions 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 on the Mezzanine, will be open during the following dates and times:

Thursday, August 29	8:00AM – 10:00AM
Friday, August 30	8:00AM – 7:00PM
Saturday, August 31	8:00AM – 7:00PM
Sunday, September 1	8:00AM – 5:30PM

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 on the mezzanine.

Complimentary WIFI Information:
Complimentary Wifi is available during the conference.

Network: Flux Congress

Code: flux2019

Flux Fun Night
This year's Flux excursion will take place at the **Boat Basin Cafe** located at W 79th Street, New York. Advance ticket purchase is required for this event. The Boat Basin Cafe is a 20-minute subway trip from The New Yorker Hotel. A subway token for transport to the restaurant is included with your ticket.

Poster Information

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 – Friday, August 30

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

Poster Hours:
5:00 – 7:00PM – Poster Session

Removal of all posters by: 8:00pm on August 30

Poster Session 2 – Saturday, August 31

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

Poster Hours:
5:00 – 7:00PM – Poster Session

Removal of all posters by: 8:00pm on August 31

Flux Social Functions

Flux Fun Night

Saturday, August 31 | 7:00pm

This year's Flux excursion will take place at the **79th Street Boat Basin Cafe** located at W 79th Street, New York. Advance ticket purchase is required for this event. The Boat Basin Cafe is a 20-minute subway trip from The New Yorker Hotel. A subway token for transport to the restaurant is included with your ticket and we encourage you to "go local"! *Please note your subway card is valid for two rides on the NYC subway.*

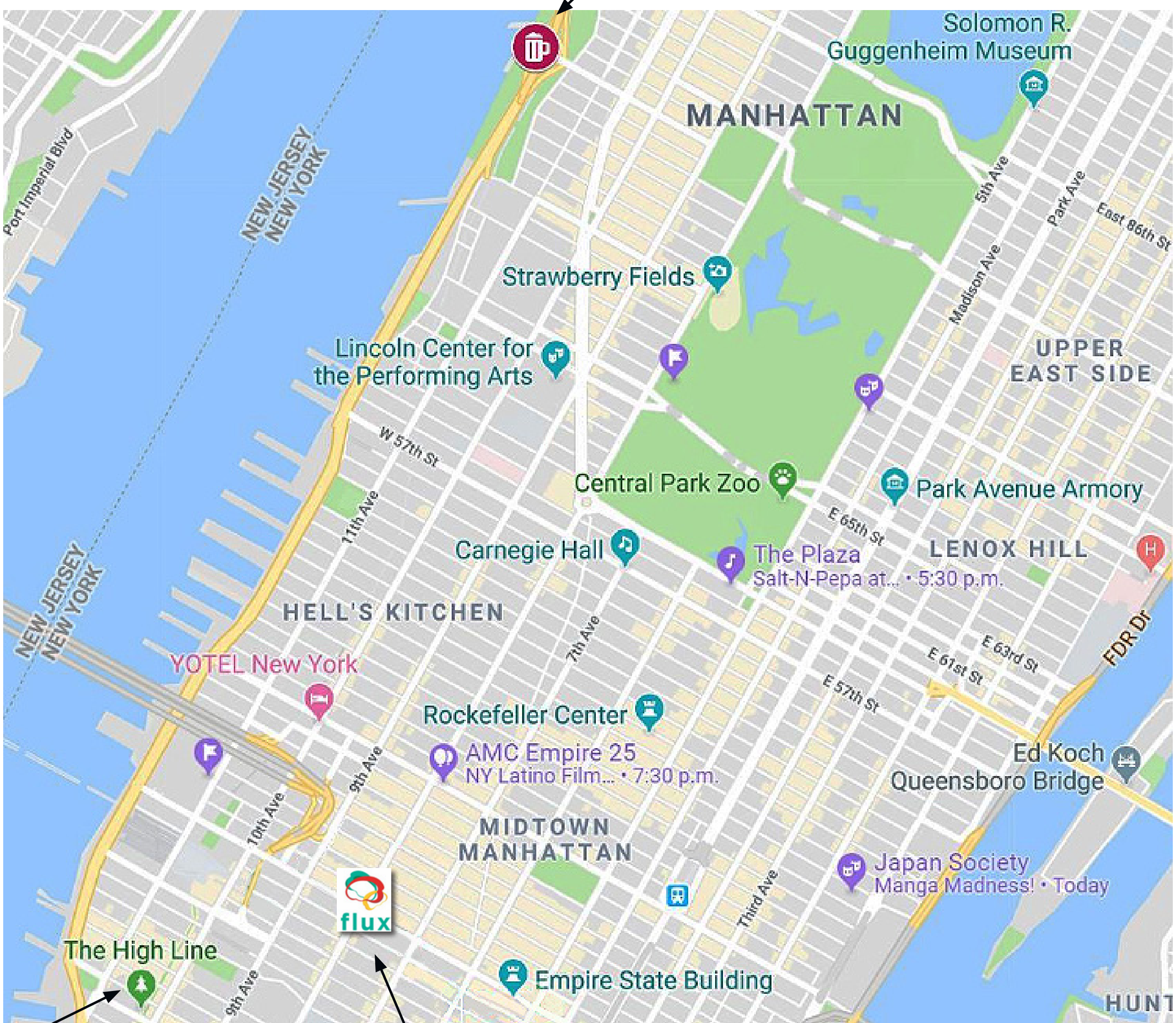
This event is casual and will include a buffet meal. A cash bar will also be available. See map for directions.

Student and Early Career Researchers Evening

Thursday, August 27

The Flux Trainee Committee is pleased to announce a Student and Early Career Researchers Evening! On August 27, we will meet up at the Highline at 6:00pm and walk towards Chelsea market to get something to eat (dinner on own dime).

Boat Basin Cafe, *W 79th Street*

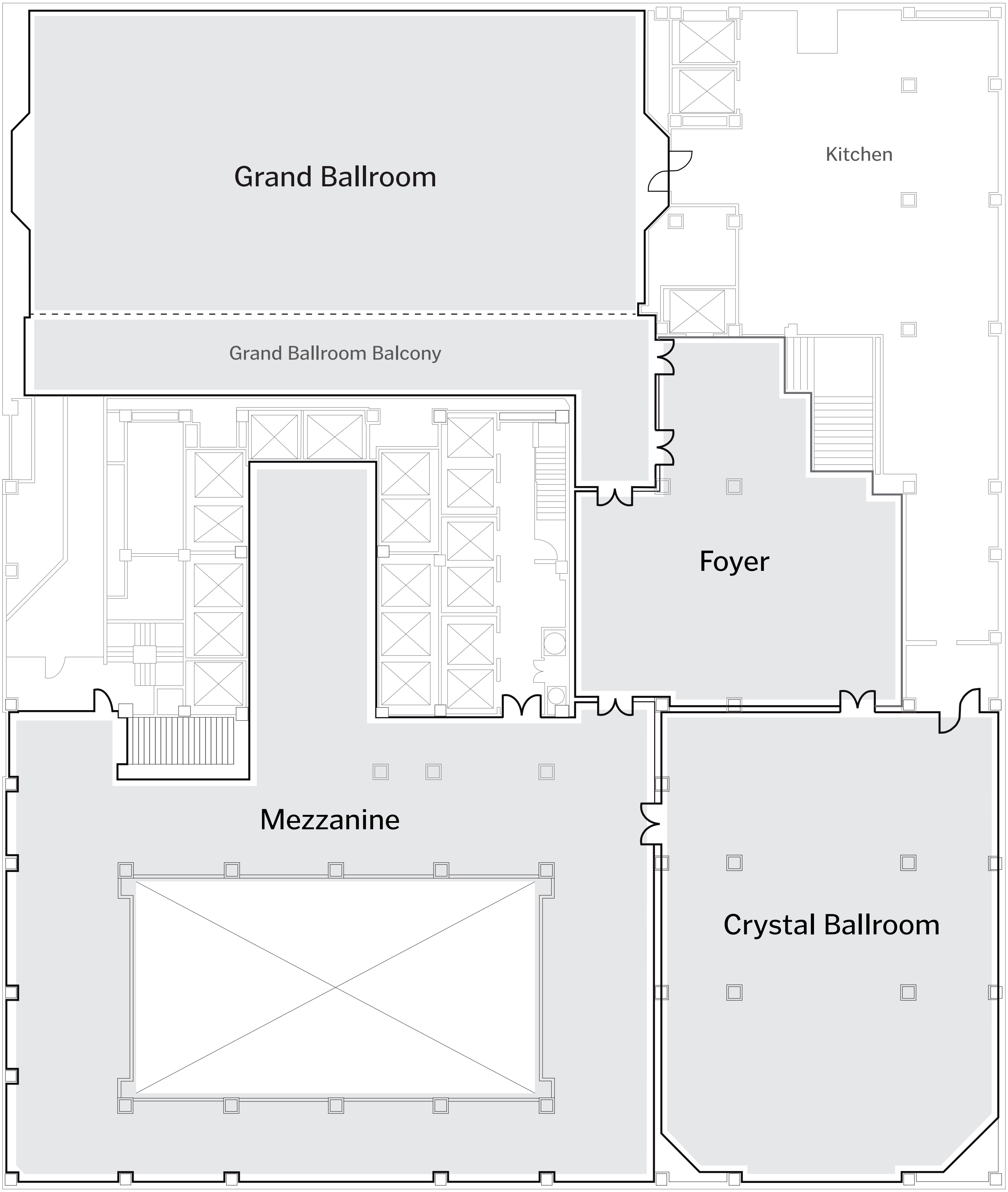


The High Line, *515 W 23rd Street* **Flux - The New Yorker Hotel**, *481 8th Avenue*

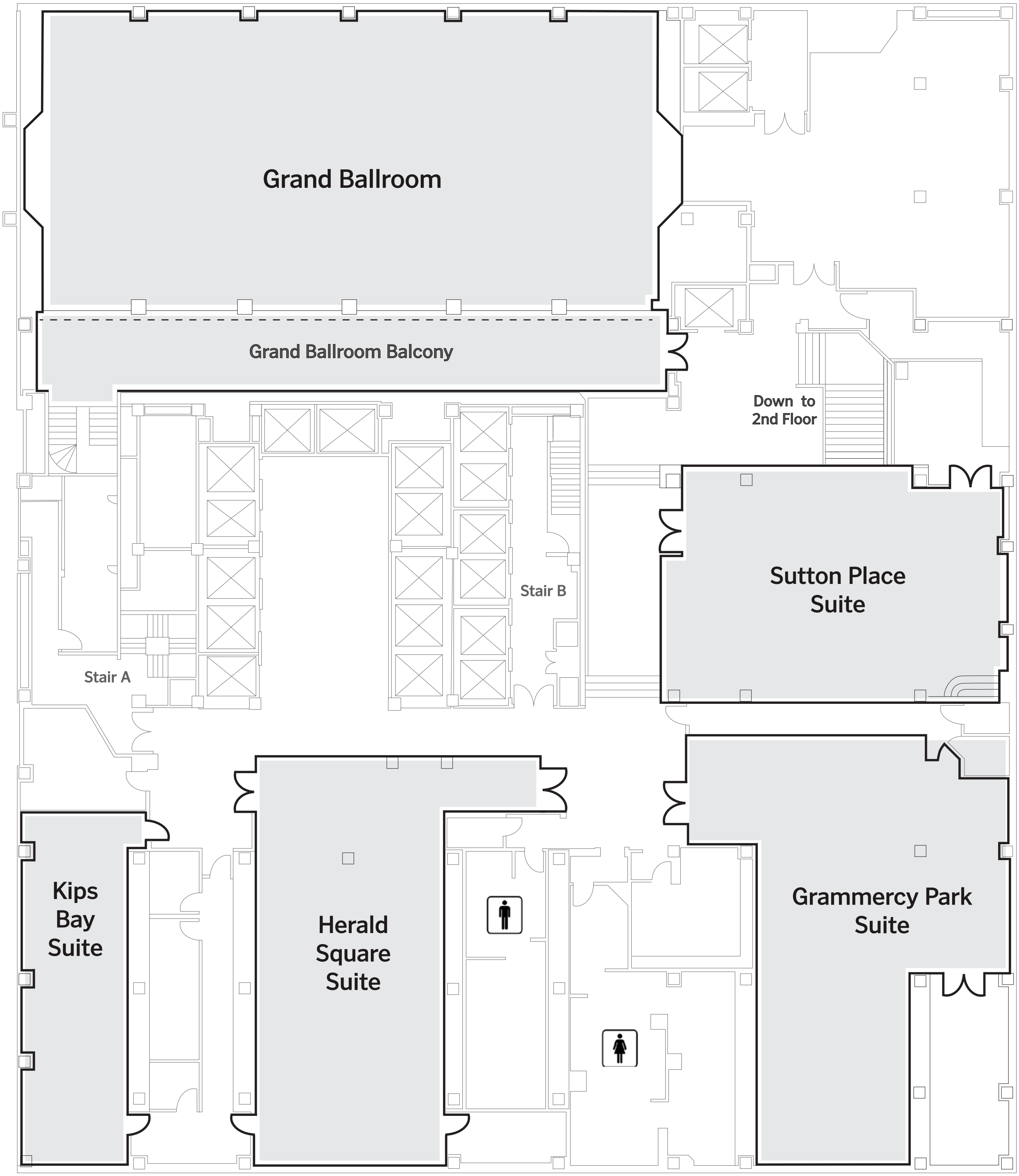
CLICK HERE TO SEE THE FULL MAP

https://www.google.com/maps/d/viewer?mid=1yPj-a6gbxejtEvf0uwW30b6es8SHQP-I&ll=40.7657053252209%2C-73.98359189720736&z=15

Congress Venue Floor Plan - 2nd Floor



Congress Venue Floor Plan - 3rd Floor



Flux Congress Program Schedule

Day 1 Friday, August 30

8:30 – 8:55AM Coffee

8:55 – 9:10AM **Welcome Comments**
Beatriz Luna University of Pittsburgh, USA
Deanna Barch Washington University in St Louis, USA
Nim Tottenham Columbia University USA

Science of Learning Symposium

Chair: **Bruce McCandliss** Stanford University, USA
Sponsored by Jacobs Foundation

9:10 – 9:30AM **Magnetoencephalographic signatures of hierarchical rule learning in newborns**
Julia Moser University of Tübingen, Germany

9:30 – 9:50AM **Cortical plasticity associated with a parent-implemented language intervention**
Rachel Romeo MIT & Boston Children's Hospital, USA

9:50 – 10:10AM **Dynamic neural correlates of fear conditioning in children exposed to trauma and associations with psychopathology**
Stephanie DeCross Harvard University, USA

10:10 – 10:30AM Q&A

10:30 – 10:50AM Break

Local Symposium - NeuroConstruction & the self-organizing brain

Chair: **Nim Tottenham** Columbia University, USA

10:50 – 11:10AM **Perinatal interference with the serotonergic system affects VTA function in the adult via glutamatergic co-release**
Catia Teixeira Nathan Kline Institute, USA

11:10 – 11:30AM **Molecular mechanisms of episodic learning and memory in early development**
Christina Alberini New York University, USA

11:30 – 11:50AM **Brain injury at birth disrupts the development of dopamine and working memory networks in humans**
Sean Froudist-Walsh New York University, USA

11:50AM – 12:10PM **Learning how to remember**
Chris Baldessano Columbia University, USA

12:10 – 12:20PM Q&A

Trainee Dissertation Award Presentation

Chair: **Bea Luna** University of Pittsburgh, USA
Sponsored by the Bezos Family Foundation

12:20 – 12:30PM **Brain and behavioral asymmetries for gain and loss learning emerge with age during adolescence**
Katie Insel Harvard University, USA

12:30 – 1:50PM Lunch (on own)

Huttenlocher Lecture

Chair: **Deanna Barch** Washington University in St. Louis, USA

1:50 – 2:25PM **Developmental cognitive neuroscience: We've come a long way, baby, or have we?**
BJ Casey Yale University, USA

Flux Congress Program Schedule

Local Session: - Translational developmental neuroscience: From transcriptomes to connectomes

Chair: **Francis Lee** New York Presbyterian/Weill Cornell Medical Center, USA

2:25 – 2:50PM	**Epigenetic signature in CA3 neurons associated with altered stress reactivity in mice subjected to early-life stress** **Jordan Marrocco** The Rockefeller University, USA
2:50 – 3:15PM	**Title to come** **Conor Liston** Cornell Medical, USA
3:15 – 3:40PM	**Subcortical brain structure and function in youth with depression or familial risk** **David Pagliaccio** Columbia University, USA
3:40 – 3:55PM	Q&A
3:55 – 4:15PM	Break

Flash Talks

Chair: **Kate Hartley** New York University, USA

4:15 – 4:20PM	**The neural correlates of giving under different social contexts in adolescence** **Suzanne van de Groep** Leiden University, The Netherlands
4:20 – 4:25PM	**Perseverance in adolescents and young adults is related to neural response to performance feedback** **Sarah Tashjian** University of California, Los Angeles, USA
4:25 – 4:30PM	**Neighborhood racial demographics predict infants' motor system activation toward r acial out-group individuals** **Hyesung Grace Hwang** University of Chicago, USA
4:30 – 4:35PM	**Individual variation in fronto-parietal control network topography supports executive function in youth** **Zaixu Cui** University of Pennsylvania, USA
4:35 – 4:40PM	**Neural correlates of self-evaluation during puberty** **Marjolein Barendse** University of Melbourne / University of Oregon, USA
4:40 – 4:45PM	**Executive functions in reading: impairment and plasticity in children with and without dyslexia** **Tzipi Horowitz-Kraus** Technion and Cincinnati Children's Hospital, USA
4:45 – 4:50PM	**Two patterns of atypical development involving distinct functional networks in Tourette syndrome** **Ashley Nielsen** Washington University in St. Louis, USA
4:50 – 4:55PM	**Neural mechanisms of digit processing in kindergartners: An fMRI study** **Benjamin Conrad** Vanderbilt University, USA
4:55 – 5:00PM	**Response time variability is associated with more current and future negative life outcomes in children** **Ana Cubillo** University of Zurich, Switzerland
5:00 – 7:00PM	**Poster Session 1**

Flux Congress Program Schedule

Day 2 Saturday, August 31

Oral Session 2 - Prenatal influences on brain development and subsequent behaviour

Chair: **Alice Graham** Oregon Health & Science University, USA

9:00 – 9:20AM **Fetal programming of brain development – Role of maternal-placental-fetal stress biology**
Claudia Buss Charité Universitätsmedizin Berlin, Germany

9:20 – 9:40AM **Maternal metabolic and dietary environmental influences on offspring behavior**
Elinor Sullivan Oregon Health and Science University, USA

9:40 – 10:00AM **Aberrant structural and functional connectivity underlies neurodevelopmental impairment and psychopathology in preterm children**
Cynthia Rogers Washington University, USA

10:00 – 10:20AM **Aberrant structural and functional connectivity underlies neurodevelopmental impairment and psychopathology in preterm children**
Chris Smyser Washington University, USA

10:20 – 10:30AM Q & A

10:30 – 10:50AM Break

Oral Session 3: Big data and open science: Relevance for developmental cognitive neuroscience

Chair: **Damien Fair** Oregon Health & Science University, USA

10:50 – 11:15AM **Large-scale, open neuroimaging datasets are increasing more than just sample size**
Mike Milham Child Mind Institute, USA

11:15 – 11:40AM **Improving practices and inferences in developmental cognitive neuroscience: Open science tools for research design, analysis, and publication**
Jenn Pfeiffer University of Oregon, USA

11:40AM – 12:05PM **Opportunities and challenges of sharing and pooling data from existing longitudinal neuroimaging cohorts**
Kathrine Skak Madsen Danish Research Centre for Magnetic Resonance, Denmark

12:05 – 12:30PM Q&A

12:30 – 2:00PM Lunch (on own)

Young Investigator Award Lecture

Chair: **Brad Schlaggar** Kennedy Krieger Institute, USA
Supported by Kennedy Krieger Institute

Kennedy Krieger Institute
KennedyKrieger.org

2:00 – 2:30PM **For better or for worse?: Neurobiological sensitivity to social context**
Eva Telzer University of North Carolina at Chapel Hill, USA

Flash Talks

Chair: **Jess Church** University of Texas at Austin, USA

2:30 – 2:35PM **Peers exert a stronger prosocial than antisocial influence on adolescent attitudes: Evidence from brain and behavior**
Kathy Do University of North Carolina, Chapel Hill, USA

2:35 – 2:40PM	**Hippocampal multivoxel encoding signatures predict long-term memory across middle childhood and adolescence in humans.** **Bridget Callaghan** Columbia University, USA
2:40 – 2:45PM	**The role of toddler myelination in preschool executive function development** **Lourdes Delgado Reyes** University of East Anglia, UK
2:45 – 2:50PM	**The moderating role of socioeconomic status on relations between level of responsibility and cortical thinning during adolescence** **Giorgia Picci** The Pennsylvania State University, USA
2:50 – 2:55PM	**Using fNIRS and Galvanic Skin Response as a novel approach to infer Limbic-Prefrontal processes in early childhood** **Adam Grabell** University of Massachusetts, USA
2:55 – 3:00PM	**Higher quality neural representations of phonemes scaffold longitudinal reading gains in 5- to 7-year-old children** **Jin Wang** Vanderbilt University, USA
3:00 – 3:05PM	**Unique effects of age and pubertal development on amygdala-PFC connectivity during face processing** **Arianna Gard** University of Michigan, USA
3:05 – 3:10PM	**Striatal dopamine contributions to the development of frontostriatal connectivity in a reward learning context** **Ashley Parr** University of Pittsburgh, USA
3:10 – 3:15PM	**Predicting vulnerability to risk behaviors in a large cohort of children** **Kristina Rapuano** Yale University, USA
3:15 – 3:30PM	Break

Oral Session 4: Individual differences in brain development: Moving beyond the average developmental trajectory

Chair: **Angie Laird** Florida International University, USA

3:30 – 3:55PM	**Moving beyond the mean level: A longitudinal study examining individual differences in social brain developmental trajectories** **Andrik Becht** Leiden University, The Netherlands
3:55 – 4:20PM	**Modelling the dynamics of brain structure and cognitive development** **Rogier Kievit** University of Cambridge, UK
4:20 – 4:45PM	**The strategic adolescent brain: functional brain organization during adolescence relates to behavioral strategies** **Kate Mills** University of Oregon, USA
4:45 – 5:00PM	Q&A
5:00 – 7:00PM	**Poster Session 2**
7:30 – 10:00PM	**Flux Fun Night** at the **Boat Basin Café**. See General Information section and the map on page 8

Flux Congress Program Schedule

Day 3 Sunday, September 1

Oral Session 5: New progress in understanding memory development from infancy to childhood

Chair: **Sarah Durston** University Medical Centre Utrecht, The Netherlands

9:00 – 9:20AM	**Functional brain imaging of learning and memory in human infants** **Nicholas Turk-Browne** Yale University, USA
9:20 – 9:40AM	**The what, where, and when of memory in toddlers: Behavioral and neural evidence** **Simona Ghetti** University of California, Davis, USA
9:40 – 10:00AM	**The binding of space and time in episodic memory** **Sang Ah Lee** Korea Advanced Institute of Science and Technology, Korea
10:00 – 10:20AM	**Development of holistic episodic recollection** **Zoë Ngo** Temple University, USA
10:20 – 10:30AM	Q&A
10:30 – 10:50AM	Break

Oral Session 6: Early social markers of social competency: Translational studies in primates

Chair: **Jocelyne Bachevalier** Emory University, USA

10:50 – 11:15AM	**Early mother-infant interactions and social development in rhesus monkeys** **Amanda Dettmer** Yale University, USA
11:15 – 11:40AM	**Early social experience, genetic influences and epigenetic regulation in the developing social brain** **Pier Francesco Ferrari** Univeristà di Parma, Italy
11:40AM – 12:05PM	**Development of macaque face visual processing using combined eye-tracking and MRI: in search of nonhuman primate models of social deficits of relevance to Autism** **Mar Sanchez** Emory University, USA
12:05 – 12:20PM	Q&A
12:20 – 1:35PM	Lunch (on own)

Oral Session 7: Computational/predictive coding and development

Chair: **Gregoire Borst** Université Paris-Sorbonne, France

1:35 – 1:55PM	**The promise and challenges of using fNIRS to study predictive mechanisms in human infants** **Richard Aslin** Yale University, USA
1:55 – 2:15PM	**Predictive "EN"-coding: How prior beliefs influence preschooler's memory** **Elizabeth Bonawitz** Rutgers University - Newark, USA
2:15 – 2:35PM	**Deep predictive learning in the neocortex and pulvinar** **Randy O'Reilly** Colorado University, USA
2:35 – 2:55PM	Q&A
2:55 – 3:25PM	**Flux Business Meeting**
3:00 – 3:45PM	**Student Skills Exchange**

3:25 – 3:45PM	Break
	Oral Session 8: The effects of pubertal and sex hormones on brain maturation: Current research across different phases of development, and across species Chair: **Deanna Barch** Washington University, USA
3:45 – 4:05PM	**Androgens and structurally distinct amygdala subregion development in children and adolescents** **Megan Herting** University of Southern California, USA
4:05 – 4:25PM	**Pubertal hormones predict sex-specific trajectories of pituitary gland volume during the transition from childhood to adolescence** **Sarah Whittle** University of Melbourne, Australia
4:25 – 4:45PM	**Prenatal masculinization of the auditory system in infants: the MIREC-ID study** **Tuong-Vi Nguyen** McGill University, Canada
4:45 – 5:05PM	**Cortical reorganization during adolescence: what the rat can tell us about the cellular basis** **Janice Juraska** University of Illinois, USA
5:05 – 5:15PM	Q&A
5:15 – 5:30PM	**Closing & Awards**

Flux Congress Oral Presentations

Day 1 Friday, August 30

Jacobs Foundation Science of Learning Symposium

Chair: **Bruce McCandliss** Stanford University, USA

Julia Moser fMEG-Center/Institute for Diabetes Research and Metabolic Diseases (IDM) of the Helmholtz Center Munich at the University of Tübingen, Germany

Magnetoencephalographic signatures of hierarchical rule learning in newborns

Fetal magnetoencephalography (fMEG) allows to non-invasively measure fetal and neonatal brain activity. With fMEG, auditory event-related responses to tones as well as auditory mismatch responses can be reliably recorded in the last trimester of pregnancy as well as shortly after birth, which demonstrates auditory discrimination on a neuronal level. To differentiate conscious perception and learning from automated sensory processing, a complex - hierarchical - oddball paradigm was used. The auditory "local-global" mismatch paradigm establishes a global rule, whose violation causes a global mismatch response, in addition to the mismatch response caused by a local oddball. After an initial rule-learning phase, this globally deviant sequence appears in one fourth of trials. Depending on the rule, the local oddball can be within either the standard or the deviant sequence. The sequence without oddball can be standard or global deviant respectively. All subjects were stimulated with both rules, resulting in four stimulus conditions. fMEG measurements were performed in 21 newborns between 13 and 55 days (M=31). Stimuli were sequences of 500Hz as well as 750Hz tones. Newborns showed mismatch responses towards local as well as global rule violations. The local oddball within the globally deviating sequence elicited the strongest mismatch response. A weaker mismatch response was observed for the oddball within the standard sequence. Comparison of both sequences with or without oddball (role of global standard or deviant) revealed in both cases an early and a late global mismatch response (peaking at 350ms & 1010ms; 380ms & 920ms respectively). These findings give a strong indication for learning of the presented rule. Within the framework of the "local-global" paradigm, learning of the global rule is seen as a neuronal correlate of conscious processing. Investigating this correlate can be a valuable contribution to the research on early cognitive development.

Rachel Romeo MIT & Boston Children's Hospital, USA

Cortical plasticity associated with a parent-implemented language intervention

Objective: Children's early language experiences, including high quality parent-child interactions, are related to their linguistic, cognitive, and academic development, as well as their brain structure and function (Romeo et al., 2018). On average, children from lower socioeconomic status (SES) backgrounds receive reduced language exposure, and several parent-implemented interventions have resulted in both improved home language environments as well as increases in children's language skills (e.g., Leech et al., 2018). However, the neuroplastic mechanisms underlying these changes are yet unknown. Methods: One hundred lower-SES 4-to-6 year-old children and their primary caregivers were randomly assigned to either a 9-week family-based intervention focused on enhancing children's communication, executive functioning, and school readiness skills or a no-contact control group. Children completed pre and post assessments of verbal and nonverbal cognition, and subsets of each participant group additionally completed LENA home language recording and structural neuroimaging, from which longitudinal cortical thickness changes were calculated using Freesurfer. Results: Controlling for baseline measures, families who completed the intervention exhibited significantly increased adult-child conversational turns. The magnitude of turn-taking change was positively correlated with increases in children's language scores, and was also positively correlated to cortical thickening in language-related left inferior frontal regions, as well as social-related right supramarginal regions. Conclusions: This is the first study to investigate neural mechanisms underlying perturbations to children's language environments. Results suggest that parent-implemented language interventions may improve children's language skills via cortical plasticity in canonical language and social regions during development. This has implications for social and educational policies for early intervention.

Stephanie DeCross Harvard University, USA

Dynamic neural correlates of fear conditioning in children exposed to trauma and associations with psychopathology

Objective: One potential mechanism linking childhood trauma (CT) exposure to psychopathology is fear learning, a phenomenon that is well understood in adult but not developmental populations. This study aims to describe how the neural correlates of fear learning unfold over time in children, as well as how CT may disrupt patterns of neural response in ways that contribute to psychopathology. Methods: 147 children (aged 8-16 years) with and without exposure to CT underwent a differential fear conditioning procedure during an fMRI scan. Dynamic patterns of learning were examined in voxel-wise parametric modulation analyses and region-of-interest analyses, and functional connectivity was assessed with whole-brain task-based connectivity analyses. Multiple regression was used to examine associations with psychopathology symptoms. Results: In children, canonical salience network regions (including amygdala, insula, anterior cingulate cortex) were active to the CS+ relative to CS- and exhibited habituation across learning blocks. Default mode network regions (including hippocampus, frontal pole, vmPFC, and posterior cingulate cortex) were active to CS- relative to CS+, and increased activation across learning blocks. Children with CT display blunted habituation to CS+>CS- in right amygdala and insula and smaller increases in right hippocampus and frontal pole to CS->CS+. Additionally, children with CT showed greater functional connectivity of amygdala with fronto-parietal regions associated with attention direction and initiation of defensive responses to CS+>CS-, and less amygdala-hippocampus connectivity. Patterns of altered dynamic neural response were associated with depression, generalized anxiety, and externalizing symptoms. Conclusions: Alterations in fear learning processes and the dynamic communication between salience network and default mode network regions may be a key mechanism underlying the link between CT and psychopathology.

Flux Congress Oral Presentations

Local Symposium: NeuroConstruction and the self-organizing brain

Chair: **Nim Tottenham** Columbia University, USA

Catia Teixeira Nathan Kline Institute, USA

Perinatal interference with the serotonergic system affects VTA function in the adult via glutamatergic co-release
Serotonin and dopamine are neurotransmitters associated with multiple psychiatric disorders. However, how they interact during development to affect subsequent behavior remains relatively unknown. Here I will present work from my laboratory showing how changes in serotonin levels during early-life, induced by exposure to antidepressants, alter dopaminergic function and behavior later in life.

Christina Alberini New York University, USA

Molecular mechanisms of episodic learning and memory in early development
Infantile episodic experiences are rapidly forgotten; nonetheless, they profoundly affect the brain's functions and physiology throughout life. In agreement, recent studies in rodents showed that memories formed in infancy are not lost, but instead are stored long-term in latent forms. Molecular and behavioral characterization of hippocampus-dependent memories in rats and mice led us to suggest that they undergo a developmental critical period. I will discuss new findings revealing that, during this period, learning produces a significant maturation at the cellular, synaptic and behavioral levels. This maturation appears to be selective for the type of experience encountered.

Sean Froudist-Walsh New York University, USA

Brain injury at birth disrupts the development of dopamine and working memory networks in humans
Working memory requires dopamine. In rodents, damage to the hippocampus at birth affects dopamine function and working memory in later life. Similar studies in humans have been lacking. I first present results from a longitudinal study of people who had brain injury at birth. Their hippocampal damage correlates with reduced presynaptic dopamine function in adulthood. However, compensatory cortical activity may reduce working memory deficits. Next, I present a new large-scale computational model. We find that increases in cortical dopamine in development can lead to less distractible working memory. Together, this shows how specific developmental changes can impact working memory ability.

Chris Baldessano Columbia University, USA

Learning how to remember
Building memories of realistic experiences in our everyday lives is a daunting task, requiring us to break down the continuous world in meaningful events that can be understood, stored, and communicated. My recent projects have explored the ways in which our knowledge about the schematic structure of the world changes how we build these event representations. I will discuss the new experimental and analytic methods I have developed to study this question in naturalistic stimuli, and current work in my lab in which we have applied these approaches to study developmental changes in event perception.

Trainee Dissertation Award Presentation

Sponsored by Bezos Family Foundation

Chair: **Bea Luna** University of Pittsburgh, USA

Katie Insel Harvard University, USA

Brain and behavioral asymmetries for gain and loss learning emerge with age during adolescence
Adolescence is a period of the lifespan accompanied by normative shifts in motivated behavior, and the ability to learn from gain and loss incentives matures with age. However, it remains unclear whether adolescents exhibit value prioritization during gain and loss learning, a process that allows individuals to enhance learning for high-value outcomes in a goal-directed fashion. To test this question, N=84 participants age 13-20 completed a value-modulated probabilistic reinforcement learning task with low and high stakes gain and loss learning contexts during functional neuroimaging. Value prioritization was indexed by comparing learning performance, as measured by proportion optimal choice, between high and low stakes conditions when participants learned to approach gains or avoid losses. Older adolescents exhibited value prioritization in the gain domain, a behavioral profile that emerged with age during late adolescence. In contrast, younger adolescents exhibited value prioritization in the loss domain, and this effect attenuated with age. These age-related differences in learning could not be explained by differences in self-reported subjective value of the monetary incentives. Age-related asymmetries in value-prioritization were mirrored in functional recruitment of the ventral striatum during feedback. Younger adolescents exhibited value-based differentiation in the striatum during loss learning. However, with age, individuals were more likely to increase ventral striatal activity for high relative to low value gain outcomes. Moreover, gain value-tracking in the ventral striatum was associated with enhanced value prioritization during gain learning. Together, these findings reveal age-related asymmetries in brain and behavioral signatures of value-prioritization during gain and loss learning.

Huttenlocher Lecture

Chair: **Deanna Barch** Washington University, USA

BJ Casey Yale University, USA

Developmental cognitive neuroscience: We've come a long way, baby, or have we?
With advances in imaging technology, we have significantly improved our ability to examine the developing brain in vivo. The rise in large scale, longitudinal data collection now allows us to examine developmental trajectories in dynamic brain systems across and within individuals to make predictions about long term outcomes. But what impact has developmental science had on the quality of life for our youth or for our society to date? How can developmental science better inform the treatment of the developing brain in medicine, law and society? This lecture will discuss these issues from a historical perspective and consider future opportunities.

Flux Congress Oral Presentations

Local Session: Translational developmental neuroscience: From transcriptomes to connectomes

Chair: **Francis Lee** New York Presbyterian/Weill Cornell Medical Center

Jordan Marrocco The Rockefeller University, USA

Epigenetic signature in CA3 neurons associated with altered stress reactivity in mice subjected to early-life stress

Epigenetic control of gene expression by early-life adversities affects discrete brain regions involved in mood regulation and response to stress, such as the hippocampus. Using a protocol of chronic early-life stress (ELS) in mice followed by acute-swim stress in adulthood, we showed that ELS induced persistent changes in histone methylation in CA3 region that differed from those observed in control mice. RNA-sequencing of TRAP-isolated CA3 neurons revealed that ELS programs a restricted transcriptional response to stress in adulthood, inducing unique gene pathways. This sheds light on novel biomarkers for diagnostic prevention of psychiatric disorders in populations at risk.

Conor Liston Cornell Medical, USA

Early life stress effects on postsynaptic dendritic spine plasticity and prefrontal cortex function

Depression is a fundamentally episodic form of mental illness, yet the neurobiological mechanisms underlying the induction and remission of depressive episodes over time are not well understood. Early life stress is among the most established risk factors for depression, but it is unclear how early life stress influences depression susceptibility in adulthood, especially at the level of neural circuits. I will present new data from two-photon imaging and optogenetic experiments showing how early life stress modulates stress susceptibility, motivated escape behavior, and learning-related plasticity in adulthood through effects on dendritic spine remodeling.

David Pagliaccio Columbia University, USA

Subcortical brain structure and function in youth with depression or familial risk

Research probing subcortical structural and functional deficits in youth depression has often relied on small sample sizes, which limits generalizability. Toward addressing this gap, data from the Adolescent Brain Cognition Development Study (n=4,521 9-10-year-olds) showed that maternal depressive history related to smaller right nucleus accumbens volume. Building on this, data from the Human Connectomes Related to Anxiety and Depression in Adolescents Project (n=170 14-16-year-olds) indicated that reduced accumbens volume and reactivity to incentive cues in depressive-anxious adolescents relative to healthy adolescents. Collectively, smaller accumbens volume and altered accumbens functioning may play a key role in depression onset and maintenance.

Flash Talks

Chair: **Kate Hartley** New York University, USA

Suzanne van de Groep Leiden University, The Netherlands

The neural correlates of giving under different social contexts in adolescence

Giving is essential for forming and maintaining social relationships, which is an important challenge for adolescents. This behavior is often characterized by the conflicting decision whether to forego self-interest to benefit others, and as such is highly context-dependent. There is currently little understanding of the mechanisms that drive context-dependent giving and how they develop in adolescence. Understanding the neural components of giving in different social contexts may shed light on these mechanisms. In this preregistered study, we studied giving and its neural correlates in different social contexts across adolescence. Specifically, we manipulated the extent to which self-interest outweighed benefits for others (i.e., donations were small instead of large), whether adolescents gave to a friend or unfamiliar other, and whether they were being observed by others or made anonymous choices. Participants (N = 140, ages 9 - 18) performed a novel giving fMRI paradigm, in which they divided coins between themselves and someone else in the aforementioned different social contexts. In line with our expectations, results showed that regardless of age, adolescents gave more i. when self-interest outweighed benefits for others, ii. when the beneficiary was a friend, and iii. when being observed. On a neural level, we found medial prefrontal cortex activity for small compared to large donations, and bilateral postcentral gyrus activation for the reverse contrast. Playing for a friend compared to an unfamiliar other elicited activity in the lateral and medial prefrontal cortex, as well as the right precentral gyrus, and the right inferior and left superior parietal lobules. These findings provide insights into the modulation of neural processes that underlie giving decisions as a function of the social context, highlighting the role of prefrontal areas and social brain regions.

Sarah Tashjian University of California, Los Angeles, USA

Perseverance in adolescents and young adults is related to neural response to performance feedback

Although performance feedback itself has no extrinsic value, it can produce subjective feelings similar to rewards and punishments (Eisenberger, 2012). When perceived as motivational, performance feedback provides valuable information that can help guide learning (Tricomi et al., 2016). The present study examines whether neural response to feedback is related to intrinsic motivation to engage in an effortful cognitive task despite prior failure (i.e., perseverance). Adolescents and young adults were tested to examine age-related development in neural response and behavioral perseverance. During functional magnetic resonance imaging, 100 adolescents and young adults ages 13-30 (61 female; Mage=18.33) completed a novel perseverance task. Participants first completed a series of mental rotations during which they received quasi-manipulated feedback that their responses were either correct or incorrect (40% of trials received incorrect feedback regardless of performance, 60% received accurate feedback). Participants then made decisions to continue on a path requiring more mental rotations (persevere) or quit for an easier path. Perseverance decisions increased with age, $t(98)=-2.27$ $p=.026$.

Negative feedback (manipulated and accurate collapsed) elicited activation of anterior insula (AI) and dorsal anterior cingulate whereas positive feedback elicited activation in ventral striatum and medial prefrontal cortex, Z>3.1 p<.05 corrected. Individuals who persevered exhibited reduced AI activation to negative feedback and lower behavioral inhibition scores (BIS scale, Carver & White, 1994), measuring tendency to avoid aversive experiences, compared to individuals who quit. Results expand understanding of the neural systems associated with motivation and perseverance during adolescence and early adulthood. Additional results controlling for prediction error during manipulated feedback and examining how feedback relates to subsequent performance will be presented.

Hyesung Grace Hwang University of Chicago, USA

Neighborhood racial demographics predict infants' motor system activation toward racial out-group individuals

Objective: The human tendency to view the social world in terms of "us" and "them" emerges early in ontogeny yet the mechanism behind this tendency remains unclear. One candidate mechanism for this tendency is the action processing and mirroring mechanism. This study examined whether infants' perception of others' actions as reflected in neural motor activation is affected by the racial demographics of the neighborhood they live in. Methods: Forty-three 8- to 12-month-old White infants' EEG data across three studies were combined for secondary analyses. In all studies, infants observed either a White or Asian female actor grasp an object. Baseline-corrected mu power (6-9 Hz for infants) averaged across the C3 and C4 electrode clusters was extracted locked to the observed reach-to-grasp movement. This neural correlate of motor activity was examined in relation to neighborhood demographics based on zip code using a mixed model approach. Results: There was a significant interaction of mu power between the proportion of non-White population in the zip code and the racial group (White vs. Asian) of the presenter, = -7.965, SE = 2.348, t = -3.392, p = .002. Specifically, when White infants viewed an Asian presenter (n = 24), those from a neighborhood with greater proportion of non-White population showed greater mu desynchronization (i.e., greater motor activity), adjusting for variety of racial groups, proportion of Asian population, median income, and population density of the neighborhood, = -5.757, SE = 2.047, t = -2.812, p = .012. However, when White infants viewed a White presenter (n = 19), none of the neighborhood demographic variables predicted mu desynchronization. Conclusions: White infants showed greater motor activation toward a racial out-group individual if they have more exposure to racial out-group individuals in their neighborhood, suggesting motor system activation related to action understanding and mirroring is sensitive to neighborhood context.

Zaixu Cui University of Pennsylvania, USA

Individual variation in fronto-parietal control network topography supports executive function in youth

Recent evidence has established that the spatial topography of functional brain networks differs markedly among individuals, with the frontoparietal control network (FPN) being the most variable. However, it remains unknown how this topography evolves during youth or relates to individual differences in executive function. Here, we capitalized upon a sample of 713 participants ages 8-22 who were imaged as part of the Philadelphia Neurodevelopmental Cohort and had over 27 minutes of high-quality fMRI data. We used a recently developed single-subject brain parcellation method based on non-negative matrix factorization to identify 17 individualized networks for each participant. Consistent with prior reports, we found that across-subject variability of network topography was highest in FPN and lower in visual and motor networks. Notably, the proportion of cortex devoted to the FPN increased with development (P(FDR) = 0.01) and was positively associated with executive functioning (P(FDR) < 0.001) while controlling for age. Using machine learning techniques, we found that this individualized functional topography could accurately predict both an individual's age (r = 0.72, p < 0.001) and executive performance (r = 0.45, p < 0.001) in unseen data. Critically, elements of the FPN were the most important features for predicting both age and executive performance. Finally, the spatial distribution of these predictive features within the FPN aligned with fundamental properties of brain organization, including evolutionary expansion, areal scaling, myelin content, functional role, and cerebral blood flow. Together, these results delineate a process whereby specific functional network topography in the FPN matures during youth to support executive function.

Marjolein Barendse University of Melbourne / University of Oregon, USA

Neural correlates of self-evaluation during puberty

Forming a clear and multifaceted concept of the self is an important life challenge in adolescence. Previous studies have shown that self-concept changes during adolescence and that underlying neural correlates also change, for example in the medial prefrontal cortex (PFC). Very few studies have examined the change in self-evaluations/-concept and its neural correlates in relation to puberty, and whether pubertal processes relate to self-evaluative neural processes over and above age. The current study uses data from 174 girls aged 10.0 to 13.0 years to examine this. The girls completed a functional MRI paradigm in which they decided whether or not an adjective describes them, including positive and negative adjectives grouped into three factors: 'prosociality', 'antisociality/aggressiveness', 'surgency/detachment'. Participants also completed the Pubertal Development Scale and morning saliva samples to measure DHEA, testosterone and estradiol levels. We expect that (1) activation in the ventromedial PFC (vmPFC) and pregenual anterior cingulate (pgACC) during self-evaluation (relative to the control condition) increases with age; (2) pubertal development, both hormonal changes and self-reports of physical changes, will explain activation in areas subserving self-referential, affective and reward processes over and above age. This effect of pubertal development on neural activation will depend on adjective type/factor; (3) activation in vmPFC, pgACC and ventral striatum will be higher for positive adjectives compared to negative. In addition, on a trial-by-trial-level, negatively valenced adjectives that are endorsed as self-descriptive will engage the vmPFC and pgACC more than those that are rejected. This project is preregistered here: https://osf.io/g94h8/.

Tzipi Horowitz-Kraus Technion and Cincinnati Children's Hospital, USA

Executive functions in reading: impairment and plasticity in children with and without dyslexia

Approximately 15% of children in the western world have reading disabilities, a neurodevelopmental disorder known to impact academic achievements as well as social and emotional wellbeing. Identification of the underlying factors contributing to RD is crucial for proper classification and planning of remedial interventions. Current strategies rely exclusively on behavioral measures and are of limited precision. Here, we aimed to study the role of cognitive control in reading among children from birth to age 12 years using a multimodal approach utilizing several MRI methodologies as well as EEG data. Results provided potential biomarkers for reading difficulties in children: EEG data suggested decreased event related potentials evoked from the anterior cingulate cortex (ACC) and functional MRI data showed decreased functional connectivity of cognitive control networks. Using MRI, we then demonstrated the effect of an executive-function based intervention on these functional connections during both reading and resting-state conditions. Greater attention- and inhibition-related ERPs were observed following training. The advantages of using neuroimaging methods in evaluation of neurodevelopmental disorders in children and the challenges the field of developmental neuroimaging is facing will be discussed.

Ashley Nielsen Washington University in St. Louis, USA

Two patterns of atypical development involving distinct functional networks in Tourette syndrome

Tourette syndrome (TS) is a complex disorder with symptoms that involve sensorimotor and top-down control processes that fluctuate over the course of development. Understanding the neural substrates supporting the range and time course of symptoms in TS may require a whole-brain description of large-scale circuitry and examination of these substrates across development. Here, we used functional connectivity MRI to examine, in TS, the diverse functional networks across the brain that support cognitive functions. We considered the connections within each functional network and between each pair of functional networks separately. We then compared the development (here, cross-sectional differences between children and adults) of these connections in TS to that in healthy controls. We found evidence for two patterns of atypical development in TS that involved different within-network and cross-network connections. Developmental differences that were greater in TS than in controls were among control and processing networks. These connections did not differ between control children and adults, but were stronger in adulthood TS. By contrast, developmental differences that were smaller in TS than in controls involved functional connections between subcortical structures and control and processing networks. The strength of these connections increased/decreased between control children and adults, but to a smaller extent in TS and were indicative of immaturity in adulthood TS. These two distinct patterns of atypical development may be supported by different mechanisms. Divergently stronger functional connectivity in adulthood TS may be associated with frequent, coordinated engagement of attention, top-down control, and sensorimotor processes that accompanies a history of tics. The incomplete maturation of the integration and segregation of the subcortex and cortical sensory and attention networks may be a factor in persistent tics in adulthood.

Benjamin Conrad Vanderbilt University, USA

Neural mechanisms of digit processing in kindergartners: An fMRI study

Number symbol processing is a critical foundation for math achievement. Evidence in adults suggests preferential engagement of a "Number Form Area" (NFA) in the ventral occipito-temporal cortex (vOTC), during the processing of Arabic numerals compared to other symbols, and that the function of this region relates to individual differences in calculation ability. It is currently unknown, however, 1) when preferential processing of the NFA develops, 2) what mechanisms drive category specificity in the NFA, and 3) how NFA function relates to behavior in children. We address these questions using fMRI in typically-developing kindergartners who performed a symbol classification task. Participants (n=46, Mean age 6.1✱0.4yo) saw digits, letters, or scrambled symbols, deciding whether they "knew the name" of the stimulus. We found no evidence for preferential processing of digits in the NFA in relative activation level, nor in representational distinction via MVPA. Similarly, we found no evidence of differences across symbol categories in NFA-to-parietal connectivity, as would be predicted from a biased-connectivity account of vOTC functional development. In a brain-behavior correlation, a significant negative association was observed between digit-related activity in the NFA and digit naming speed ($r = -0.52$, $p < 0.001$), with higher performance related to lower activation to digits relative to other symbols. The relationship remained significant ($p < 0.02$) after controlling for letter naming speed. This finding suggests NFA function is relevant for digit recognition in kindergarten, albeit in the opposite direction than expected. Overall, our results are not easily reconcilable with prior findings in adults, suggesting a complexity to NFA development which requires further investigation, including longitudinal assessment of NFA functional maturation.

Ana Cubillo University of Zurich, Switzerland

Response time variability is associated with more current and future negative life outcomes in children

Aims: Intra-individual variability in response times (RT-variability) has been associated with symptom severity in ADHD, ASD, schizophrenia, and dementia. This study investigates its potential as a marker of risk for negative outcomes in terms of both psychopathology and more general well-being. Methods: We recruited 28 typically developing 7-8 year-old children from an on-going longitudinal study on working memory training. They performed an fMRI-adapted N-Back as well as several other cognitive tasks. We used a step-wise regression analysis including accuracy and RT-variability measures from the N-Back task as independent variables and scores from Strength and Difficulties Questionnaire (total and externalising scores) and Math performance at 6 or 12 months after training as outcome measures. We also tested for similar relationships in a sample of 3,223 children from the ABCD study. For the ABCD sample, we used the total and externalising T-scores from the Child

Behaviour Check List (CBCL) and body-mass-index (BMI) as outcome measures. Results: In the longitudinal sub-sample, RT-variability during the N-Back was significantly associated with future SDQ total scores (Standardized Beta=0.44, p=0.013), externalizing scores (Standardized Beta=0.44, p=0.01), and Math performance (Standardized Beta= -0.612, p=0.002). We found a similar association in the ABCD study. There, RT-variability in the N-Back was significantly related to CBCL total (Standardized Beta=0.023, p=0.014) and externalizing (Standardized Beta=0.029, p =0.003) measures, as well as BMI (Standardized Beta=0.027, p=0.003). Conclusions: RT-variability during the N-Back task is correlated with adverse outcomes on measures of academic performance, general behavior, and health. This increased RT-variability might be thus an early signal reflecting inefficient processes underlying the dynamic control of sustained or selective attention, or interference inhibition processes, response selection and/or execution.

Day 2 Saturday, August 31

Oral Session 2 - Prenatal influences on brain development and subsquent behaviour

Chair: **Alice Graham** Oregon Health & Science University, USA

Claudia Buss Charité Universitätsmedizin Berlin, Germany

Fetal programming of brain development – Role of maternal-placental-fetal stress biology

The origins of alterations in brain anatomy and connectivity, that may underlie cognitive impairment and mental illness, can often be traced back to the fetal period of life when the developing embryo/fetus responds to suboptimal conditions during critical periods of brain development (“Fetal Programming”). Maternal stress during pregnancy may affect fetal developmental trajectories by altering stress-sensitive endocrine and immune biological mediators, such as cortisol and interleukin-6 (IL-6). Evidence in humans will be presented in support of elevated maternal cortisol and IL-6 concentrations during pregnancy being associated with offspring brain anatomy and connectivity with implications for cognitive function and mental health.

Elinor Sullivan Oregon Health and Science University, USA

Maternal metabolic and dietary environmental influences on offspring behavior

Perinatal environmental factors such as poor maternal diet influence the risk of pediatric neurodevelopmental disorders. In a nonhuman primate model, exposure to maternal obesity and a Western-style diet (high in saturated fat and sugar) altered s brain development resulting in long-lasting changes in behavior including increased anxiety and impaired social behavior. These findings indicate that poor maternal nutrition initiates a fetal environment that may result in neural reprogramming and predisposes offspring to pediatric neurodevelopmental and metabolic disorders.

Cynthia Rogers Washington University, USA
Chris Smyser Washington University, USA

Aberrant structural and functional connectivity underlies neurodevelopmental impairment and psychopathology in preterm children

Despite advances in neonatal care, preterm birth remains a leading risk factor for neurodevelopmental disabilities and is linked with high rates of co-occurring attention deficit hyperactivity, anxiety and autism spectrum disorders. Affected children also demonstrate elevated rates of aberrant cerebral structural and functional connectivity, with persistent changes across MRI modalities evident as early as the neonatal period. This talk highlights alterations in connectivity within key functional networks and white matter tracts underlying the neurodevelopmental impairments and psychiatric diagnoses common in this population, including detailing the effects of early life adversity and related clinical and psychosocial risk factors modifying these relationships.

Oral Session 3: Big data and open science: Relevance for developmental cognitive neuroscience

Chair: **Damien Fair** Oregon Health & Science University, USA

Mike Milham Child Mind Institute, USA

Large-scale, open neuroimaging datasets are increasing more than just sample size

An increasing number of multimodal imaging datasets are becoming available, each creating novel opportunities for discovery – both individually and collectively. Using selected examples, this presentation will provide a survey of opportunities that exist for generating and addressing novel questions capable of advancing developmental neuroscience. Additionally, the impact of the open datasets on how we are conducting research, not just what is being asked, will be discussed. Relevant examples from the existing literature will be highlighted. Potential pitfalls to avoid will be discussed as well.

Jenn Pfeiffer University of Oregon, USA

Improving practices and inferences in developmental cognitive neuroscience: Open science tools for research design, analysis, and publication

The open science movement has produced introspection and concern regarding research practices and publication biases. To move forward, we must make changes to our analytical strategies and publication standards that are simultaneously transformative and accessible. This talk focuses specifically on implementing such changes in developmental cognitive neuroscience (DCN), from my dual perspective as a lab director and journal editor. I describe some common and useful open science tools for DCN, as well as distinguish between confirmatory and exploratory approaches. Doing so reveals tools particularly suited to each approach, such as pre-registration, registered reports, and specification curve analysis.

Kathrine Skak Madsen Danish Research Centre for Magnetic Resonance, Denmark

Opportunities and challenges of sharing and pooling data from existing longitudinal neuroimaging cohorts

Longitudinal (developmental) neuroimaging studies have acquired rich data on e.g. cognition, mental health, lifestyle, genetics and biological measures. Given their expensive and time-consuming nature, the number of assessed participants, however, is often limited. Pooling data from different developmental cohorts may improve statistical power and representativeness, both critical for elucidating more complex relationships between e.g. brain and behavioral development and the impact of intrinsic and extrinsic factors. However, as data sharing and pooling rarely have been thought into existing studies by design, researchers need to overcome several challenges before effective and productive data sharing and pooling can be realized.

Young Investigator Award Talk

Supported by the Kennedy Krieger Institute

Chair: **Brad Schlaggar** Kennedy Krieger Institute, USA
Eva Telzer University of North Carolina at Chapel Hill, USA

For better or for worse?: Neurobiological sensitivity to social context

Flash Talks

Chair: **Jess Church** University of Texas at Austin, USA

Kathy Do University of North Carolina, Chapel Hill, USA

Peers exert a stronger prosocial than antisocial influence on adolescent attitudes: Evidence from brain and behavior

Parents and peers differentially influence decision making during adolescence, yet little is known about social conformity in contexts where parents and peers exert competing influences. The present fMRI study examined adolescent conformity to different types of behaviors in the face of conflicting influences from parents versus peers. Adolescents (n=39; 12-14 years) and their parents rated their attitudes toward everyday positively and negatively valenced behaviors that adolescents might engage. During a brain scan one week later, adolescents were shown their parent's and an unknown peer's ratings of these same behaviors, which were manipulated to conflict with adolescents' initial ratings, and indicated who they agreed with. Generalized linear mixed effects models indicated adolescents were equally likely to conform to their parent and peer when their parent's ratings conflicted with their peer's ratings, with no differences in the brain. When their parent's or peer's ratings conflicted with their initial ratings, adolescents tended to stick with their initial ratings 70% of the time. When they did conform, adolescents were more likely to conform to their peer on positive than negative behaviors, which was paralleled by decreased vmPFC activation to positive behaviors but increased vmPFC activation to negative behaviors. Furthermore, an interaction between the valence of the behavior and magnitude of peer influence suggests that adolescents were more likely to conform on negative behaviors when their peer endorsed prosocial ratings (i.e., peer rated negative behavior as "less good") than antisocial ratings (i.e., peer rated negative behavior as "more good"). These results suggest that adolescents are relatively autonomous in the face of conflicting social influence but selectively conform to positive peer influences, thereby challenging prevailing conceptions of adolescence as a period of increased and unmitigated susceptibility to negative social influences.

Bridget Callaghan Columbia University, USA

Hippocampal multivoxel encoding signatures predict long-term memory across middle childhood and adolescence in humans.

The episodic memory system changes dramatically across the first few years of life. However, subtle alterations in episodic memory continue throughout middle childhood/adolescence. The neural mechanisms underlying such nuanced memory development are elusive, and studies using traditional Region of Interest (ROI) based approaches provide conflicting evidence for the role of hippocampal functional maturation during those ages. In this study we employ an advanced statistical technique, multivoxel correlation structure (MVCS), to functional magnetic resonance imaging (fMRI) data, while children and adolescents were engaged in an item-context associative learning task, which was sandwiched between two resting state scans. This statistical approach enables us to examine coordinated activity within the hippocampus at rest, during learning, and immediately after learning in a purported consolidation period. We report that such multivoxel activity changes across middle childhood-adolescence, with representations at learning and rest becoming more granular (i.e., less coordinated) with age. We also report that age changes in hippocampal multivoxel activity are regionally specific, with the posterior areas of the hippocampus changing the most across development. Importantly, we find that the level of representational granularity in the hippocampus during learning, and in the post-learning consolidation period, is associated with better immediate recognition memory, and delay associative memory (1 week after the scan), respectively. These data support the use of multivariate analysis approaches for uncovering subtle changes in hippocampal maturation across middle childhood and adolescence.

Lourdes Delgado Reyes University of East Anglia, UK

The role of toddler myelination in preschool executive function development

Infancy and early childhood are times of rapid change in the organization of cognition and behaviour, as well as brain development. An important process during this period is the maturation of myelinated white matter (WM), which facilitates rapid communication across the neural systems thought to underlie the emergence of complex cognitive abilities. Previous studies have linked WM development with cognitive development, but few studies have examined these relationships in early development. Here, we aim to explore the relationship between myelination and executive function (EF) in early development. Executive function refers to an interrelated set of neurocognitive systems that underlie behavioral control and cognitive flexibility. EF has pervasive influences on cognition and later development. A key challenge is to understand how EF develops early in development where early interventions might have the most impact. Diffusion tensor imaging studies have identified several WM tracts that are important for performance on EF tasks: cingulum bundle (CB), the superior longitudinal fasciculus (SLF), the anterior thalamic radiations (ATR), and inferior longitudinal fasciculus (ILF). We measured WM myelination using a multi-component relaxation approach (mcDESPOT) to calculate the myelin water fraction in 30-mo toddlers. Participants also completed the Minnesota Executive Function Scale (MEFS) at 30- and 42-mo. We will examine the relationship between myelination in the previously identified WM structures, as well as, whole brain WM when participants are 30mo and executive function performance at 42-mo. We hypothesize that EF at 42-mo will be related to myelination in these WM structures, in particular in the ATR and SLF such that participants with more myelin will have better EF scores, even after controlling for age, SES and EF at 30-mo. These results will provide new insights into the neuro-anatomical correlates of executive function in early development.

Giorgia Picci The Pennsylvania State University, USA

The moderating role of socioeconomic status on relations between level of responsibility and cortical thinning during adolescence

The development of autonomy and goal-directed behaviors are key milestones of adolescence. Expectations from parents to engage in responsible behaviors (e.g., household chores, outside work) may support this emergent process by recruiting brain regions that subserve executive functions (EFs) which, when in deficit, underlie poor outcomes such as substance use (SU). Adolescent responsibility, however, may exert either beneficial or detrimental effects, depending upon the context; e.g., parental pressure to be responsible may induce stress. Outcomes related to responsibility may be moderated by family resources (SES), indicative of whether parental demands for responsibility are due either to need or personal choice. The relationship between level of responsibility and neurocognitive development has yet to be examined. Further, such a study requires delineation of contexts likely to play a role in helpful vs. harmful effects of responsibility. We explored relationships between responsibility, SES (low vs. high), SU, and brain structure in drug-naïve adolescents (N=114; 11-14 years;60 females), some of whom initiated SU at 18-or 36-month follow-up (N=37). Contrary to expectation, greater levels of responsibility predicted earlier SU onset (Cohen's d=0.7). The low SES group reported higher levels of responsibility than the high group (d=.5). In low SES (and not high SES), higher levels of responsibility corresponded with cortical thinning in regions implicated in EF (i.e. left precuneus and right middle frontal) (d=.8), which may indicate a developmental deficit. In high SES, responsibility positively correlated with performance in a problem-solving task (Stockings of Cambridge) (d=.7). These results suggest a moderating role of SES in the positive vs. negative effects of responsibility on adolescent neurobiology and behavior, with greater responsibility predicting impaired development of regions subserving EF in low SES and improved EF behavior for those in higher SES.

Adam Grabell University of Massachusetts, USA

Using fNIRS and Galvanic Skin Response as a novel approach to infer Limbic-Prefrontal processes in early childhood

Objective. Functional Near-Infrared Spectroscopy (fNIRS) is a popular approach to measure neural activation in early childhood populations that cannot tolerate fMRI, and provides good spatial resolution of prefrontal cortex (PFC) areas important for emotion regulation. However, fNIRS cannot reach sub-cortical limbic structures or measure limbic-prefrontal connectivity crucial to emotion regulation. Galvanic skin response (GSR) is a sensitive index of autonomic arousal heavily influenced by myriad limbic structures, suggesting GSR could be combined with fNIRS to infer limbic-prefrontal processes. We recorded simultaneous PFC activation via fNIRS and GSR in 3 to 5 year old children during a rewarding and frustrating task. We tested associations between PFC activation and GSR reactivity and recovery and whether associations were moderated by children's level of irritability. Methods. Thus far 40 3-5 year old children (M = 54 months; SD = 7.6; 55% male) completed a developmentally sensitive task (Incredible Cake Kids) comprising win and frustration blocks while fNIRS and GSR were recorded. Results. Regression models showed children with greater LPFC activation during reward had greater GSR reactivity (b= 11.5, $p < .05$) and weaker GSR recovery post-reward (b= 9.1, $p < .05$) than peers. Children with greater LPFC activation during frustration had lower GSR reactivity (b= -160.7, $p < .05$) and greater GSR recovery post-frustration (b= -108.3, $p < .05$). There was a significant irritability*GSR reactivity interaction (b= 17.3, $p < .05$) such that the inverse association was strongest for children with moderate irritability and absent those with high irritability. Conclusions. Combining fNIRS and GSR may be a promising novel approach for inferring limbic-PFC processes underpinning early emotion regulation and psychopathology. Results suggest an inverse association between PFC activation and GSR reactivity that is disrupted in children with high irritability.

Jin Wang Vanderbilt University, USA

Higher quality neural representations of phonemes scaffold longitudinal reading gains in 5- to 7-year-old children

The objective of this study was to investigate, using a brain measure of phonological awareness, whether phonological awareness is crucial for the development of reading skill (i.e. scaffolding hypothesis) and/or whether learning to read words refines phonological awareness (i.e. refinement hypothesis). We specifically looked at how different grain sizes of phonology and how two different phonological processes (i.e. phonological representation in the posterior superior temporal gyrus, STG, and phonological access in the dorsal inferior frontal gyrus, IFG) played a role in this bidirectional relation. 36 children completed a reading test outside the scanner and an auditory phonological awareness task inside the scanner which included both small (i.e. onset) and large (i.e. rhyme) grain size conditions. Children were tested when they were 5.5-6.5 years old (Time 1) and once again approximately 1.5 years later (Time 2). To study the scaffolding hypothesis, a regression analysis was carried out by entering brain activation for either small (onset>rhyme) or large (rhyme>onset) grain size in either STG or IFG at T1 as the predictor and reading skill at T2 as the dependent measure. Non-verbal IQ, phonological working memory and reading skill (all at T1) were entered as covariates of no interest. In order to study the refinement hypothesis, the regression analysis included reading skill at T1 as the predictor and brain activation for either small or large grain size in either STG or IFG at T2 as the dependent measure. Non-verbal IQ, phonological working memory and brain activation (all at T1) were entered as covariates of no interest. Our results provided the first neural evidence supporting the scaffolding hypothesis, by showing that the better the representational quality for small grain size phonology in the brain at T1, the larger growth of reading skill over time. This has important implications for early reading identification and interventions.

Arianna Gard University of Michigan, USA

Unique effects of age and pubertal development on amygdala-PFC connectivity during face processing

Processing facial expressions of threat (anger) and distress (fear) is linked to psychopathology and is thought to be mediated, in part, by connectivity between the amygdala and regions of the prefrontal cortex (PFC). Though resting-state approaches have found that amygdala-mPFC connectivity strengthens with age (Gabard-Durnam et al., 2014), and several task-based studies suggest that amygdala-mPFC connectivity shifts from positive to negative connectivity with increasing age (Gee et al., 2013), there have been no studies to parse the effects of age from correlated pubertal development. The current study examined the overlapping and distinct effects of age and puberty on amygdala-PFC connectivity during emotion processing. Participants were from the Michigan Twin and Neurogenetics Study (N=265; Age=8-18 years), a population-based sample of twins (Burt & Klump, 2013). We used a large prefrontal mask of Brodmann's Areas 9,10,11,24,25,32, and 47 to characterized amygdala connectivity patterns with multiple prefrontal regions during an implicit emotional faces matching task. We examined changes in connectivity during angry and fearful face versus shapes conditions using Generalized Psycho-Physiological Interactions (McLaren et al., 2012).

Perceived pubertal development was measured with the Pubertal Development Scale (Peterson et al., 1998). Covariates included gender and child race. Although both advancing pubertal development and chronological age were associated with greater right amygdala - right orbitofrontal (BA 11) and right amygdala - right medial prefrontal (BA 9) connectivity during fearful face processing, only pubertal development exerted unique effects (i.e., after accounting for age). Pubertal development was also associated with condition-specific changes in amygdala connectivity during angry face processing, where chronological age was not. Measures of pubertal development should be integrated into developmental studies of corticolimbic maturation.

Ashley Parr University of Pittsburgh, USA

Striatal dopamine contributions to the development of frontostriatal connectivity in a reward learning context

Developmental changes within the mesolimbic dopamine system are thought to contribute to heightened motivation and risk taking in adolescents. Initial studies indicate developmental decreases through adolescence in connectivity between reward striatal and executive prefrontal systems, possibly reflecting animal models of pubertal changes in dopamine (DA). However, the role of DA in developmental changes in frontostriatal reward processing is not understood in vivo in humans. Using direct and indirect measures of DA processing within the context of reward learning, we tested the hypothesis that there is heightened nucleus accumbens (NAcc)/ventromedial prefrontal cortex (vmPFC) connectivity associated with increased DA in the adolescent period versus adults. A Siemens 3T mMR was used to obtain MR (12-30 yo) and PET (18-30 yo) measures in 115 participants. Background connectivity, a measure of context-dependent changes in functional connectivity, was assessed by regressing out task-related components during a reward learning task. R2' was used to measure tissue iron changes as a non-invasive indirect measure of striatal DA processing. PET [11C] dihydrotetrabenazine (DTBZ) in adults provided a measure of presynaptic vesicular DA storage. Linear mixed-effects models revealed that during a state of reward-guided decision-making, functional coupling between the NAcc-and ventral anterior cingulate (t=2.79, p=0.006), subgenual cingulate (t=2.29, p=0.02), and posterior medial orbitofrontal (t=2.24, p=0.03) cortices decreased from adolescence to adulthood. These age-related decreases in NAcc-vmPFC connectivity were mediated by R2' indices of NAcc dopamine levels that were confirmed to be associated with PET DTBZ. These results provide new in vivo evidence of DAergic changes in adolescence underlying reward processing frontostriatal connectivity.

Kristina Rapuano Yale University,

Predicting vulnerability to risk behaviors in a large cohort of children

The prevalence of risky behaviors and substance abuse increases during adolescence. Using a data-driven approach, we sought to develop behavioral and neural models of vulnerability to risky behaviors in childhood. To identify a behavioral indicator of risk for use, responses to substance use-related questions were assessed in 11,875 nine- and ten-year-olds participating in the Adolescent Brain and Cognitive Development (ABCD) study (Casey et al., 2018; Lisdahl et al., 2018). A principal components analysis of responses revealed two orthogonal components that loaded highly on child knowledge of and intention to use substances (i.e., PC1) and familial factors related to substance use (i.e., PC2). Component loadings were validated across twenty-one sites to determine the reliability of dimensions associated with risk. Behavioral components were used to generate connectome-based predictive models (CPM; Shen et al., 2017) of risk based on resting-state neural connectivity. Individual differences in PC1 scores were significantly predicted in left-out subjects using CPM; however, neural models were not predictive of PC2 scores. These findings suggest that substance use-related risk factors can be quantified and predicted prior to initiation. Moreover, they may distinguish risk associated with child intent from familial risk that may emerge later in development. These findings set the groundwork for future prediction of early substance use initiation and chronicity.

Oral Session 4: Individual differences in brain development: Moving beyond the average developmental trajectory

Chair: **Angie Laird** Florida International University, USA

Andrik Becht Leiden University, The Netherlands

Moving beyond the mean level: A longitudinal study examining individual differences in social brain developmental trajectories

Aim: Adolescence is considered a key period for the development of advanced social cognitive and high quality social relationships. Parallel to these psychosocial changes, massive structural brain changes occur in a network of brain regions that are considered crucially involved in social cognition and social relationships. These brain regions consist of the medial prefrontal cortex (Brodmann area 10, mBA10), temporoparietal junction (TPJ), posterior superior temporal sulcus (pSTS), and precuneus (Mills et al, 2014). To date, existing research has largely focussed on average development across ages, which may have obscured meaningful individual differences in the speed of development in social brain regions (Foulkes & Blakemore, 2018). Therefore, the aim of this study was to empirically examine individual differences in social brain development. Moreover, we examined whether and how individual differences in social brain development predicted individual differences in the quality of peer relationships. Method: To this end, 270 adolescents (Mage 14.14 years at T1) were followed across three biannual waves (T1-T3). Peer relationship quality was assessed at T3. Results: Consistent with previous studies, latent growth curve models revealed decreases in grey matter area and thickness in social brain regions across adolescence. However, our findings revealed significant individual differences in both the level (i.e., intercepts) and change (slopes) in social brain regions across adolescence. These individual differences in the speed of development were meaningfully related to individual differences in peer relationship quality; Those adolescents who showed a slower decrease in thickness in precuneus, TPJ, and pSTS, relative to other adolescents, reported less positive peer relationships over time. Conclusion: Our findings emphasize the importance to move beyond the study of average trajectories for structural social brain regions in adolescence. In doing so, our findings highlight possible developmental neurobiological markers of adolescents' social functioning in the peer context.

Rogier Kievit University of Cambridge, UK

Modelling the dynamics of brain structure and cognitive development

In this talk, I will discuss findings from the Danish HUBU cohort, which scanned N=93 typically developing children (age 7.5-19) up to 11 times with Diffusion weighted imaging alongside a broad battery of cognitive tests. In this talk, I will focus on the interplay of white matter microstructure (5 waves) and processing speed (3 waves). I will illustrate how cognitive ability and white matter microstructure develop in concert across developmental time, and how to use tailored SEM's to better understand lead-lag relationships between brain and behaviour.

Kate Mills University of Oregon, USA

The strategic adolescent brain: functional brain organization during adolescence relates to behavioral strategies

The malleability of the developing brain helps us learn to navigate our social environment. This presentation will examine how brain networks involved in mentalizing, cognitive control, and reward valuation develop in adolescence and how interactions between these networks relate to behavioral strategies. The first study investigates how the preference for delayed rewards, which is typically considered a marker of developmental maturity, can be better understood when considering an individual's functional brain organization in relation to chronological age. The second study examines how individual differences in functional connectivity between mentalizing and reward valuation networks facilitates the development of intimacy between friends.

Day 3 Saturday, August 31

Oral Session 5: New progress in understanding memory development from infancy to childhood

Chair: **Sarah Durston** University Medical Centre Utrecht, The Netherlands

Nicholas Turk-Browne Yale University, USA

Functional brain imaging of learning and memory in human infants

Tremendous progress has been made in understanding the brain systems that support human learning and memory. However, this progress is based predominantly on adult data and mostly neglects the astonishing learning that occurs early in life. A major stumbling block is that key brain systems like the hippocampus are accessible only with fMRI, a difficult technique in infants, especially when they need to be awake during tasks. We have devised approaches that make it possible to obtain considerable high-quality data of this type. This is allowing us to characterize the nature and early development of statistical learning and episodic memory.

Simona Ghetti University of California, Davis, USA

The what, where, and when of memory in toddlers: Behavioral and neural evidence

Relational processes are responsible for forming memory representations that include various elements of an experience such as spatial and temporal details. These processes provide the foundation for episodic memory. Episodic memory emerges during late infancy and improves during early childhood. However, many open questions remain including whether different features of young children's memories (e.g., spatial versus temporal details) improve at similar rates, and whether memory performance in toddlers is related to hippocampal structure and function. In my presentation, I will discuss the results of recent studies that have attempted to address these questions.

Sang Ah Lee Korea Advanced Institute of Science and Technology, Korea

The binding of space and time in episodic memory

In the present study, we explored whether the ability to bind spatiotemporal information plays an important role in the development of episodic memory. We tested children's binding of what and whereand when components of memory in an active object-placement task. Results suggest that children first develop the ability to reliably bind together space and time around 4 years and then bind objects onto this representation at ~6 years. These results are not due to improvements in object or spatial processing alone and suggest that spatiotemporal binding occurs early in development and provides a scaffold for episodic memories.

Zoë Ngo Temple University, USA

Development of holistic episodic recollection

Episodic memory binds together the diverse elements of an event into a coherent representation, allowing for the reconstruction of multidimensional experiences when triggered by a cue related to a past event—a process of pattern completion. Such holistic recollection is evident in young adults, as shown by contingency the retrieval success different within-event associations. However, the ontogeny of pattern completion is uncharted. Here, we found that, akin to adults, 4 and 6-year-olds retrieve complex events in a holistic manner. Nevertheless, the degree of holistic retrieval increased from age 4 to adulthood, suggesting a protracted refinement in pattern completion in development.

Oral Session 6: Early social markers of social competnecy: Translational studies in primates

Chair: **Jocelyne Bachevalier** Emory University, USA

Amanda Dettmer Yale University, USA

Early mother-infant interactions and social development in rhesus monkeys

Owing to their social, behavioral, anatomical, physiological, and genetic similarities to humans, nonhuman primates are especially strong translational models to determine how early life experiences shape later social development. This presentation will focus on individual variability in mother-infant interactions in the neonatal period in rhesus monkeys. I will describe some of the factors that contribute to this variability, as well as the developmental sequelae of infant monkeys experiencing different levels of early caregiver interactions. A particular focus will be an early face-to-face intervention tested in nursery-reared infant monkeys, and the social development of these infants compared to typically nursery rearing.

Pier Francesco Ferrari Univeristà di Parma, Italy

Early social experience, genetic influences and epigenetic regulation in the developing social brain

Infants' capacity to engage in social interactions is fundamental to their psychological development, and in primates it includes the spontaneous tendency to attend to a limited set of socially-salient stimuli and to respond selectively to them. During mother-infant face-to-face interactions infants are also capable to modulate both intensity and timing of facial expressions in response to mother's facial gesture. These early forms of matching/synchronous behaviors are important in tuning mother-infant emotional exchanges and in predicting later infant social development and brain maturation. Perturbations or absence of such early social exchanges have important short and long term consequences on social development and emotional regulation with significant implications on the emergence of psychological disturbances. Neurochemical regulation of these infants' behaviors through oxytonergic administration suggest that oxytocin have a major role in modulating early social interactions. Moreover, the differential expression of its receptor at the brain level, due to early social adversities, is responsible for diminished social responses and increased stress reactivity. From a neurophysiological standpoint, there is evidence that specific brain networks specifically process social information related to others' emotions and behaviors, and are therefore potential markers of brain development under normal and perturbed social conditions. One of these brain networks, the mirror neuron network comprises the parietal-premotor circuit and the connected regions involved in affective/emotional regulation, such as the amygdala-prefrontal circuit, the anterior cingular cortex, the hippopcampus and the anterior insula. We are collecting evidence that these areas are sensitive to the effects of early social adversity. Preliminary data, in fact, suggest that the effects of early social deprivation has not only an impact on such functional brain networks in the early postnatal period but also at a later stage of development, in the pre-pubertal/peri-adolescence period, when the main psychiatric disturbances emerge.

Mar Sanchez Emory University, USA

Development of macaque face visual processing using combined eye-tracking and MRI: in search of nonhuman primate models of social deficits of relevance to Autism

Reading faces in social interactions is crucial to understanding intentions and emotions in others, and is impaired in individuals with neurodevelopmental disorders such as Autism Spectrum Disorder (ASD). Characterizing the emergence and development of these skills and underlying brain circuits may help understand impaired socioemotional development in children with ASD. A theory in the etiology of ASD is that early neonatal visual attention is "reflex-like", becoming voluntary –reward-based– at later ages, so that disruptions in this transition result in ASD pathology. Using longitudinal eye-tracking and structural and MRI methods, our group has shown that infant rhesus monkeys also exhibit inflections in developmental trajectories of fixation in the eye region of faces that parallel those reported in humans. This critical period for social skills refinement takes place around 4-8 weeks of age, in parallel to switches in brain networks that seem to underlie the inflections in developing social skills. Our results show similarities to developmental trajectories of social visual engagement in human infants (Jones & Klin, 2013), and further validate rhesus monkeys as a translational model of early socioemotional development to examine the underlying neurodevelopmental mechanisms.

Oral Session 7: Computational/predictive coding and development

Chair: **Gregoire Borst** Université Paris-Sorbonne, France

Richard Aslin Yale University, USA

The promise and challenges of using fNIRS to study predictive mechanisms in human infants

Predictive Coding entails a comparison of bottom-up data-driven signals with top-down hypothesis-driven signals. Despite the sluggish time-course of hemodynamic measures, there is substantial evidence of top-down signals in adults using fMRI and in infants using fNIRS. While this neural architecture is efficient, it is not necessary as a mechanism for making predictions, which can be accomplished based solely on sophisticated (i.e., contextually based) bottom-up signals. Indeed, infants at risk of cognitive delay/deficit due to extreme prematurity exhibit little evidence of top-down signals, yet display normative behavioral evidence of prediction. The promise of using MVPA techniques to separate bottom-up from top-down signals as an estimate of prediction error will be reviewed, along with the challenges of obtaining such data from human infants using fNIRS.

Elizabeth Bonawitz Rutgers University - Newark, USA

Predictive "EN"-coding: How prior beliefs influence preschooler's memory

Models of children's inductive inference provide a framework for how children's prior beliefs and new evidence are integrated to support learning. In this talk, we follow on previous research demonstrating cases when prior beliefs help and hinder recall. In one set of studies, we show that children, like adults, rely on category information in their recall of color. In another set of studies, we find that given strong model expectations, event violations have both benefits and costs to future event encoding. Taken together, this studies present a glimpse of how prior beliefs can influence children's encoding of information.

Randy O'Reilly Colorado University, USA

Deep predictive learning in the neocortex and pulvinar

Early developmental learning in babies appears largely passive, and yet forms the deep foundation of all that follows. We propose that, hidden under that passive exterior, a very active form error-driven predictive learning is taking place, based on the temporal difference over the Pulvinar between predictions generated by deep neocortical layers and a ground truth signal from strong, one-to-one projections via layer 5IB bursting cells, at the alpha frequency (every 100 msec). This model is consistent with a wide range of biological data, and it can self-organize invariant, categorial object representations in its simulated inferotemporal cortex.

Oral Session 8: The effects of pubertal and sex hormones on brain maturation: Current research across different phases of development, and across species

Chair: **Deanna Barch** Washington University, USA

Megan Herting University of Southern California, USA

Androgens and structurally distinct amygdala subregion development in children and adolescents

The amygdala is comprised of a heterogeneous set of nuclei that are vital to emotional processing, motivation, and social behaviors that continue to develop across childhood and adolescence. This talk will discuss a novel method to segment and measure the developmental patterns seen in amygdala subregions across adolescence. Specifically, findings will be presented as to how amygdala subregion development varies by sex, physical and hormonal characteristics of sexual maturation, and androgen receptor genotype in typical developing adolescents. Lastly, we also discuss how disruptions to early life androgens may impact amygdala development as seen in children with Congenital Adrenal Hyperplasia.

Sarah Whittle University of Melbourne, Australia

Pubertal hormones predict sex-specific trajectories of pituitary gland volume during the transition from childhood to adolescence

Pituitary gland volume (PGV) increases during childhood and adolescence, yet no work has investigated the contribution of hypothalamic-pituitary-adrenal axis hormones that play a role in the earliest pubertal phase of adrenarche. To address this question, longitudinal data from 249 children (409 datasets, age range 8 to 13 years) were used to explore associations between PGV and dehydroepiandrosterone (DHEA), its sulfate (DHEA-S) and testosterone. We found that all three hormones explained variance in PGV development over and above age. In all cases, associations were stronger in females. Our findings suggest a key role for the hormones of adrenarche in PGV development.

Tuong-Vi Nguyen McGill University, Canada

Prenatal masculinization of the auditory system in infants: the MIREC-ID study

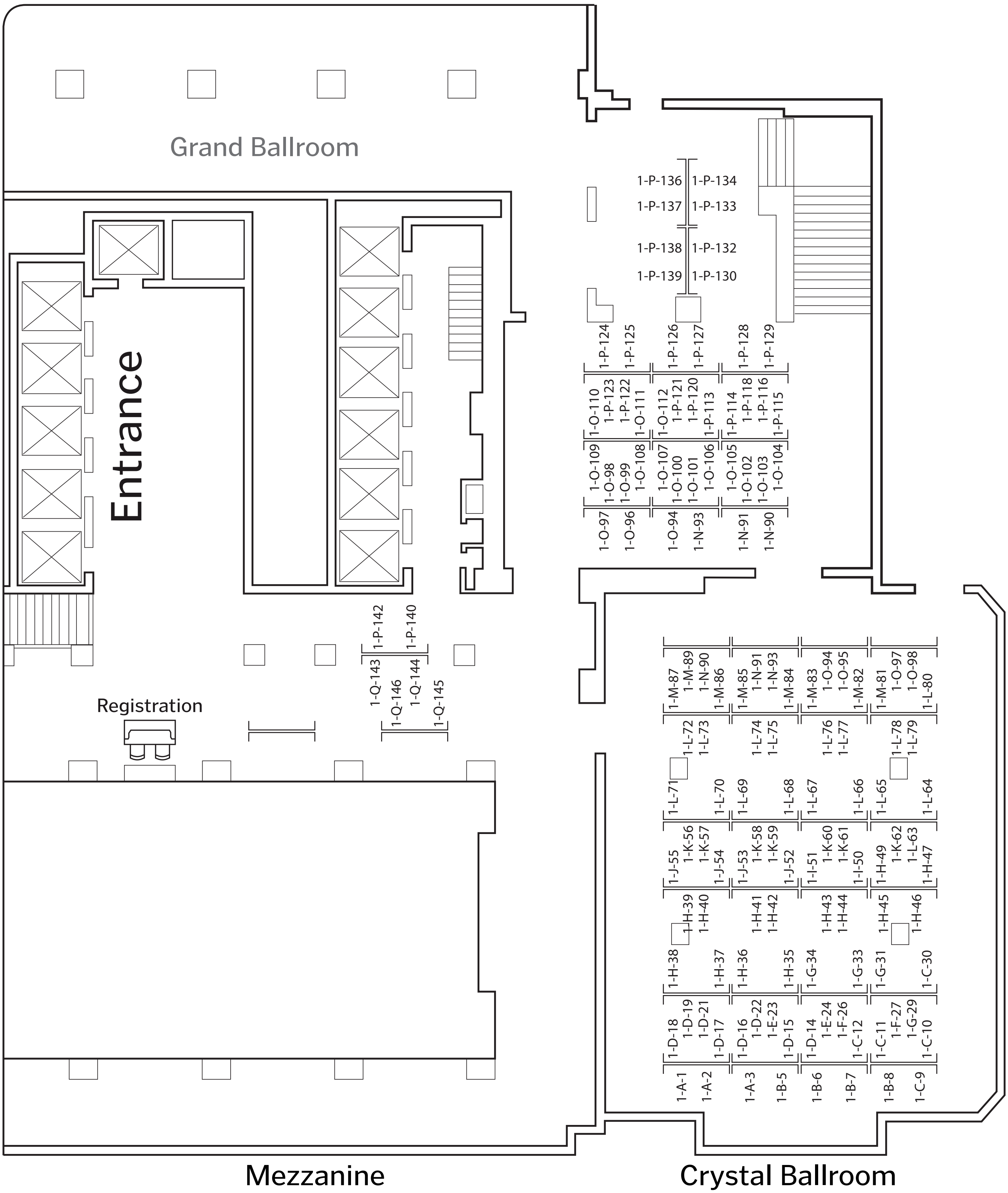
Sex differences in inner-ear function are detectable in infants, notably through the measurement of otoacoustic emissions (OAEs). Prevailing theories posit that prenatal exposure to high levels of androgens in boys may weaken OAEs, and that this phenomenon may predominantly affect the right ear/left hemisphere (Geschwind-Galaburda (GG) hypothesis). Yet, actual tests of these models have been difficult to implement in humans. Here we examined the relationship between markers of fetal androgen exposure collected at birth (anogenital distances (AGD); penile length/width, areolar/scrotal/vulvar pigmentation) and at 6 months of age (2nd to 4th digit ratio (2D:4D)) with two types of OAEs, click-evoked OAEs (CEOAEs) and distortion-product OAEs (DPOAEs) (n=49; 25 boys; 24 girls). We found that, in boys, scrotal pigmentation was inversely associated with the amplitude and reproducibility of CEOAEs in the right ear at 4 kHz, with trends also present in the same ear for mean CEOAE amplitude and CEOAE amplitude at 2 kHz. Penile length was inversely associated with the mean amplitude of DPOAEs in both the right and left ears, as well as with DPOAE amplitude in the right ear at 2 kHz and the reproducibility of CEOAEs in the left ear at 2.8 kHz. Finally, AGD-scrotum in boys was positively associated in boys with the amplitude of DPOAEs in the left ear at 2.8 kHz. Unexpectedly, there were no sex differences in the amplitude or reproducibility of OAEs, nor, in girls, any associations between androgenic markers and auditory function. Nonetheless, these findings, reported for the first time in a sample of human infants, support both the prenatal-androgen-exposure and GG models as explanations for the masculinization of auditory function in male infants.

Janice Juraska University of Illinois, USA

Cortical reorganization during adolescence: what the rat can tell us about the cellular basis

The human cerebral cortex decreases in volume during adolescence while the underlying white matter increases. These changes also occur in the adolescent/peripubertal rat prefrontal cortex, where synapses, dendrites and neurons are pruned peripubertally. These decreases are larger in females and more definitively tied to puberty. In addition, perineuronal nets that alter the efficacy of inhibitory interneurons increase in both sexes but female puberty changes the time course. In contrast, the increase in white matter is due to myelination, not differences in the number or size of axons. Thus size changes are an amalgam of cellular alterations.

Flux Congress Poster Floor Plans - Day 1



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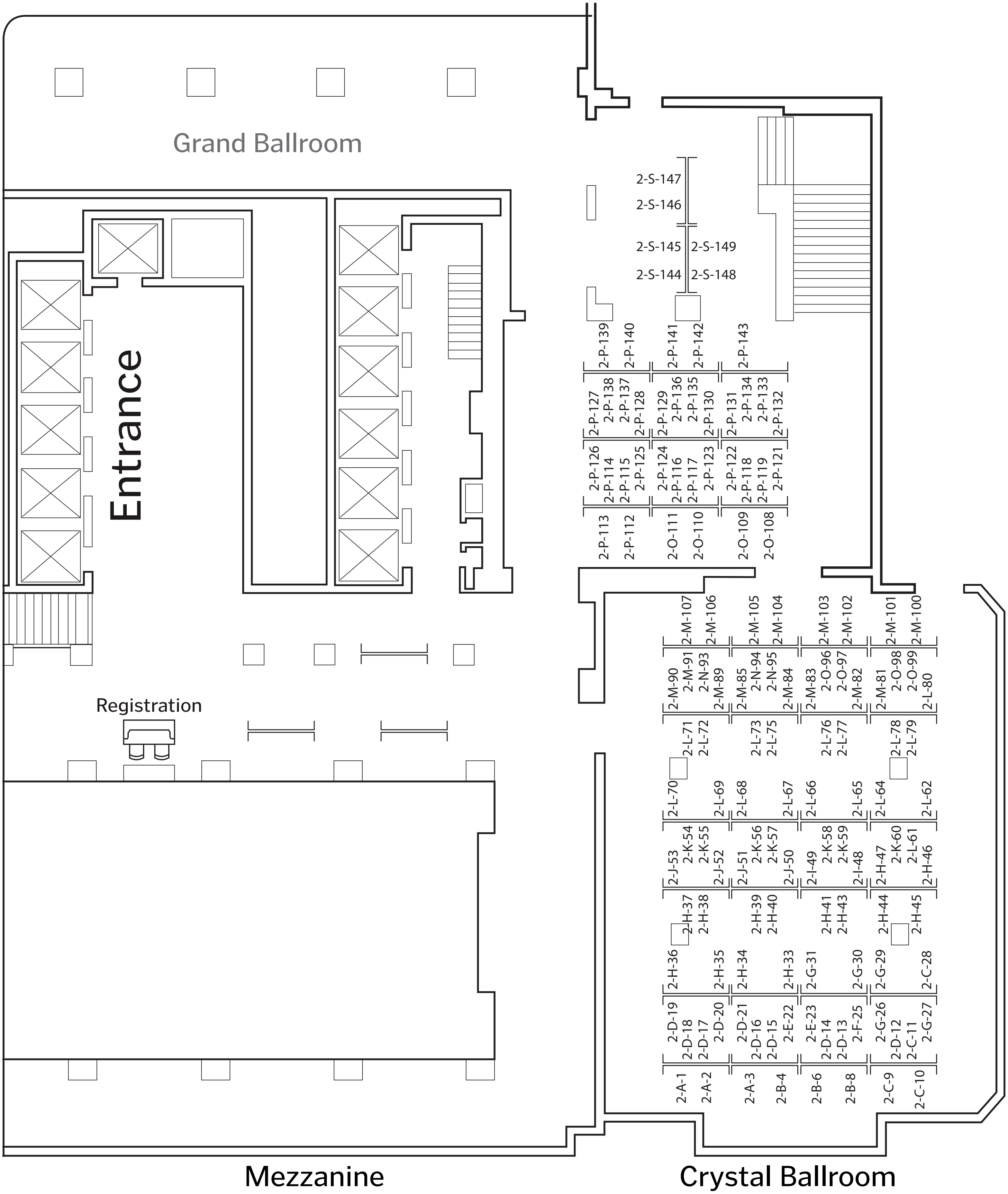

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Location of the individual poster boards are indicated on poster board floor plans following the poster author index list. Poster set up and removal is the responsibility of the presenter. Please have your poster set up no later than 8:30AM on your 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.

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- B Socioemotional Processing
- C Learning
- D Rewards/Motivation
- E Education
- F Memory
- G Environment (Stress, SES)
- H Brain Structure
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- K Methods
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1-A-2 Neonatal brain structural connectivity underlies links between social adversity and executive fFunction in very preterm children

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Tien Tong[1], Jatin Vaidya[1], John Kramer[1], Samuel Kuperman[1], Douglas Langbehn[1], Daniel O'Leary[1]

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Daniel Petrie[1], Cassidy Fry[1], Nicole Roberts[1], Lisa Gatzke-Kopp[1], Charles Geier[1]

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Julia Moser[1], Franziska Schleger[1], Magdalene Weiß[1], Katrin Sippel[1], Hubert Preißl[1]

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Daniela Czernochowski[1], Ann-Kathrin Beck[1], Andre Haese[1]

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Grace Icenogle[1], Cortney Simmons[1], Laurence Steinberg[2]

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Paul Bloom[1], Andrea Fields[1], Tricia Choy[1], Nicolas Camacho[1], Lisa Gibson[1], Rebecca Umbach[1], Charlotte Heleniak[1], Sage Hess[2], Daphna Shohamy[1], Nim Tottenham[1]

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Josiane Bourque[1], Sean Spinney, Flavie Laroque[1], Rachel Sharkey[2], Marco Leyton[2], Alain Dagher[2], Stephane Potvin[1], Patricia Conrod[1]

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Zeena Ammar[1], Aiden Ford[2], Longchuan Li[2], Warren Jones[2], Sarah Shultz[2]

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Margot Roell[1], Arnaud Cachia[1], Gregoire Borst[1], Anna Matejko, Daniel Ansari[1]

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Cameron McKay[1], Melanie Lozano[1], Eileen Napoliello[1], D Flowers[1], Guinevere Eden[1]

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Rita Taylor[1], Deanna Barch[1]

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Mackenzie Woodburn[1], Margaret Sheridan[1], Cheyenne Bricken[1], Weili Lin[1], Jessica Cohen[1]

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Natasha Duell[1], Jorien van Hoorn[2], Ethan McCormick[1], Eva Telzer[1]

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Rosemarie Perry[1], Stephen Braren[1], Annie Brandes-Aitken[1], Cristina Alberini[1], Regina Sullivan[1], Clancy Blair[1]

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

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Lorna Ginnell[1], James Boardman[1], Rebecca Reynolds[1], Emma Telford[1], Sue Fletcher-Watson[1]

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Lauren Schmitt[1], Ernest Pedapati[1], Craig Erickson[1], John Sweeney[2]

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Dienke Bos[1], Bob Oranje[1], Sarah Durston[1]

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Laura Quinones-Camacho[1], Frank Fishburn[1], Susan Perlman[1]

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Laya Rajan[1], Gabriel Santos Malavé[1], Alaina Pearce[2], Joseph Cherry[1], Xiaozhen You[1], Alexandra Olson[3], Eleanor Mackey[3], Evan Nadler[3], Chandan Vaidya[1]

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Gabrielle Reimann[1], Michal Ramot[1], Catherine Walsh[1], Patrick McClure[1], Francisco Pereira[1], Alex Martin[1]

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

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Myrthe Ottenhoff[1], Ivette Planell-Mendez[1], Sabine Kastner[1]

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Tehila Nugiel[1], Mary Abbe Roe[1], Laura Engelhardt[1], Jessica Church[1]

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Aislinn Sandre[1], Anna Weinberg[1], Melanie Dirks[1]

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Andrew Lynn[1], Lakshmi Govindarajan[1], Kim Seungchan[1], Kalpit Thakkar[1], Thomas Serre[1], Dima Amso[1]

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

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Michael Perino[1], Qiongru Yu[1], Chad Sylvester[1]

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Hannah Grotzinger[1], Rachel Romeo[1], Melissa Giebler[1], Andrea Imhof[2], Anila D'Mello[1], John Gabrieli[1]

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Rachael Davis[1], Hugh Rabagliati[1], Antonella Sorace[1], Sue Fletcher-Watson[1]

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Mariel Schroeder[1], Alexandra Svoboda[1], Kalyan Tripathy[1], Rachel Ulbrich[1], Andrew Fishell[1], Joseph Culver[1], Adam Eggebrecht[1]

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Kate Riggall[1], Mark Kohler[2], Sally Brinkman[3], Phil Kavenagh[4], Ina Bornkessel-Schlesewsky[1]

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1-O-95 Sensory perception and processing in early childhood

Svenja Espenhahn[1], Tingting Yan[1], Kate Godfrey[1], Winnica Beltrano[1], Olesya Dmitrieva[1], Niloy Nath[2], Carly McMorris[1], Deborah Dewey[1], Andrea Protzner[1], Mark Tommerdahl[3], Ashley Harris[1], Signe Bray[1]

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Ashley Smith[1], Quyen Do[2], Marissa Yetter[1], Anni Subar[1], Katharina Kircanski[1], Anita Harrewijn[1], Elise Cardinale[1], Ellen Leibenluft[1], Melissa Brotman[1], Daniel Pine[1]

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1-O-103 How much sleep is enough sleep? Effects of self-reported sleep hours on the brain functions of school age children

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1-O-104 Differential mechanisms supporting social vs. monetary reward processing in adolescent anxiety and depression

Tessa Clarkson[1], Megan Quarmley[1], Brady Nelson[2], Johanna Jarcho[1]

[1]Temple University, [2]Stony Brook University

1-O-105 Examining the neurocircuitry of habits in adolescents and young adults

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

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1-O-106 Behavioral and neural signatures of working memory in childhood

Monica Rosenberg[1], Steven Martinez[2], Kristina Rapuano[2], May Conley[2], Alexandra Cohen[3], M. Daniela Cornejo[4], Donald Hagler[4], Tor Wager[5], Eric Feczko[6], Eric Earl[6], Damien Fair[6], Deanna Barch[7], Richard Watts[2], BJ Casey[2]

[1]The University of Chicago, [2]Yale University, [3]New York University, [4]University of California, San Diego, [5]Dartmouth College, [6]Oregon Health & Science University, [7]Washington University in St. Louis

1-O-107 Poverty and maltreatment: Distinct pathways to emotion regulation deficits

Nourhan Elsayed[1], Brent Rappaport[1], Joan Luby[1], Deanna Barch[1]

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1-O-108 Adolescents exhibit dampened prefrontal activation to stress compared to children and adults

Jessica Uy[1], Macrina Cooper-White[1], Carrianne Leschak[1], Naomi Eisenberger[1], Andrew Fuligni[1], Adriana Galvan[1]

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1-O-109 Normative development of vibrotactile metrics in healthy boys and girls

Jason He[1], Mark Tommerdahl[2], Richard Edden[1], Stewart Mostofsky[3], Nicolaas Puts[1]

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1-O-110 Neural correlates of self-evaluation during puberty

Marjolein Barendse[1], Nandi Vijayakumar[1], John Flournoy[1], Danielle Cosme[1], Theresa Cheng[1], Samantha Chavez[1], Jessica Flannery[1], Michelle Byrne[1], Nicholas Allen[1], Jennifer Pfeifer[1]

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1-O-111 Development of cognitive control and fronto-striatal circuitry in children with Autism Spectrum Disorder or Obsessive-Compulsive Disorder: A longitudinal fMRI study

Bram Gooskens[1], Dienke Bos[1], Vincent Mensen, Devon Shook, Muriel Bruchhage, Jill Naaijen, Isabella Wolff, Daniel Brandeis, Steven Williams, Jan Buitelaar, Bob Oranje[1], Sarah Durston[1]

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1-O-112 Brain responses to socially vs. non socially relevant aversive auditory stimuli in youth with and without autism

Genevieve Patterson[1], Kaitlin Cummings[1], Jiwon Jung[1], Lamia Abbas[1], Susan Bookheimer[1], Mirella Dapretto[1], Shulamite Green[1]

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1-P-113 Localizing differences in between network functional connectivity in attention deficit/hyper-activity disorder

Teague Henry[1], Kelly Duffy[1], Mary Beth Nebel[2], Stewart Mostofsky[2], Jessica Cohen[1]

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1-P-114 Dynamic changes of functional connectivity are associated with age and cognitive ability

Dietsje Jolles[1], Eva Mennigen[2], Catherine Hegarty[2], Mohan Gupta[2], Carrie Bearden[2], Katherine Karlsgodt[2]

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

1-P-115 Associations of premotor connectivity with handwriting impairment in children with autism

Amira Herstic[1], Nicholas Wymbs[1], Rebecca Rochowiak[1], Carolyn Koch[1], Mary Beth Nebel[1], Stewart Mostofsky[1]

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1-P-116 Maternal cannabis use during pregnancy affects fetal hippocampal functional connectivity

Carly Lenniger[1], J Hect[2], T Lewis[2], B Coyle[2], C Espinoza-Heredia[1], T Qawasmeh[2], C Trentacosta[2], M Thomason[4]

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1-P-118 Cognitive control networks are functionally and structurally connected during narrative comprehension from infancy to 9 years

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

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1-P-120 Functional connectivity and early number skills in first grade students

Lina Shanley[1], Ben Clarke[1], Brian Gearin[1], HyeonJin Yoon[1], Jolinda Smith[1], Virany Men[1], Fred Sabb[1]

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1-P-121 Social risk perception and functional brain connectivity between reward and mentalizing brain regions during adolescence

Jack Andrews[1], John Flournoy[2], Garrett Ross[3], Shannon Peake[3], Jessica Flannery[3], Theresa Cheng[3], Phil Fisher[3], Jennifer Pfeifer[3], Kathryn Mills[3]

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1-P-122 Behavioral inhibition is linked to functional connectivity during reward anticipation and greater risk-taking in adolescents.

Marissa Laws[1], Shady El Damaty[1], Maria Stoianova[1], Emma Rose[2], Diana Fishbein[2], John VanMeter[1]

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1-P-123 An anterior-to-posterior functional connectivity shift in the developing fronto-parietal number network

Priya Kalra[1], Edward Hubbard[1]

[1]University of Wisconsin--Madison

1-P-124 Childhood violence exposure and resting-state connectivity: Person-specific networks capture heterogeneity and some consistency.

Leigh Goetschius[1], Tyler Hein[1], Sara McLanahan[2], Jeanne Brooks-Gunn[3], Vonnie McLoyd[1], Hailey Dotterer[1], Nestor Lopez-Duran[1], Colter Mitchell[1], Luke Hyde[1], Christopher Monk[1], Adriene Beltz[1]

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1-P-125 Adolescent stress and the development of neural circuits underlying social behaviors

Danielle Gerhard[1], Francis Lee[1]

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1-P-126 Neurobiological embedding of recent or concurrent child maltreatment in connectivity patterns

Emma Rose[1], Giorgia Picci[1], Rachel Bernier[1], Hannah Schreier[1], Idan Shalev[1], Chad Shenk[1], Christine Heim[2], Jennie Noll[1]

[1]The Pennsylvania State University, [2]Charité University

1-P-127 Variation in fetal limbic system functional connectivity relates to prenatal household SES

Claudia Espinoza-Heredia[1], Jasmine Hect[2], Toni Lewis[2], Tamara Qawasameh[2], Carly Lenniger[1], Brendan Coyle[2], Christopher Trentacosta[2], Moriah Thomason[1]

[1]New York University Medical Center, [2]Wayne State University

1-P-128 Advantages of multi-shell diffusion models for studies of brain development in youth

Adam Pines[1], Matthew Cieslak, Graham Baum[1], Philip Cook[1], Azeez Adebimpe[1], Diego Dávila[1], Mark Elliott[1], Kristin Murtha[1], Desmond Oathes[1], Kayla Piiwaa[1], Adon Rosen[1], Sage Rush[1], Robert Jirsaraie[1], Russell Shinohara[1], Danielle Bassett[1], David Roalf[1], Theodore Satterthwaite[1]

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1-P-129 Functional networks and minimum spanning trees in developmental dyslexia

Diandra Brkić[1], Joel Talcott[2], Arjan Hillebrand[3], Caroline Witton[2]

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1-P-130 Subnetworks that comprise the core functional brain networks display distinct patterns of maturation

Nessa Bryce[1], John Flournoy[1], Maya Rosen[1], Kelly Sambrook[1], Katie McLaughlin[1]

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1-P-132 A preliminary evaluation of potential epigenetic and neural biomarkers of emotion dysregulation in children

Kaley Davis[1], Amy Roy[1], Marija Kundakovic[1]

[1]Fordham University

1-P-133 A Joint Network Optimization Framework to Predict Clinical Severity from Resting-State Functional Connectomics

Niharika D'Souza[1], Mary Beth Nebel[2], Nicholas Wymbs[2], Stewart Mostofsky[2], Archana Venkataraman[1]

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1-P-134 Utilizing conditioned safety to augment fear extinction in adolescent mice

Heidi Meyer[1], Francis Lee[1]

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1-P-136 Neonatal default mode network connectivity relates to autism symptoms at ages 2 and 5 years

Peppar Cyr[1], Cynthia Rogers[1], Tara Smyser[1], Jeanette Kenley[1], Sydney Kaplan[1], Rebecca Brenner[1], Rachel Lean[1], Chad Sylvester[1], Christopher Smyser[1]

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1-P-137 Neural systems supporting set-shifting in children with autism spectrum disorder

Celia Romero[1], Bryce Dirks[1], Willa Voorhies[2], Dina Dajani, Paola Odriozola[3], Jason Naomi[1], Meaghan Parlade[1], Michael Alessandri[1], Jennifer Britton[1], Lucina Uddin[1]

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1-P-138 Functional connectivity between the amygdala and ventromedial prefrontal cortex is associated with emotional regulation dysfunction and suicidal ideation in adolescents

Johanna Walker[1], Artensia Kulla[1], Manpreet Singh[1], Ian Gotlib[1], Tiffany Ho[1]

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1-P-139 Developmental changes in delay discounting and fronto-striatal functional connectivity among children with ADHD and typically developing children

Aaron Tan[1], Mary Beth Nebel[1], Stewart Mostofsky[1], Karen Seymour[1], Yi Zhao[1], Keri Rosch[1]

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1-P-140 The relationship between psychophysiological and neural reponses to auditory and tactile aversive stimuli in youth with autism spectrum disorder

Jiwon Jung[1], Tomislav Zbozinek[2], Kaitlin Cummings[1], Candace Chan[1], Michelle Craske[1], Susan Bookheimer[1], Mirella Dapretto[1], Shulamite Green[1]

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1-P-142 Multimethod evidence for a prolonged development of the visual scene network

Tobias Meissner[1], Sarah Weigelt[2]

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1-P-123 An anterior-to-posterior functional connectivity shift in the developing fronto-parietal number network

Priya Kalra[1], Edward Hubbard[1]

[1]University of Wisconsin--Madison

1-Q-143 Within-person fluctuations in sleep duration and regularity predict future stress exposure and anxiety and depression symptoms in adolescents

Constanza Vidal Bustamante[1], Alexandra Rodman[1], John Flournoy[1], Kate McLaughlin[1]

[1]Harvard University

1-Q-144 Investigating ERP consistency across child and adolescent worriers in tasks measuring sensitivity to punishment

Taylor Heffer[1], Teena Willoughby[1]

[1]Brock University

1-Q-145 Factors underlying the effects of the Video-feedback intervention to promote Positive Parenting and Sensitive Discipline on parenting behaviour: the role of neural face processing

Laura Kolijn[1], Rens Huffmeijer[2], Bianca van den Bulk[2], Saskia Euser[2], Marinus van IJzendoorn[3], Marian Bakermans-Kranenburg[1]

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1-Q-146 Exploring cortical hemodynamics in X&Y disorder using functional near infrared spectroscopy

Afrouz Anderson[1]

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Poster Session 2

Saturday, August 31

Sponsored by Elsevier

2-A-1 Maturation of domain general neurocognitive processes

Brenden Tervo-Clemmens, Finnegan Calabro[1], Beatriz Luna[1]

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2-A-2 Changes in the insula and caudate nucleus activity during SST induced by inhibitory control training. A fMRI study in school-age children

Emilie Salvia[1], Sylvain Charron[2], Valérie Dorriere[1], Marine Moyon[1], Cloelia Tissier[1], Lisa Delalande[1], Bernard Guillois[3], Katell Mevel[1], Nicolas Poirel[1], Julie Vidal[1], Catherine Oppenheim[2], Olivier Houdé[1], Arnaud Cachia[1], Gregoire Borst[1]

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2-B-3 Gonadal hormone administration alters neural response to both unfamiliar peer's and own mother's voice in adolescents

Michele Morningstar[1], Roberto French[1], Connor Grannis[1], Andy Hung[1], Meika Travis[1], Whitney Mattson[1], Leena Nahata[2], Scott Leibowitz[2], Eric Nelson[1]

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2-B-4 Associations between limbic white matter microstructure and social and emotional functioning in children with ADHD+ASD

Kate Stephens[2], Timothy Silk[2], Peter Enticott[2], Emma Sciberras[2]

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2-B-5 Age-related differences in prosocial and antisocial influence in adolescence

Saz Ahmed[1], Lucy Foulkes[2], Jovita Leung[1], Cait Griffin[1], Ashok Sakhardande, Marc Bennett[3], Darren Dunning[3], Kirsty Griffiths[4], Jenna Parker[3], MYRIAD Team[1], Willem Kuyken[5], Mark Williams[6], Tim Dalgleish[3], Sarah-Jayne Blakemore[1]

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2-B-6 Neural correlates of conflicting social influences on adolescent risk-taking

Seh-Joo Kwon[1], Kathy Do[1], Ethan McCormick[1], Eva Telzer[1]

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2-B-8 Childhood maltreatment relates to a weaker effect of negative emotional distraction on inhibitory control and less recruitment of fronto-regulatory regions

Lauren Demers[1], Ruskin Hunt[1], Dante Cicchetti[1], Julia Cohen-Gilbert[2], Fred Rogosch[3], Kathleen Thomas[1]

[1]University of Minnesota, [2]McLean Hospital, [3]University of Rochester

2-C-9 Longitudinal resting-state fMRI in individuals with autism

Benjamin Silver[1], Charles Lynch[1], Elysha Clark-Whitney[1], Emily Barnes[1], Jonathan Power[1], Rebecca Jones[1]

[1]Weill Cornell Medicine

2-C-10 Is Cognitive Segmentation the core limit to problem solving abilities in children?

Sinead O'Brien[1], Daniel Mitchell[1], John Duncan[1], Daphne Chylinski[2], Joni Holmes[1]

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

2-C-11 The relationship between pubertal onset and benefits from a task-switching training

Corinna Laube[1], Neda Khosravani[1], Linda Wilbrecht[2], Silvia Bunge[2], Ulman Lindenberger[1], Yana Fandakova[1]

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2-D-12 An electrophysiological investigation of reinforcement effects in attention deficit/hyperactivity disorder: Dissociating cue sensitivity from down-stream effects on target engagement and performance

Georgia Chronaki[1], Fruzsina Soltesz[2], Nicholas Benikos[3], Edmund Sonuga-Barke[4]

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2-D-13 Behavioral and neural correlates of feedback responsivity in adolescent risk taking

Amanda Baker[1], Hongjing Lu[1], Adriana Galván[1]

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2-D-14 Neural correlates of risk and reward in safe and risky young men who have sex with men

Vita Droutman[1], Emily Barkley-Levenson[2], Feng Xue[3], Antoine Bechara[1], Lynn Miller[1], Stephen Read[1]

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2-D-15 Does early social deprivation alter social decision making processes?

Joao Guassi Moreira[1], Adriana Mendez Leal[1], Yael Waizman[1], Emilia Ninova[1], Jennifer Silvers[1]

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2-D-16 Like mother, like daughter? Associations between mothers' and daughters' neural responses to rewards are moderated by daughters' developmental status

Paige Ethridge[1], Anna Weinberg[1]

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2-D-17 Preregistration: Neural and behavioral mechanisms of persistence to setbacks during childhood

Michelle VanTieghem[1], Paul Bloom[1], Andrea Fields[1], Chelsea Harmon[1], Tricia Choy[1], Nicholas Camacho[1], Lisa Gibson[1], Rebecca Umbach[1], Charlotte Heleniak[1], Daphna Shohamy[1], Nim Tottenham[1]

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2-D-18 The upside of social media: The influence of peer 'likes' on adaptive social behavior

Emily Brudner[1], Mauricio Delgado[1]

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2-D-19 An ERP investigation of children and adolescents' sensitivity to wins and losses during a perceived peer observation manipulation

Teena Willoughby[1], Taylor Heffer[1], Stefon van Noordt[2]

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2-D-20 Developmental change in the influence of causal judgments on reinforcement learning

Alexandra Cohen[1], Kate Nussenbaum[1], Hayley Dorfman[2], Xinxu Shen[1], Daphne Valencia[1], Morgan Glover[1], Samuel Gershman[2], Catherine Hartley[1]

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2-D-21 Reward magnitude increases learning rate and the activity in value-related brain areas in adolescent

Maria Paz Martinez Monlina[1], Gabriela Valdebenito-Oyarzo[1], Josefina Larrain-Valenzuela[1], Ximena Stecher[2], Cesar Salinas[2], Francisco Zamorano[1], Pablo Billeke[1]

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2-E-22 Is it possible to train self-concept? Behavioral and neural evaluation of a naturalistic training program for adolescents

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

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2-E-23 Cognitive dimensions of learning problems in children who have been identified as struggling at school

Joni Holmes[1], Rogier Kievit[1], The CALM Team[1], Susan Gathercole[1]

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2-F-25 Mapping the persistence of memory in three- to five-year-olds

Natalie Saragosa-Harris[1], Alexandra Cohen[1], Xinxu Shen[1], Catherine Hartley[1]

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2-G-26 The enduring effect of parents and peers on the neural correlates of risk taking and antisocial behavior during adolescence

Christy Rogers[1], Virnaliz Jimenez[1], Amanda Benjamin[1], Karen Rudolph[2], Eva Telzer[1]

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2-G-27 Chronic environmental stress is related to a maturational lag in infant brain activity by 9 months of age

Sonya Troller-Renfree[1], Natalie Brito, Pooja Desai[1], Jerrold Meyer, Kimberly Noble[1]

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2-G-28 The culture of socioeconomic status and social reward and threat processing in adolescence

Nathan Jorgensen[1], Ethan McCormick[1], Kristen Lindquist[1], Mitchell Prinstein[1], Eva Telzer[1]

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2-G-29 Cognitive control and generalizability across different subtypes of caregiving adversity

Andrea Fields[1], Paul Bloom[1], Chelsea Harmon[1], Michelle VanTieghem[1], Tricia Choy[1], Nicolas Camacho[1], Lisa Gibson[1], Rebecca Umbach[1], Charlotte Heleniak[1], Nim Tottenham[1]

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2-G-30 Concurrent and longitudinal behavioral implications of infant negative reactivity

Sarah Vogel[1], Clancy Blair[2]

[1]New York University, [2]New York University School of Medicine

2-G-31 Age-related improvements in predictions of environmental controllability

Careen Foord[1], Hillary Raab[1], Romain Ligneul[2], Katerina Frangulova[3], Sophia Mascialino[1]

[1]New York University, [2]Champalimaud Research, [3]Vanderbilt University

2-G-32 Impacts of childhood maltreatment and SES on reqrd processing networks in adulthood

Shreya Lakhan-Pal[1], Ruskin Hunt[1], Dante Cicchetti[1], Meriah DeJoseph[1], Fred Rogosch[2], Kathleen Thomas[1]

[1]University of Minnesota, [2]University of Rochester

2-H-33 Longitudinal trajectories of cortical thickness from birth to 6 years predict cognitive outcomes at 9 years

Cheyenne Bricken[1], Jessica Cohen[1], Daniel Bauer[1], Mackenzie Woodburn[1], Weili Lin[1], Margaret Sheridan[1]

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2-H-34 The role of sleep in early infant myelin development

Samuel Forbes[1], Lourdes Delgado Reyes[1], Jeevun Grewal[1], Joe Cassidy[1], Sean Deoni[2], John Spencer[1]

[1]University of East Anglia, [2]Brown University

2-H-36 Mapping latent neuroanatomical substrates underlying severe temper outbursts in children

Anthony Mekhanik[1], Seok-Jun Hong[1], Michael Milham[1], Amy Roy[2]

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2-H-37 Reading ability, but not math ability, is associated with cortical thickness in an age-dependent manner

Gabrielle-Ann Torre[1], Anna Matejko[1], Guinevere Eden[1]

[1]Georgetown University

2-H-38 Longitudinal development of hippocampal subregions during early-childhood

Kelsey Canada[1], Morgan Botdorf[1], Tracy Riggins[1]

[1]University of Maryland

2-H-39 Reduced hippocampal volume after childhood violence increases risk for depression after later life stress

Hilary Lambert[1], David Weissman[2], Alexandra Rodman[2], Margaret Sheridan[3], Katie McLaughlin[2]

[1]University of Washington, [2]Harvard University, [3]University of North Carolina

2-H-40 Associations between chronic physiologic stress and white matter in children

Katrina Simon[1], Emily Merz[1], Pooja Desai[1], Jerrold Meyer[2], Xiaofu He[3], Kimberly Noble[1]

[1]Teachers College, Columbia University, [2]University of Massachusetts Amherst, [3]Columbia University Medical Center

2-H-41 Childhood socioeconomic disadvantage, cumulative risk exposure, and surface morphometry in adulthood

Alexander Dufford[1], Pilyoung Kim[1], Gary Evans[2], James Swain[3], Israel Liberzon[4]

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2-H-43 Differential association of early experiences of threat and deprivation with brain structure.

Matthew Peverill[1], Maya Rosen[1], Kelly Sambrook[2], Margaret Sheridan[3], Katie McLaughlin[2]

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2-H-44 Relations between typical variations in stress and hippcampal volume in young children

Morgan Botdorf[1], Emma Chad-Friedman[1], Lea Dougherty[1], Tracy Riggins[1]

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2-H-45 Relating stunting, underweight, and wasting to brain structure in 2-month-old Bangladeshi infants growing up in poverty: a feasibility and pilot study

Ed Turesky[1], Wanze Xie[1], Swapna Kumar[2], Danielle Sliva[3], Borjan Gagoski[1], Jennifer Vaughn[4], Lilla Zollei[5], Rashidul Haque[6], Shahria Hafiz Kakon[6], Nazrul Islam[7], William Petri[8], Charles Nelson[1], Nadine Gaab[1]

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2-I-46 Insular resting state functional connectivity: Associations with age, internalizing, and externalizing behaviors in adolescence

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

[1]University of Minnesota-Twin Cities

2-I-47 Modes of functional development in adolescence

Finnegan Calabro[1], Brenden Tervo-Clemmens[1], Beatriz Luna[1]

[1]University of Pittsburgh

2-I-48 A systematic exploration of the long-term reliability of monetary gain and loss activation

David Baranger[1], Melissa Nance[1], Daniel Shaw[1], Erika Forbes[1]

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2-I-49 Prenatal Maternal Immune Activation is associated with brain microstructural tissue organization in neonates

Marisa Spann[1], Catherine Monk[1], Ravi Bansal[2], Bradley Peterson[2]

[1]Columbia University, [2]University of Southern California

2-J-50 Effect of age and gonadal hormones on risk-taking and impulsivity in gender dysphoric youth

Roberto French[1], Whitney Mattson[1], Michele Morningstar[1], Scott Leibowitz[2], Leena Nahata[1], Eric Nelson[1]

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2-J-51 Changes in GABA and Glutamate underlying improvements in planning ability through adolescence

Maria Perica[1], Finnegan Calabro[1], Will Foran[2], Victor Yushmanov[2], Hoby Hetherington[2], Beatriz Luna[1]

[1]University of Pittsburgh, [2]University of Pittsburgh Medical Center

2-J-52 Contributions of changes in frontal GABA/ glutamate levels to emotion processing through adolescence.

Orma Ravindranath[1], Finnegan Calabro[1], Will Foran[1], Hoby Hetherington[1], Victor Yushmanov[1], Beatriz Luna[1]

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2-J-53 Developing to disperse: age-dependent movement, risk taking, and object investigation of wild mice in novel spaces

George Prounis[1], Linda Wilbrecht[1]

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2-J-54 Longitudinal development of basal ganglia tissue-iron concentration in adolescence

Bart Larsen[1], Tyler Moore[1], Russell Shinohara[1], Mark Elliott[1], Kosha Ruparel[1], Azeez Adebimpe[1], Josiane Bourque[1], Monica Calkins[1], Ruben Gur[1], Raquel Gur[1], Paul Moberg[1], Adrian Raine[1], Bruce Turetsky[1], Simon Vandekar[1], Daniel Wolf[1], David Roalf[1], Theodore Satterthwaite[1]

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2-K-55 Using multivoxel pattern analysis to determine test-retest reliability of neural representations in response to food cues in children

Alaina Pearce[1], Bari Fuchs[1], Travis Masterson[1], Maria Bermudez[1], Eleanor Brian[1], Kathleen Keller[1]

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2-K-56 Test-retest reliability of neural responses to visual food cues in children

Bari Fuchs[1], Alaina Pearce[1], Travis Masterson[1], Maria Bermudez[1], Eleanor Brian[1], Kathleen Keller[1]

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2-K-57 Mathematical modeling of the go/no-go task informs prospective prediction of substance use in emerging adulthood by clarifying the task's mechanistic neural correlates

Alexander Weigard[1], Sarah Brislin[1], Lora Cope[1], Jillian Hardee[1], Meghan Martz[1], Chandra Sripada[1], Mary Heitzeg[1]

[1]University of Michigan

2-K-59 Examining neural similarity between live peer interaction and mentalizing

Junaid Merchant[1], Diana Alkire[1], Sarah Dziura[1], Kathryn McNaughton[1], Elizabeth Redcay[1]

[1]University of Maryland

2-K-60 Reliability in clustering solutions derived from resting state fMRI: Insights from the Human Connectome Project.

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

[1]University of North Carolina at Chapel Hill

2-L-61 Posterior fossa arachnoid cyst in pediatric population is associated with social perception and cortical functioning abnormalities

Elza Rechtman[1], Stephanie Puget[2], Ana Saitovitch[2], Hervé Lemaitre[2], Jean-Marc Tacchella[2], Jennifer Boisgontier[2], Marie-Laure Cuny[2], Nathalie Boddaert[2], Monica Zilbovicius[2]

[1]Icahn School of Medicine at Mount Sinai, [2]University René Descart

2-L-62 Information sharing between autistic and neurotypical people

Catherine Crompton[1], Danielle Ropar[2], Claire Evans-Williams[3], Emma Flynn[4], Sue Fletcher-Watson[1]

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2-L-64 Borderline personality and perceived trust-worthiness of others modulates learning mechanisms in social trust exchange

Alison Schreiber[1], Alexandre Dombrovski[2], Polina Vanyukov[2], Michael Hallquist[1]

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2-L-65 Developmental trajectories of impaired response control are distinct in boys and girls with ADHD

Keri Rosch[1], Karen Seymour[1], Yi Zhao[2], Carolyn Koch[3], Alyssa Tiedemann[1], Stewart Mostofsky[1]

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2-L-66 Mapping neural correlates to biological motion in school-aged children with Autism using high density diffuse optical tomography

Alexandra Svoboda[1], Adam Eggebrecht[1]

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2-L-67 Investigating the stability of differences in social cognition related to preterm birth through early childhood

Bethan Dean[1], Lorna Ginnell[1], Emma Telford, Sue Fletcher-Watson[1], James Boardman[1]

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2-L-68 Shape of gesture learning curve predicts praxis and social function in autism

Yi Zhao[2], Brian Caffo[2], Stewart Mostofsky[1], Joshua Ewen[1]

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2-L-69 Interoceptive associations in early onset addiction to smoked cocaine

Laura Alethia de la Fuente[1], Lucas Sedeño[2], Sofia Schurmann[1], Camila Ellmann[1], Silvina Sonzogni[3], Teresa Torralvaa[1], Eduardo T. Cánepa[3], Enzo Tagliazucchi[4], Agustín Ibañez[1], Marcelo Cetkovitch[1]

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2-L-70 Behavioural and mental health problems in children struggling at school: An application of the strengths and difficulties questionnaire

Jacalyn Guy[1], Annie Bryant[2], CALM Team[1], Joni Holmes[1]

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2-L-71 Global memory impairments and hyperactivation of affective and motivational systems for successfully-encoded social stimuli in children with ASD

Ahmad Al-Zughoul[1], Lang Chen[1], Shaozheng Qin[1], Vinod Menon[1]

[1]Stanford Cognitive & Systems Neuroscience Laboratory

2-L-72 Cortisol stress response, right amygdala volume, and depressive symptoms in preschool age children.

Carina Fowler[1], Michael Gaffrey[1]

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2-L-73 Gray matter density patterns in the prefrontal cortex predict irritability scores

M. Catalina Camacho[1], Helmet Karim[1], Laura Quinones-Camacho[1], Lauren Wakschlag[2], Susan Perlman[1]

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2-L-74 Reduced longitudinal growth of the cerebellum is associated with greater symptom severity in pre-school children with ADHD

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2-L-75 Functional connectivity between the default mode and task positive networks is associated with failures

Kelly Duffy[1], Keri Shiels Rosch[2], Mary Beth Nebel[2], Karen Seymour[2], Stewart Mostofsky[2], Jessica Cohen[1]

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2-L-76 Salience network co-cativation patterns in children with autism spectrum disorder

Jason Nomi[1], Emily Marshall[1], Bryce Dirks[1], Celia Romero[1], Willa Voorhies[1], Meghan Parlade[1], Michael Alessandri[1], Lucina Uddin[1]

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2-L-77 Anomalous relationship between sensorimotor GABA levels and task-dependent cortical excitability in children with Attention-deficit/hyperactivity disorder

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2-L-78 Higher levels of inflammatory cytokines are associated with reduced white matter organization in depressed adolescents

Lucinda Sisk[1], Artenisa Kulla[1], Yael Rosenberg-Hasson[1], Holden Maecker[1], Ian Gotlib[1], Tiffany Ho[1]

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2-L-79 Preliminary validation of automated computer-vision methods for assessing motor imitation during dance videogame task in children with autism

Bahar Tuncgenc[1], Rebecca Rochowiak[1], Carolina Pacheco[1], Ajay Pillai[1], Efi Mavroudi[1], Deana Crocetti[1], Sundararaman Rengarajan[1], Brice Messenger[1], Gillian Miller[1], Rene Vidal[1], Stewart Mostofsky[1], Rosemary Nicholas[2]

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2-L-80 Testosterone-cortoisol ration, cortico-amygdalar structural covariance and cognition

Ji Min Lew[1], Andree-Anne Bouvette-Turcot[1], Isobel Orfi, Charlotte Little, Kelly Botteron[2], Simon Ducharme[1], James McCracken[3], Tuong-Vi Nguyen[1]

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Kelley Gunther[1], Xiaoxue Fu[2], Leigha MacNeill[1], Briana Ermanni[1], Kristin Buss[1], Koraly Pérez-Edgar[1]

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2-M-82 Error-related activity and attention difficulties in children

Mary Abbe Roe[1], Laura Engelhardt[1], Tehila Nugiel[1], Mackenzie Mitchell[1], Jenifer Juranek[2], K. Paige Harden[1], Elliot Tucker-Drob[1], Jessica Church[1]

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2-M-83 Naturalistic social attention across a dynamic social interaction

Alicia Vallorani[1], Kayla Brown[1], Xiaoxue Fu[2], Kelley Gunther[1], Leigha MacNeill[1], Briana Ermanni[1], Kristin Buss[1], Koraly Dr. Pérez-Edgar[1]

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Madeleine Moses-Payne[1], Sarah-Jayne Blakemore[1]

[1]University College London

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Denise Oleas[1], Jessica Burris[1], Michell Sarquez[1], Koraly Perez-Edgar[2], Kristin Buss[2], Vanessa LoBue[1]

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2-M-87 Stability of attention from infancy to early childhood in the preterm infant

Noémie Pauwels[1], Lorna Ginnell[1], Emma Telford[1], James Boardman[1], Sue Fletcher-Watson[1]

[1]University of Edinburgh

2-N-89 Investigating the relationship between bilingualism and perspective taking skills in adulthood

Berengere Digard[1], Sue Fletcher-Watson[1], Antonella Sorace[1], Andrew Stanfield[1]

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Tina Melamed[1], Yvonne Ralph[1], Mandy Maguire[1]

[1]University of Texas at Dallas

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Shaina Brady[1], Sonya Troller-Renfree[1], Natalie Brito[2], Kimberly Noble[1]

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Alexandra Bonthrone[1], Andrew Chew[1], Christopher Kelly[1], Lucilio Cordero-Grande[1], Emer Hughes[1], Kuberan Pushparajah[2], Joseph Hajnal[1], John Simpson[2], Suresh Victor[1], Camilla O'Keeffe[1], Jacqueline Brandon[1], Chiara Nosarti[1], A. David Edwards[1], Mary Rutherford

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2-O-93 Physiological evidence that excessive overflow movement in ADHD is due to motor system immaturity

Jack Adamek[1], Danielle McAuliffe[2], Stewart Mostofsky[1], Joshua Ewen[1]

[1]Kennedy Krieger Institute, [2]Temple University

2-O-94 Dynamic neural correlates of fear conditioning in children exposed to trauma and associations with psychopathology

Stephanie DeCross[1], Katie McLaughlin[1]

[1]Harvard University

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Joseph Venticinque[1], Rajpreet Chahal[1], Sarah Beard[1], Amanda Guyer[1]

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Michelle Achterberg[1], Anna van Duijvenvoorde[1], Marian Bakermans-Kranenburg[2], Marinus van IJzendoorn[3], Eveline Crone[1]

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[1]Michelle Byrne[1], Nicholas Allen[1], Jennifer Pfeifer[1]

[1]University of Oregon

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Charlotte Heleniak[1], Kelly Sambrook[2], Katie McLaughlin[3]

[1]Columbia University, [2]University of Washington, [3]Harvard University

2-O-100 Association between internalizing symptoms and substance use from early to late adolescence: The moderating role of neural response to social exculsion

Sarah Beard[1], Rajpreet Chahal[1], Joseph Venticinque[1], Paul Hastings[1], Richard Robins[1], Amanda Guyer[1]

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Anna Matejko[1], Melanie Lozano[1], Sikoya Ashburn[1], Guinevere Eden[1]

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2-O-102 Individual differences in human frontoparietal plasticity

Austin Boroshok[1], Gerardo Velasquez[1], Anne Park[1], Katrina Simon[2], Jasmine Forde[1], Emily Cooper[3], Allyson Mackey[1]

[1]University of Pennsylvania, [2]Columbia University, [3]University of California, Berkeley

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Hester Sijtsma[1], Mariët van Buuren[1], Nikki Lee[1], Lydia Krabbendam[1]

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Danielle Cosme[1], Arian Mobasser[1], Garrett Ross[1], Dagmar Zeithamova[1], Elliot Berkman[1], Jennifer Pfeifer[1]

[1]University of Oregon

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Annie Brandes-Aitken[1], Stephen Braren[1], Ashley Greaves[1], Rosemarie Perry[1], Natalie Brito[1]

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2-O-106 Neural networks supporting long-term memory guided and cued attention in children: Associations in socioeconomic status

Maya Rosen[1], Kelly Sambrook[1], Andrew Meltzoff[1], Katie McLaughlin[2]

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Max Herzberg[1], Ruskin Hunt[1], Megan Gunnar[1], Kathleen Thomas[1]

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Connor Grannis[1], Michele Morningstar[1], Whitney Mattson[1], Scott Leibowitz[1], Leena Nahata[1], Eric Nelson[1]

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2-O-110 Neurocognitive development of inhibitory control and substance use vulnerability

Alina Quach[1], Brenden Tervo-Clemmens[1], William Foran[1], Finnegan Calabro[1], Duncan Clark[1], Beatriz Luna[1]

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2-O-111 Examination of developmental effects of mirror overflow and speed during sequential finger tapping in children with and without ADHD

Christine Chen[1], Deana Crocetti[1], Yi Zhao[2], E. Mark Mahone[1], Stewart Mostofsky[1]

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2-P-112 Functional connectivity at rest is similar across youths and adults and varies with genetic similarity

Damion Demeter[1], Laura Engelhardt[1], Remington Mallett[1], Evan Gordon[2], Tehila Nugiel[1], Jenifer Juranek[3], K. Paige Harden[1], Elliot Tucker-Drob[1], Jarrod Lewis-Peacock[1], Jessica Church[1]

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2-P-113 EEG connectivity as a biomarker for predicting schizophrenia based on machine learning

Yu Luo[1], Jicong Zhang[1]

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2-P-114 Associations between infant reactivity and resting state functional connectivity

Sanjana Ravi[1], Courtney Filippi[1], Chad Sylvester[2], Daniel Pine[3], Nathan Fox[1]

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2-P-115 Altered cortico-cerebellar connectivity in 6-week-old infants at high risk for ASD

Nana Okada[1], Janelle Liu[1], Tawny Tsang[2], Shulamite Green[1], Shafali Jeste[1], Susan Bookheimer[1], Mirella Dapretto[1]

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2-P-116 Bilateral frontal aslant tract development and its relation to inhibitory control in 4- to 7-year old children

Dea Garic[1], Diana Behar[1], Armando Torres[1], Rina Badran[1], Valentina Linocci[1], Hector Borges[1], Paulo Graziano[1], Anthony Dick[1]

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2-P-118 Functional development of the social brain in middle childhood

Diana Alkire[1], Yaqiong Xiao[2], Dustin Moraczewski[1], Elizabeth Redcay[1]

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2-P-122 Early-life dentine manganese concentrations and intrinsic functional brain connectivity in adolescents and young adults

Erik de Water[1], Demetrios Papazaharias[1], Claudia Ambrosi[2], Lorella Mascaro[2], Yuri Levin-Schwartz[1], Elza Rechtman[1], Giuseppa Cagna[3], Daniele Corbo[3], Roberto Gasparotti[3], Roberto Lucchini[1], Manuela Oppini[3], Donatella Placidi[3], Christine Austin[1], Manish Aror[4]

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2-P-123 Gender effects in the relationship between parenting and resting-state functional connectivity in the ABCD Study

Kara Kerr[1], Hannah Kim[2], Florence Breslin[3], Kelly Cosgrove[4], Henning Tiemeier[2], Martin Paulus[3], Amanda Morris[1]

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2-P-124 Regulatory ability in infancy mediates the association between newborn amygdala connectivity and future internalizing symptomology

Elina Thomas[1], Claudia Buss[2], Dakota Ortega[1], Julian Ramirez[1], Jerod Rasmussen[2], Marc Rudolph[3], Pathik Wadhwa[2], Sonja Entringer[2], John Gilmore[4], Martin Styner[4], Damien Fair[1], Alice Graham[1]

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2-P-125 Stress exposure in early childhood relates to altered midbrain functional connectivity

Anne Park[1], Julia Leonard[1], Allyson Mackey[1]

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2-P-126 A history of maternal childhood maltreatment is associated with neonatal amygdala and hippocampal resting state functional connectivity

Mollie Marr[1], Alice Graham[1], Eric Feczko[1], David Ball[1], Emma Schifsky[1], Darrick Sturgeon[1], Jerod Rasmussen[2], Martin Styner[3], Sonja Entringer[3], Pathik Wadhwa[2], Damien Fair[1], Claudia Buss[4]

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Aki Nikolaidis[1], Yu Tong[1], Michael Milham[1]

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Ursula Tooley[1], Anne Park[1], Julia Leonard[1], Danielle Bassett[1], Allyson Mackey[1]

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2-P-129 Functional subdivisions of the hippocampus defined in individuals

Annie Zheng[1], Scott Marek[1], Timothy Laumann[1], Evan Gordon[2], Adrian Gilmore[3], Steven Nelson[2], Gagan Wig[4], Joshua Shimony[1], Dimitrios Alexopoulos[1], Mario Ortega[1], Deanna Greene[1], Nico Dosenbach[1]

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2-P-130 The human coparental bond implicates distinct corticostriatal pathways: Longitudinal impact on family formation and child well-being

Eyal Abraham[1]

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2-P-131 A multisample, multimethod study of connectivity mechanisms linking pubertal development and depression in adolescence

Rajpreet Chahal[1], Scott Marek[2], Weissman David[3], Veronika Vilgis[1], Paul Hastings[4], Richard Robins[4], Kate Keenan[5], Erika Forbes[6], Alison Hipwell[6], Amanda Guyer[1]

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2-P-132 Covariance regression as a method to investigate age, ADHD, and overflow-related changes in resting-state functional connectivity

Yi Zhao[1], Mary Beth Nebel[1], Keri Rosch[1], Stewart Mostofsky[1], Brian Caffo[1]

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2-P-134 Social cognition deficits associated with psychotic-like experiences and functional dysconnectivity in salience and cognitive control networks in adolescence

Eva Mennigen[1], Dietsje Jolles[2], Katherine Karlsgodt[1], Carrie Bearden[1]

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2-P-135 Association of default mode network functional and structural connectivity with social responsiveness in autism

Bryce Dirks[1], Jason Nomi[2], Willa Voorhies[3], Meaghan Parlade[1], Michael Alessandri[1], Lucina Uddin[2]

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2-P-136 PTSD- and IPT-related differences in intrinsic connectivity in a pilot sample of female adolescent survivors of sexual assault with PTSD

Tamara Sussman[1], Jonathan Posner[1], Marcelo Feijó Mello[2], Andrea Parolin Jackowski[2], Adriana Correa[2], Ana Carolina Coelho Milani[2]

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2-P-137 Underconnectivity between the rostral prefrontal cortex and sensorimotor cortex associated with better fine motor skills in toddler with autism spectrum disorders

Cynthia Ibarra[1], Annika Linke[1], Bosi Chen[1], Lindsay Olson[1], Sarah Reynolds[1], Mikaela Kinnear[1], Inna Fishman[1]

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2-P-138 Salience network connectivity relates differently to sensory over-responsivity in males vs. females with autism spectrum disorder

Kaitlin Cummings[1], Emily Wood[1], Susan Bookheimer[1], Mirella Dapretto[1], Shulamite Green[1]

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2-P-139 Distinct forms of childhood adversity are associated with differential patterns of intrinsic connectivity in reward-related neural networks

Steven Kasparek[1], Kelly Sambrook[2], Stephanie DeCross[1], Maya Rosen[1], Katie McLaughlin[1]

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2-P-140 Effects of methylphenidate on response control and intrinsic whole-brain functional network organization in children with attention-deficit/hyperactivity disorder

Kelly Eom[1], Shana Hall[1], Laura Politte[1], Margaret Sheridan[1], Jessica Cohen[1]

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2-P-141 Top-down modulation of sensory cortex in the developing human brain

Yaelan Jung[1], Amy Finn[1]

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2-P-142 Sleepy, Disconnected, and Inattentive: ADHD symptoms in children reflect greater behavioral vulnerability to partial sleep deprivation through compromised brain connectivity

Jared Saletin[1], Gabriela de Queiroz Campos[2], M. Elisabeth Koopman-Verhoeff[1], Silvia Bunge[3], Daniel Dickstein[1], Mary Carskadon[1]

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2-P-143 Identifying reproducible individual differences in childhood functional brain networks: An ABCD study

Scott Marek[1†], Brenden Tervo-Clemmens[2†], Ashley N. Nielsen[3], Muriah D. Wheelock[1], Ryland L. Miller[1], Timothy O. Laumann[1], Eric Earl[5], William W. Foran[4], Michaela Cordova[5], Olivia Doyle[5], Anders Perrone[5], Oscar Miranda-Dominguez[5], Eric Feczko[5], Darrick Sturgeon[5], Alice Graham[5], Robert Hermosillo[5], Kathy Snider[5], Anthony Galassi[5], Bonnie J. Nagel[5], Sarah W. Feldstein Ewing[5], Adam T. Eggebrecht[1], Hugh Garavan[6], Anders M. Dale[1], Deanna J. Greene[1], Deanna M. Barch[1], Damien A. Fair[5], Beatriz Luna[4], Nico U.F. Dosenbach[1]

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2-S-144 Brain plasticity in childhood: How can individual differences in change trajectories inform real-life learning?

Diana Alkire[1], Yana Fandakova[1], Corinna Laube[1], Neda Khosravani[1], Silvia A. Bunge[2], Ulman Lindenberger[1,3]

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2-S-145 Using portable neurotechnologies (fNIRS, EEG) for more naturalistic developmental cognitive neuroscience research

Nienke van Atteveldt[1], Chiara Bulgarelli[2], Ido Davidesco[3], Suzanne Dikker[4], Tieme Janssen[1], Eliana Vassena[5], Argiro Vatakis[6], Elana Zion-Golumbic[7], Roma Siugzdaite[8]

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2-S-146 Lost in translation: How does neuroimaging contribute to understanding development in everyday diverse environments

Paul Matusz[1], Yana Fandakova[2], Lucía Magis-Weinberg[3], Bruce McCandliss[4]

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2-S-147 How can developmental cognitive neuroscience inform school-based interventions to foster healthy digital habits in very young adolescents?

Lucía Magis-Weinberg[1], Lucía Magis-Weinberg[2], Estelle Berger[1], Ron Dahl[1]

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2-S-148 Flexibility, adaptation and the two-language dilemma: Advantage, disadvantage or neither

Arturo Hernandez[1], Ioulia Kovelman[2], Maria Arrendondo[3], Swathi Kiran[4],

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2-S-149 The bilingual reading brain: Cross-linguistic influences on children's literacy

Ioulia Kovelman[1]

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2-S-150 Does bilingualism alter attentional shifting in the developing infant brain?

Maria M. Arredondo[1], Richard N. Aslin[2], Janet F. Werker[3]

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2-S-150 BiLex: A neural-network model of the bilingual lexicon

Uli Grasemann[1], Claudia Penaloza[2], Maria Dekhtyar[2], Risto Miikkulainen[1], Swathi Kiran[2]

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NYU Langone Health is a world-class, patient-centered, integrated academic medical center, known for its excellence in clinical care, research, and education. Included in the 200+ locations throughout the New York area are six inpatient locations: Tisch Hospital, its flagship acute-care facility; Kimmel Pavilion, its state-of-the-art healthcare facility, opened in 2018; Rusk Rehabilitation, ranked as one of the top 10 rehabilitation programs in the country; NYU Langone Orthopedic Hospital, a dedicated inpatient orthopedic hospital with all musculoskeletal specialties ranked top 10 in the country; Hassenfeld Children's Hospital at NYU Langone, a comprehensive pediatric hospital supporting a full array of children's health services; and NYU Langone Hospital—Brooklyn, a full-service teaching hospital and level 1 trauma center located in Sunset Park, Brooklyn. Also part of NYU Langone Health is the Laura and Isaac Perlmutter Cancer Center, a National Cancer Institute–designated cancer center, and NYU School of Medicine, which since 1841 has trained thousands of physicians and scientists who have helped to shape the course of medical history. For more information, go to **nyulangone.org**, and interact with us on Facebook, Twitter, YouTube, and Instagram.

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At the Isabelle Rapin Division of Child Neurology of the Saul R. Korey Department of Neurology at the Einstein College of Medicine/Montefiore Medical Center we have pioneered research in conditions associated with developmental cognitive dysfunction such as epilepsy, movement disorders and autism. Major advantages are the availability of unique populations at Montefiore Medical Center and the close relationships and interactions of the clinical faculty with the Einstein based Neuroscience Community where we have developed state of the art basic science programs ripen for translational research to improve the welfare of our children with developmental cognitive dysfunction. We have developed programs to Identify target mechanisms and biomarkers for the development, translation, and implementation of novel therapies using a combination of neurophysiological, imaging, behavioral, and molecular biology technologies. Gene-network interactions with age, sex, and environmental and epigenetic factors are also investigated to explain the individual phenotypes and build the knowledge base to support personalized medicine. The importance of these strategic programs is underscored by the increasing awareness of the scope, complexity, socioeconomic impact and persistent societal stigma associated with disorders of developmental cognitive dysfunction. Our primary mission is to provide the highest quality of care to our patients and families. We all know how important it is that patients trust their doctors, nurses and other healthcare professionals. They also must trust our organization and believe that everyone who works here respects and obeys the law and adheres to the highest standards of professional and ethical conduct.

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The Youth Anxiety Center focuses on understanding the root causes of anxiety disorders in young people and on improving and disseminating evidence-based treatments. The program is a unique research and clinical initiative with more than 30 experts from NewYork-Presbyterian, Columbia University Vagelos College of Physicians and Surgeons, and Weill Cornell Medicine working together to help young people and their families.

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