

CENTRE FOR BRAIN AND COGNITIVE DEVELOPMENT: THE FIRST 21 YEARS AND BEYOND

**15-16 NOVEMBER 2019
LONDON, UK**

CBCD Centre for Brain and
Cognitive Development

**MARY WARD HOUSE,
5-7 TAVISTOCK PLACE,
LONDON WC1H 9SN**



Key Mission Statement

We seek to:

- **To understand the relation between postnatal brain development and changes in perceptual, cognitive, and linguistic abilities of typically and atypically developing children.**
- **To pursue theory-driven programmes of research that combine convergent methods of investigation.**
- **To bring together scientists, end-users and other practitioners for a better and more impactful understanding of infant, child, and adolescent development.**

The First 21 Years

The Centre was established in October 1998 when Mark Johnson, Gergely Csibra and Leslie Tucker moved to Birkbeck, University of London, from the former Medical Research Council Cognitive Development Unit. Denis Mareschal joined in the same year as a founder member. Steady growth since then has involved the addition of faculty members Michael Thomas (from the Institute of Child Health, University College London in 2002), Fred Dick (from the University of California, San Diego in 2004), Annette Karmiloff-Smith (from the Institute of Child Health, University College London in 2006), Natasha Kirkham (from Stanford in 2007), Angelica Ronald (from the Institute of Psychiatry, Psychology and Neuroscience, King's College in 2007), Emma Meaburn (from the Institute of Psychiatry, Psychology and Neuroscience, King's College in 2009), Matthew Longo (from University College London in 2010), Marie Smith (from the MRC Cognition and Brain Sciences Unit, Cambridge in 2010), Tim Smith (from the University of Edinburgh in 2011), Iroise Dumontheil (from the Institute of Cognitive Neuroscience, University College London in 2012), Clare Press (from University of Reading in 2012), Adam Tierney (from Northwestern University in 2015), and Gillian Forrester (from University of Westminster in 2016). Atsushi Senju and Emily Jones have developed their careers within CBCD, graduating from research fellowships to academic appointments in 2014 and 2015 respectively. In line with the Centre's increasing translational activities, Professors Tony Charman (Institute of Psychiatry, Psychology and Neuroscience, King's College) and Clare Elwell (Medical Physics and Biomedical Engineering, University College London) have joined us as visiting professors in the last five years. Denis Mareschal succeeded Mark Johnson as Director of the Centre in 2017.

This growth in staff coincided with an ever increasing growth in capacity. The CBCD was initially housed in 32 Torrington Square. This was complemented by the opening of the purpose designed Henry Wellcome Building in 2006, and then the opening of the BUCNI MRI imaging facility specifically designed to accommodate early years brain imaging research. Over the last 21 years, the CBCD has been at the forefront of developing methods tailored to answering specific questions about development during infancy. These have included developing new electrophysiological imaging and analysis techniques, solving engineering and analysis challenges

for using functional Near Infrared Spectroscopy (fNIRS) with infants, developing new behavioural methods including using kinematics and eye tracking, and combining these with genetic analyses, as well as cross-syndrome and comparative approaches comparing human development with other species. Since 1998, when the CBCD first opened its door, over 15,000 babies, and many more child and adult participants, have passed through our doors. In that time the CBCD has been awarded over £38 million in research and infrastructure funds.

The Future: ToddlerLab wearable technologies and real world scenarios

While we have developed excellent methods for the direct and indirect measurement of brain functions of babies during the first year of life, these methods are less viable with toddlers (1–3 year olds) and young children (3–5 year olds) as they depend on the child remaining relatively static and immobile for periods of time. Indeed, the age range from 12 months to 4 or 5 years old is often regarded as being the “black hole” of developmental cognitive neuroscience studies due to the difficulties in testing highly mobile young children with poor understanding of, or compliance to, verbal instructions. This is particularly the case with toddlers with emerging developmental disorders such as autism who may have poor language comprehension.

The new world-leading ToddlerLab (to be completed in mid 2020) will address these challenges by housing natural environment rooms, one set-up to be similar to a typical living room, but within which markers can detect the precise location of the child's looking, their movements and actions, and on-line measurements of their brain function. To do this we will take advantage of wireless systems currently available, or just being developed, for eye tracking, EEG/ERP, and NIRS imaging, as well as recent developments in immersive projector technology and motion analysis systems. This state-of-the-art facility will be a world first in its application to toddlers with emerging developmental disorders, and will break new ground in allowing us to bridge the divide between laboratory and clinical measures and the child's natural behaviour, free play, and social interactions in a (near) real world environment.

Friday 15 November

9.00–9.30	<i>Coffee and pastry</i>
9.30–11.15	Session 1: The first 10 years and beyond
11.15–11.45	<i>Coffee and group photo taken by Harish Patel</i>
11.45–13.15	Session 2: Social Interactions
13.15–14.15	<i>Hot lunch buffet</i>
14.15–15.00	Session 3: Social Cognition
15.00–15.45	Session 4: Development Through the Lens of Autism
15.45–16.30	<i>Coffee and Posters</i>
16.30–18.00	Session 5: Mechanisms of Learning
18.30	<i>Buffet dinner at Burr & Co. 1 Russell Square, WC1B 5BE</i>

(All events at Mary Ward House except the dinner)

Saturday 16 November

9.00–9.30	<i>Coffee and pastry</i>
9.30–11.10	Session 6: Atypical Trajectories
11.00–11.30	<i>Coffee</i>
11.30–13.00	Session 7: Development in a Digital World
13.00–14.00	<i>Hot lunch buffet</i>
14.00–15.00	Session 8: Infant Brain Function
15.00–16.00	Session 9: Sensorimotor Development
16.00–16.45	<i>Coffee and Posters</i>
16.45–17.45	Session 10: Dick Aslin, CBCD turns 21: What have we learned about the mechanisms of learning and development?
17.45–19.00	<i>Wine reception</i>





The Centre for Brain and Cognitive Development has been a jewel in Birkbeck's research portfolio since its inception in 1998. It exemplifies the College's commitment to outstanding international research, a focus on promoting learning at all ages, and a commitment to understanding and overcoming obstacles to positive life outcomes.
(Professor David Latchman, Master of Birkbeck)

Everyone we met was friendly, professional and very welcoming. Little extras like the certificate and t shirt were unexpected but made us smile and were fun to show the family when we got home. It helped us turn a tough diagnosis into a positive experience.
(Babylab Parent Volunteer)

The integration of experimental work on development with computational modeling and developmental cognitive neuroscience came to fruition in the current CBCD. This work has deeply influenced my own thinking about such topics as the development of face recognition, and core cognition of objects and agents. BRAVO for the body of work you have produced.
(Professor Susan Carey, Harvard University)

Commitment to training future generations of researchers

Achieving the long term aims of the Centre is only possible through training future generations of multidisciplinary researchers equally determined to understand the development of brain and cognitive development. In part, this objective has been met through the participation in and leadership of numerous Marie (Skłodowska) Curie training actions funded by the EC, including twice being selected as a Centre of Excellence in training, and in addition participating in 4 International Training Networks and one Industrial Doctoral Programme. As a result of this, over the last 21 years, we have trained 125 doctoral students 65 postdoctoral researchers from across the world. We have seen our impact grow through the development of labs in the UK, Poland, Italy, Hungary, Canada, Australia, and the USA. In recent years we have taken up the Global health challenge by helping to train developmental scientists in countries such as the Gambia and India.

The future is looking healthy!

Thanks for Sponsors/Funders over the years

We are deeply grateful for the gifts, awards and donations without which our research would not be possible.

Action Medical Research & Great Ormond Street Hospital Children's Charity; Autistica; Autism Speaks; Autour des Williams; Baily Thomas Charitable Trust; BIAL Foundation;

Bill and Melinda Gates Foundation; Biotechnology and Biological Sciences research Council; Birkbeck College; Brain Canada Foundation; British Academy; CareTech Foundation; Daiwa Foundation; Department of Health, UK; Economic and Social Research Council; Education Endowment Foundation; Edward Glover CMG and Dame Audrey Glover; Engineering and Physical Sciences Research Council; European Commission; European Science Foundation; Experimental Psychology Society; Garfield Weston Foundation; The Great Britain Sasakawa Foundation; Health Enterprise East Ltd; Innovative Medicines Initiative – EU; Jacobs Foundation; Japan Society for promotion of Science; Kansai University; James S McDonnell Foundation; L'Oréal UK and Ireland; Leverhulme Trust; The Maurice Wohl Charitable Foundation; Medical Research Council; MQ; Transforming Mental Health; Ministry of Defence (DERA); National Institute for Health Research; National Alliance for Autism Research (NAAR); National Science Foundation; Nuffield Foundation; The Sackler Institute; Riksbankens Jubileumsfond; Rothschild family; Society for Education; Music & Psychology Research; Peltz Foundation; Royal Society; Simons Foundation; United Nations Educational, Scientific and Cultural Organisation; VolkswagenStiftung; Waterloo Foundation; Wellcome Trust; The Wolfson Foundation.

In addition, many individuals have generously donated to the construction of the ToddlerLab. And of course, this research could not be completed without the full support of the parents and children who take part in our studies. We are truly thankful for the time they have given up to help us understand development and improve infant, children and adolescent's life outcomes.