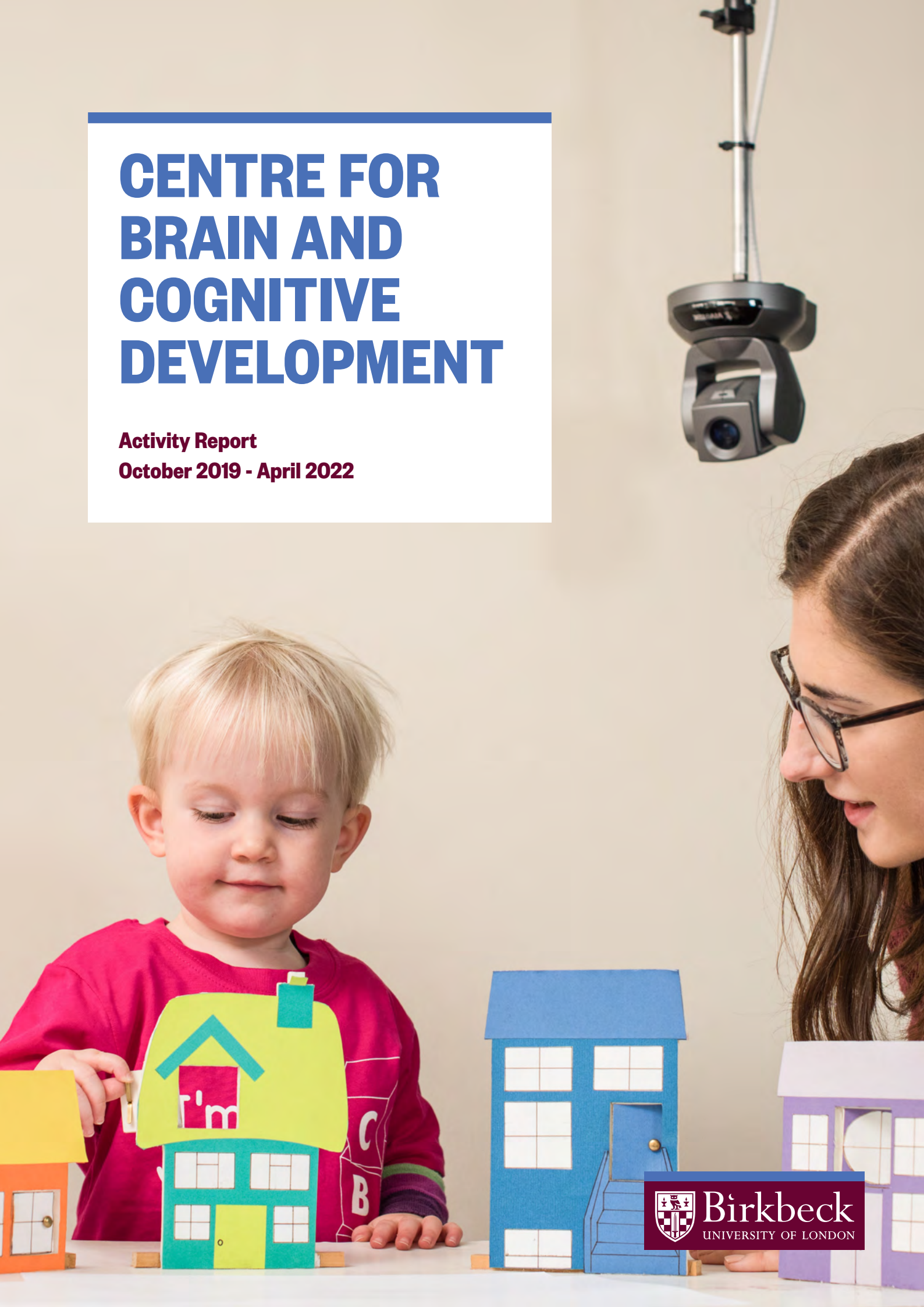
CENTRE FOR BRAIN AND COGNITIVE DEVELOPMENT

Activity Report
October 2019 - April 2022



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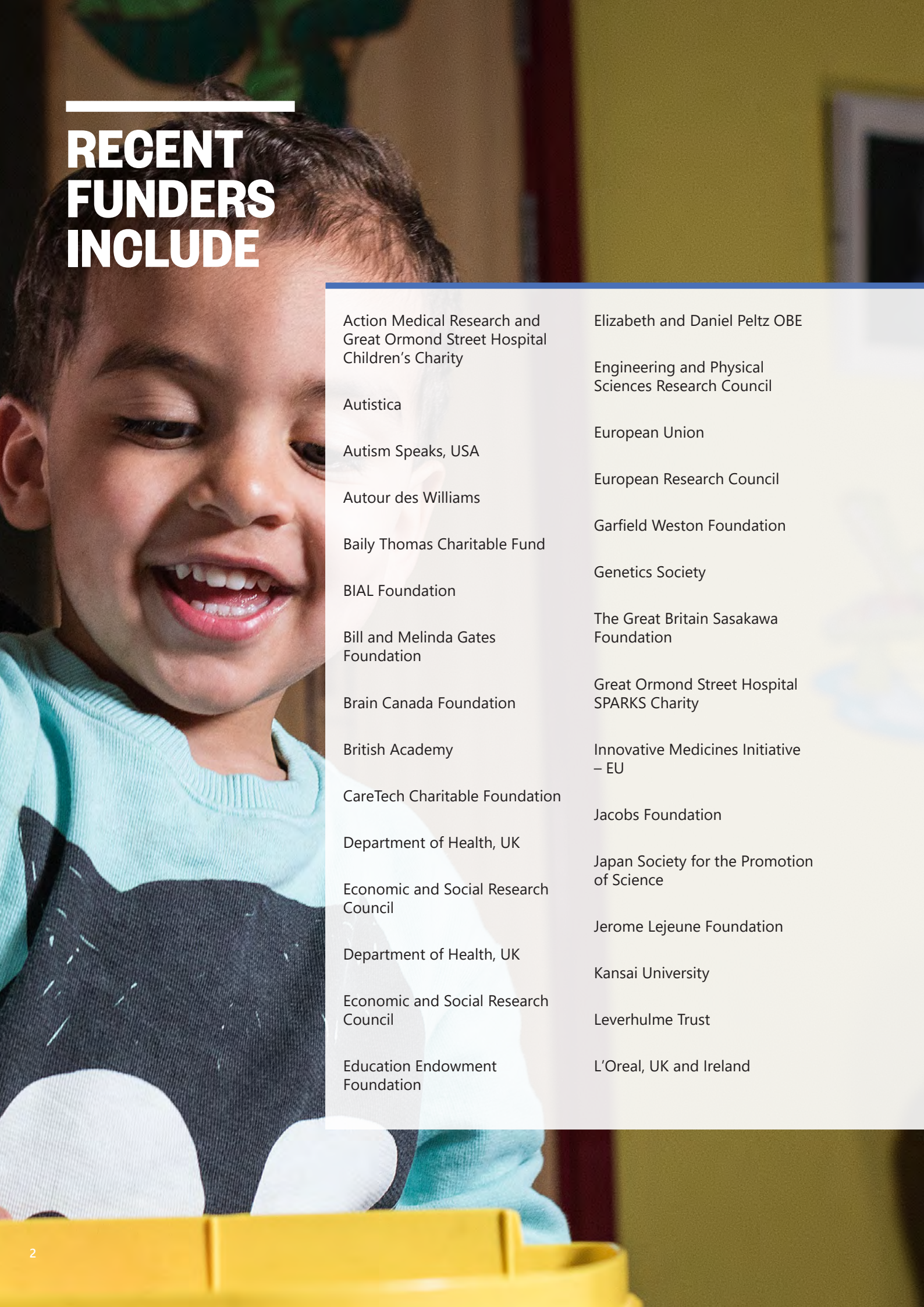

RECENT FUNDERS INCLUDE

Action Medical Research and Great Ormond Street Hospital Children's Charity

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SEMPRE: Society for Education, Music & Psychology Research

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The Waterloo Foundation

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CBCD COMPONENT LABS

BabyLab & ToddlerLab
www.cbcd.bbk.ac.uk

Bridge Lab
www.bridgelab.bbk.ac.uk

Developmental Neurocognition Lab
www.bbk.ac.uk/psychology/dnl

Genes Environment Lifespan Lab
www.gel.bbk.ac.uk

BOND Lab
www.sites.google.com/view/bondcbcd

AlphaLab
www.alphalab-london.com

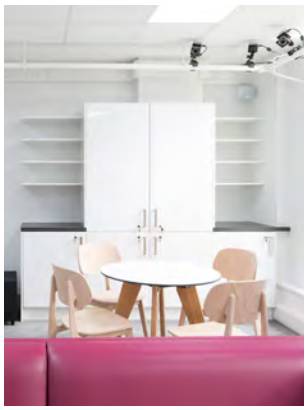
INTRODUCTION

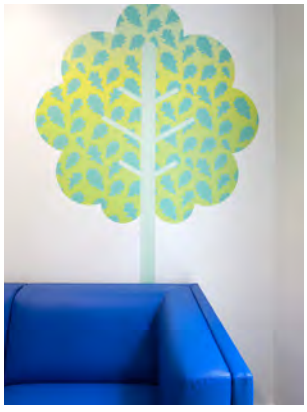
Welcome to our progress report for the period October 2019–April 2022. This has been a particularly challenging period because of the world-wide pandemic that affected our activities for over 2 years. Nevertheless, through careful planning and risk management we managed to remain open and functional for the majority of this period. The current report illustrates some of the major projects, themes and achievements of members of the Centre for Brain and Cognitive Development (CBCD) and builds on our previous reports.

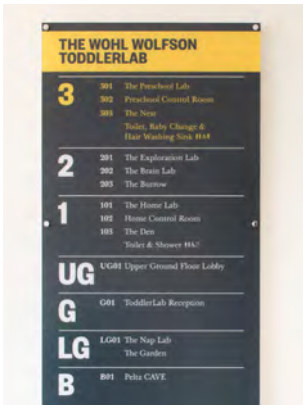
Since its foundation in 1998, the CBCD has been fortunate to be staffed by outstanding international researchers. A few of our core faculty have changed since the last report. We are very happy to announce the arrival Ori Ossmy (from New York University in the USA, 2021). We also congratulate Atsushi Senju who has accepted the position of Director at the Research Centre for Child Mental Development at Hamamatsu University, Japan, in 2021. This is an especially important and prestigious role. Prof Senju's appointment as director of this centre reflects his exceptional ability and the international impact and reach of the CBCD more generally. We wish him all the best in his future role and hope to continue our association with Prof Senju through formal collaborative links with Hamamatsu University.

The CBCD is a dynamic and continually changing entity refreshed by new post docs and research fellows annually from across the world. Consequently, it has become a major centre for postgraduate training (see CBCD Scientists). Some have retained membership of the CBCD as Affiliated Scientists. We are particularly pleased that many former members have gone on to establish their own labs and research centres elsewhere in Europe, North America, Japan and Australia. In 2021, two of our alumni Kyle Jasmin and Saloni Krishnan, (both formerly of the AlphaLab) were elected as Association for Psychological Science 'Rising Stars'.

In addition to many individual collaborations, the CBCD also maintains strong collaborative partnerships with the Institute of Psychiatry, Psychology & Neuroscience (King's College London), the Institute for Research in Child Development (UEL), UCL Medical Physics, Cambridge University, and the UCL-Institute of Education. We have several partnerships with commercial companies, including Artinis Medical Systems, Gorilla, IWAL Institute Dyslexie, Janssen, Neuroelectrics, Noldus, Oefenweb, Procter and Gamble, Roche, and Transylvanian Institute of Neuroscience.







The CBCD is also a place of training for the future generation of international researchers. We are immensely proud of our doctoral (PhD) students who have completed their degrees over the last few years. The calibre of their success is evidenced by the international prizes that they have received for their doctoral research from such organisations as the Cognitive Science Society (USA), the American Psychological Association and the Society for Research in Child Development (USA).

The work of CBCD members continues to be characterised by its use of converging methods (behavioural testing, eye tracking, ERP, EEG, optical imaging, computer modelling, functional and structural MRI, genetics) and by its theory-driven programmes of empirical research on visual, cognitive and language development in human infants, children and adults.

We will continue these activities over the next 5 years with a renewed focus on addressing questions of *Diversity and Adversity*. This takes into consideration the realisation that the extremely broad range of experiences children have impact dramatically on their development and that these differences must be reflected in the research methods used and populations studied. This also means working towards co-developing wearable or remote technology solutions that will allow us to reach populations not able or willing to come into the labs to participate in our research. In this way we aim to develop a more complete understanding of brain and behavioural development as it occurs in all childhood contexts.

While the CBCD shares common infrastructure, it is further organised into several constituent labs, each with its own particular focus. Some members of the CBCD are also members of associated centres, such as the Centre for Educational Neuroscience (**www.educationalneuroscience.org.uk/**), Birkbeck-UCL Centre for Neuroimaging (BUCNI; **www.ucl.ac.uk/pals/birkbeck-ucl-centre-neuroimaging-bucni**), and the Birkbeck Psychology Genetics Grouping (**www.bbk.ac.uk/psyc/research/primary_research/geneticsgrouping**),

One of the highlights of this period was the celebration of our 21st Anniversary in November 2019, where we hosted a conference attended by over 120 past and present CBCD members from all career stages and from 4 continents. It provided an opportunity not just to revisit some of our most impressive findings, but also to discover what our former members were currently up to in terms of research. It was a pleasure to see former faculty, postdocs, and PhD students again. The range, impact and recognition of their research is a testimony to the success of the CBCD.

A second highlight has been the opening of the new world-first **ToddlerLab.** We were delighted to have received funding from the Maurice Wohl Charitable Foundation, the Wolfson Foundation, Daniel and Elizabeth Peltz, The CareTech Charitable Foundation, Garfield Weston Foundation and the Wellcome Trust for a state-of-the-art, new research facility. Using the latest wireless technologies, the ToddlerLab will enable the advanced scientific study of the brain and behavioural development of children aged 18 months to six years in an environment simulating familiar surroundings for toddlers. It will enable us to understand development in more real-world contexts – such as their home or their classroom - in which the children interact with each other and are free to roam about as they would naturally do in the real world. It also means that we can now follow up babies who have taken part in our Babylab studies until they are 5 or 6 years old.

Needless to say, that the work undertaken at CBCD is only possible through the generous support of our many funders, Birkbeck and the numerous families and children who have volunteered their time. We hope that you enjoy reading the report.

MEDIA HIGHLIGHTS

Inside the ToddlerLab

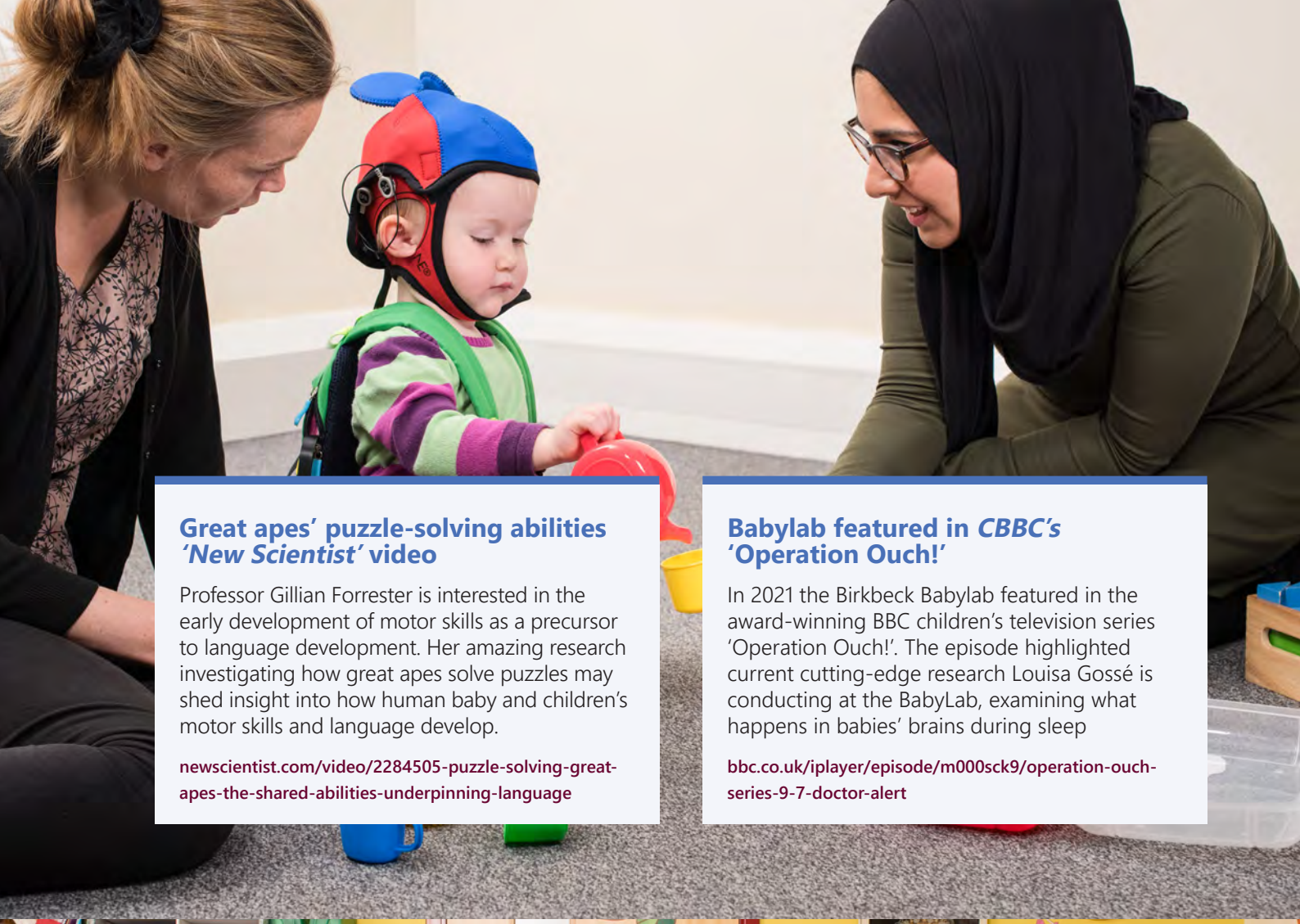
The Guardian's scientific correspondent Linda Geddes discusses how cutting-edge wearable technology is used to investigate development through toddlerhood and beyond at the new Wohl Wolfson ToddlerLab

theguardian.com/society/2022/jan/07/inside-the-toddlerlab-london-research-wearable-tech

The New Scientist

The ToddlerLab was recently featured in *The New Scientist* with an article and video showcasing how we are utilising technological advances to understand what is going on in the minds of young children

Video: youtube.com/watch?v=OAqIklBFagEyoutube.com/watch?v=OAqIklBFagE
Article: newscientist.com/article/mg25233594-400-a-new-kind-of-brain-scan-is-letting-us-understand-how-toddlers-think



Great apes' puzzle-solving abilities *'New Scientist'* video

Professor Gillian Forrester is interested in the early development of motor skills as a precursor to language development. Her amazing research investigating how great apes solve puzzles may shed insight into how human baby and children's motor skills and language develop.

newscientist.com/video/2284505-puzzle-solving-great-apes-the-shared-abilities-underpinning-language

Babylab featured in *CBBC's* 'Operation Ouch!'

In 2021 the Birkbeck Babylab featured in the award-winning BBC children's television series 'Operation Ouch!'. The episode highlighted current cutting-edge research Louisa Gossé is conducting at the BabyLab, examining what happens in babies' brains during sleep

bbc.co.uk/iplayer/episode/m000sck9/operation-ouch-series-9-7-doctor-alert

BBC Radio 4's 'Archive on 4'

Professor Tim Smith chats to film critic Robbie Collin about how our brains process and react to films of varying format, from Tik Tok to wide screen.

bbc.co.uk/sounds/play/m0014wnj

Do Touchscreens Make Toddlers More Distractible?

Dr Ana Portugal was featured in a *Verywell Family* article discussing findings from the TABLET Project.

verywellfamily.com/do-touchscreens-make-toddlers-more-distractible-5119381

MEDIA HIGHLIGHTS

Babies: Their Wonderful World

BBC Two featured Professors Emily Jones and Tim Smith, alongside other CBCD staff and alumni in a three-part series which explored the impact of the changes babies experience in the first two years of life

bbc.co.uk/programmes/b0bt7v0j

Virtual Reality is Helping Bridge the Communication Divide for People with Autism

Charity Digital dedicated a section of their article to the innovative virtual reality technology that will be used at our new Toddler Lab, allowing us to transport toddlers to different surroundings, for example a farmyard or city street.

charitydigitalnews.co.uk/2019/09/30/how-virtual-reality-is-helping-bridge-the-commnication-divide-for-people-with-autism

Stop, Think, and Overcome Intuitions

Prof Denis Mareschal shared insights from an intervention which aimed to encourage children to stop and think when faced with a counterintuitive concept

thepsychologist.bps.org.uk/stop-think-and-overcome-intuitions

Why Does Children's TV Seem So Ridiculous and Addictive?

Prof Tim Smith discusses with *The Independent* how educational TV programmes such as 'Baby Einstein' can backfire if their content is not age-appropriate

independent.co.uk/life-style/health-and-families/childrens-tv-addictive-sesame-street-spongebob-squarepants-a9224156.html

Children's Tantrums: Why They Happen and How to Cope

BBC Radio 4 Woman's Hour featured Professor Emily Jones discussing how to mitigate children's tantrums exacerbated by social isolation and confinement during the Covid-19 pandemic.

bbc.co.uk/sounds/play/m000gc4d

ToddlerLab Aims to Decode Young Minds

The Times published an article about the amazing wearable technology being deployed at the ToddlerLab.

thetimes.co.uk/article/toddler-lab-aims-to-decode-young-minds-7vkmkrnj9

SCIENTISTS

Professor Denis Mareschal
Director of CBCD

Professor Mareschal continues to investigate the mechanisms of perceptual and cognitive development across infancy and childhood. As part of this work, he has been developing neural network models of how different memory systems interact to both solve problems and generate explanations of the how they solved these problems. A second line of research has explored how constraints from embodiment both support and reflect the underlying cognitive processes when children and infants try to solve real-world problems. Finally, Professor Mareschal has continued his work bridging between educational practice and findings in developmental cognitive neuroscience. For example, the *Unlocke* project explores the efficacy of an inhibitory control educational intervention designed to enhance primary school children's uptake of difficult counterintuitive concepts in maths and science.

Bell, D., Mareschal, D. & The UnLocke Team (2021). UnLocke-ing learning in maths and science: the role of cognitive inhibition in developing counter-intuitive concepts. *Journal of Emergent Science, 20,* 19-26.

Schroer, I., Cooper, R. P. & Mareschal, D. (2021). Science with Duplo: Multilevel goal management in preschoolers' toy house constructions. *Journal of Experimental Child Psychology, 206,* 105067.

Kirkham, N. Z., Rea, M., Osborne, T., White, H. & Mareschal, D. (2019). Do cues from multiple modalities support quicker learning in primary school children? *Developmental Psychology, 55,* 2048-2059.

Dr Jannath Begum Ali
Postdoctoral Researcher

Dr Begum Ali investigates (multi)sensory processing and sensorimotor processing in typical and atypical infants and young children (with specific consideration of cross-modal interactions between vision, proprioception and touch). One key finding from this body of research has been that infants' neglect the location of touch in the external environment until around six months of age. She is currently a post-doctoral researcher on the STAARS study, with much of her research focusing on sensory processing and motoric abilities in infants with a higher familial likelihood of developing autism and/or ADHD. She is also investigating these processes in infants with genetic syndromes, such as neurofibromatosis type 1 and tuberous sclerosis. Her research uses a variety of behavioural and neurophysiological measures (e.g. EEG and fNIRS) in typically and atypically developing infants and toddlers.

Begum Ali, J., Goodwin, A., Mason, L., Pasco, G., Charman, T., Johnson, M. H., ... & STAARS Team. (2022). Altered theta–beta ratio in infancy associates with family history of ADHD and later ADHD-relevant temperamental traits. J*ournal of Child Psychology and Psychiatry.* DOI: 10.1111/jcpp.13563

Begum Ali, J., Kolesnik-Taylor, A., Quiroz, I., Mason, L., Garg, S., Green, J., ... & Jones, E. J. (2021). Early differences in auditory processing relate to Autism Spectrum Disorder traits in infants with Neurofibromatosis Type I. *Journal of neurodevelopmental disorders, 13*(1), 1-19.

Begum Ali, J., Charman, T., Johnson, M. H., Jones, E. J., & BASIS/STAARS Team. (2020). Early motor differences in infants at elevated likelihood of Autism Spectrum Disorder and/or Attention Deficit Hyperactivity Disorder. *Journal of Autism and Developmental Disorders,* 1-18.

Dr Chiara Bugarelli
Research Fellow

Dr Chiara Bulgarelli is interested in how infants and children become social humans, and what happens in their brains during social interactions. During her PhD, she used functional near-infrared spectroscopy (fNIRS) to investigate infants' and young toddlers' brain activations during mimicry and in relation to the self-other person distinction. She then joined the Brain Imaging for Global Health Project (BRIGHT) for 3 years where she used fNIRS in The Gambia to understand how adversity such as undernutrition could impair infants' brain development in low-resourced settings. Chiara also focused on advancing data-analysis and network analysis methods for fNIRS. Chiara recently started a prestigious Early Career Leverhulme Fellowship at CBCD to leverage the new ToddlerLab facilities. She will be using avatars in the CAVE to understand how empathy matures in preschoolers.

Bulgarelli, C., de Klerk, C. C. J. M., Richards, J. E., Southgate, V., Hamilton, A., & Blasi, A. (2020). The developmental trajectory of fronto-temporoparietal connectivity as a proxy of the default mode network: a longitudinal fNIRS investigation. *Human Brain Mapping. 41*(10), 2717–2740.

Bulgarelli, C., Blasi, A., Arridge, S. R., Powell, S., de Klerk, C. C. J. M., Southgate, V., Brigadoi, S., Penny, W., Tak, S., & Hamilton, A. (2018). Dynamic causal modelling on infant fNIRS data: A validation study on a simultaneously recorded fNIRS-fMRI dataset. *NeuroImage,* 175, 413–424.

Bulgarelli, C., Blasi, A., de Klerk, C. C. J. M., Richards, J. E., Hamilton, A., & Southgate, V. (2019). Fronto-temporoparietal connectivity and self-awareness in 18-month-olds: A resting state fNIRS study. *Developmental Cognitive Neuroscience,* 100676.

Professor Tony Charman
Visiting Professor

Tony Charman is a professor of Clinical Child Psychology at the Institute of Psychiatry, Psychology & Neuroscience, King's College London. His main research interest is the investigation of social cognitive development in children with autism and the clinical application of this work via screening, diagnostic, epidemiological, intervention and family history studies. He is the lead Clinical Psychologist in an NHS England-funded specialist service for children with autism and complex neurodevelopmental conditions at the South London and Maudsley NHS Foundation Trust. He has published more than 400 peer-reviewed papers and over 30 book chapters. He has served on several expert panels for the MRC and NICE in the UK, NIH in the USA and the WHO. He has worked closely with Ambitious about Autism, the National Autistic Society, Research Autism and Autistica to advocate for services and positive policy development for individuals with autism spectrum disorders and their families.

Green, J., Leadbitter, K., Ellis, C.,... Charman, T., Emsley, R., & Pickles, A. (2022). Combined social communication therapy in home and education for young children with autism (PACT-G): A parallel, single-blind, randomised controlled trial. *Lancet Psychiatry,* 9, 307-320.

Lord, C., Charman, T., Havdahl, A.,...Holbrook, A., Toolan, C., & McCauley, J. B. (2022). Lancet Commission on the Future of Care and Clinical Research in Autism. *Lancet,* 399, 271-334.

Charman, T., Palmer, M., Stringer, D.,... Pickles, A., Scott, S. & Simonoff, E. (2021). A novel group parenting intervention for emotional and behavioural difficulties in young autistic children: Autism Spectrum Treatment and Resilience (ASTAR) – A randomised controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 60,* 1404-1418.

Professor Gergely Csibra
Cognitive Development Centre, Central European University, Hungary

Professor Csibra has continued his work on receptive communication in infants, and especially how infant-directed communication is exploited for learning about the world. He is also involved in studies on infants' understanding of social relations and social interactions.

Tatone, D., Hernik, M., & Csibra, G. (2019). Minimal cues of possession transfer compel infants to ascribe the goal of giving. *Open Mind, 3,* 31-40. 10.1162/opmi_a_00024

Mahr, J., Mascaro, O., Mercier, H., & Csibra, G. (2021). The effect of disagreement on children's source memory performance. *PLOS One, 16*(4): e0249958. 10.1371/journal.pone.0249958

Revencu, B. & Csibra, G. (2021). For 19-month-olds, what happens on-screen stays on-screen. *Open Mind, 5,* 71-90. 10.1162/opmi_a_00043

Professor Frederic Dick
Professor of Auditory Cognitive Neuroscience
and
Director of Birkbeck/UCL Centre for NeuroImaging

Professor Dick's work focuses on the acquisition, development, and elaboration of expert skills in higher-level audition and spoken language. This research uses experimental models of short- and long-term auditory learning to understand the cognitive, perceptual, and neural mechanisms underlying complex skills, such as spoken language comprehension and auditory scene analysis. To constrain and ground these experimental models in basic anatomical and physiological research on auditory learning in non-human mammals, he and his collaborators have developed non-invasive MRI methods of delineating auditory areas in humans.

Bono, D, Belyk, M, Longo, M & Dick F. (in press). Beyond language: the unspoken sensory-motor representation of the tongue in non-primates, non-human and human primates. *Neuroscience and Biobehavioral Reviews.*

Krishnan, S., Carey, D., Dick, F., & Pearce, M. T. (2021). Effects of statistical learning in passive and active contexts on reproduction and recognition of auditory sequences. *Journal of Experimental Psychology: General.* Advance online publication. https://doi.org/10.1037/xge0001091

Zhao S, Brown CA, Holt LL, & Dick F. (2021). Robust and efficient online auditory psychophysics with the right auditory hygiene. *BioRxiv.* https://doi.org/10.1101/2021.07.17.452796

Professor Iroise Dumontheil
Professor of Cognitive Neuroscience

Prof Dumontheil's research examines social cognition, emotional regulation and executive functions in adulthood and their development during childhood and adolescence. Her research combines a variety of methods to study brain and cognitive development, including behavioural assessments, structural and functional neuroimaging methods, and genetics. In the last few years, she has been studying the relationships between individual differences in emotional regulation and executive functions, the effects of mobile phone use on adolescent cognition in collaboration with researchers at Imperial College (scampstudy.org) and the benefits of an intervention focusing on encouraging children to Stop & Think when solving counterintuitive science and maths problems in primary school, as part of the UnLocke project (unlocke.org). As a member of the Centre for Educational Neuroscience, Prof Dumontheil is interested in the potential implications of neuroscience research for education.

Donati, G., Meaburn, E.M., & Dumontheil I. (2021). Internalising and externalising in early adolescence predict later executive function, not the other way around: a cross-lagged panel analysis. *Cognition and Emotion, 35*(5), 986-998.

Dumontheil, I., Kilford, E.J., & Blakemore, S-J. (2020). Development of dopaminergic genetic associations with visuospatial, verbal and social working memory. *Developmental Science, 23*(2), e12889.

Magis-Weinberg, L., Custers, R., & Dumontheil, I. (2019). Rewards enhance proactive and reactive control in adolescence and adulthood. *Social Cognitive and Affective Neuroscience, 14*(11), 1219-1232.

Professor Clare Elwell
Visiting Professor

Clare Elwell is a Professor of Medical Physics in the Department of Medical Physics and Biomedical Engineering at UCL. She leads the fNIRS research group developing novel optical systems for monitoring and imaging the human body. Her research projects include studies of autism; acute brain injury in adults, children and infants; sports performance; migraine; and malaria. Her most recent project is the use of fNIRS to investigate malnutrition-related brain development in rural Gambia, resulting in the first functional brain imaging of infants in Africa.

Collins-Jones, L. H., Arichi, T., Poppe, T. Billing, A., Xiao, J., Fabrizi, L., Brigadoi, S., Hebden, J. C., Elwell, C. E., Cooper, R. C. (2021). Construction and validation of a database of head models for functional imaging of the neonatal brain. *Human Brain Mapping.* 42: 567– 586.

Elwell, C. E. (2020). Brain Imaging for Global Health, *Journal of Neurosurgical Anesthesiology.* 32(3). 188-190.

Siddiqui, M. F., Pinti, P., Lloyd-Fox, S., Jones, E. J. H., Brigadoi S., Collins-Jones, L., Tachtsidis, I., Johnson, M. H., Elwell, C. E. (2022). Regional Haemodynamic and Metabolic Coupling in Infants. *Frontiers in Human Neuroscience,* 15. DOI=10.3389/fnhum.2021.780076

Professor Gillian Forrester
Professor of Comparative Cognition

Professor Forrester is the Director of the Comparative Cognition Group. Her current developmental research focuses on the relationships between motor and cognitive ability throughout development in children at high- and low-risk for neurodevelopmental disorders. The aim is to reveal behavioural markers during infancy that will allow for novel and early therapeutic interventions of infants born at risk for neurodevelopmental disorders. Gilly's current evolutionary work focuses on chimpanzees, orangutans, gorillas and human children, specifically regarding the social and communication abilities and mental wellbeing. Her multidisciplinary research programme incorporates theory and methods from multiple fields and benefits from engaging the public in citizen science, educational and research activities.

Donati, G., Davis. R., Forrester, G.S. (2020). Gaze behaviour to lateral face stimuli in infants who do and do not receive an ASD diagnosis, *Scientific Reports, 10,* 13185 https://doi.org/10.1038/s41598-020-69898-9

Forrester, G.S., Davis, R., Malatesta, G., Todd, B.K. (2020). Evolutionary motor biases and cognition in children with and without autism. *Scientific Reports, 10,* 17385. https://doi.org/10.1038/s41598-020-74224-4

Forrester, G.S., Davis, R., Mareschal, D., Malastrata, G., Todd, B. (2019). The Left Cradling Bias: An Evolutionary Facilitator of Social Cognition?, *Cortex* (Special Issue: The Evolution of the Mind and the Brain (eds, Zilles & Thiebaut de Schotten) https://doi.org/10.1016/j.cortex.2018.05.011

Dr Anna Gui
Postdoctoral Researcher

Dr Gui's work focusses on understanding the neurobiological mechanisms underlying individual differences in psychomotor developmental trajectories. As a post-doctoral researcher, she expanded her PhD work looking at the relationship between genetic predispositions for neurodevelopmental conditions and brain activation when seeing faces in infants with an older sibling with autism. To further understand whether early neural responses to social stimuli reflect individual differences in behaviour, she set up the Behavioural and Online Neuroimaging to study the Development of Socialisation (BONDS) study with Prof Emily Jones. She is currently working on the Genetics of Early Milestones and Skills (GEMS) study with Prof Angelica Ronald to gain more insights about the link between behavioural differences in infancy and differences in DNA.

Gui A. (2021). A neurodevelopmental perspective on sex-differentiated genetic effects on behavior, Biological Psychiatry, 89:12, e63-e65.

Gui A., Bussu G., Tye C., Elsabbagh M., Charman T., Johnson M.H. and Jones E.J.H. (2021). Attentive brain states to faces in infants with and without later autism, Translational Psychiatry, 11: 196. https://doi.org/10.1038/s41398-021-01315-9

Gui A., Meaburn E., Tye C., Charman T., Johnson M.H., Jones E.J.H. (2021). Association of polygenic liability for autism with face-sensitive cortical responses from infancy, JAMA Pediatrics, 175(9):968-970,

Dr Rianne Haartsen
Postdoctoral Researcher

Dr Rianne Haartsen is interested in individual variability of brain development and how this variability relates to variability in later behaviours and clinical symptoms in individuals with typical and atypical development. Examining the trajectories of brain development from infancy to adulthood may help us identify underlying mechanisms of neurodevelopmental disorders. Her work focuses on EEG methods and applying novel analyses to EEG data. She further develops robust and scalable EEG measures of brain development that may be used in non-lab settings such as clinical settings and global health settings. Dr. Haartsen is involved in data analysis of a range of studies, including the British Autism Study of Infant Siblings (BASIS) and the Studying Autism and ADHD Risks (STAARS) study, Longitudinal European Autism Project (LEAP and AIMS-2-TRIALS), Braintools, South African Safe Passage Study (PASS), Arbaclofen Trial, EEG on-the-go, and the Behaviour and Online Neuroimaging to study Development of Socialisation (BONDS) study.

Haartsen, R., Jones, E.J.H., Orekhova, E.V., Charman, T., Johnson, M.H., & The BASIS team (2019). Functional EEG connectivity in infants associates with later restricted and repetitive behaviours in autism; a replication study. *Translational Psychiatry,* 9(66).

Haartsen, R., Mason, L., Braithwaite, E. K., Del Bianco, T., Johnson, M. H., & Jones, E. J. (2021). Reliability of an automated gaze-controlled paradigm for capturing neural responses during visual and face processing in toddlerhood. *Developmental Psychobiology, 63*(7), e22157.

Haartsen, R., van der Velde, B., Jones, E. J., Johnson, M. H., & Kemner, C. (2020). Using multiple short epochs optimises the stability of infant EEG connectivity parameters. *Scientific reports, 10*(1), 1-13.

Professor Mark Johnson, FBA
Professor of Psychology, Birkbeck
and
Professor of Experimental Psychology, University of Cambridge

Professor Johnson's current main project is leading large-scale longitudinal studies on babies at elevated incidence for a later diagnosis of autism (BASIS – British Autism Study of Infant Siblings) and ADHD (STAARS project), the project has involved multiple sites across Europe (EU-Aims, Eurosibs). These studies elucidate mechanisms of typical and atypical cognitive development through analyses that include genetics, various measures of brain structure and function, cognitive studies, parent-child interaction and family context. In essence, he attempts to trace the typical and atypical postnatal functional development of the human brain within its surrounding social and physical environment. Research has also included trialling early interventions that may boost aspects of development in infants at-risk for less optimal outcomes. Johnson also co-leads the PIPKIN project in Cambridge, which is designed to examine in detail the infants transition from pre- to postnatal life, as well as the effects of the Covid pandemic on infant experiences.

Ilyka, D., Johnson, M.H., Lloyd-Fox, S. (2021). Infant social interactions and brain development: A systematic review. *Neuroscience & Biobehavioural Reviews, 130, 448-469.*

Johnson, M.H. (2020). Theories in developmental cognitive neuroscience. In: *Comprehensive Developmental Neuroscience: Neural Circuit and Cognitive Development. 2nd Edition.* Eds. J.L.R Rubenstein & Pasco Rakic. Elsevier. 273-309.

Johnson, M.H., Charman, T., Pickles, A., & Jones, E.J.H. (2021). Anterior modifiers in the emergence of neurodevelopmental disorders (AMEND) – A systems neuroscience approach to common developmental disorders. *Journal of Child Psychology & Psychiatry,* doi: 10.1111/jcpp.13372

Professor Emily Jones
Professor of Translational Neurodevelopment

Professor Jones leads the BASIS-affiliated STAARS project (Studying Autism and ADHD Risk in Siblings) and coordinates a cross-European study of infants with older siblings with ASD in addition to leading the Ethics and EEG workstreams of the AIMS-2-TRIALS consortium. She is also involved in collaborative longitudinal studies of infants with genetic disorders, such as neurofibromatosis type 1 and early intervention development for high-risk infants. Her research interests include using cognitive, behavioural and psychophysiological methods to characterise attention, learning and memory in typical and atypical development. The long-term goal of this research is to understand the mechanisms that contribute to individual differences in developmental trajectories and how those processes may be disrupted in conditions such as autism and ADHD.

Constantino, J. N., Charman, T., & Jones, E. J. (2021). Clinical and translational implications of an emerging developmental substructure for autism. *Annual Review of Clinical Psychology, 17,* 365-389.

Jones, E.J.H., Goodwin, A., Orekhova, E., Charman, T., Dawson, G., Webb, S. J., & Johnson, M. H. (2020). Infant EEG theta modulation predicts childhood intelligence. *Scientific Reports, 10,* 11232. https://doi.org/10.1038/s41598-020-67687-y

Manzini, A., Jones, E. J., Charman, T., Elsabbagh, M., Johnson, M. H., & Singh, I. (2021). Ethical dimensions of translational developmental neuroscience research in autism. *Journal of Child Psychology and Psychiatry, 62*(11), 1363-1373.

Mason, L., ... Jones, E.J.H. (In press). The N170 face-sensitive brain response as a stratification biomarker for ASD. *Science Translational Medicine.*

Professor Natasha Kirkham
Professor in Psychology

Prof Kirkham is interested in how the environment affects all aspects of development. In particular, she is interested in the development of cognition and attention in infants and children. She is involved in two streams of research: one that addresses the question of how infants learn about their visuospatial environment with regards to the statistical regularities inherent in their perceptual world and one that investigates the roles of attention and memory in young children. Across three ESRC-funded PhD studentships, Prof Kirkham is investigating the effect of noise and chaos on early attentional development (with PhD student Brittney Chere), the role of distraction in learning (with PhD student Guilia Serino), and how young children develop prosocial behaviour (with PhD student Judit Sebok-Rose). Prof Kirkham employs several different methodologies in her research projects, such as corneal reflection eye tracking, fNIRS and habituation/dishabituation with infants, and executive function tasks with pre-schoolers/adults. Her current lines of research include the role of socioeconomic status and home chaos on all aspects of development.

Amso, D., & Kirkham, N. (2021). A Multiple-Memory Systems Framework for Examining Attention and Memory Interactions in Infancy. *Child Development Perspectives, 15*(2), 132-138.

Chere, B., & Kirkham, N. (2021). The negative impact of noise on adolescents' executive function: an online study in the context of home-learning during a pandemic. *Frontiers in psychology, 12.* doi.org/10.3389/fpsyg.2021.715301

Massonnie, J., Frasseto, P., Mareschal, D., & Kirkham, N. Z. (2022). Learning in noisy classrooms: children's reports of annoyance and distraction from noise are associated with individual differences in mind-wandering and switching skills. *Environment and Behavior,* 54(1), 58-88.

Dr Ines Mares
Postdoctoral Researcher

Dr Mares' work is focused on understanding different aspects of social cognition, such as face recognition, gaze processing, and emotion categorization in different populations with typical and atypical face processing (Williams syndrome, Down syndrome, brain lesion due to stroke). In her work she has aimed to understand the development of our relatively expert face abilities using a range of techniques including behavioural (e.g. eye-tracking) and electrophysiological (EEG) methodologies, as well as both univariate and multivariate (MVPA) analysis tools. Recently she has focused on the role that top-down factors such as predictions and expectations play in face perception and its neural underpinnings, and how this might be modulated by object expertise. Recent research has been supported by the Leverhulme Trust and the BIAL foundation.

Farran, E. K.*, Mares, I.*, Papasavva, M., Smith, F. W., Ewing, L., & Smith, M. L. (2020). Characterizing the neural signature of face processing in Williams syndrome via multivariate pattern analysis and event related potentials. *Neuropsychologia,* 107440.

Mares, I.,* Ewing, L.*, Farran, E. K., Smith, F. W., & Smith, M. L. (2020). Developmental changes in the processing of faces as revealed by EEG decoding. *NeuroImage, 211,* 116660.

*Joint first author

Dr Luke Mason
Senior Postdoctoral Researcher

Luke joined the CBCD in 2013 and specialises in using EEG and eye tracking measures from large longitudinal studies to develop markers of development and brain function in developmental conditions such as autism and ADHD.

Mason, L., Moessnang, C., Chatham, C., Ham, L., Tollman, J., Dumas, G. ... Jones, E.H. (in press) The N170 face-sensitive brain response: toward a stratification biomarker for ASD. *Science Translational Medicine.*

Mason, L., Shic, F., Falck-Ytter, T., Chakrabarti, B., Charman, T., Loth, E., ... & Jones, E. J. H. (2021). Preference for biological motion is reduced in ASD: implications for clinical trials and the search for biomarkers. *Molecular Autism, 12*(1), 1-13.

Gui, A., Mason, L., Gliga, T., Hendry, A., Ali, J. B., Pasco, G., ... & Jones, E. J. (2020). Look duration at the face as a developmental endophenotype: elucidating pathways to autism and ADHD. *Development and Psychopathology, 32*(4), 1303-1322.

Dr Emma Meaburn
Reader in Human Genetics

Dr Emma Meaburn is a human geneticist and Co-Director of the Genes, Environment, Lifespan Lab, Director of the BRIDGE Lab (a bio-banking and wet lab) and a member of the Centre for Educational Neuroscience. Dr Meaburn's research program is centered on the fundamental question of how genetic variation contributes to individual differences in behaviour and how these causal processes unfold across development. Her research harnesses molecular genomic and statistical genetic approaches using clinical, twin, familial and population-based samples. This multidisciplinary and developmentally informed approach has real-world implications for educational practice and social policies, and for early identification of neurodevelopmental disorders.

Donati, G., Dumontheil, I., Pain, O., Asbury, K., Meaburn, E. L. (2021). Evidence for specificity of polygenic contributions to attainment in English, maths and science during adolescence. *Sci Rep 11,* 3851 https://doi.org/10.1038/s41598-021-82877-y

Gui A, Meaburn EL, Tye C, Charman T, Johnson MH, Jones EJH. (2021). Association of Polygenic Liability for Autism With Face-Sensitive Cortical Responses From Infancy. *JAMA Peadiatrics.* doi:10.1001/jamapediatrics.2021.1338

Meaburn, E.L., and Donati, G. (2020). What has behavioural genetic research told us about the origins of individual differences in educational abilities and achievements? in Thomas, M., Mareschal, D., Dumontheil, I. (Eds) *Educational Neuroscience: Development Across the Life Span.* Frontiers of Developmental Science series. London: Routledge

Dr Bosiljka Milosavljevic
Postdoctoral Researcher

Dr Milosavljevic's research interests focus on examining longitudinal trajectories of development to better understand how neurocognitive markers in infancy contribute to cognitive, emotional, and social outcomes later in childhood. She also has a keen interest in examining neurodevelopment in diverse populations, particularly in global health settings. She completed her PhD at the Institute of Psychiatry, Psychology and Neuroscience at King's College London, working on the British Autism Study of Infant Siblings (BASIS; www.basisnetwork.org), following up the first cohort of children with higher familial likelihood of autism spectrum disorder (ASD) at school age. Her focus was to investigate the development and correlates of co-occurring anxiety symptoms in this group. Since 2017, she has been working on the Brain Imaging in Global Health project (BRIGHT; www.globalfnirs.org/the-bright-project), a longitudinal study that examines the neurocognitive development of children from a rural area of The Gambia from the antenatal period to preschool age. She has recently been awarded an ESRC Secondary Data Analysis Initiative Grant, which she is currently working on at the University of Cambridge. The aims of this grant are to map the longitudinal trajectories of cognitive development from infancy to early childhood in the Gambian population and to examine the contribution of both environmental risk and protective factors to development. She remains strongly affiliated with the CBCD as a visiting researcher and guest lecturer on both undergraduate and postgraduate courses.

Milosavljevic, B., Carter Leno, V., Simonoff, E., Baird, G., Pickles, A., Jones, C. R. G., Erskine, C., Charman, T., & Happé, F. G. (2016). Alexithymia in adolescents with autism spectrum disorder: Its relationship to internalising difficulties, sensory modulation and social cognition. *Journal of Autism and Developmental Disorders, 46*(4), 1354–1367. https://doi.org/10.1007/s10803-015-2670-8

Milosavljevic, B., Shephard, E., Happé, F. G., Johnson, M. H., Charman, T., & BASIS Team. (2017). Anxiety and Attentional Bias to Threat in Children at Increased Familial Risk for Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders, 47*(12), 3714–3727. https://doi.org/10.1007/s10803-016-3012-1

Milosavljevic, B., Vellekoop, P., Maris, H., Halliday, D., Drammeh, S., Sanyang, L., Darboe, M. K., Elwell, C., Moore, S. E., & Lloyd-Fox, S. (2019). Adaptation of the Mullen Scales of Early Learning for use among infants aged 5- to 24-months in rural Gambia. *Developmental Science, 22*(5). https://doi.org/10.1111/desc.12808

Dr Ori Ossmy
Lecturer

Dr Ossmy's work reflects a unique integration of theory and methods drawn from developmental psychology, neuroscience, and artificial intelligence. He uses state-of-the-art concepts and technologies to discover the developmental interplay between brain and behaviour. Specifically, he is interested in the development of behavioural problem solving—how infants and children learn to navigate a cluttered environment, use a tool, and so on. As our bodies, skills, and environments change, new problems emerge and require new means to solve them. With learning and development, children respond more adaptively and efficiently to environmental challenges and opportunities. To address questions about these adaptive skills, Dr Ossmy combines interdisciplinary perspectives (development, behaviour, neuroscience, motor control, computer science), recording methods (fMRI, EEG, EMG, tACS, ECoG, single-unit recordings, eye tracking, motion tracking, virtual reality, and video), analytic techniques (machine learning, robotics), populations (infants to elderly adults, patients), and tasks (manual and locomotor).

Ossmy, O., Adolph, K.E. (2020). Real-time assembly of coordination patterns in human infants. *Current Biology, 30,* 1-10.

Ossmy, O., Han, D., Kaplan, B., Xu, M., Bianco, C., Mukamel, R., Adolph, K.E.(2021). Children do not distinguish efficient from inefficient actions during observation. *Scientific Reports, 11*(1), 1-13.

Ossmy, O., Kaplan, B., Han, D., Xu, M., Mukamel, R., Adolph, K.E. (2021). Real-time processes in the development of action planning. *Current Biology, 32,* 1–10.

Dr Paola Pinti
Senior Research Laboratory Developer

Dr Paola Pinti's research involves the use of functional Near Infrared Spectroscopy (fNIRS) to study functional brain activity and, in particular, by means of the new generation of wireless and wearable fNIRS devices in naturalistic environments. More precisely, her technical work focuses on the development and implementation of new algorithms and tools for the analysis of fNIRS data collected in more ecologically-valid settings with unstructured cognitive experiments. She is currently working on the development of the new ToddlerLab to create tools that integrate cutting-edge wearable technologies like fNIRS, EEG, motion capture, eye-tracking in an immersive Virtual Reality environment for the study brain development in ecological settings. In addition, she is investigating the use of wearable fNIRS combined with other modalities to explore social brain and executive functioning development across toddlerhood as well as how children collaborate with each other.

Pinti, P., Scholkmann, F., Hamilton, A., Burgess, P., & Tachtsidis, I. (2019). Current status and issues regarding pre-processing of fNIRS neuroimaging data: an investigation of diverse signal filtering methods within a general linear model framework. *Frontiers in human neuroscience, 12,* 505.

Pinti, P., Siddiqui, M. F., Levy, A. D., Jones, E. J. H., & Tachtsidis, I. (2021). An analysis framework for the integration of broadband NIRS and EEG to assess neurovascular and neurometabolic coupling. *Scientific reports, 11*(1), 1-20.

Pinti, P., Tachtsidis, I., Hamilton, A., Hirsch, J., Aichelburg, C., Gilbert, S., & Burgess, P. W. (2020). The present and future use of functional near-infrared spectroscopy (fNIRS) for cognitive neuroscience. *Annals of the New York Academy of Sciences, 1464*(1), 5-29.

Professor Clare Press
Professor of Cognitive Neuroscience

Prof Press has been studying the mechanisms that underlie our ability to act and perceive, and often how perception and action rely upon each other synergistically. She typically studies these questions in neurotypical individuals but additionally examines atypicalities in these processes in autism. Action control and sensory processing impairments are widely reported in individuals with autism alongside their more widely publicised social problems, but it is unclear what underlies these difficulties or the relationship between them. Her recent work has elucidated the predictive processes that are necessary for both perception and action, and she has just been awarded an ERC consolidator grant to unravel the paradoxes that emerge within these theories.

Press, C., Kok, P., & Yon, D. (2020). The perceptual prediction paradox. *Trends in Cognitive Sciences, 24,* 13-24.

Press, C., Yon, D., & Heyes, C. (2022). Building better theories. *Current Biology, 32,* R13-R17.

Yon, D., Gilbert, S.J., de Lange, F.P., & Press, C. (2018). Action sharpens sensory representations of expected outcomes. *Nature Communications, 9,* 1-8.

Professor Angelica Ronald
Professor of Psychology and Genetics

Professor Ronald conducts behaviour genetic and molecular genetic research on psychopathology from infancy to adolescence. Her research has particularly focused on the genetic and environmental causes of autism spectrum conditions, ADHD, psychotic experiences and the causes of co-occurring psychopathology in childhood and adolescence. Professor Ronald is a Professor of Psychology and Genetics at the CBCD and the Director of the Genes Environment Lifespan laboratory, a lab group within the CBCD that was established in 2011 (http://www.gel.bbk.ac.uk).

Barkhuizen, W., Dudbridge, F. & Ronald, A. (2021). Genetic overlap and causal associations between smoking behaviours and mental health. *Scientific Reports, 11 (14871)*

Falck-Ytter, T., Hamrefors, L., Siqueiros Sanchez, M., Portugal, A.M., Taylor, M. J., Li, D., Viktorsson, C., Hardiansyah, I., Myers, L., Westberg, L., Bolte, S., Tammimies, K., Ronald, A. (2021). Babytwins Study Sweden (BATSS): A multi-method infant twin study of genetic and environmental factors influencing infant brain and behavioral development. *Twin Research and Human Genetics, 24,* 217-227.

Ronald, A., De Bode, N. & Polderman, T.V.C. (2021). Systematic review: How the ADHD polygenic risk score adds to our understanding of ADHD and associated traits. *Journal of the American Academy of Child and Adolescent Psychiatry, 60,* 1234-1277.

Professor Atsushi Senju
Professor and Director at the Research Center for Child Mental Development, Hamamatsu University School of Medicine

Dr Senju has been studying how people effortlessly and spontaneously process and react to social signals, how such skills develop and adapt to individual sociocultural environments, and how such capacity could be disturbed in a minority of people who struggle to adapt to social environment, such as those with autism. His recent work has greatly contributed to our understanding of how brains process social communication, how infants and young children develop such a skill, how the social experience changes the way these skills develop and why such spontaneous processing of social information is difficult in individuals with autism spectrum disorders (ASD). His new team in Hamamatsu, Japan, is also developing new research projects to translate and implement such academic findings to educational and clinical practices, to improve children's quality of life.

Haensel, J. X., Smith, T. J., & Senju, A. (2022). Cultural differences in face looking and mutual gaze: a dual head-mounted eye-tracking study. *Visual Cognition, 30,* 100-115.

Hirai, M., & Senju, A. (2020). The two-process theory of biological motion processing. *Neuroscience & Biobehavioral Review, 111,* 114-124.

Kikuchi, Y., Akechi, H., Senju, A., Tojo, Y., Osanai, H., Saito, A., & Hasegawa, T. (2022). Attention to live eye contact in adolescents with autism spectrum disorder. *Autism Research,* 1–10.

Dr Maheen Siddiqui
Research Fellow

Dr Siddiqui's work focuses on developing a novel optical neuroimaging technique (referred to as broadband near-infrared spectroscopy or bNIRS) to understand the role of energy metabolism in typical and atypical brain development. During her PhD at the CBCD, Dr Siddiqui led the development of an integrated bNIRS and electroencephalography (EEG) system to study infant brain development. During her postdoctoral research she expanded on her PhD work and developed new methods for the integration of bNIRS and EEG signals to understand neurobiological mechanisms in the developing brain.

Pinti, P., Siddiqui, M. F., Levy, A. D., Jones, E. J. H., & Tachtsidis, I. (2021). An analysis framework for the integration of broadband NIRS and EEG to assess neurovascular and neurometabolic coupling. *Scientific reports, 11*(1), 1-20.

Siddiqui, M. F., Pinti, P., Lloyd-Fox, S., Jones, E. J. H., Brigadoi, S., Collins-Jones, L., Tachtsidis, I., Johnson, M. H., Elwell, C. E. (2022). Regional Haemodynamic and Metabolic Coupling in Infants. *Frontiers in Human Neuroscience, 15.* https://doi.org/10.3389/fnhum.2021.780076

Dr Marie Smith
Reader in Cognitive Neuroscience

Dr Smith's research focuses on better understanding the perception and categorization of faces and their emotions in adults, children and populations who display atypical face processing. She employs a range of techniques (behavioural, eye tracking, eeg) and state of the art methodologies (reverse correlation, multi-variate analysis tools) to explore sources of the normal variation in face processing expertise observed in children and adults; the role of prediction and expectation in influencing face perception, and the impact of social factors (e.g. attractiveness, status/power) in modulating the behavioural and neural response to faces.

Farran, E.K., Mares, I., Papasavva, M., Smith, F.W., Ewing, L. and Smith, M.L. (2020). Characterizing the neural signature of face processing in Williams syndrome via multivariate pattern analysis and event related potentials. *Neuropsychologia, 142,* p. 107440. ISSN 0028-3932.

Mares, I., Ewing, L., Farran, E.K., Smith, F.W. and Smith, M.L. (2020). Developmental changes in the processing of faces as revealed by EEG decoding. *NeuroImage,* ISSN 1053-8119.

Smith, F.W. and Smith, M. L. (2019). Decoding the dynamic representation of facial expressions of emotion in explicit and incidental tasks. *NeuroImage, 195,* pp. 261-271. ISSN 1053-8119.

Professor Tim J. Smith
Professor in Cognitive Psychology

Prof Smith's research focuses on how we actively attend to and perceive dynamic visual displays, such as real-world scenes, cinema and interactive technologies (e.g. tablets and VR). He is the head of the Cognition in Naturalistic Environments (CINE) Lab where advanced computational and behavioural methods, including eye tracking, psychophysiology and EEG are used to understand the factors that influence visual attention; how these factors can be shaped by designers of audiovisual experiences, such as filmmakers and creators of virtual environments; and how these technologies shape us. These questions are applied to infants during their first years of life, to atypical groups (autism and ADHD), and to typical adults. Recently, Prof Smith's research team has been focused on studying the impact of touchscreen use on cognitive, behavioural, and neural development during the first few years of life.

Haensel, J., Smith, T. J. and Senju, A. (2021). Cultural differences in mutual gaze during face-to-face interactions: a dual head-mounted eye-tracking study. *Visual Cognition,* ISSN 1350-6285.

Loschky, L.C. and Larson, A.M. and Smith, T. J. and Magliano, J.P. (2019). The Scene Perception & Event Comprehension Theory (SPECT) applied to visual narratives. *Topics in Cognitive Science,* ISSN 1756-8757.

Portugal, A.M., Bedford, R., and Cheung, C. H.M., Gliga, T., and Smith, T. J. (2020). Saliency-driven visual search performance in toddlers with low– vs high–touch screen use. *JAMA Pediatrics,* ISSN 2168-6203.

Dr Ashley Symons
Postdoctoral Researcher

Individuals differ in the strategies they use when perceiving and categorizing speech. Dr Symons has been studying whether and how factors such as music and language experience contribute to these individual differences in speech perception. She has also been developing new ways of measuring attention to sound and sound features and using these measures to explore the role that attention plays in speech perception.

Symons, A. E., Dick, F., & Tierney, A. T. (2021). Dimension-selective attention and dimensional salience modulate cortical tracking of acoustic dimensions. *NeuroImage, 244,* 118544.

Symons, A. E., & Tierney, A. (2021). Musicians upweight pitch during prosodic categorization. https://doi.org/10.31234/osf.io/c4396

Professor Michael S. C. Thomas

Michael Thomas's recent work has focused on three areas, lifespan development in Down syndrome; the computational modelling of development in large populations; and translational research in educational neuroscience that focuses on brain plasticity. Regarding Down syndrome, recent work has explored how early developmental trajectories in motor and cognitive skills predict subsequent development and educational achievement. With regard to computational modelling, he has investigated how brain plasticity is linked to intelligence, the possible mechanisms by which autism impacts brain development and how behavioural interventions can alleviate developmental deficits. With regard to educational neuroscience, he has explored the implication of new findings from genetics (e.g., on the heritability of children's exam results) for parents, teachers, and policymakers. Current projects involve ways to improve science and maths education in primary age children using principles from neuroscience, evaluating the possible influence of mobile phone use on teenage brain development, and attempting to improve the outcome of adult literacy programs in low-income countries based on the science of learning.

Thomas, M. S. C., Fedor, A., Davis, R., Yang, J., Alireza, H., Charman, T., Masterson, J., & Best, W. (2019). Computational modelling of interventions for developmental disorders. *Psychological Review, 126(5),* 693-726.

Thomas, M. S. C., Knowland, V. C.P., & Rogers, C. (2020). *The Science of Adult Literacy.* Social Protection and Jobs Discussion Paper, No. 2001. World Bank, Washington, DC.

Thomas, M. S. C., Ojinaga Alfageme, O., et al. (2020). A multi-level developmental approach to exploring individual differences in Down syndrome: genes, brain, behaviour, and environment. *Research in Developmental Disorders, Volume 104,* 103638. https://doi.org/10.1016/j.ridd.2020.103638

Dr Adam Tierney
Reader in Cognitive Neuroscience

Linguistic structure in speech is communicated via complex acoustic patterns, including changes in pitch, duration, and sound quality. Dr Tierney has been studying how prior experience can shape the strategies that listeners use when integrating this acoustic information, biasing them to pay attention to certain dimensions and down-weight others. He has also designed and tested training programs for boosting attention to sound dimensions in children with ADHD and adults learning a second language. Finally, he has been investigating how attention changes brain responses to sound, to try to clarify how the brain selects pertinent information while ignoring irrelevant noise.

Jasmin, K, Dick, F, Stewart, L, Tierney, A. (2020). Altered functional connectivity during speech perception in congenital amusia. *ELife, 9,* e53539.

Laffere, A, Dick, F, Holt, L, Tierney, A, (2021). Attentional modulation of neural entrainment to sound streams in children with and without ADHD. *NeuroImage, 224,* 117396.

Tierney, A, Gomez, J, Fedele, O, Kirkham, N. (2021). Reading ability in children relates to rhythm perception across modalities. *Journal of Experimental Child Psychology, 210,* 105196.

AFFILIATED SCIENTISTS

Dr Rachael Bedford
University of Bath

Prof Andy Bremner
University of Birmingham

Dr Hana D'Souza
University of Cambridge

Dr Mayada Elsabbagh
McGill University

Prof Teresa Farroni
University of Padova

Dr Roberto Filippi
University College London, Institute of Education

Dr Teodora Gliga
University of East Anglia

Dr Karla Holmboe
University of Oxford

Prof Rob Leech
King's College London

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Birkbeck, University of London

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Goldsmiths, University of London

Dr Greg Pasco
King's College London

Prof Gaia Scerif
University of Oxford

Dr Przemek Tomalski
Institute of Psychology Polish Academy of Sciences

Prof Sam Wass
University of East London

Prof Gert Westermann
Lancaster University

SCIENTIFIC SUPPORT STAFF

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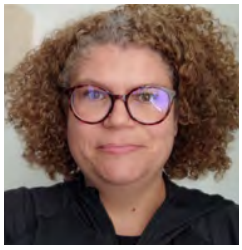

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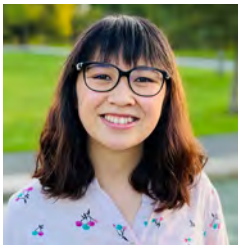

Winnie Yeh
BUCNI Administrator

COMPLETED PHDS AT THE CBCD 2019 - 2022

Wikus Barkhuizen: The cooccurrence, shared genetic aetiology and causal associations between tobacco use and psychotic experiences (2020).

Sam Blakeman: Understanding efficient reinforcement learning in humans and machines (2021).

Alicja Brzozowska: Caregiver touch and infant exploratory behaviour (2021).

Aude Carteron: Development of routine and supervisory processes in sequential action control (2022).

Brittney Chere: The impact of in-home noise on cognitive development (2022).

Viktoria Csink: An exploration of the filtering mechanisms involved in infants' selection of events for deeper encoding and memory retention (2020).

Cécile Gal: Active learning in infancy and adulthood: individual strategies for information sampling (2022).

Jennifer Glennon: Visuo-perceptual correlates of autistic trait expression in children with Fragile X syndrome and Down Syndrome (2019).

Louisa Gossé: Multi-method exploration of the relationship between sleep and infant neurocognitive development (2021).

Giada Guerra: The contribution of auditory attention to reading processes of school-age children with and without dyslexia (2021).

Anna Gui: Evaluating the role of social attention in the causal path to Autism Spectrum Disorder (2019).

Jen Haensel: Cultural Differences in the Development of Face Perception (2019).

Anna Kolesnik: Experience-based specialisation: underpinnings of communication in typical and atypical development (2020).

Jessica Massonnié: Understanding the impact of classroom noise on children's learning and well-being, and its modulation by executive functions (2019).

Susanne de Mooij: Optimising adaptivity in online learning environments (2021).

Elena Serena Piccardi: Early development of sensory perception in Autism Spectrum Disorders and Attention Deficit Hyperactivity Disorder (2021).

Catherine Jane Rogers: A mixed methods analysis of how executive control processes contribute, positively and negatively, to children's creativity (2021).

Lisanne Schroër: Multilevel goal management in toddlers' and preschoolers' action sequence planning and execution (2022).

Emily Thomas: The perceptual prediction paradox: do actions exert a distinct influence on perception? (2021).

Ana Maria Vaz Portugal Da Silva: The association of early touchscreen media use with the development of visual attention and executive function (2020).

CURRENT PHD STUDENTS

Pinelopi Bounia-Mastrogianni Imaging and planning instrumental and epistemic actions across development.

Astrid Bowen: Evaluation of a child-centred intervention targeting wellbeing and cognitive skills in primary age children.

Aislinn Bowler: Multidisciplinary approaches to individual differences in early motor development.

Eleanor Braithwaite: Developing a toolkit of scalable measures for young children's development.

Cynthia Cabanas Gonzales: The role of theory of mind in film narrative comprehension.

Francesco Caprini: Testing models of auditory learning in expert listeners: Acoustical and perceptual processing in designers of novel sounds.

Pedro Carvalho de Paula Ferreira Da Costa: Latent spaces for understanding the developing brain.

Maria Paz Cebrecos: From competition to collaboration in young children's game playing: Insights from kinematics.

Claire Essex: The dynamics of attention in response to media presented on touchscreen devices.

Helen Grimshaw: How SES affects school readiness in 4-6-year-olds: exploring the roles of home chaos, noise and mental wellbeing.

Laura Havers: Population-reported negative symptoms across the lifespan.

Anja Hollowell: An investigation into the relationship between dimensions of infant temperament and lifespan psychological development.

Magdalena Kachlicka: Perceptual strategies underlying second language acquisition.

Egor Levchenko: Multimodal representational analysis of neural responses to naturalistic stimuli.

Olatz Ojinaga Alfageme: The neonatal brain in Down Syndrome: White matter alterations and the relationship between brain volumes and childhood cognitive abilities.

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