Report on Centre activities 2024-2025

Spring 2025

A message from the Director:

The Centre for Educational Neuroscience (CEN) was established in 2008 and is a university-based research centre which spans Birkbeck University of London and University College London, as well as including affiliate members. Its goal is to support translational research and dialogue between neuroscience, psychology, and educational policy and practice. This report summarises research activities, engagement, and dissemination for CEN members in 2024-2025. It covers diverse projects spanning randomised controlled trials of educational interventions, cohort studies tracking children's developmental and the societal, technological, and health factors that shape their educational trajectories, as well as basic research projects relevant to education, and dissemination activities involving the science of learning. The CEN hosted its first annual conference, ENCORE, in April 2025.

The CEN members are: Michael Thomas (Birkbeck, Director), Andy Tolmie (UCL, Deputy-Director), Denis Mareschal (Birkbeck, Deputy-Director), Jo Van Herwegen (UCL, Deputy-Director), Iroise Dumontheil (University of Melbourne), Emily Farran (University of Surrey), Liory Fern-Pollak (UCL), Roberto Filippi (UCL), Katie Gilligan-Lee (University College Dublin), Rebecca Gordon (UCL), Spencer Hayes (UCL), Mairéad MacSweeney (UCL), Emma Meaburn (Birkbeck), Ori Ossmy (Birkbeck), Laura Outhwaite (UCL), Kaska Porayska-Pomsta (UCL), Mojtaba Soltanlou (UCL), Sam Wass (University of East London).

The CEN PhD student group are: Dr Yasin Arslan, Dr Astrid Bowen, Arcelia Cheung, Thuy-Ann Dao, Mahi Elgamal, Imogen Green, Sarah McCarthy, Lucy Palmer, Nina Peleg, Dr Roisin Perry, Isabella Rubens, Dr Zahra Siddiqui, Stella Xu.

This overview of our recent activities gives an indication of the range of translational research work currently underway in our centre.

Professor Michael S. C. Thomas

April 2025

Executive Summary

The Centre for Educational Neuroscience (CEN) Report on Activities 2024-2025 provides an overview of the research, collaborations, and initiatives undertaken to bridge the gap between neuroscience, psychology, and educational policy and practice. The centre's primary mission is to translate scientific research into practical strategies that enhance students' learning outcomes and well-being.

Key research projects over the past year have focused on cognitive development, learning processes, and interventions to support diverse student needs. The centre has conducted studies on the impact of neuroscience-informed teaching methods, the role of executive function in academic success, and the effects of stress and mental health on learning. Collaborations with schools, policymakers, and educators have facilitated the application of these findings in real-world educational settings.

In addition to research, the centre has expanded its outreach through workshops, training sessions, public engagement initiatives, and online resources. These efforts aim to equip teachers with evidence-based strategies and foster a deeper understanding of how neuroscience can inform classroom practices.

The report also highlights ongoing partnerships with international research institutions and government bodies to influence educational policy at a systemic level. Looking ahead, CEN aims to enhance its impact by leveraging digital tools for research dissemination, expanding interdisciplinary collaborations, and developing new interventions that support inclusive and equitable education.

The report underscores the centre’s commitment to advancing translational research and fostering meaningful dialogue between scientists, educators, and policymakers.

Professor Iroise Dumontheil

Iroise has been building her research lab at the University of Melbourne, developing her new work investigating metacognition.

She recently published papers on the role of inhibitory control skills in counterintuitive reasoning in science and maths in primary age children, and on creative dance in childhood and its impact on cognition and self-regulation. At part of the Study of Childhood Adolescence and Mobile Phones (SCAMP) project, she was part of a team that published work on the effects of urban pollution on adolescent cognitive development and wellbeing.

She recently presented work at the International Mind Brain and Education Society conference in Belgium. She presented her research at departmental seminars in Australia at the University of Melbourne, both in the School of Psychological Sciences and at the Faculty of Education, at the University of Queensland, and at Swinburne University.

Iroise contributed to a UNICEF Innocenti – Global Office of Research and Foresight meeting on *Applying the evidence: Children's evolving capacities and rights*. And she recently gave a training talk to a group of teachers in Tahiti.

Publications

Palmer, L., Sumanapala, D., Mareschal, D., **Dumontheil, I.** & The UnLocke Team. Neural associations between inhibitory control and counterintuitive reasoning in science and maths in primary school children. *Journal of Cognitive Neuroscience.*

Vasilopoulos, F., & **Dumontheil I**. Effect of a creative dance-based physical education intervention on primary school children's creativity and self-regulation: A pilot study. *Psychology of Aesthetics, Creativity, and the Arts.*

Vasilopoulos, F. & **Dumontheil I**. Predictors of cognitive and motor creativity in childhood. *Psychology of Aesthetics, Creativity, and the Arts.*

Thompson, R., Stewart, G., Vu, T., Jephcote, C., Lim, S., Barratt, B., Smith, R. B., Karim, Y. B., Mussa, A., Mudway, I., Fisher, H. L., **Dumontheil**, I., Thomas, M. S. C., Gulliver, J., Beevers, S., Kelly, F. J., & Toledano, M. B. (2024). Air pollution, traffic noise, mental health, and cognitive development: A multi-exposure longitudinal study of London adolescents in the SCAMP cohort. Environment International, 191, 108963, https://doi.org/10.1016/j.envint.2024.108963.

Professor Emily Farran

Emily's team at the University of Surrey recently completed the Spatial Cognition to Enhance Mathematical Learning (SPACE) programme, funded by the Education Endowment Foundation. The aim of the SPACE programme was to determine the impact of a LEGO® construction intervention, paired with teacher training, on children's spatial language, spatial skills and mathematics competence. They worked with over thirty teachers and practitioners and over 500 children from sixteen different primary schools to achieve this. The results were promising and will be released soon.

Her team has created a Trajectory of Spatial Reasoning Development for 7-to-11 year olds. This complements the existing trajectory for children from birth to seven years, helping to understand how skills in spatial reasoning develop from birth to late childhood.

With the Royal Society Advisory Committee on Mathematics Education (ACME), Emily published an expert panel perspective on spatial reasoning. This forms part of the Curriculum and Assessment | Royal Society page.

Emily has begun a new project called MathMIND, funded by the Economic and Social Research Council (ESRC), which started in July 2024. In this project, researchers at the University of Oxford, the University of Surrey, and University College London are aiming to find out what thinking skills and educational supports help children with Down Syndrome, Fragile X Syndrome and Williams Syndrome in relation to mathematics.

Emily leads the CEN's Embodied working group.

Blogs and articles

Spatial reasoning part 3: Differences between sliced and whole… - *Nursery World Magazine, March 2025*

Spatial reasoning part 2: Developing body sense - *Nursery World Magazine, February 2025*

Spatial reasoning part 1: Using the outdoors to develop this essential skill - *Nursery World Magazine, January 2025*

English children lag behind in geometry – parents can help them learn through play - *The Conversation, 2025*

Timss: could a focus on spatial reasoning improve maths scores? - *Times Education Supplement, 2024*

What is spatial thinking and why does it matter for students in schools – *Forbes science, 2024*

The Spatial Reasoning Toolkit: Enhancing children's early mathematical learning – *Chartered College of Teaching, 2024*

Publications

Gripton, C., Bates, K.E., Gifford, S., Gilligan-Lee, K.A., Williams, H.J., Borthwick, A., Williams, A.Y, Lancaster, A., & **Farran, E.K.** (2025) Navigating 'the bumpy road' from research to practice: Improving the impact of research on spatial reasoning practice with young children. Early Years. https://doi.org/10.1080/09575146.2025.2463666

Hodgkiss, A., Tolmie, A. K., Thomas, M.S.C., & **Farran, E.K.** (2025). Associations between spatial skills and physics knowledge in primary school: spatial skills are more important for conceptual scientific knowledge than for factual scientific knowledge. *Journal of Experimental Child Psychology.* https://doi.org/10.1016/j.jecp.2024.106135

Bradbury, A., **Farran, E.K.**, Gilligan-Lee, K., Outhwaite, L. A., Van Herwegen, J., & Wyse, D. (2024). Dividing times: the views of early adopters of a new assessment framework on mathematics in England. *Early Years*, 1-15.https://doi.org/10.1080/09575146.2024.2401401

Farran, E.K., McCarthy, S., Gilligan-Lee, K.A., Bates, K., Gripton, C. (2024). Translating Research to Practice: Practitioner Use of the Spatial Reasoning Toolkit. *Gifted Child Today, 47.* https://doi.org/10.1177/10762175241242494

Morris, S., **Farran, E. K**., & Gilligan-Lee, K. A. (2024). Exploring relative strengths in people with Down syndrome: Spatial thinking and its role in mathematics. *Journal of Experimental Child Psychology*, *246*, 105986. https://doi.org/10.1016/j.jecp.2024.105986

Dr Liory Fern-Pollak

Liory continues to lead as Director of the UCL-Birkbeck Masters in Educational Neuroscience programme. She also leads the team organising and running the CEN Seminar series. In her research, she is developing a project exploring the link between beliefs in neuromyths and wellbeing in adolescents with reading difficulties.

Professor Roberto Filippi

Over the past year, Roberto has focused on the educational and cognitive implications of multilingual exposure in typically developing and neurodiverse children.

Key outputs from his research include a paper co-authored with Peter Bright titled "A cross-sectional developmental approach to bilingualism: Exploring neurocognitive effects across the lifespan," which received the 2023-24 Ampersand Best Paper Award; and the recent publication "The Impact of Multilingualism and Socio-Economic Status on Academic Performance: Evidence from the SCAMP and the National Pupil Databases," co-authored with Andrea Ceccolini, Roisin Perry, and Thomas. A follow-up of this work will be submitted soon.

Roberto has contributed to several events, including invited talks at the University of Warsaw, the University of Florence, and knowledge exchange activities in primary schools in London. He will present his CEN work at the 15th International Symposium on Bilingualism in Spain in June. He also organised a series of talks on multilingual language learning, featuring leading experts from across the globe.

At the UCL Institute of Education, Roberto leads a module entitled Psychology and Neuroscience in Education and he has developed the new module, The Psychology of Multilanguage Acquisition Across the Lifespan. He also contributes lectures to the MSc Educational Neuroscience and the UCL Language & Cognition courses.

In broader dissemination, Roberto was interviewed in Cambridge for a podcast, was invited to deliver a TED talk based on his most recent scientific papers, and contributed to an upcoming book by a journalist from the New York Times. He has also secured funding for another project on dialogic reading and will be attending the ENCoRE conference on educational neuroscience, the HABILNET3, and the ISB15 conference in San Sebastian.

Publications

Filippi, R., & Bright, P. (2023). A cross-sectional developmental approach to bilingualism: Exploring neurocognitive effects across the lifespan. *Ampersand*, 10, 2023, 100097. https://doi.org/10.1016/j.amper.2022.100097

Filippi, R., Ceccolini, A., Perry, R. C., & Thomas, M. S. C. (2024). The impact of multilingualism and socio-economic status on academic performance: evidence from the SCAMP and the national pupil databases. *International Journal of Bilingual Education and Bilingualism*, 28(1), 53–72. https://doi.org/10.1080/13670050.2024.2397445

Dr Katie Gilligan-Lee

Katie has been continuing to build her lab at University College Dublin which investigates how an understanding of cognitive development can be used to inform and improve education. Her work has a particular focus on improving children's Science, Technology, Engineering and Mathematics (STEM) outcomes. Her current projects include 'Spatial Interference and Mathematics (SIMS): Using a dual-task paradigms to investigate the cognitive underpinnings of space-mathematics relations'; an investigation of spatial processing deficits in children born very pre-term; and a meta-analysis of studies on spatial skills and their role in (a) science and (b) engineering performance.

Katie is part of a collaborative team that has recently established the All Island Consortium to Foster Educational Neuroscience Research and Practice (AIEN) in Ireland.

Invited talks

Gilligan-Lee, K.A. (June 2024). Optimising spatial cognition in the classroom: A journey from correlations to causation. Invited keynote presentation at Spatial Cognition 2024, Technological University of Dublin.

Publications

Gilligan-Lee, K. A., McGuigan, K., & Snellgrove, H. (2025). A pilot study of the effectiveness of the Maths For Life programme for children with Down syndrome. *Frontiers in Education*, 9. https://doi.org/10.3389/feduc.2024.1453156

Farran, E. K., Fink, E., Hughes, C., **Gilligan-Lee, K. A.,** Foley, S., McHarg, G., ... & Lindberg, A. (2025). Limited sex differences in spatial language in parent-child dyads. *Learning and Instruction*, 95, 102006. https://doi.org/10.1016/j.learninstruc.2024.102006

Gripton, C., Bates, K. E., Gifford, S., **Gilligan-Lee, K. A**., Williams, H. J., Borthwick, A., … Farran, E. K. (2025). Navigating 'the bumpy road' from research to practice: improving the impact of research on spatial reasoning practice with young children. *Early Years*, 1–19. https://doi.org/10.1080/09575146.2025.2463666

McDougal, E., **Gilligan-Lee, K. A**., Gilmore, C., & Farran, E. K. (2024). Construction play frequency and relations with spatial ability and mathematics performance. *British Journal of Developmental Psychology*, 42, 72–77. https://doi.org/10.1111/bjdp.12465

Morris, S., Farran, E. K., & **Gilligan-Lee, K. A.** (2024). Exploring relative strengths in people with Down syndrome: Spatial thinking and its role in mathematics. Journal of Experimental Child Psychology, 246, 105986. https://doi.org/10.1016/j.jecp.2024.105986

Wu, Y., **Gilligan-Lee, K.**, Ng-Knight, T., & R. Tenenbaum, H. (2024). Student-perceived parents' and teachers' expectancies and feedback influence homework motivation and effort. *The Journal of Educational Research*, 117(5), 267–283. https://doi.org/10.1080/00220671.2024.2385405

Gentle, J., Shakur, A., Ivanova, M. & **Gilligan-Lee, K. A.** (2024). Navigation abilities and spatial anxiety in individuals with and without Developmental Coordination Disorder (DCD/Dyspraxia). *Research in Developmental Disabilities*, Volume 146, March 2024, 104672. https://doi.org/10.1016/j.ridd.2024.104672

Dr Rebecca Gordon

Rebecca's research focuses on the mechanisms and measurement of working memory/executive function, and their relationships with typical and atypical outcomes, including dyslexia.

She recently published a paper challenging the consensus view of working memory, in the Quarterly Journal of Experimental Psychology, also presenting this work at the International Conference on Working Memory in July 2024. As an extension of this line of work, she is developing an ESRC grant application proposing working with researchers in Brazil to examine environmental and innate factors which influence working memory development.

Rebecca took part in the UNESCO Science of Learning Socio-emotional Learning workshop, and attended the linked December UNESCO Science of Learning meeting in Paris.

She is working with the Initial Teacher Education / Early Career Framework teams at the UCL Institute of Education to create educational neuroscience taught provision for early career teachers, mentors, induction tutors, and facilitators.

She recently ran an open science event at the Bloomsbury Festival in October collecting data on the lived experiences of children and adults with dyslexia.

Rebecca's PhD student, Yasin Arslan, passed his viva with minor corrections in January 2025. The title of Yasin's thesis was *Teachers' understanding of educational neuroscience: A mixed-method approach to understanding knowledge, attitudes and application*.

Publications

Miller-Cotto, D., & **Gordon, R.** (2024). Revisiting working memory 50 years after Baddeley and Hitch: A review of field-specific conceptualisations, use and misuse, and paths forward for studying children. *Quarterly Journal of Experimental Psychology*, 17470218241301701. https://doi.org/10.1177/17470218241301

Dr Spencer Hayes

Spencer's research lab investigates the processes that underpin the control and acquisition of movements across multiple domains – these domains include special educational needs, autism, school attainment, and motor competency. Spencer is currently completing work projected funded by the Baily Thomas Charitable Fund entitled: 'Children and adolescents with learning disabilities: A cross-syndrome comparison of motor skill learning, physical activity and mental health in autism spectrum disorder, Down syndrome, and Williams syndrome'.

He is working on three papers which illustrate his approach:

> Clowes, D., Bennett, S.J., Andrew, M., Foster, N.C., & **Hayes, S.J.** Differential sensorimotor control processes underpin tabletop collaborative educational engagement in autistic children: the influence of co-speech gestures.
>
> Cetiner, T., Van Herwegan, J., Bennett, S.J., & **Hayes, S.J.** Practice specificity on motor learning: The feasibility of a home-based intervention for training handwriting in young autistic children.
>
> Yang, P., Wong, K., Bennett, S.J., & **Hayes, S.J.** Visuomotor control and predictors of literacy skills in autistic and non-autistic children aged 7 to 11 years old

Spencer is also running a longitudinal study which is tracking the development of visuomotor control and predictors of literacy skills in autistic and non-autistic children. His team completed data collection for time-point 1 last year (aged 5-6 years), and they are running timepoint 2 collection through summer of 2025. Spencer's previous background is in sports science, and he has two recent publications which overlap with education.

> Andrew, M., Ford, P., McRobert, A., Foster, N.C., Miller, M., & **Hayes, S.J.** (2024). Using a coproduced educational workshop to change the focus of verbal instructions delivered by professional youth soccer coaches: a case study. *Physical Education and Sport Pedagogy*. https://doi.org/10.1080/17408989.2024.2319056
>
> van Rossum, T., Foweather, L., **Hayes, S.J.**, & Morley, D. (2024). Start to Move (S2M): Measuring the feasibility of a teacher-led digital fundamental movement skills assessment tool. *Journal of Teaching in Physical Education*.

Looking forward, Spencer is developing a grant application to investigate motor disadvantage, literacy outcomes and perceived motor skill competency in young children.

Professor Natasha Kirkham

Natasha's lab investigates the development of selective attention in infants, preschool, and primary age children. She is involved in two streams of research. The first addresses the question of how infants learn about their environment with regard to the statistical regularities inherent in their perceptual world. The second investigates the roles of attention and executive functions in young children.

Natasha's team employs several different methodologies in her research projects, using both corneal reflection eye-tracking and habituation/dishabituation with infants, executive function tasks with preschoolers/adults, and fNIRS neuroimaging recordings from infants.

Her recent work has focussed on how the home environment impacts on the development of attention (e.g., noise, chaos), and how noise affects children's learning in the classroom.

Publications

Serino, G., Mareschal, D., Scerif, G., & **Kirkham, N**. (2024). Playing hide and seek: Contextual regularity learning develops between 3 and 5 years of age. *J Exp Child Psychol*. 2024 Feb;238:105795. https://doi.org/10.1016/j.jecp.2023.105795

Massonnié, J., Mareschal, D., & **Kirkham, N.** (2022). Individual differences in dealing with classroom noise disturbances. *Mind, Brain, and Education 16* (3), 252-262. https://doi.org/10.1111/mbe.12322

Professor Mairéad MacSweeney

Mairéad's research explores how the brain processes language in people who are born profoundly deaf. Her team is currently halfway through a longitudinal study of reading development in young deaf children. They have successfully recruited 120 severely and profoundly deaf 4-year-old in three separate cohorts from 63 schools across England and are visiting them twice a year over a 3-year period. Data collection will finish in July 2027. The project is investigating how visual communication skills (lipreading, British Sign Language and fingerspelling) relate to later reading outcomes.

Some of these children will also be invited to participate in new neuroimaging studies of language development in deaf children using Optically Pumped Magnetometers (OPMs). This is a new imaging technique which measures the magnetic fields on the scalp generated by current flow in assemblies of neurons oriented perpendicular to the cortical surface below each sensor. First results from this work should emerge next year.

Mairéad's most recent publication is on bilingual language development in infants:

> Mousley, V.L., **MacSweeney, M**., & Mercure, E. (2024). Revisiting perceptual sensitivity to non-native speech in a diverse sample of bilinguals. *Infant Behav Dev*. 2024 Sep;76:101959. https://doi.org/10.1016/j.infbeh.2024.101959 .

In March 2025, she organised a conference entitled *Language and Literacy in Deaf Children - Research to Practice*.

Professor Denis Mareschal

Over the last year, Denis has had two primary directions of research activity.

The first is leading work on the CEN's development and assessment of a neuroscience-inspired teaching activity for improving science and maths learning for primary age children, focusing on counter-intuitive concepts. The activity is called 'Stop&Think' and was developed through a project funded by the Education Endowment Foundation and the Wellcome Trust. The teaching activity has been undergoing evaluations of its effectiveness using large randomized controlled trials (RCTs). Following a successful efficacy trial with over 6,000 children, testing the approach under ideal conditions, Denis has been supporting a larger Efficiency trial with over 14,000, testing the approach 'in the wild'. The results of the trial, delivered by the Behavioural Insights Team and funded by the Education Endowment Foundation, have just been published. The trial was a success, replicating the results of the earlier trial, and confirming the robustness of the approach. A term of 15-minute lesson starters using Stop&Think activities three times a week confers an advantage for Year 3 and Year 5 students of 2 months of academic progress in science and a smaller effect of 1 month progress in maths, over usual practice.

There were other research activities around the evaluations. The team has published neuroimaging data from the Year 3 and 5 children involved in the original trial (with Iroise Dumontheil and Lucy Palmer) exploring the brain mechanisms underpinning reasoning about science and maths concepts. They have also published research carried out with adolescents as part of Annie Brookman's PhD. Lastly, the original trial contained an 'active' control – a comparable condition where children were given similar activities designed to improve some other skill (in this case, socioemotional reasoning) but not science and maths. This was to test that the novelty of the new activities was not responsible for any improvement. The active control condition did its job. Science and maths skills improved at the usual rate, not showing the Stop&Think benefit, but notably, there were improvements in socioemotional learning among the children using the 'SEE+' social training software. These results have now been written up separately and submitted for publication.

In Denis's other research direction, he has been leading a project using functional Near Infrared Spectroscopy (fNIRS) to investigated neural synchrony during collaborative problem solving and learning in children. fNIRS is a non-invasive brain imaging technique that works well with children in naturalistic environments, while neural synchrony is where the brain activity of two interacting people (say a child and parent playing a game together) become synchronised. The project includes an ongoing study looking at neural synchrony in 3- and 5-year-old children who are either friends, strangers, or siblings (work led by Victoria St. Claire) and a study looking at synchrony between Year 5 pupils and their teacher delivering either interactive or instructional science lessons. The team is also exploring the association between synchrony and long-term (2 weeks later) retention of the material delivered in the class.

In other work, Denis has been supporting Emily Farran's spatial cognition (SPACE) pilot trial as a consultant.

Publications

St. Clair, V. L., Contini, L., Re, R., Pinti, P. & **Mareschal, D.** (in press). Analytical pipeline optimization in developmental fNIRS hyperscanning: Neural coherence between preschoolers collaborating with their mothers. *Imaging Neuroscience*.

Palmer, L. R. J., Sumanapala, D. K., **Mareschal, D.,** Dumontheil. I & the UnLocke Team (2025) Neural associations between inhibitory control and counterintuitive reasoning in science and maths in primary school child. *Journal of Cognitive Neuroscience*. 1-26. https://doi.org/10.1162/jocn_a_02303

Palmer, L., **Mareschal, D.,** & Dumontheil, I (submitted). Similarities of neural correlates of inhibitory control and maths and science counterintuitive reasoning in adulthood. *ZDM MAthematics* (invited submission to special issue).

Farran, E. K., Gilligan-Lee, K., **Mareschal, D**., Zivkovic, M., Bartusevic, S., Bell, D., Jay, T., & Gilmore, C. (under review). Teacher delivered block construction training improves children's mathematics performance. *Mind, Brain and Education*.

Mayer, S., Dumontheil, I, Wilkinson, H., Porayska-Pomsta, K., Farran, E.K., Tolmie, A., **Mareschal, D**. & The UnLocke Team (under review). Teacher delivered block construction training improves children's mathematics performance. *PLoS One*.

Talks

Green, I., Pinti, P. & **Mareschal, D**. (July 2024). Interpersonal Neural Synchrony in Learning Pre-conference lightning talk presented at *International Mind, Brain and Education Society Conference 2024*, Louvain, Belgium.

St. Clair, V. L. (2025, Jan). Experience-dependent effects of social cognitive development in early childhood. Presented at *UCL Institute of Cognitive Neuroscience's Visual Communication Group* lab meeting.

St. Clair, V. L. (2025, Jan). Experience-dependent effects of social cognitive development in early childhood. Invited talk at *University of Birmingham's Cognitive Linguistics and Psycholinguistics* seminar series.

Conference Posters

St. Clair, V. L., Contini, L., Re, R., Pinti, P., & **Mareschal, D**. (accepted: 2025, May). Neural correlates of collaborative problem solving in preschoolers. Poster presentation accepted to *SRCD 2025*, Minneapolis, USA.

Mousley, V. L., Contini, L., Re, R., Soderberg, C., **Mareschal, D**., & Pinti, P. (2024, September). Analytical pipeline optimisation in developmental fNIRS hyperscanning during children's naturalistic interactions. Poster presented at *fNIRS 2024 Conference*, Birmingham, UK.

Terry, R., Pinti, P. & **Mareschal, D**. (Sept 2024). Markers of Neural Synchrony between Mothers and Toddlers during Collaboration'. Poster presented at the *BPS Developmental Conference*, Glasgow, UKL

Green, I., Pinti, P. & **Mareschal, D**. (accepted: April 2025). Scaffolding or explanatory: The effect of teaching style on neural synchrony in teacher-student interactions. Poster presented at *Centre for Educational Neuroscience conference (ENCORE)*, London, UK

Green, I., Pinti, P. & **Mareschal, D.** (accepted: May 2025). The effect of teaching style on interpersonal neural synchrony and learning. Poster presented at Centre for Educational Neuroscience conference (ENCORE), London, UK. *Poster presentation accepted to SRCD 2025*, Minneapolis, USA.

Schroer, L., Pinti, P. Cooper, R.C, & **Mareschal. D.** (August 2024). Using mobile fNIRS to explore planning and brain development in freely moving toddlers. *Poster presented at the Cognitive Science Society Annual meeting 2024*, Rotterdam, NL.

Dr Emma Meaburn

Emma's lab investigates the fundamental question of how genetic variation contributes to individual differences in behaviour and, in the context of education, educational outcomes. Emma is concluding a research secondment at the Nuffield Foundation, where she led a collaborative project with the Nuffield Council on Bioethics. Her work examined findings and emerging directions in educational genomic research, focusing on the processes linking genetic differences to variation in traits related to education. The recently published report, *Navigating Genomics and Education: Insights, Opportunities, and Challenges*, assesses the readiness of genomic findings for real-world application, highlighting scientific, practical, and ethical challenges.

As part of this project, Emma hosted a workshop with stakeholders from government, educational practice, and bioethics to explore in greater depth the ethical implications arising from the potential use of polygenic indices for prediction within and beyond educational settings.

Meanwhile at Birkbeck, her research group has been utilising longitudinal genomic cohort data to examine how genetic influences unfold across development, and the routes by which transmission of genetic predispositions to behavioural difficulties occur within families.

Overall, her research aims to contribute to our understanding of the interplay between genes and environment in shaping child behavioural development, while ensuring that ethical considerations are embedded from the outset.

Publications

Meaburn, E., & Michaux, N. (2025). Navigating genomics and education: insights, opportunities and challenges. *Nuffield Foundation*. https://cdn.nuffieldbioethics.org/wp-content/uploads/Navigating-Genomics-and-Education.pdf

Bowler A, Arichi T, Fearon P, **Meaburn E**, Begum-Ali J, Pascoe G, Johnson MH, Jones EJH, Ronald A. (2024). Phenotypic and Genetic Associations Between Preschool Fine Motor Skills and Later Neurodevelopment, Psychopathology, and Educational Achievement. *Biol Psychiatry*. 2024 May 1;95(9):849-858. https://doi.org/10.1016/j.biopsych.2023.11.017

Dr Ori Ossmy

Ori leads the Physical Cognition Lab. His research focus is on understanding (and intervening on) the processes that underlie changes in physical cognition and behavioural problem solving - how to navigate a cluttered environment, how to use a tool, with our bodies embedded in the real world. He has a range of projects that are considering physical cognition in the context of education. One study is testing the effects of collaborative learning on spatial skills and science reasoning in schools, with in 8- to 11-year-olds. A second study is evaluating executive functions of 7-to-11-year-old children with and without ADHD in an embodied task using virtual reality, comparing abilities both to the children's ADHD characteristics and to their 'non-embodied' EF skills. A third study in schools is developing an automatic real-time hand tracking device to enhance adolescents' spatial skills by eliminating haptic feedback, targeting 12- to 16-year-olds.

In the lab, he is using the CAVE, a unique immersive virtual reality laboratory able to simulate real-world surroundings, which is based in Birkbeck's Toddlerlab. One study is testing the effects of physical activity with cognitive demands on functional connectivity in the brain (using fNIRS). The project again explores executive function skills in children with ADHD, comparing them to physical activity without cognitive demands, and to solving executive function tasks without physical activity.

Publications

Peleg, N., Mcauley, H., & **Ossmy, O.** (under review). Better together: Classroom-based social intervention for spatial skills. *Preprint*: https://doi.org/10.31234/osf.io/z2nv3 *BBK-IOE PhD student is first author

Cherry, L., Cheng, M., Ghilardi, T., & **Ossmy, O.** (2024). Automatic real-time hand tracking enhances adolescents' spatial skills by eliminating haptic feedback. In *IEEE International Conference on Development and Learning (ICDL)*, pp. 1-6. *Ed Neuro MSc student is first author

Cherry, L., Soderberg, C., Haetter, J., & **Ossmy, O.** (2024). Extended reality in STEM: A modernised educational tool for children. *Journal of human-centred Technology*, 3(2), 10-20. *Ed Neuro MSc student is first author

Muszynska, M., & **Ossmy, O.** (2024). The BlockQuest game: Digital behavioural phenotyping of ADHD using the embodied serious game in virtual reality. In *IEEE International Conference on Serious Games.* Cham: Springer International Publishing.

Dr Laura Outhwaite

Laura is a Principal Research Fellow at UCL's Centre for Education Policy and Equalising Opportunities, which aims to identify and reduce structural barriers to opportunities across the life course. She recently joined the editorial board of the British Journal of Educational Technology. In her CEN work, Laura recently contributed to the upcoming UNESCO Technology for Learning report and, with Petri Peternan (Mid Sweden University), the Swedish National Agency for Education consultation on the use of digital tools in learning. She also attended a round table at Apple with the Royal Foundation on technology in early childhood.

With Jo Van Herwegen, she is continuing her work on the *Maths@Home* app and the *MathsEverywhere* cards, with funding from UCL Social Ventures. They recently published their systematic review on assessments and screeners for early mathematical skills.

Talks

Keynote on dyscalculia 'Dyscalculia into the Future' at the 2024 British Dyslexia Association practitioner conference. (Milton Keynes, November 2024).

Publications

Outhwaite, L. A., Fischer, N. M., Jusek, A. S., & Van Herwegen, J. (2025). Understanding the role of parental self-efficacy for supporting children's early learning in the home mathematics environment. *Early Child Development and Care*, 1–13. https://doi.org/10.1080/03004430.2025.2474668

Outhwaite, L. A., Aunio, P., Leung, J. K. Y., & Van Herwegen, J. (2024). Measuring Mathematical Skills in Early Childhood: a Systematic Review of the Psychometric Properties of Early Maths Assessments and Screeners. *Educational Psychology Review*, 36(4), 110. https://doi.org/10.1007/s10648-024-09950-6

Professor Kaska Porayska-Pomsta

Kaska is professor of Artificial Intelligence (AI) in Education at the UCL Knowledge Lab, where her work focuses on the intersection of AI, Learning and Psychological Sciences, and Education. Her current work spans five interlinked themes: the computational modelling of human communication, aimed to enhance our understanding of the role and nature of communication in learning and socio-cognitive development; computational modelling of learners' behaviours in context, aimed to inform our understanding of cognitive and affective traits and states of relevance to successful learning, which knowledge can in turn inform the design of AI-driven systems for education; AI as research methodology, aimed to demonstrate and curate the value of AI as an instrument for understanding complex human behaviours; AI in service of social and educational inclusion, aimed to develop AI-driven educational interventions and support mechanisms in service of all learners; and AI and Ethics, looking specifically at questions around human vs AI autonomy, accountability as well as mechanisms for enabling explainable AI at scale.

UCL recently joined the UNESCO Global Education Coalition and Digital Transformation Collaborative, and Kaska is serving is a UNESCO advisor on AI and education. Kaska was recently a juror for the UNESCO King Hamad Bin Isa Al-Khalifa Prize for the Use of ICT in Education.

Publications

Rapaport, H., Clapham, H., Adams, J., Lawson, W., **Porayska-Pomsta, K.,** & Pellicano, E. (2024). "In a State of Flow": A Qualitative Examination of Autistic Adults' Phenomenological Experiences of Task Immersion. *Autism in Adulthood*, Vol. 6, No. 3. https://doi.org/10.1089/aut.2023.0032

Porayska-Pomsta, K. (2024). A Manifesto for a Pro-Actively Responsible AI in Education. *Int J Artif Intell Educ 34*, 73–83 (2024). https://doi.org/10.1007/s40593-023-00346-1

Dr Mojtaba Soltanlou

The primary research questions of Mojtaba's lab are: How do children acquire knowledge and develop cognitive and educational skills? Why do some children experience difficulties in developing those skills? And what are the cognitive and environmental sources of those learning variabilities? He focuses on three main areas: numerical and mathematical development and learning in early childhood, mathematical learning difficulties and individual differences, and cross-cultural and environmental influences on mathematical learning.

His ongoing projects include a longitudinal study of the neurocognitive mechanisms of variability in mathematical learning in 3-5-year-old children using functional near-infrared spectroscopy (fNIRS); a study of the neurocognitive mechanisms of mathematical learning and development in 5-11-year-old children using electrophysiology (EEG); a study of longitudinal neurocognitive changes during numerical knowledge acquisition in 1-3-year-old children using fNIRS.

His team recently completed the first educational neuroscientific studies of math in South Africa (and even sub-Saharan countries), part of their investigation of cross-cultural differences in mathematical learning.

Talks

Mathematical cognition, Lunch and Learning, UCL, UK, 2024

Application of functional near-infrared spectroscopy (fNIRS), University of Toronto, Canada, 2024 (Virtual)

Linguistic influences on mathematical cognition, Centre for Language, Literacy and Numeracy: Research and Practice, UCL, UK, 2024

Educational neuroscience, The 12th Iranian Symposium of Cognitive Neuropsychology, Iran, 2024 (Virtual)

Editorial

10/2024-present: Guest Editor, special issue on "Numerical cognition" in Journal of Scientific Reports

Publications

Ivanova, E., Joanisse, M., Ansari, D., & **Soltanlou, M.** (in-principle acceptance, Stage 1 Registered Report, 2024). The origin of symbolic numerical knowledge in early development – An fNIRS Registered Report. *Peer Community* In. doi:10.17605/OSF.IO/GZPK5

Desarkar, P., Vicario, C. M., & **Soltanlou, M.** (2024). Editorial on Non-invasive Brain Stimulation in Research and Therapy. *Scientific Reports*. 14 (1), 29334. doi:10.1038/s41598-024-79039-1. https://www.nature.com/articles/s41598-024-79039-1

Hochman, S., Havedanloo, R., Heysiettalab, S., & **Soltanlou, M.** (2024). How does language modulate the association between number and space? A Registered Report of a cross-cultural study. *Journal of Experimental Psychology: General*. https://doi.org/10.1037/xge0001653

Loenneker, H. D., Cipora, K., Artemenko, C., **Soltanlou, M.**, Bellon, E., De Smedt, B., Garcia-Orza, J., Giannouli, V., Gutierrez-Cordero, I., Lipowska, K., van Dijck, J.-P., Yao, X., Nuerk, H.-C., Huber, J. F. (2024). Math4Speed - a freely available normed measure of arithmetic fluency. *Canadian Journal of Experimental Psychology.* https://doi.org/10.1037/cep0000347

Professor Michael Thomas

Michael leads the Developmental Neurocognition Lab, which focuses on understand cognitive variability (development, intelligence, neurodevelopmental conditions, giftedness, ageing).

He is currently working with Dr Hana D'Souza (University of Cardiff) on a longitudinal project to explore early cognitive and motor predictors of variation in educational abilities, school readiness, and role of therapeutic intervention in primary age children with Down syndrome.

With Jo Van Herwegen, Michael is investigating the most effective interventions to improve educational abilities in children with Special Educational Needs and Disabilities (SEND).

With Dr Cathy Rogers and Dr Victoria Knowland (University of Newcastle), he is continuing to work on educational neuroscience approaches to improving the effectiveness of adult literacy programmes in low-income countries.

With Iroise Dumontheil and a team of epidemiologists at Imperial College led by Professor Mireille Toledano and Dr Steven Shen, he is part of a longitudinal study exploring the effects of technology use in a cohort of teenagers in the UK (the SCAMP study). The most recent analyses of these data have looked at the effects of multilingualism on educational outcomes in our cohort, led by Roberto Filippi; and the effects of urban pollution, led by Dr Rachael Thompson.

As part of his work in educational evaluations, he is working on the Stop&Think programme aiming to improve science and mathematics learning in primary age children, led by Denis Mareschal; and with Andy Tolmie a trial on the use of worked examples to learn grammar for writing in Year 7 (13-year-old) students, in a project led by the National Foundation For Educational Research. Both projects are funded by the Educational Endowment Foundation. Michael recently wrote a blog on why researchers use control groups in educational evaluations.

Michael is also working with Emma Meaburn on the implications for education of the latest findings in behavioural genetics.

He is also working on a project exploring the implications of research in the science of learning for education around climate change and sustainability.

Michael has two books in development, one with Dr Jessica Massione, Dr Olympia Palikara, and Jo Van Herwegen on *Educational neuroscience and special educational needs and disabilities* (Cambridge University Press), and one with Dr Cathy Rogers and Dr Roisin Perry, *an A to Z of Educational Neuroscience* (Psychology Press).

Talks

Educational neuroscience and the nature-nurture debate. Seminar, Department of Cognitive Neuroscience, Karolinska Institute, Sweden. March 2025.

Educational Neuroscience: What teachers need to know about the learning brain. Keynote at International Symposium on 'The Science of Learning and Development -at the interface of brain science and AI in the classroom', University of Sydney, Australia, January 2025.

What do teachers need to know about neuroscience? Keynote, 1st International Congress on Educational Neuroscience. Universidad Unab, Bucaramanga, Colombia. September 2024.

The role of neuroscience in transforming education. Conference on 'Linking Neuroscience and Education: Promoting Student Success' organised by the Maltese Department for Education. Malta, November 2024.

Publications

Hodgkiss, A., **Thomas, M. S. C**., Tolmie, A. K., & Farran, E. K. (2025). Associations between spatial skills and physics knowledge in primary school: Spatial skills are more important for conceptual scientific knowledge than for factual scientific knowledge. *J Exp Child Psychol*. 2025 Apr;252:106135. https://doi.org/10.1016/j.jecp.2024.106135

Rogers, C. J., Knowland, V. C. P., Vitikainen, A., Patrick Gondwe, P., & **Thomas, M. S. C.** (2025). The application of a mind, brain and education approach to the Literacy for Women in Africa programme and recommendations for practitioners. *Int Rev Educ* 71, 35–53 (2025). https://doi.org/10.1007/s11159-024-10095-5

Van Herwegen, J., Masterman, T., Dockrell, J., Gordon, R., Marshall, C. & **Thomas, M.S.C.** (2025) Raising educational outcomes for individuals with Down syndrome: Findings from a larger systematic review of targeted interventions for individuals with SEND. *Journal of Research in Special Educational Needs*, 00, 1–10. https://doi.org/10.1111/1471-3802.70004

Thomas, M. S. C., & Arslan, Y. (2024). Why does the brain matter for education? *Br J Educ Psychol*. 2024 Dec 4. https://doi.org/10.1111/bjep.12727

Filippi, R., Ceccolini, A., Perry, R. C., & **Thomas, M. S. C.** (2024). The impact of multilingualism and socio-economic status on academic performance: evidence from the SCAMP and the national pupil databases. *International Journal of Bilingual Education and Bilingualism*, 28(1), 53–72. https://doi.org/10.1080/13670050.2024.2397445

Bowen, A.E.J., Palmer, L.R.J., Perry, R.C., **Thomas, M.S.C**., Tolmie, A., Borst, G. and Van Herwegen, J. (2024), Evaluating What Works in the Classroom: Best Practice and Future Opportunities. *Mind, Brain, and Education*, 18: 474-484. https://doi.org/10.1111/mbe.12430

Thompson, R., Stewart, G., Vu, T., Jephcote, C., Lim, S., Barratt, B., Smith, R. B., Bou Karim, Y., Mussa, A., Mudway, I., Fisher, H. L., Dumontheil, I., **Thomas, M. S. C**., Gulliver, J., Beevers, S., Kelly, F. J., & Toledano, M. B. (2024). Air pollution, traffic noise, mental health, and cognitive development: A multi-exposure longitudinal study of London adolescents in the SCAMP cohort. *Environment International*, 108963. https://doi.org/10.1016/j.envint.2024.108963

Thomas, M.S.C., Howard-Jones, P., Dudman-Jones, J., Palmer, L.R.J., Bowen, A.E.J. & Perry, R.C. (2024), Evidence, Policy, Education, and Neuroscience—The State of Play in the UK. *Mind, Brain, and Education*, 18: 461-473. https://doi.org/10.1111/mbe.12423

Professor Andy Tolmie

Andy's research at the Institute of Education continues to focus on science learning in the primary school years, and on the relationships between motor development and growth of executive function.

At present, his new work is attempting to fuse these two areas by looking at the impact of manipulation on mechanistic concepts of physical phenomena, and the moderating role on outcomes of individual variation in motor skills.

He is also involved in work on the impact of social disadvantage on the development of verbal and nonverbal abilities, on spaced learning in physics lessons, and on interventions to improve spatial and other cognitive skills. He has had 6 papers published over the past year, with 9 others submitted and at various stages of review.

Andy lead's CEN International working group.

Publications

Hodgkiss, A., Thomas, M. S. C., **Tolmie, A. K.**, & Farran, E. K. (2025). Associations between spatial skills and physics knowledge in primary school: Spatial skills are more important for conceptual scientific knowledge than for factual scientific knowledge. J Exp Child Psychol. 2025 Apr;252:106135. https://doi.org/10.1016/j.jecp.2024.106135

Bowen, A.E.J., Palmer, L.R.J., Perry, R.C., Thomas, M.S.C., **Tolmie, A. K**., Borst, G. and Van Herwegen, J. (2024), Evaluating What Works in the Classroom: Best Practice and Future Opportunities. Mind, Brain, and Education, 18: 474-484. https://doi.org/10.1111/mbe.12430

Perry, R. C., Johnson M., Charman, T., Pascoe, G., Thomas, M. S. C., **Tolmie, A. K.**, Dumontheil, I., Jones, E. J., & The BASIS Team (in press, 2024). Twenty-four-month effortful control predicts emerging autism characteristics. *Developmental Science*, Nov;27(6):e13560. doi: 10.1111/desc.13560 https://doi.org/10.1111/desc.13560

Zhou, Y., & **Tolmie, A. K.** (2024). Associations between Gross and Fine Motor Skills, Physical Activity, Executive Function, and Academic Achievement: Longitudinal Findings from the UK Millennium Cohort Study. *Brain Sciences*, 14(2), 121. https://doi.org/10.3390/brainsci14020121

Elgamal, M., **Tolmie, A. K.**, Thomas, M. S. C., Meaburn, E., & Jerrim, J. (2024). The impact of socioeconomic status on longitudinal trajectories of Children's language ability and non-verbal Reasoning. *International Mind, Brain and Education Society (IMBES) Conference*, 11 Jul 2024, Leuven, Belgium.

Arslan, Y., Gordon, R., & **Tolmie, A. K.** (2024). Educational Neuroscience in Teacher Training and Practice. *International Mind, Brain and Education Society (IMBES) Conference*, 11 Jul 2024, Leuven, Belgium.

Professor Jo Van Herwegen

Jo leads the Child Development and Learning Difficulties lab. Her research focuses on improving educational outcomes, especially for students with special educational needs, using evidence from developmental psychology, educational neuroscience, and neurodiverse populations.

Her recent projects include the NeuroSENse project, which aims to improve teacher understanding of neurodevelopmental conditions. And the MetaSENse project, which has carried out a systematic review and meta-analysis of the published studies on interventions to improve educational outcomes for students with special educational needs and disabilities. The MetaSENse project has been funded by the Nuffield Foundation (see the recent report here) and BERA/KUSUMA. It has created a toolkit for teachers to access the evidence supporting the effectiveness of various interventions to improve SEND educational outcomes.

She is running several educational evaluations, include Maths for Life with SEND students, and PlayMyMath for fractions.

She is working with Professor Chloe Marshall and Dr Louise Livingstone investigating the evidence from neuroscience related to mathematical development within the Montessori approach.

With Michael Thomas, she is organising CEN's inaugural Educational Neuroscience conference, ENCORE (see here) in April 2025.

Jo has a book in development with Dr Jessica Massione, Dr Olympia Palikara, and Michael Thomas on *Educational neuroscience and special educational needs and disabilities* (Cambridge University Press),

Jo leads the CEN's Teachers and Evidence working group

Publications

Van Herwegen, J., Masterman, T., Dockrell, J., Gordon, R., Marshall, C. & Thomas, M.S.C. (2025) Raising educational outcomes for individuals with Down syndrome: Findings from a larger systematic review of targeted interventions for individuals with SEND. *Journal of Research in Special Educational Needs*, 00, 1–10. https://doi.org/10.1111/1471-3802.70004

Cameron, C., Villadsen, A., Roberts, A., Evans, J., Hill, V., Hurry, J., Johansen, T., **Van Herwegen, J.**, & Wyse, D. (2025). School absence and (primary) school connectedness: evidence from the Millennium Cohort Study. *London Review of Education*, 23 (1), 5. DOI: https://doi.org/10.14324/LRE.23.1.05.

Outhwaite, L. A., Fischer, N. M., Jusek, A. S., & **Van Herwegen, J.** (2025). Understanding the role of parental self-efficacy for supporting children's early learning in the home mathematics

environment. *Early Child Development and Care*, 1–13. https://doi.org/10.1080/03004430.2025.2474668

Van Herwegen, J., Dockrell, J., Thomas, M. S. C., Marshall, C., Gordon, R., & Masterman, T. (2024). *Raising educational outcomes for students with Special Educational Needs and Disabilities*. Nuffield Foundation. https://www.nuffieldfoundation.org/wp-content/uploads/2022/07/Raising-educational-outcomes-for-students-with-Special-Educational-Needs-Disabilities.pdf

Bowen, A.E.J., Palmer, L.R.J., Perry, R.C., Thomas, M.S.C., Tolmie, A., Borst, G., & **Van Herwegen, J.** (2024), Evaluating What Works in the Classroom: Best Practice and Future Opportunities. *Mind, Brain, and Education*, 18: 474-484. https://doi.org/10.1111/mbe.12430

Professor Sam Wass

Sam leads the BabyDevLab and the Developmental Group at University of East London. Sam's research has three elements. First, his research examines the early development of attention and stress. He tries to do this based entirely on naturalistic real-world observations of real-world behaviours, and corresponding fluctuations in physiology and brain activity.

Second, he is interested in the development of attention control (how we choose to allocate our attention, second by second) and arousal control (how we change our behaviours to 'correct for' exogenously caused increases and decreases in physiological stress). He used to think that the common theme was that these both involved executive processes, but nowadays he is not so sure about that!

Third, he is interested in how a child's early interactions with caregivers (co-regulation) and their everyday environments influence how attention and arousal states develop.

In 2024, Sam published articles on child-led attention and learning and early learning environments in journals including Proceedings of the National Academy of the Sciences, Trends in Cognitive Sciences and others.

With Dr Gemma Goldenberg he also co-authored a book on Attention in Early Years for Bloomsbury Education, a part of a series he is leading for them on Putting Neuroscience into Practice. He has given talks and training across the Early Years and Primary sector for the National Association of Headteachers, National Day Nurseries Association, EY Alliance, Action for Children and others, and contributed to reports on Early Years Policy and Practice for the Royal Foundation, BookTrust and others.

Sam leads the CEN's Early Years working group

Publications

Wass, S., & Goldenberg, G. (2025). Take Action on Distraction: The definitive guide to improving attention and focus in the Early Years and Key Stage One. Bloomsbury Education (UK)

Wass, S., Perapoch Amado, M., Northrop, T., Marriott Haresign, I.... more authors (2025). Foraging and inertia: Understanding the developmental dynamics of overt visual attention. *Neuroscience & Biobehavioral Reviews.* 169 (Art. 105991). https://doi.org/10.1016/j.neubiorev.2024.105991

Wass, S., Smith, C. S., Mirza, F. U., Greenwood, E.... more authors (2025). Needing to shout to be heard? Caregiver under-responsivity and disconnection between vocal signaling and autonomic arousal in infants from chaotic households. *Child Development*. 96 (2), pp. 527-545. https://doi.org/10.1111/cdev.14183

Lancaster, K. & **Wass, S.** (2024). Finding order in chaos: influences of environmental complexity and predictability on development. *Trends in Cognitive Sciences*. p. In press. https://doi.org/10.1016/j.tics.2024.11.012

Goldenberg, G., Atkinson, M., Dubiel, J., & **Wass, S.** (2024). Outdoor learning in urban schools: Effects on 4–5 year old children's noise and physiological stress. *Journal of Environmental Psychology*. 97 (Art. 102362). https://doi.org/10.1016/j.jenvp.2024.102362.

Wass, S., Phillips, E. A. M., Marriott Haresign, I., Perapoch Amado, M.... more authors (2024). Contingency and Synchrony: Interactional Pathways Toward Attentional Control and Intentional Communication. *Annual Review of Developmental Psychology*. 6, pp. 63-85. https://doi.org/10.1146/annurev-devpsych-010923-110459

Daubney, K., Suata, Z., Haresign, I. M., Thomas, M. S. C..... more authors (2023). The development of the relationship between auditory and visual neural sensitivity and autonomic arousal from 6 m to 12 m. *Developmental Cognitive Neuroscience*. 63 (Art. 101289). https://doi.org/10.1016/j.dcn.2023.101289

PhD Students

Dr Yasin Arslan (supervisors: Andy Tolmie, Rebecca Gordon): Teachers' Understanding of Educational Neuroscience: A Mixed-Method Approach to Understanding Knowledge, Attitudes and Application

Dr Astrid Bowen (supervisors: Michael Thomas, Andy Tolmie): Evaluating educational interventions: An Exploration of the Interface between Academic Research and Commercial Intervention Provision.

Arcelia Cheung (supervisors: Jo Van Herwegen, Dr Victoria Sims, Michael Thomas): Home Maths Experience (HoME) intervention study – improving mathematical abilities in children with Down syndrome and Williams syndrome

Thuy-Ann Dao (supervisors: Dr Liz Halstead, Jo Van Herwegen, Michael Thomas): Early cognitive and motor predictors of educational abilities in primary age children with Down syndrome.

Mahi Elgamal (supervisors: Andy Tolmie, Michael Thomas, Emma Meaburn, Professor John Jerrim): The influence of family socioeconomic status and genetic variation on developmental trajectories of verbal and non-verbal skills in children

Imogen Green (supervisor: Denis Mareschal, Michael Thomas, Dr Paola Pinti): Scaffolding or explanatory: The effect of teaching style on neural synchrony in teacher-student interactions

Sarah McCarthy (supervisors: Emily Farran, Michael Thomas): Partnering with Educational Practitioners to Enhance Mathematical Understanding via Spatial Reasoning in Children from Disadvantaged Backgrounds

Lucy Palmer (supervisors: Iroise Dumontheil, Denis Mareschal): The neural correlates of inhibitory control and counterintuitive reasoning in science and maths across development.

Nina Peleg (supervisor: Ori Ossmy, Andy Tolmie): Collaborative versus individual training of spatial skills for 6-7-year-olds to improve science concept learning

Dr Roisin Perry (supervisors: Andy Tolmie, Michael Thomas, Professor Emily Jones): Social inequalities in executive function development and attainment during adolescence: An examination of longitudinal relations in the Study of Cognition, Adolescents and Mobile Phones.

Isabella Rubens (supervisors: Andy Tolmie, Michael Thomas): Evaluation of a child-centred intervention targeting wellbeing and cognitive skills in secondary age children

Dr Zahra Siddiqui (supervisor: Jo Van Herwegen, Laura Outhwaite): Investigating mathematical development using an educational math app: The importance of theory and developmental pathways.

Stella Xu (supervisors: Jo Van Herwegen, Michael Thomas): Mathematical development in individuals with Williams syndrome and Down syndrome

Report prepared 28 April 2025.