



This edition's spotlight Neuromyths and Education



Winter is here!

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Welcome to our Winter 2021 Newsletter!

Another year gone just like that! It's been a very busy year for CDLD. Despite the pandemic, there has been a flurry of activity within the lab and not everything has made it into this newsletter. I think we all kind of ran out of time...

However, there has been a lot of activity related to our **neuromyths** study and the **awareness campaign** we are running about developmental disorders. If you haven't seen it yet, check out our video explainers, infographic or blogs! Our research featured in the TES and many podcasts. The links are provided within this newsletter. Do share them with colleagues, families, practitioners and other people who support children with special educational needs. It will help reduce stigma and hopefully improve best-evidence based practice.

You may also see that the lab has grown exponentially, and we are very proud to host researchers from across the world! There are a number of new and **exciting studies** that will examine the impact of newly designed **interventions** for children with special educational needs and developmental disorders so have a look inside as we really can use your help and expertise!

Last but not least, do let us know how we can help you. Research should not only be for academia but should most of all impact those with special needs and developmental disorders, their families, and professionals who work with them.

From the entire CDLD team, many thanks for all your support and best wishes for the holiday season and 2022!

All the best,

Jo

Director of the CDLD lab



Neuromyths

Neuromyths in Education

By William Taylor
BSc Placement Student

What Are Neuromyths?

Neuromyths are defined as:

**“A misconception generated by a misunderstanding, misreading, or misquoting of facts scientifically established to make a case for the use of brain research in education and other contexts”
(OECD, 2002)**

How do they Originate?

There are three ways that have been noted in which Neuromyths can arise:

1. Distortion of Scientific Fact - Neuromyths stem from undue simplification of scientific facts. – *Example: Left and Right Brained Individuals – Research on the specialisation of brain hemispheres led to the belief that individuals are differentiated between left and right-brained, and that each group has a specific learning style: with left-brain people being better at language and right-brain people being more creative. Yet, although the two brain hemisphere’s are lateralised, all people have a left and a right brain.*
2. Offspring of Hypotheses – *In other cases hypotheses may be held true but then later disproved by science, yet the content of the original hypothesis may still be regarded as the truth. For Example: The Mozart Effect – A study was done on the effects of different music types on spatial capacities and showed that listening to Mozart music resulted in an increase of 8-9 IQ points. It was later disproved that listening to Mozart makes people smarter, but the concept of the Mozart-Effect was still shown to be familiar, with “80% of 496 people in California and Arizona were familiar with the Mozart Effect” (Pasquinelli, 2012)*
3. Misinterpretations of Scientific Results – *Myths can be based on accurate scientific information that has been interpreted in an erroneous way. – Example: Critical Period Theory – States that learning depends on synaptic growth and the first three years of life are the best period for learning. This myth “fails to take into account the different maturation rates of the human brain and lifelong learning based on functional plasticity” (Pasquinellie, 2012). For example, the brain is also very receptive to learning and plastic during puberty!*

Article – Neuromyths about Neurodevelopmental Disorders: Misconceptions by Educators and the General Public

A new study by colleagues from CDLD examined the endorsement of neuromyths about the typically developing brain and myths related to neurodevelopmental disorders by adults working in education and those not working in education.

Hypotheses

1. It was predicted that all groups would endorse some neuromyths, but neuromyths concerning neurodevelopmental disorders would be more common.
2. It was predicted that mainstream class teachers would hold less incorrect belief than the general public, and that SEND teachers would hold fewer incorrect beliefs than mainstream teachers.
3. It was predicted that those with more familiarity with a disorder would hold fewer incorrect beliefs, and that those with regularly access information about the brain would hold more incorrect beliefs.

Participants

569 participants were recruited via online sampling through online research websites as well as popular social media platforms such as Twitter or Facebook. Some worked in education (35%), others didn't (65%).

Materials

2 Qualtrics Questionnaires were used:

- General Neuromyth Questionnaire: 15 statements to test general knowledge about the brain: 9 correct statements and 6 incorrect statements.
- Neurodevelopmental Neuromyth Questionnaire: Contained 30 statements about Neurodevelopmental Disorders, some were non-specific and could apply to multiple disorders, others were more specific to different disorders such as Autism.

Procedure

- In addition, the participants filled out a demographic information questionnaire at the end to give participant information
- Answers to the questionnaire were recoded using a scale of 1-4 from least correct, to most correct answer. This produced a total score for the overall belief of neuromyths for each participant; lower scores indicated higher acceptance of neuromyths.

Neuromyths

Analyses

Results from the Qualtrics Survey were analysed to see if any differences existed between the responses to the general neuromyths and to those related to neurodevelopmental disorders. Further analyses were performed to investigate whether there were any differences in the performances of individuals working in education and those within the general public.

Key Findings

- Analyses found that:
 - There was no significant difference between those working in education and those not working in education for neuromyths.
 - In both groups, people endorsed more neuromyths related to neurodevelopmental disorders compared to neuromyths related to general brain development.
 - Although familiarity with neurodevelopmental disorders was not a factor, neuromyths associated with ASD were identified with greater accuracy than neuromyths related to other developmental disorders.
- The study showed that the participants were able to recognise neuromyths with greater accuracy compared to participants a decade ago.
- The frequency of access to brain research, and scientific resources, was shown to be a protective factor against neuromyths.
- In general the results suggested that greater understanding and knowledge of developmental disorders through awareness campaigns can help combat the endorsements of neuromyths.

Full Text - Gini, S., Knowland, V., Thomas, M. S. C., & Van Herwegen, J. (2021).

Neuromyths About Neurodevelopmental Disorders: Misconceptions by Educators and the General Public. *Mind, Brain, and Education*. <https://doi.org/10.1111/mbe.12303>



Neuro-awareness and Special Educational Needs

By Unta Taiwo



NeuroSENse
Five steps towards addressing neuromyths in Special Educational Needs & Disabilities (SEND)

Free CPD resources: educationalneuroscience.org.uk/neuroSENse

- 1 Developing professional knowledge**
 - Myths spread when there is weak and inconsistent knowledge among staff
 - Understanding basic principles of common developmental disorders can inform teaching practice and help protect against potentially damaging misconceptions
 - Visit the NeuroSENse website for CPD materials and links to resources
- 2 Understanding individual differences**
 - Labels can be a good starting point for understanding children's individual needs and where there is support, although children with the same diagnosis can have different strengths and weaknesses and may need different types of support
 - Develop professional knowledge of common developmental disorders (point 1), engage in regular reflective practice (2), and communicate with colleagues (point 4)
- 3 Individual reflection**
 - Engaging reflective practice and communication with colleagues can help develop teaching expertise and knowledge of children's individual support needs
 - Notice when support works well and collect evidence (keep a diary of what worked / did not work in different settings) reflect on how children's strengths and weaknesses, social processes, and classroom context can impact support
- 4 Whole-school communication**
 - SEND support works best when teachers, assistants, SENDCos, and school leaders have shared knowledge and are working together
 - Develop an ongoing inter-working group to regularly discuss children's needs, status and support options, and reflect on teaching practice and school policy
- 5 Reaching out to experts**
 - If you are unsure about whether something is true or a neuromyth, reach out to trusted experts
 - Build a knowledge base of specialist organisations
 - Visit the NeuroSENse website for links to organisations and experts who can help

A dedicated team of researchers from the Centre for Educational Neuroscience launched the NeuroSENse project (with Jo Van Herwegen as PI), which included a survey about the number of facts and misconceptions members of the public and educators hold about neurodevelopmental disorders. A better understanding of what people understand about brain development allows insight into future training requirements as well as any barriers that may impact on educational outcomes from people with special education needs and disabilities (SEND).

569 participants responded to a range of statements related to general myths about the brain (e.g., Drinking water is often promoted to improve learning) and myths related to a range of neurodevelopmental disorders which included autism, attention deficit hyperactivity disorder (ADHD), down syndrome, and dyslexia. Research findings suggested that there were no differences between members of the public and educators in understanding misconceptions about neurodevelopmental disorders (Gini et al., 2021). For example, common neuromyths endorsed by both groups included: Children with autism do not like to be touched, Sugar causes ADHD, or Children with dyslexia experience visual stress and reverse letters and words. However, the results indicated that participants who had access to information were more able to correctly recognise neuromyths. This suggests that there is a need to better inform the public about SEND and to equip educational practitioners with robust SEND information. It was advised that further training and awareness campaigns may improve the way in which individuals with neurodevelopmental disorders are understood and able to access appropriate SEND support.

lisahunter et al. (2011) draw attention to the way in which a staffroom has the potential to be a space for professional learning, especially for newly qualified teachers. Many a good conversation can be had around the staffroom at lunchtime, enriching and thought-provoking about practice, current affairs and even insightful about the colleague you have shared tea with over the years. However, there are occasions that render a staffroom a place of misinformation and discomfort. Gini et al. (2021) present findings that highlight how neuromyths such as 'all children with dyslexia see letters backward' have the potential for staff to overlook a child with dyslexia who is not demonstrating letter reversal.

NeuroAwareness



If only we could make staffrooms neuroAWARE zones. This shared and collective space, commonly known as the staffroom has the potential to be an abundant platform for informally and formally sharing good knowledge to prime best practice and more so if educators are provided with rich learning that covers wide ranging SEND topics including neurodevelopmental disorders.

Good school leadership enables all staff to be well-informed and equipped to manage the challenges and triumphs faced daily in one of the most dynamic settings anyone will ever encounter. The NeuroSENse project has developed an online resource platform which offers short video explainers, blogs, and related links aimed at providing well evidenced and accessible information about common neurodevelopmental disorders (autism, ADHD, dyslexia, deafness, and intellectual disability). As a SENDCO I used to provide early morning continued professional development (CPD) for teaching assistants across the school. Feedback from these sessions led me to understand just how bitesize, relevant information can transform the way in which certain behaviours from an individual or group of students are viewed, understood, and managed. Stepping back in time, I can see exactly how I would commence a whole staff, or phase meeting with a short video from the NeuroSENse resources and use that to work towards a compassionate and inclusive school community. Whether it's debunking myths around autism, broadening horizons in relation to understanding ADHD, or upskilling teachers to identify children with dyslexia in the early years, it's time for neuro-awareness to be rolling off the tongues of not just SENDCOS but also our colleagues enjoying a cuppa at break time in the staffroom ([NeuroSENse Resources: http://www.educationalneuroscience.org.uk/neurosense-resources/](http://www.educationalneuroscience.org.uk/neurosense-resources/)).

Gini, S., Knowland, V., Thomas, M., & Van Herwegen, J. (2021). Neuromyths About Neurodevelopmental Disorders: Misconceptions by Educators and the General Public. *Mind, Brain and Education*, 15(4), 289-298. <https://doi-org.libproxy.ucl.ac.uk/10.1111/mbe.12303>.

lisahunter, Rossi, T., Tinning, R., Flanagan, E., & Macdonald, D. (2011). Professional learning places and spaces: The staffroom as a site of beginning teacher induction and transition. *Asia-Pacific Journal of Teacher Education*, 39(1), 33-46. DOI: <https://doi-org.libproxy.ucl.ac.uk/10.1080/1359866X.2010.542234>.

Current Study Update



Designing and Evaluating Educational Maths Apps for Young Children: Current Evidence and Future Directions.

In September 2021, Dr Jo Van Herwegen, with our collaborator Dr Thea Herodotou from the Open University, chaired a symposium at the British Psychological Society Developmental Conference on the current evidence and future directions in the field of designing and evaluating educational maths apps for young children.

Educational maths apps are an emerging trend in children's learning environments aiming to raise achievement. 94% of children in the UK own or have access to touchscreen tablet devices with parents of preschool aged children most likely to download educational apps and 41% of teachers use maths apps in early primary school. Policy makers are also increasingly advocating for and investing in the use of educational apps to support early learning in school and at home.

Dr Erin Early (Research Fellow) presented a systematic review synthesising 50 studies examining the impact of educational maths apps for supporting young children's mathematical learning and development. Results showed most studies have been conducted with typically developing children ($n = 43$) in the classroom ($n = 46$). Important directions for future research were highlighted, including working with children with special educational needs and disabilities, evaluating the use of maths apps at home with parents, and using more innovative methods for online data collection.

Dr Laura Outhwaite (Senior Research Fellow) presented a content analysis of the maths apps identified through the systematic review of 50 studies. This study aimed to understand the mechanisms underpinning how maths apps might work to support learning by looking at their mathematical content and app design features. Results showed evaluated maths apps primarily targeted basic skills in understanding number representations and relationships. Furthermore, children's learning outcomes with maths apps were maximised when the apps provided a scaffolded and personalised learning journey and explained why their answer was right or wrong, as well as giving motivational feedback (e.g., 'Great job!').

Current Study Update



Zahra Siddiqui (PhD student) presented her PhD proposal that will use large-scale user data collected by the Funexpected maths app to identify which games and which maths content areas within the app were being played by children across different age ranges, as well as how much time children spent on each game, and the classification of errors made by children during play. This initial evidence, combined with the narrative synthesis reported by Dr Early has helped inform the co-design of a mixed-methods intervention study evaluating the efficacy of the Funexpected maths app with young children.

Erica Ranzato (PhD student) presented our UCL Enterprise project designing the 'Maths@Home' app. The app includes 40 age-appropriate games that are designed to improve a broad range of mathematical abilities in children aged 2-6 years or those with mathematical learning difficulties who are working at this ability level. The games are designed to encourage off-screen engagement between parent(s) and their child, using resources easily accessible in the home. Initial user testing with the app prototype showed that parents enjoyed using the app and felt that it was beneficial for their children's early maths experiences. We are using this parental feedback to steer future design iterations.

Go CDLD team!

Current Study Update

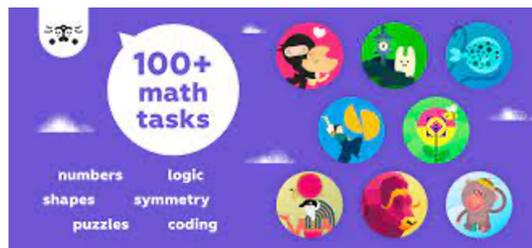


Update from Zahra Siddiqui: Funexpected Maths apps

Zahra is a second-year PhD student, and her PhD is funded by UBEL DTP and Funexpected, an educational maths app.

Zahra's PhD study is investigating factors affecting mathematical development and the use of educational maths app in supporting children's mathematical abilities. Currently, she is completing the analyses for the first study of her PhD, which utilises log-data from the maths app Funexpected to understand optimal dosage of maths training. This will allow us to understand how long children should spend practicing different mathematical abilities to become better at them. Once this project is complete, in the new year Zahra will begin her systematic literature review of mathematical intervention studies. This will then be plotted onto a theoretical framework. This study will provide mapping of the many different variables that influence mathematical development, and provide greater understanding of the relationship between variables, u.e, what should be taught about early maths foundations and in what order!

If you wish to contact Zahra, or have any questions about her project, you can contact her via email - zahra.siddiqui.18@ucl.ac.uk, or via Twitter - @ZahraSiddiqui95



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Who are we?

Founded in 2014, the CDLD unit is a research group consisting of academics, PhD students and researchers with a broad range of interests and expertise in how children learn and develop.

Lab director:

Dr Jo Van Herwegen

Deputy director:

Dr Laura Outhwaite

Researchers

Dr Elizabeth Burchell

Dr Afaf Manzoor

Dr Muhammad Shakir

Dr Erin Early

PhD-students

Erica Ranzato

Yi Wang

Tugce Cetiner

Unta Taiwo

Hannah Hamid

Research Students

William Taylor

Jaimie Leung

Kaiyue Jia

Chenxu Gao

Rebecca Connor

Laura Alderson

Marcella Lam

Victoria Levy

Isabella Wong

Sophie Yao

For more information about us or to apply to become a volunteer researcher, please see email j.vanherwegen@ucl.ac.uk

Meet the researcher!

Will Taylor

My name is William Taylor, I am a third year BSc Psychology at the University of Surrey on placement within the CDLD Lab.

I am interested in the clinical aspects of Psychology, especially around neurodevelopmental disorders and how they relate to anxiety and depression in young children and adolescents.

I am also interested in researching how various neurodevelopmental disorders affect the brain functions of children throughout their developmental stages, as well as how these conditions can affect their development, and display, of cognitive abilities.

This is why working in the lab is so useful and educational as it enables me to gain clinical experience as well as giving me the chance to apply my skills and knowledge within a professional research environment.

Within my placement, I am helping Jo within the Williams Syndrome Clinic, and with the running of the CDLD Lab. I am also helping with some of the ongoing research projects, such as the systematic review of the Feuerstein Instrumental Educational Intervention Programmes, where I have helped with data formatting and statistical tests.



Meet the researcher!

Unta Taiwo

My name is Unta Taiwo and it is a pleasure to join the CDLD lab after a career of nearly eighteen years in education. Over that time, I have worked as a primary school teacher in mainstream and special needs. This led me to become a special education needs and/or disabilities co-ordinator (SENDSCO), autism advisory teacher and senior leader for inclusion within mainstream schools.

My interests in the value and impact of intervention programmes has led me to explore charity work in children's mental health and well-being within school settings. The significance of interventional work also informed my motivation for further study. I have just completed an MSc in Child Development at UCL Institute of Education, where my dissertation explored the experience of an autism diagnosis from the perspective of young people and their parents. I am now delighted to start my PhD project with Dr Jo Van Herwegen, Dr Victoria Simms and Prof Michael Thomas, which will look at improving mathematical outcomes for children with William syndrome and Down syndrome (funded by Bloomsbury Studentship). I am driven by the way in which thoughtful education can be the vehicle that enables young people to reach their full potential, and this has underpinned my continued career path. Outside of studies, I have delivered teacher training in Lagos, Nigeria with a focus on implementing reading programmes in primary school settings. More recently I co-authored a children's storybook with an 11-year-old from Sheffield for Save the Children. When I'm not engaged with research, my happy place is with family on the Cornish coastline.



Meet the researcher!

Afaf Manzoor

My name is Afaf Manzoor. Currently, I am placed at Department of Psychology and Human Development, IOE, University College London. UK as post-Doc fellow on highly competitive scholarship, awarded by the Punjab Higher Education Pakistan. I am also serving as Assistant Professor in Department of Special Education at University of Education, Lahore. I am actively working for the moment of inclusive education in Pakistan to make education accessible for all children in the country. I am also the Member of the Federal committee on Inclusive Education for Single National Curriculum in Pakistan. This year, I have been elected as Member Board of Governance at Comparative Education Society of Asia (CESA). My recent publications highlight the sufferings of PWDs during Covid-19 pandemic in Pakistan.



My 18 years journey in the field of disability studies and research started with the Masters in Special Education from University of the Punjab, Pakistan with distinction. During my Masters research, I designed home based intervention program for children with Cerebral Palsy. I joined Department of Special Education initially as Special Education Teacher and later, I worked as head teacher in various special schools for more than 12 years. During my work in special schools, I realized that the existing structure of special education in schools is not fully equipped and ready to accept all children with disabilities. Especially children with Autism Spectrum Disorder, children having severe or multiple disabilities including severe behavior and health problems. This consciousness compelled me to step into the research and I published on inclusive practices, curriculum adaptation, teacher education for inclusion, diversity and adaptive assessment. I completed my MPhil from Allama Iqbal Open University Pakistan and did PhD from University of Management & Technology, Pakistan. My PhD research was unique indigenous study to address out of school children with disabilities and their hopes for inclusion in schools. The findings of study emerged distance from home to school as core lever of exclusion among other reasons that keep children with disabilities out of school in Pakistan.

I am cherishing my knowledge quest in UCL under the supervision of Dr. Zachray Walker, since I joined in February 2021 and got opportunity to engage in activities like research “Enriching Teacher Education for Diverse Learners”, teaching MASIE program, volunteer in organizing and presenting in Inclusive and Supportive Education Conference (ISEC)2021 with the team of Center of Inclusive Education. I am also connecting with studious IOE faculty. My interaction with Dr. Jo Van Herwegen inspired me to join the team of Child Development and Learning Difficulties Lab (CDLD). My current research at CDLD focuses on the development of literacy scale to include persons with disabilities in literacy measurement. Moreover, I am looking forward to collaborating with the team to investigate and facilitate the learning difficulties faced by children with Autism Spectrum Disorder and William Syndrome in Pakistan. I hope joining the team CDLD will enrich my professional experiences in many ways.

Afaf Manzoor (PhD) Email: afaf.manzoor@ucl.ac.uk afaf.manzoor@ue.edu.pk

Meet the researcher!

Hannah Hamid

Hello, I'm Hannah, a first year PhD student at the Child Development and Learning Difficulties Lab within the department of Psychology and Human Development. My background is in psychology and special education needs, having previously worked as an Honorary Assistant Psychologist. I current work as an Assistant Headteacher and SENDCo at a Primary and Secondary school. Working within education has enabled me to gain a deeper understanding of the barriers for students with special educational needs and I am passionate about ensuring that the education systems is as inclusive as possible for those with additional needs.

My research will investigate how interventions on parental involvement can impact parental engagement and the outcomes of students with special educational needs. Hopefully, this research will inform schools and parents on how to build meaningful partnerships that support the holistic development of students with special educational needs. I look forward to working with the CDLD lab and contributing to new developments and research.



Thanks for reading!



Do you have any questions about our activities? Or any questions about children's development you would like some answer to?

or are you interested in any CPD events for staff at your school or organization? Then please contact Jo on j.vanherwegen@ucl.ac.uk

At CDLD we work together with a number of other UCL based labs and centres.

- Centre for Educational Neuroscience (CEN): <http://www.educationalneuroscience.org.uk/>
- Centre for research in Autism and Education (CRAE): <http://crae.ioe.ac.uk/>
- Centre for Language, Literacy and Numeracy: Research & Practice (LL&NRP): <https://www.ucl.ac.uk/ioe/departments-and-centres/centres/centre-language-literacy-and-numeracy-research-practice>

twitter 



To stay up-to-date with our events: follow us on Twitter @CDLDlab or see our facebook page: <https://www.facebook.com/CDLD-Unit-Research-Group-238269226640000/>