

Developing Minds

Exploring Cognitive Diversity



Newsletter

Issue 10

**Kingston
University**
London

Foreword

Welcome to our first newsletter of 2024!

Our feature article is by Dr Fiona Barlow-Brown on the topic of letter reversals in children (see pages 5-10) which should be of interest to parents and educators.

You will be able to read about an interview with Dr Jocelyn Kwok, who is a new member of our lab (see pages 11-13) and you will also be able to see our recently published papers, conference presentations and funding news on pages 15-17.

We are holding a webinar about sleep in autistic children on 8th February and there are still places available so for further information and to register please see page 14.

We will be holding our annual Young Scientist event in the summer half-term so if you haven't yet done so, please 'like' our [Facebook page](#) so we can keep you informed about our research and future events.

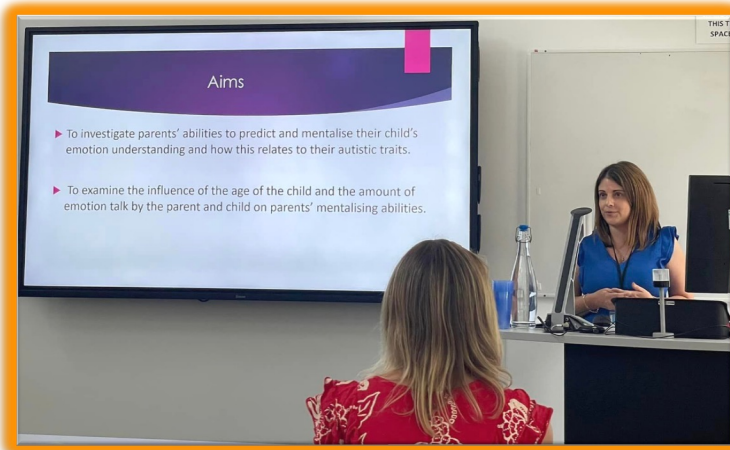
With very best wishes,

Dr Elisa Back
Director of the Developing Minds Lab
e.back@kingston.ac.uk

Recent Events



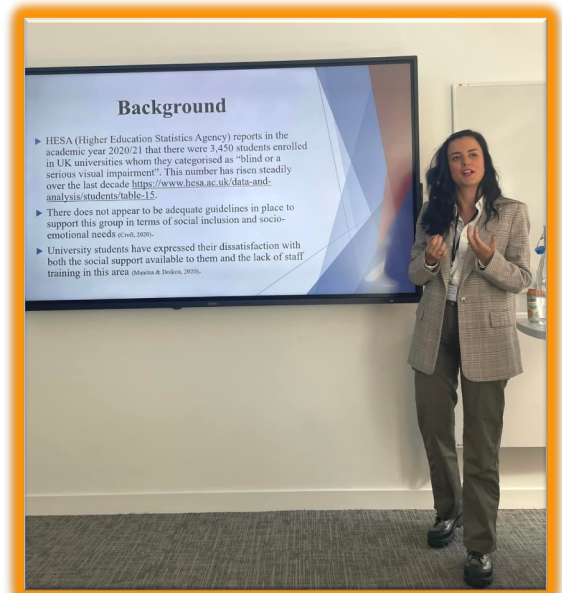
BPS Developmental Section Conference September 2023



Dr Elisa Back and Dr Ifigeneia Manitsa presented their research on socio-emotional development and neurodiversity at the BSP Cognitive and Developmental Section Annual Conference in Bristol.



We discussed our research with academics from across the UK and met collaborators from other universities.



Here are Elisa and Ifigeneia with Developing Minds Lab alumni and collaborator Dr Maria Livanou!



Invited talk – Dr Wendy Ross

13th December 2023



Thank you to our Developing Minds Lab alumni,
Dr Wendy Ross for being our
guest speaker!

Here are some of
our lab members
at a delightful
lunch with our
guest speaker.



Dr Wendy Ross, Senior Lecturer at London Metropolitan University, came back and presented a talk on “**Methodological messiness: A call for a multi-perspective approach to cognition**”.

It was incredibly insightful, and we enjoyed having her back!





Why do young children sometimes reverse their letters?

Written by: Dr Fiona Barlow-Brown

It's a very common sight – to see children getting their b's and d's confused! Sometimes it's other letters too, and even whole words or numbers! Sometimes the letters, numbers or words are back to front – sometimes even upside down! Children can reverse letters when reading them, and thus might read *big* as *dig*. They can also reverse their letters when writing even when copying from something written in front of them.



teapot tɛpɔt
tɛpɔt tɛpɔt
teapot tɛpɔt
tɛpɔt teapot
tɛpɔt tɛadɔt

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Is it really that common?

YES! Fischer and Tazouti (2012) found that 95% of the 356 x 5–6-year-old children they studied reversed at least one character in their study. They found no relationship between age, gender or whether children were left or right-handed. In fact, many studies show that letter reversals are still fairly common to around 8 years of age. Obviously, there are individual differences – there is not a cut-off point when you have your eighth birthday!



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How can we explain it?

For a long time, researchers believed that being left-handed, your gender or being dyslexic were possible explanations. However, research has since suggested that this is not the case. It would appear that letter confusions and mirror writing are far more general across the population.

Lots of different theories have been proposed to explain this phenomenon. Historically the argument centred around whether the explanation was more likely to be perceptual (e.g. Dehaene et al., 2010) or motor driven (e.g. Della Sala & Cubelli, 2007).

Perceptual theories relate to the theory of mirror generalization where mirror reversals occur when mirror generalisation is not suppressed (Perea et al., 2011).



How can we explain it?

Effectively here the argument is that our brains evolved to “mirror generalise” - that is recognise an object as the same thing whichever way it is facing. Of course, when learning letters, we need to be able to suppress this or we will confuse letters like “b” and “d”. Motor explanations in the past have related the phenomenon to whether people are writing with their dominant or non-dominant hand, but little work has been done on this with children. Della Sala and Cubelli (2007) use the term 'directional apraxia' and discuss whether young children have the knowledge to understand what is an appropriate writing direction; stating that mirror writing relates to “... the unavailability of the appropriate movement direction representation ... because the right configuration has yet to be specified fully...” in children learning to write.



An alternative theoretical explanation which has been proposed is the statistical learning hypothesis, this suggests the phenomenon occurs because children learn early on that there is a bias towards letters and digits facing towards the right (Treiman & Kessler, 2011). A more recent implicit writing direction character-facing bias theory (Fischer, 2017) suggested that children are more prone to write letters in the direction of their writing which could explain certain reversals. Overall, in more recent years, research seems to favour mirror writing to be a perceptual phenomenon, with a relationship found between difficulty in discriminating correctly orientated and reversed letters (McIntosh et al., 2018).

How can we explain it?

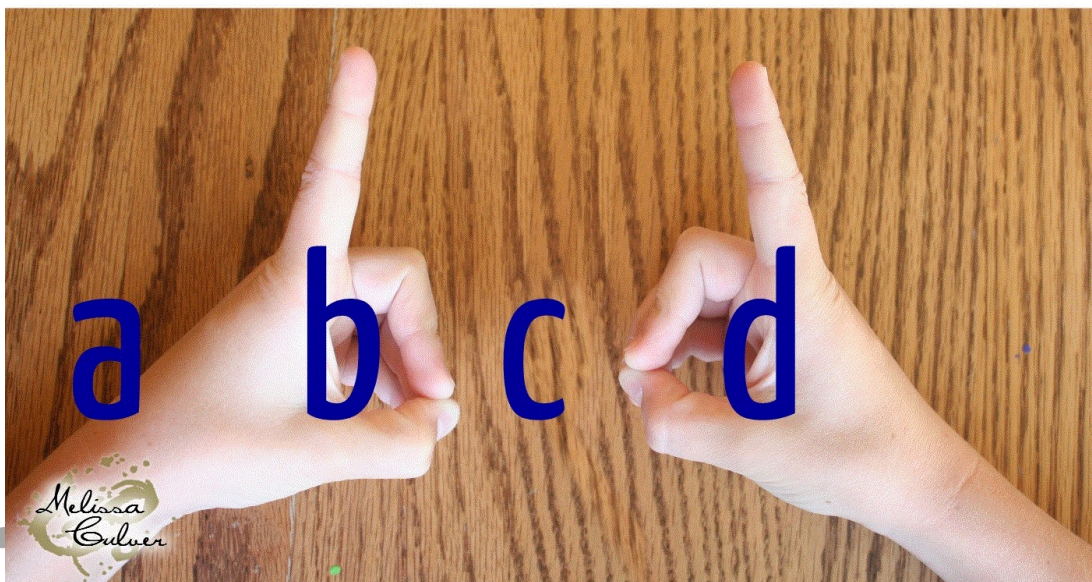
However, very recently researchers in France (Fischer & Luxembourger, 2022) have looked more closely at the relationship between children “confusing” the letters b and d, and the phenomenon of children “reversing” letters and digits in their writing. They state “.These results seem to rule out the possibility that the same process leads to reversing characters (letters or digits) in writing and misrecognizing b as d (or vice versa). This is the first study reporting strong empirical evidence that the processes of reversal and confusion are very different. Consequently, it would be a mistake to treat confusion between b and d as the reversal of b into d (and vice versa).” It would appear then that there are still plenty more questions to ask and answer in this area!

Are there strategies for children to try to remember which way around the letters go?

Yes. One great strategy is to get children to imagine the word bed. Imagine a bed with the stalks of the b and the d making the bedhead and the foot of the bed. This helps them remember which letter is which. Children can either try to write the word bed in the air or they can use their hands as in the picture below to form the front end and bottom end of the bed (or more importantly a “b” and a “d”!

b and d Confusion?

Think about the alphabet and use your hands.



Other strategies include practicing writing b's and d's using wide sweeping motions in the air whilst saying the appropriate letter or writing the letters with your finger in trays of sand. Make it fun! You can make fun games with plastic letters and get children to try to sort them with their eyes closed. Perhaps make a bingo card of lots of pictures of objects beginning with the two letters they most frequently confuse and get them to write the first letter under each picture.



However, it is worth remembering that whilst children might find specific letters confusing (both in their reading and their writing) – research (such as that discussed in this article) suggests that this is part of typical development!

Research by Dr. Barlow-Brown and colleagues has been looking further at letter reversals in different mediums, the potential overlap between different theoretical explanations and the impact of different interventions on the frequency of errors.



References:

- Dehaene, S., Nakamura, K., Jobert, A., Kuroki, C., Ogawa, S., & Cohen, L. (2010). Why do children make mirror errors in reading? Neural correlates of mirror invariance in the visual word form area. *Neuroimage*, 49(2), 1837-1848.
- Della Sala, S., & Cubelli, R. (2007). Directional apraxia: A unitary account of mirror writing following brain injury or as found in normal young children. *Journal of Neuropsychology*, 1(1), 3-26. doi:10.1348/174866407X180783
- Fischer, J. (2017). Character reversal in children: The prominent role of writing direction. *Reading and Writing: An Interdisciplinary Journal*, 30(3), 523-542. doi:10.1007/s11145-016-9688-y
- Fischer, J.-P., & Luxembourger, C. (2022). Typical 6-year-old children's confusion between "b" and "d" in reading cannot be assimilated to reversal. *Reading & Writing*, 35(10), 2433–2451. <https://doi.org/10.1007/s11145-022-10290-6>
- Fischer, J.-P., & Tazouti, Y. (2012). Unraveling the mystery of mirror writing in typically developing children. *Journal of Educational Psychology*, 104(1), 193–205. <https://doi.org/10.1037/a0025735>
- McIntosh RD, Hillary K, Brennan A, Lechowicz M. (2018) Developmental mirror-writing is paralleled by orientation recognition errors. *Laterality*. 23(6):664-683. doi: 10.1080/1357650X.2018.1445748.
- Perea, M., Moret-Tatay, C., & Panadero, V. (2011). Suppression of mirror generalization for reversible letters: Evidence from masked priming. *Journal of Memory and Language*, 65(3), 237–246. <https://doi.org/10.1016/j.jml.2011.04.005>
- Treiman, R., & Kessler, B. (2011). Similarities among the shapes of writing and their effects on learning. *Written Language and Literacy*, 14(1), 39–57. <https://doi.org/10.1075/wll.14.1.03tre>

Meet the Researcher

As you may now know, Developing Minds 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.

We are very happy to tell you more about Dr Jocelyn Kwok in this interview.

Jocelyn, your research focuses on children's literacy, cognitive development, and learning difficulties in reading. Can you tell us more about this and how/why you got interested in it?

My interest in children's literacy, cognitive development, and learning difficulties, particularly in reading, stems from my personal experience. I have two younger siblings who faced challenges in learning at an early age, and they were eventually diagnosed with dyslexia and ADHD. Observing their struggles, I realised that the support and interventions available for children with these difficulties were insufficient and sometimes ineffective due to their diverse underlying needs.

This sparked my interest in teaching and supporting children with learning difficulties. Consequently, I was motivated to pursue a career as an educational psychologist and engage in research that focuses on literacy development and learning disorders. I aim to develop more targeted and effective interventions that cater to the specific needs of children with learning disabilities. This field is not only professionally fulfilling but also close to my heart, as it resonates with my personal experiences and the desire to make a meaningful difference in the lives of children facing similar challenges.



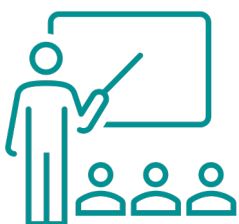
What about being a researcher do you love the most?

What I love most about being a researcher is the excitement of exploring new ideas and breaking new ground. There's something incredibly rewarding about venturing into topics that not only push the boundaries of theoretical development but also have practical implications, especially in education. For me, the excitement lies in the fact that my research can directly impact teaching and learning practices. Additionally, the process of developing innovative methods to investigate these topics is something I find particularly fulfilling. It's like solving a complex puzzle, and each piece of the puzzle not only enhances our understanding but can also make a tangible difference in the real world. That blend of theoretical exploration and practical application is what keeps my passion for research alive.



Has there been any challenges you faced during your research career and what were they?

One of the most challenging periods in my research career was undoubtedly during the COVID-19 pandemic, particularly when it came to data collection. The pandemic posed significant difficulties in recruiting participants, which was a crucial part of my research. Given that my studies typically require face-to-face interaction to gather data, the restrictions and health concerns during the pandemic made this process exceptionally challenging. Additionally, I had to balance these difficulties with the need to stick to a strict data collection timeline. It was a tough period, but it also taught me a lot about adaptability and resilience in research.





What do you like to do when you are not working on research?



When I'm not immersed in my research, I often find myself cycling. It's not just about the exercise for me; it's also a chance to observe the world around me, to take in the everyday sights and sounds. I find this particularly enjoyable as it connects me with nature. There's something incredibly refreshing and grounding about being outdoors and experiencing the natural environment, which provides a wonderful balance to my work.

Finally, what advice would you give to a student researcher or a researcher early in their career?

This question resonates with me as I'm also in the early stages of my research career. Well, I believe it's crucial to stay true to your initial passion and maintain a sense of curiosity. These qualities are vital for developing innovative and impactful ideas in research. No matter how outlandish your ideas might seem at the moment, they could potentially contribute to a larger theory in the future. Who knows? Your 'nonsense' idea today might be a part of a groundbreaking theory tomorrow. So, my advice is to hold onto that original spark that drew you to research and keep questioning, exploring, and imagining.



A Guide to Understanding Autism

and Sleep Across
Development

**Thursday 8th
February 2024
12-1 pm**

Please register for the event
with this link or QR code:



<http://www.kingston.ac.uk/sleep>

We invite parents, carers, and autistic adults to our webinar, where we will discuss the autism research projects of the Developing Minds Lab, as well as a special talk about sleep across the lifespan.

Recent Publications

Roche, M., **Back, E.** & Van Herwegen, J. (2023). Parental Perspectives on the use of fidget toys and sensory-seeking profiles in autistic and neurotypical children. *Current Psychology*, 1046-1310. DOI:[10.1007/s12144-023-05483-3](https://doi.org/10.1007/s12144-023-05483-3)

Manitsa, I. (2023). Conceptualising social inclusion and examining its relationship with social competence. *British Journal of Visual Impairment*. <https://doi.org/10.1177/02646196231212744>

Heneghan, A., **Manitsa, I.**, Livanou, M., & Treasure, J. (2023). The perceived experiences of having a sibling with an eating disorder: A systematic review of the literature. *European Eating Disorders Review*. <https://doi.org/10.1002/erv.305>

Day, Ed., **Manitsa, I.**, Farley, A., & Kelly, J. (2023). A UK national study of prevalence and correlates of adopting or not adopting a recovery identity among individuals who have overcome a drug or alcohol problem. *BMC Substance Abuse Treatment, Prevention & Policy*. <https://rdcu.be/droEY>

Manitsa, I., **Barlow-Brown, F.**, & Livanou, M. (2023). Evaluating the role of social inclusion in the self-esteem and academic inclusion of adolescents with vision impairment. *British Journal of Visual Impairment and Blindness*. <https://doi.org/10.1177/02646196231183888>

Hsieh, S. S., Kao, S. C., Raine, L. B., Lloyd, K. M., Pontifex, M. B., & Hillman, C. H. (2023). Acute bouts of aerobic exercise do not modulate task-evoked midfrontal theta oscillations in school-age children. *Journal of Cognitive Enhancement*. <https://doi.org/10.1007/s41465-023-00281-y>

Media Engagement & Invited Talks

Manitsa, I. (11 November 2023). *Social Emotional Wellbeing and VI Session*. Vision Impairment Centre for Teaching and Research (VICTAR) Weekend Residential 11-12 November 2023, School of Education, University of Birmingham, UK.

Manitsa, I. (29 November 2023). *The social and emotional needs of students with vision impairment in Higher Education*. Oral presentation at the Event for Disability History Month, University of Birmingham, UK.



Conferences

Back, E. & Tenenbaum, H. (September 2023). Parents' mentalising abilities and the role of autistic traits and emotion talk. *British Psychological Society Developmental Section Annual Conference*, Bristol, U.K.

Manitsa, I., & Livanou, M. (18 November 2023). *Digital interventions in the school environment: Presentation of research data and suggestions of future research and practice*. Online workshop at the 2nd International School Psychology Conference of Hellenic Association of School Psychology (HASP); 17-18 November 2023, online.

Manitsa, I., Livanou, M. **Barlow-Brown, F.,** Burnett Heyes, S., Gardia, N., Siegfried, O., Clarke, Z.*, Coelho, H.*, & De Caro, A. (22 September 2023). *Developing an educational game for the school inclusion of students with vision impairment*. Oral presentation at the online Nystagmus Network international nystagmus research symposium 2023; 22 September 2023, Nystagmus Network, UK. *authors contributed equally

Manitsa, I., Livanou, M. **Barlow-Brown, F.,** Burnett Heyes, S., De Caro, A., Gardia, N., Siegfried, O., Clarke, Z.*, Coelho, H.*, & De Caro, A. (14 September 2023). *Preventing the school exclusion of adolescents with sight impairment: The development of a digital intervention based on adolescent and adult advisory groups*. Oral presentation at the BPS Cognitive and Developmental Sections Annual Conference 2023; 12-14 September 2023, Bristol, UK. *authors contributed equally

Livanou, M. & **Manitsa, I.** (14 September 2023). *Development of ReGoal, a serious mobile game-application for young people 11-16 years with conduct problems*. Oral presentation at the BPS Cognitive and Developmental Sections Annual Conference 2023; 12-14 September 2023, Bristol, UK.

Manitsa, I., Hewett, R., **Barlow-Brown, F.,** Thurston, M., & Roe, J. (13 September 2023). *Discussing the rationale and providing updates on a research project aimed at developing university guidance for students with vision impairment in Higher Education*. Oral presentation at the BPS Cognitive and Developmental Sections Annual Conference 2023; 12-14 September 2023, Bristol, UK.

Manitsa, I., & **Barlow, Brown, F.** (12 July 2023). *The relationship between the development of social relationships at school and academic inclusion in adolescents with and without vision impairment*. Oral presentation at The Child Vision Society's 2023 Biennial Meeting (CVRS): Child Vision and Visual Impairment – Advances in Science and Related Practice; 12-14 July 2023, UCL Great Ormond Street Institute of Child Health, London, UK.

Manitsa, I. & **Barlow, Brown, F.** (12 July 2023). *The relationship between school engagement and social competence in adolescents with and without vision impairment and ways forward*. Poster presentation at The Child Vision Society's 2023 Biennial Meeting (CVRS): Child Vision and Visual Impairment – Advances in Science and Related Practice; 12-14 July 2023, UCL Great Ormond Street Institute of Child Health, London, UK.



Funding



Digital Communication within a neurodiverse framework: supporting Google's clients and users (2023-2024)

Funder: *Higher Education Innovation Fund*

Grant amount: £10,000

Awarded to: Dr Elisa Back

Google's Read-Along App: Reading intervention for autistic children (2023-2024)

Funder: *Higher Education Innovation Fund*

Grant amount: £10,000

Awarded to: Dr Elisa Back

Redefining Sleep: Empowering Autism Through a Participatory Approach

Funder: *First Grants scheme, KU*

Grant amount: £9,930

Awarded to: Dr Dina Spano (PI), Dr Elisa Back, Dr Ifigeneia Manitsa and Dr Katharine Clifford



Portable and wearable devices and inventory for eating disorder

Funder: *Research Investment Fund KU*

Grant amount: £50,000

Awarded to: Stone Hsieh

Co-producing the ActiGamer trial with children with ADHD

Funder: *Pump-priming Fund – Faculty of Business and Social Sciences, KU*

Grant amount: £10,000

Awarded to: Stone Hsieh



Developing Minds

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questions.

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read in our next newsletter

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events will follow

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