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Session I: The Developing Mind

Moderator: Penny Van Bergen

School of Education, University of Wollongong

pennyvb@uow.edu.au

I'm delighted to introduce this invited series on The Developing Mind, originally presented at a 2023 Symposium of the NSW Royal Society entitled "Our 21st Century Brain." Child development is crucial for both happiness and health functioning, with positive childhood trajectories precipitating lifelong success.

One approach to presenting papers in this series is to move in chronological developmental order, with insights related to infant development followed by child and then adolescent development. However, because development itself overlaps in multiple different ways, all four papers in this series necessarily overlap in ages and developmental pathways.

Together these papers draw on neuroscientific, social, cognitive, and behavioural methods. They address questions of nature and nurture and draw on our understandings of how developing cognitive and socio-emotional skills, including memory, attention, executive function, self-regulation, and more, can support children to thrive in an increasingly complex social world. They also consider notions of typical development, including what should be expected for all children in terms of brain development and function at different developmental milestones, and where we might naturally see individual differences between children. Finally, they necessarily highlight cases where thriving might be at threat.

Professor Adam Guastella (The Children's Hospital Westmead Clinical School and the Brain and Mind Centre at The University of Sydney), commences with a discussion of how translational neuroscience can offer insights into children's typical and atypical neurodevelopment. He focuses particularly on executive function and attention, and on the increasing identification of autism and other neurodevelopmental conditions.

Professor Sharynne McLeod (The School of Education at Charles Sturt University) discusses the critical and universal role of speech, language, and communication for engagement in the social world. Speech, language and communication skills develop rapidly in early childhood, and there is much that parents can do to support this development. Importantly, however, early difficulties with communication can cause cascading challenges in other domains.

Professor Anne Castles (the Australian Centre for the Advancement of Literacy at the Australian Catholic University) discusses children's development of reading and literacy skill and the specific case of children with dyslexia. Astute readers will notice an interesting distinction between McLeod's work on speech and language and Castle's work on literacy. Although both support communication in a modern world, there are quite different mechanisms of development: language is what evolutionary psychologist Geary (2007) calls "biologically primary knowledge," acquired via everyday

interactions the environment, while literacy draws on "biologically secondary knowledge" and requires explicit instruction. Such instruction is particularly important for children experiencing reading difficulties.

Finally, Associate Professor Kate Highfield (the Faculty of Education at the University of Canberra) discusses child development in digital contexts. Importantly, the human brain has not substantially changed for millennia. What has changed, however, is the social world in which children develop: the kinds of tasks we ask children to complete, the people who are around them, and the demands that fall to them at home, school, and online. Digital technologies are ubiquitous, offering opportunities for both learning and connection. However, an excess of poor quality digital experiences also pose threats to development.

When reading through these informative papers, new themes emerge that cut across developmental domains. First, all four papers highlight challenges in development for Australian children. McLeod highlights the alarming statistic that one in four Australian children may not meet speech and language milestones, for example, while Castles discusses the difficulties that a child with dyslexia might make in learning to read. Highfield discusses the challenges for development of excessive and low-quality screen time. Second, and as highlighted by McLeod, there are important questions about long term implications if specific challenges are not addressed in early development. Guastella addresses this question in his discussion of early intervention and the use of novel and personalised therapies, while Castles foreshadows her new research examining the social, motivational, and educational implications of poor literacy for adolescents who did learn to read well in childhood. Third, there are themes about the specific role that parents, teachers, and others play in supporting children to thrive in different domains. Highfield challenges everyone, audience included, to consider the quality of digital experiences and not just the screen-time. McLeod highlights the importance of a rich and immersive home environment, while Castles highlights the importance of high-quality instruction. Fourth, and touching on questions of neurodivergence, there are discussions of individual differences between children. These themes naturally lend themselves to the question: when are individual differences between children cause for celebration and when should we be worried? Finally, there is a cognisance of potential sociocultural differences in development. Here, all four presenters go directly to this point: identifying where findings translate across language backgrounds, contexts, or cultures, and highlighting areas where they may not.