Greetings from the Macquarie Reading Program!

Happy New Year! 2016 has been a very busy year for our group, with our researchers involved in various projects, including those we are pleased to feature for you across this newsletter. We also highlight here the Macquarie University Cognition Clinic for Reading, and the launch of their professional development workshop program in 2016.

In March 2016, we ran a successful workshop on 'Learning New Words' as part of the CCD’s Developing Mind Series, and we are currently engaged in preparations for the 'Reading and Spelling Workshop 2017' to be held in September at Macquarie University. Please Save the Date for this upcoming workshop: 27-28 September.

We continue to provide expert opinion on our research findings to the media - including through pieces we have written for The Conversation. One such piece, “Why Australia should trial the new phonics screening check” (The Conversation, Dec 2016) exemplifies the input and support we provided for the trial of a Year 1 phonics screening test in Australia.

Many thanks for your involvement and your interest in the Macquarie Reading Program across 2016, and we look forward to your continued support in 2017!

Low self-concept in poor readers: prevalence, heterogeneity, and risk

Genevieve McArthur, Anne Castles, Saskia Kohnen, and Erin Banales

We have known for many years that children who struggle to learn to read are more likely to suffer from academic failure than typical readers. It is only in the last decade or so, though, that we have become increasingly aware that poor reading also puts children at risk for problems with their emotional health, such as anxiety, depression, and low self-concept. Studies of poor readers’ emotional health have so far been ‘group studies’. This means that they have compared the average scores of a whole group of poor readers to a whole group of typical readers on tests of emotional health (e.g., self-concept). While such group studies are important in new areas of research, they can sometimes be misleading because if a group of poor readers has a low average score on an emotional health test compared to typical readers, this is often taken to suggest that ALL poor readers have low scores on that test. However, this ignores the fact that many studies have shown that poor readers are a highly heterogeneous group (i.e., they are not all the same). Thus, it seems highly unlikely, if not well nigh impossible, that all poor readers have poor emotional health.

The aim of our research was, therefore, to determine if different ‘types’ of poor readers differ in a certain aspect of their emotional health - their self-concept. We tested 77 children with poor reading for different types of self-concept, reading, spoken language, and attention. We found something quite interesting. Children who ‘only’ had a reading problem (i.e., they had typical spoken language and attention) had no self-concept problems. However, poor readers who also had poor attention had low academic self-concept, while poor readers who also had poor spoken language had low academic self-concept and low general self-concept. These findings support the idea that not all poor readers are at equal risk of low self-concept. Thus, it is important to carefully test every poor reader for their self-concept to see whether or not they need extra support for their self-concept in addition to their poor reading.

Nonlinear spelling

*Teresa Schubert and Lyndsey Nickels*

We have recently been investigating the phenomenon of 'nonlinear spelling', which is the tendency of some individuals with dysgraphia (spelling difficulty) to write the letters of words in a nonlinear temporal order.

The spatial ordering of the letters is maintained: Letters in the later positions of the words are written towards the right side of the response, though they might be written before letters in earlier positions. For example, the word NOSE might be written by beginning with the S in the middle of the line and then adding the N, O and E in their appropriate positions.

The decoupling of the temporal and spatial aspects of spelling in these instances can contribute to our knowledge of the cognitive spelling system. So far we have studied responses from one individual, but we hope to find others who write this way. Anecdotal reports from other researchers around the world suggest that this phenomenon, though unusual, may not be rare.

Blood flow in the brain when you’re listening really hard!

*Julianne Pascoe, Nicholas Badcock, and Eugene Chekaluk*

Have you ever wondered what’s happening in your brain when you’re listening very hard? Like when someone’s talking to you in a busy café but lots of other people are also talking?

This is exactly what Julianne Pascoe studied for her honours research project this year. Working with Nicholas Badcock and Eugene Chekaluk, Julianne used neuroimaging to measure the speed of blood flow in the two halves of the brain. Her results were a little surprising and very interesting!

By comparing the blood flow in the two halves (or hemispheres) of the brain, we are able to check which side is doing more of the work. For example, when most people use language, the left side of the brain is more active. That is, more of the neurons are firing. After the neurons fire, the body restores their energy resources with a fresh supply of blood. The amount of activity can be estimated by the speed of blood flow: more activity leads to faster flow.

This project used ‘functional Transcranial Doppler Ultrasound’ to do this. This involves focusing an ultrasound beam on blood vessels in the brain, through the skull, and analysing the change in sound to determine speed. Just like the change in sound when a car drives past.

Using this technique, Julianne presented participants with spoken sentences ‘in crowd speech’ as background noise. The volume of crowd speech was either low or high to create easy and hard listening tasks. The surprising result was that when the task was easy, the right hemisphere was most active. In contrast, and as we expected, when the task was hard, the left hemisphere was most active. We think the left hemisphere is specialised for processing the sounds in speech which are also important for reading. This makes sense with respect to our finding that the level of activity in the hard task was strongly related to reading ability.

Findings like this help us to understand the role of neural specialisation for language processing and its potential importance for learning to read. One day, we hope to use this understanding to support neural specialisation in people with reading difficulties.

Dyslexie font: No miracle cure for those who struggle with reading

*Eva Marinus*

Christian Boer, a Dutch artist, developed a special font in 2008 (“Dyslexie”) to facilitate reading in children and adults with dyslexia. The font received much media attention worldwide (e.g., TheGuardian.com, Slate.com, TheAtlantic.com, USA Today, io9.com).

Interestingly, there was barely any empirical evidence for the efficacy of Dyslexie. Therefore we investigated whether Dyslexie is more effective than a commonly used sans serif font (Arial) and, if so, whether this can be explained by its relatively large spacing settings.

In our research we tested 39 English speaking low-progress readers from grades 2 to 6. The children were asked to read texts of similar difficulty in Arial and Dyslexie font that had the same letter-display size, but differed in the degree of word and letter spacing. Our findings show that the Dyslexie font increased reading speed by just 7%.
To put this into perspective, in order to match the reading speed of normal readers at least a 70-100% improvement is needed. Importantly, the same gain could be obtained with Arial font when we enlarged the spacing settings. We are thrilled by the media coverage of these research outcomes – which were featured in The Australian, Channel 7 News, the SPELD Foundation newsletter and The Conversation.

This study was a joint effort of researchers from MultiLit, the CCD and from Radboud University Nijmegen (The Netherlands).

Dyslexia and foreign language learning
Alexa von Hagen, Saskia Kohnen, and Nicole Stadie

Parents, teachers and clinicians are often concerned that learning a foreign language will be too difficult for children with dyslexia. Will the difficulties these children have in their first language transfer to the foreign language? Will they face more difficulties than their classmates without dyslexia? Which foreign language skills will be especially difficult?

Unfortunately, there is little evidence to guide decision-making about dyslexic children's foreign language education.

Our project aims to investigate these questions by assessing foreign language abilities of children with and without dyslexia. We tested 64 Year 6 students in 4 primary schools in Germany, learning English as a foreign language. We found that, as a group, children with dyslexia performed more poorly on second language literacy tasks and expressive vocabulary, but not on other spoken second language tasks like receptive vocabulary, and hearing and producing sounds.

Importantly, half the poor readers/spellers performed at the same level as the control group on all second language measures (including written and spoken tasks). These findings indicate that children with poor literacy skills in their first language can successfully learn a second language.

We are currently trying to determine if we can predict which children with dyslexia will perform within the average range on foreign languages. The next step will be to assess a similar group of Australian students learning German as a foreign language. We hope our results will offer valuable information about the factors that are associated with successful second language attainment for children with dyslexia.

Macquarie University Cognition Clinic for Reading: 2016 Update

The Macquarie University Cognition Clinic for Reading provides research-based assessments and intervention for people with reading and spelling difficulties. Assessment and treatment sessions can be live-streamed (e.g., via Skype), so there is no need to physically attend the Clinic for assessment or treatment. The Clinic also offers consultancy services, and professional development for teachers and clinicians who are supporting those with poor reading and spelling. In 2016, the Clinic launched their professional development workshop program, conducting three workshops aimed at an audience of clinicians, teachers and volunteers, and presented by experts in the field.

‘Assessment and treatment approaches for children with reading difficulties’
Dr Saskia Kohnen, 26th October

Dr Kohnen presented her much-anticipated one-day workshop aimed at clinicians and teachers, where she discussed the evidence-based assessment and treatment of reading and spelling difficulties focusing on primary school-aged children. It was a great day with excellent feedback, and a fantastic introduction to our workshop program.

‘How to make evidence-based decisions about treatments for poor readers’
Professor Genevieve McArthur, 24th November

This half-day workshop provided a step-by-step guide on how to make evidence-based decisions about interventions for poor readers. Attendees were taught techniques on how to make well-informed decisions based on the current literature, through interactive and engaging computer activities and discussions.

‘Working memory & reading difficulties’
Dr Erin Banales, 6th December

Dr Banales presented this one-hour seminar on methods of intervention for children with dyslexia, including the role of verbal working memory training in treating reading difficulties, the implications of poor working memory in the classroom and how these difficulties may be supported.

For more information about the Clinic and the 2017 workshop program, visit: mq.edu.au/reading-clinic or phone (02) 9850 6889
Other 2016 Highlights

**Developing Mind Series - 'Learning New Words' Workshop**

The 'Learning New Words' workshop was held in March 2016, as part of the CCD's Developing Mind Series.

This workshop explored children's acquisition of spoken and written words, covering factors affecting word learning, including the role of sleep in the lexical consolidation process, and incorporated studies with children, as well as adult studies that have developmental implications.

The workshop featured the following presentations:

- **'Word learning: The long and short of it'**
  Professor Gareth Gaskell
  University of York, UK

- **'Orthographic learning, fast and slow'**
  Professor Kate Nation
  University of Oxford, UK

- **'The bedtime story effect: Lexical consolidation in children'**
  Dr Anna Weighall
  University of Leeds, UK

**CCD joins new FIVE from FIVE Alliance**

The Centre for Independent Studies’ FIVE from FIVE project is a new reading program aiming to improve literacy levels in Australian children, which launched on 8th March, 2016.

The CCD supports the FIVE from FIVE project and has joined the 'FIVE from FIVE Alliance', which brings together various organisations supporting the promoting of effective, evidence-based reading instruction. Further information about the project is available via the FIVE from FIVE website: [fivefromfive.org.au](http://fivefromfive.org.au)

**'Outside the Square' - Dyslexia education and advocacy films**

Professors Anne Castles and Genevieve McArthur featured in 'Outside the Square' - a series of films to increase understanding of dyslexia in our education system. For more details, visit the website: [https://vimeo.com/ondemand/outsidesquare](https://vimeo.com/ondemand/outsidesquare)

**Is your child interested in participating in research?**

The Neuronauts Brain Science Club is a register of young people (0 - 17 years) who are interested in taking part in research projects investigating language, reading and social skills. Many reading research projects, like those described in this newsletter, will be advertised through Neuronauts.

Once registered, children can sign up for relevant studies. Parents are reimbursed for their time and travel costs, and children receive certificates and other rewards.

For more details (as they become available) and to register, please visit: [ccd.edu.au/neuronauts](http://ccd.edu.au/neuronauts) OR email: neuronauts_admin@mq.edu.au

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- **Twitter:**
  - CCD: @CCD_Outreach
  - MQ Reading Clinic: @MQreadingclinic
  - Anne Castles: @annecastles
  - Genevieve McArthur: @genxmac
  - Nicholas Badcock: @nicalbee
  - Eva Marinus: @EvaMarinus
  - Hua-chen Wang: @Huachen_Wang
  - Robin Litt: @LITTerate
  - Teresa Schubert: @TeresaSchubert
  - Max Coltheart: @maxcoltheart

- **Facebook:**
  - Macquarie University Cognition Clinic for Reading: @MQCognitionClinic

**SAVE THE DATE: READING AND SPELLING WORKSHOP 2017**

**27 & 28 September, 2017**

**Macquarie University**

Following from the success of the CCD Reading and Spelling Conference in April 2015, we are pleased to announce a two-day Reading and Spelling Workshop planned for **27th-28th September, 2017**.

This workshop, hosted by the ARC Centre of Excellence in Cognition and its Disorders, in conjunction with the Macquarie University Cognition Clinic for Reading, aims to bring together leading researchers from around the world to discuss reading and spelling development, disorders, remediation and related policy. Our intended audience includes teachers, school counsellors, clinicians, parents, and researchers.

For more details (as they become available) and to register, please visit: [ccd.edu.au/events/conferences/2017/readingspelling](http://ccd.edu.au/events/conferences/2017/readingspelling)