Putting misconceptions about dyslexia to rest

Recently there has been debate around the term “dyslexia” and whether or not it is a useful word or concept. Though much of the debate is about how the word “dyslexia” affects things such as treatment decisions, a key part of the argument for eliminating the term is related to the way it is used and understood by the general public. Some researchers and clinicians feel that the term is used much too broadly, and should be eliminated and replaced by something clearer such as “reading disability” or “reading impairment.”

We don’t plan to settle that debate, but whether we use “dyslexia” or “reading impairment,” the question of what that means is critical. To reduce miscommunication between us as researchers and others discussing reading problems, here is what we mean (and don’t mean) when we discuss or publish articles about dyslexia and reading impairments:

- Reading impairment is not a single problem: Though it may not feel like it to many of us, reading is a very complex task that involves many sub-skills and processes. It requires identifying and ordering letters, mapping letter patterns to sounds, and accessing knowledge stored in memory (among other things). This means that the process can fail in a variety of ways, so we will almost never say “dyslexia” or “reading impairment” without first discussing what kind of impairment we mean. Does the reader have trouble reading new words they have never seen before? Do they mistake broad for board more often than others their age? Do they read have to rhyme with save? Do they have trouble understanding what they have read? These are different problems that don’t necessarily go together (and there are others).

- No single treatment will work for all reading impairments: Since reading involves many different processes, any particular struggling reader may have difficulty in one or more of them. The particular difficulty they have determines the treatment they need. Based on current evidence, we believe that effective treatment of a struggling reader requires first identifying the specific reading problems the reader has, and then designing a reading-based program to develop the skills that have fallen behind. This means that one-size-fits-all treatments will not be effective for many readers with dyslexia.

- Dyslexia and reading impairment are about problems with reading: That may seem obvious, but sometimes problems in other areas become so strongly associated with reading impairments that they start to be mistaken for dyslexia. For example, sometimes people with reading difficulties also have problems with working memory. This has led people to say things like “David forgets his homework a lot because he’s dyslexic,” which is

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not correct. If it were, then everyone who has dyslexia should also have memory problems, but this is not at all the case. Reading is a complicated task and problems can come up in a lot of different ways. A person with a problem in working memory does not have dyslexia unless they also have a problem with reading. A person with a reading problem may have no problems with working memory, but they still have a reading impairment. This is also true of motor skills, executive functioning, and a variety of other non-reading skills. In the extreme, one website claims Leonardo da Vinci had dyslexia not because of any evidence that he had trouble reading, but because he could write backwards and reversed (as in a mirror image). This is clearly using the term far too broadly.

Reading and spelling are related, but not the same: Some definitions of dyslexia include spelling problems. We do not. Spelling and reading are different skills even if they are both based on written language. There are some processes involved in both spelling and reading, so some people will have problems in both skills. But there are also processes that are specific to each task. As with working memory, this means that some people with spelling impairments do not have reading impairments and vice versa. To avoid grouping different problems together, we prefer to use the distinct terms dysgraphia or spelling impairment for problems in spelling, and dyslexia or reading impairment for reading problems.

Here are a few other things that are important to keep in mind when talking about dyslexia:

Reading skill and intelligence are not the same. Most children with low intelligence scores learn to read perfectly well, and many children who struggle to learn to read have high intelligence scores. Having a reading impairment doesn’t mean you are either stupid or smart. It means you are a person who has trouble reading.

Research has found that genetics sometimes plays a role in reading difficulties. Sometimes the phrase “genetic cause” is mistaken for “there’s nothing anyone can do.” This isn’t true for reading difficulties. No matter the cause of the dyslexia, there are treatments that can help.

Some children who are struggling to learn to read are struggling because of classroom teaching methods. Effective teaching methods for reading should always include systematic teaching of phonics, particularly in the early years.

Coloured lenses, coloured paper, or doing gymnastics are not effective treatments for any form of dyslexia. There are many more “snake oil” treatments out there, and many of them have been adopted by school boards and education administrators with no reliable evidence to support them. Currently, the evidence favours treatments that are based on developing reading skills that target the specific reading problem.

This statement was authored by Dr Serje Robidoux with contributions from the researchers of the CCD Reading Program.

For a full list of signatories, visit the CCD website: ccd.edu.au.

Awards and Celebrations

We’d like to congratulate several of our researchers who were recognised for excellence this year!

**Professor Brian Byrne** received the Mona Tobias Award, presented annually by Learning Difficulties Australia (LDA) in recognition of outstanding contributions to education of people with learning difficulties in Australia. Professor Byrne’s research in reading acquisition has had practical implications for teachers and has advanced understanding of how best to assist students to learn to read.

**Professor Max Coltheart** (previous recipient of the Mona Tobias Award) was selected for the the 2015 LDA Eminent Researcher Award of the Australian Journal of Learning Difficulties in recognition of his lasting contributions to theoretical research and his translation of those discoveries to benefits for children with learning difficulties.

**Dr Danielle Colenbrander** received the LDA Tertiary Student Award for 2015 for her outstanding study of children who are poor comprehenders (children who can read accurately but fail to understand what they have read).

**Dr Nenagh Kemp** received an Australian Government Learning and Teaching National Citation Award in recognition of her teaching excellence. Dr Kemp is a senior lecturer in psychology at the University of Tasmania whose research interests include spelling development in children and spelling strategies in adults.
The Dyslexie font: does it work for children with dyslexia?
Dr Eva Marinus

You may have seen recent media reports on a special font, called ‘Dyslexie’, developed by Dutch artist Christian Boer to help children and adults with dyslexia to improve their reading. Boer, who struggles with dyslexia himself, contends that the letters of the alphabet are too similar for people with dyslexia. He therefore designed the font to make letters more easily distinguished (for example, by alternating tail lengths and giving them a heavy baseline to prevent confusion of letters). The results of decades of research into reading and dyslexia, however, clearly show that these ideas are not supported by scientific evidence.

To provide a more objective evaluation of the effectiveness of Dyslexie font and to better understand why such a special font might work for children with reading difficulties, we conducted a study in which we compared reading speed for texts written in Arial and in Dyslexie font. In addition to distinctive letter shapes, Dyslexie also employs larger spacing both within and, especially, between words.

Our research found that low-progress readers read Dyslexie text more quickly than Arial text, when matched on absolute letter size. When general spacing was also matched, the performance difference became smaller. Finally, when both the within and between word spacing was matched, the children performed the same on the Arial text as they did on Dyslexie text.

From these results, we can conclude that Dyslexie font is easier for low-progress readers to read than Arial font of the same size, but only because of its increased spacing between words and within words rather than from the special letter shapes in the font per se. Therefore there seems to be no need to use Dyslexie, as spacing can be adjusted with every font.

This study was a joint effort of researchers from MultiLit, the CCD and from Radboud University (the Netherlands). We would like to thank all parents and children who were involved in this study.

2015 Event Highlights

CCD Reading and Spelling Conference - April 2015

This three-day conference, hosted by the CCD at Macquarie University in Sydney, focused on reading and spelling development, disorders and remediation and was attended by over 250 parents, teachers, clinicians, and researchers.

On the first day of the conference, which was tailored to an audience of parents, teachers and clinicians, seven speakers gave presentations about practical applications of research findings across areas including reading fluency, comprehension, spelling, and evidence-based intervention.

Presenters included Dr Danille Colenbrander, Dr Eva Marinus, Associate Professor Genevieve McArthur, Dr Nenagh Kemp, Dr Mark Boyes, Dr Robyn Wheldall, and Emeritus Professor Kevin Wheldall.

During the next two days, which were focused on research, six world-renowned experts shared their latest research and theories. This included: Professor Kate Nation (Oxford University) on learning to comprehend, Professor Peter de Jong (University of Amsterdam) on visual attention and reading, Emeritus Professor Brian Byrne (University of New England) on genetic contributions to reading ability, Professor Maggie Snowling (Oxford University) on risk factors for developing reading difficulties, Professor Denis Burnham (University of Western Sydney) on the development of speech perception and reading, and Distinguished Professor Anne Castles (Macquarie University) on orthographic learning.

Conference presentations are available for viewing online at www.ccd.edu.au/events/conferences/2015/dyslexia

We would like to thank all of those who travelled near and far to contribute to the conference. The organisers are planning to host similar events in the future, so stay tuned!

Discussion of The Dyslexia Debate - August 2015

This one-day symposium included a summary presentation of the book The Dyslexia Debate by author Julian Elliott, followed by commentaries by various people who have read the book and who are experts on learning to read and its difficulties.

The event was open to the public and was particularly relevant for reading researchers, clinicians concerned with reading, teachers involved with reading instruction and anyone concerned about reading difficulties and their remediation.

Links to presentations from the event, an interview with Julian Elliott and a post-event response by Sir Jim Rose can be found on the event web page: ccd.edu.au/events/public/2015/dyslexiadebate/index.html
Research Projects: Upcoming and in-progress

**Letter Position Dyslexia**
Teresa Schubert, Saskia Kohnen, Anne Castles, Lyndsey Nickels, Nathan Caruana & Peter Delissa

Children with letter position dyslexia misread anagram words like 'slime' as 'smile.' These fascinating errors reveal difficulties with letter position coding, a vital component of reading. It is unknown, however, how letter position dyslexia affects the reading of non-anagram words, like 'chair,' which are rarely misread.

Our upcoming project will use eye tracking to investigate reading in children with and without letter position dyslexia by monitoring eye movements while participants read sentences. Eye tracking allows investigation of real-time processing in naturalistic tasks, and recently has been extended to children's reading.

The study hopes to address the impact of letter position dyslexia on long-term memory for words of English. By learning more about how children with letter position dyslexia read non-anagram words, we may be able to refine screening tests for letter position dyslexia or to develop new treatment for this reading difficulty.

**Understanding the effect of sleep on learning to read**
Hua-chen Wang & Anne Castles

Studies in memory have found that sleep can help children to strengthen and consolidate new memories. The aim of this project is to examine how taking naps affects the learning of letter-sound knowledge in preschool children.

In the project, we will teach children aged 3-5 about letter sounds. The activities will take place in the morning before naptime. Children's nap quality will be monitored and we will then examine how well the children learned and whether learning performance is related to how well they slept during naptime.

The results of this study will provide insights into how children learn and consolidate newly learned letter-sound knowledge, which is fundamental to literacy development.

**Adolescent Literacy**
Saskia Kohnen, Nathan Caruana, Danielle Colenbrander, Erin Banales & Genevieve McArthur

While reading and spelling instruction is often considered complete after the primary school years, many high school students still struggle with some of the basic reading and spelling skills. Unfortunately, there are few theory-based assessments available for this age group.

A team from the Macquarie Cognition Clinic for Reading is currently filling this gap. We have completed over a thousand assessments with High School students looking at their basic reading and spelling skills. We will collect even more data next year. This will allow us to calculate normative comparison data, which will help us to pinpoint where High School students struggle and thus target interventions for these students.

The tests we have created will become available to teachers, clinicians and researchers via our online testing interface: www.motif.org.au.

We are grateful to our partner schools, including Arndell Anglican College, for facilitating data collection. Without their dedication, research projects such as this would not be possible.

For more information about the clinic: www.mq.edu.au/reading-clinic (02) 9850 6059

**Do children use spoken vocabulary knowledge to form written words?**
Signy Wegener, Hua-chen Wang & Anne Castles

Oral vocabulary knowledge has previously been shown to influence word reading, with known words being named more quickly and accurately than unfamiliar words. However, we do not know how this vocabulary knowledge influences learning to read new words, or whether children use their oral vocabulary knowledge to form written word forms before reading them.

We will investigate this question in this study, and the results will shed light on how children learn to read new words and how they might use their oral vocabulary knowledge to assist the process of reading acquisition.

We would like to thank all the teachers and children who were involved with this research at Pacific Hills Christian School. Thank you!

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**Online resource for teachers, clinicians and researchers**

The Macquarie Online Test Interface (MOTif) is an online facility designed to automatically administer, score and provide reports for cognitive tests developed by our researchers.

MOTif tests are available online at no charge to registered teachers, clinicians and researchers (motif.org.au). Currently there are approximately 5000 users from all around the world.

This year, the website has had a bit of a makeover and has been made more adaptive to use with different devices. We’ve also added 1) background information about the people behind MOTif, 2) a new test on grammatical processing (BAPPA-F) and, 3) a revision of the Australian pronunciation guide for the Test of Word Reading Efficiency (TOWRE).

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**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.

**To see what Neuronauts is all about or to register:**
visit: ccd.edu.au/neuronauts
or
email: nerounauts_admin@mq.edu.au