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Out of sight but not out of mind

**Kevin
Wheldall**



A common misconception about dyslexia is that it is typically to do with distorted vision. The letters on the page are said to leap about, for example, making reading difficult if not impossible. Consequently, many treatments for dyslexia have involved attempts to remedy these essentially visual problems, the most common being spectacles with coloured lenses or coloured plastic overlays. The evidence supporting the efficacy of ‘Irlen lenses’ and similar products is shaky to say the least and various international ophthalmological organisations and specialists in vision have firmly stated that such treatments are ineffective and are not to be recommended.

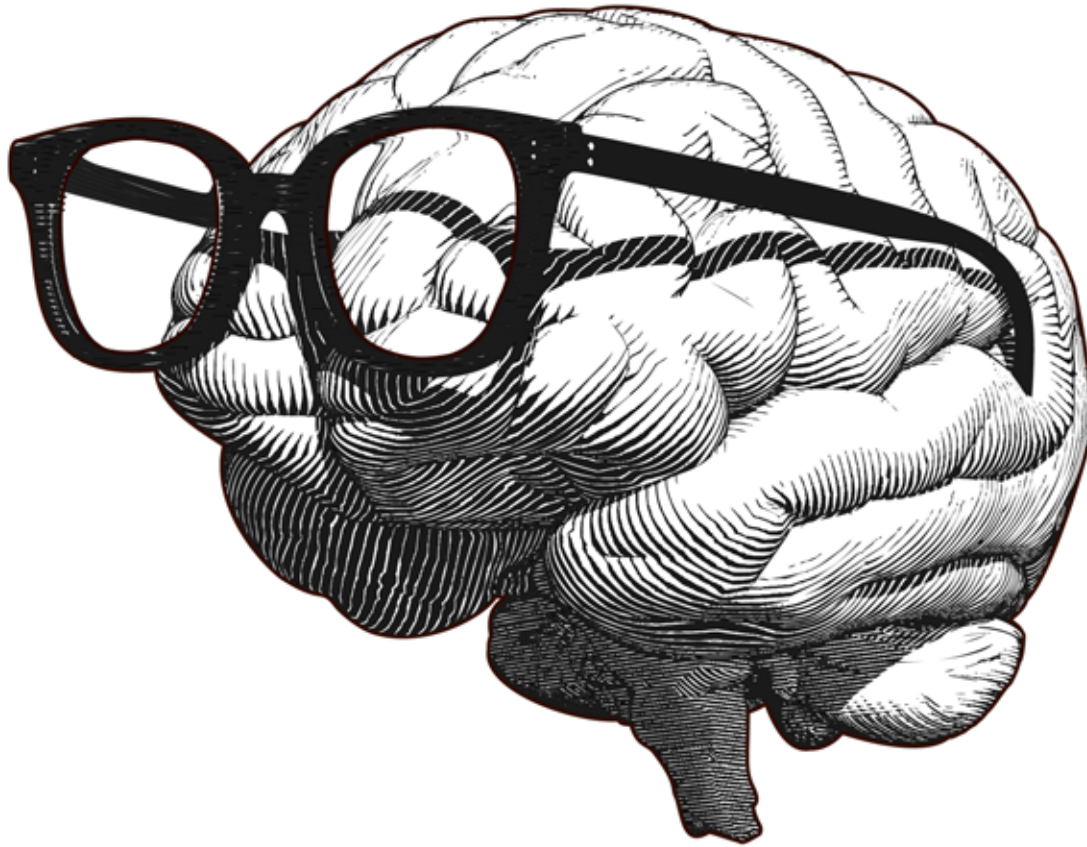
Today, most reading scientists agree that difficulty in learning to read is almost always a language problem, specifically a problem with phonological processing. But the preoccupation with visual processing continues, even among some supposed dyslexia experts.

To the extent that a minimal level of visual acuity is required to input the black marks on the page to the brain, there is of course a modicum of truth in this. One does actually have to be able to see the written words on the page but this is rarely the problem. The same could be said of algebra, but being able to register the numbers and symbols on the page in the textbook is a long way from understanding the underlying mathematical protocols.

This preoccupation with vision spills over into our language when we talk about reading, the concept of so-called ‘sight words’ being the prime example. What constitutes a sight word is a source of confusion in the language, literature and science of reading. Sometimes, ‘sight words’ refers to words that supposedly have to be learned as whole units, by sight, as a sort of logographic image like Chinese characters. Many schools still send home lists of ‘magic’ words to be learned in this way by young children at home; a dubious practice.

A more sophisticated usage of the term ‘sight words’ is to refer to words that have been successfully learned by phonological recoding (phonics) so that they are recognised automatically when they are read, without further need for sounding them out. But sight actually has very little to do with it, as we have argued, and continuing this usage will serve only to confuse and obfuscate.

If we take a moment to think about mature word recognition, it becomes obvious that successful reading is not dependent on recognising a particular logographic pattern. When we can read fully, we can read a word in any size, font, case or colour and even combinations of these variables. If the word table is printed as *tAbLe*, we can still read it. In fact we can distort its presentation quite a bit and still be able to read it. So, it is unlikely, to say the least, that we have learned words as simple visual images. What we have learned is far more abstract than that. We have learned the quintessential essence of the written word in all of its manifestations. I like to think of this as being similar to, if not an example of, Platonic universals, as described by Plato, in the mouth of Socrates in *The Republic*. In his view, when we see what we call a table in this world it is merely one, and a less than perfect, example of the ideal concept of ‘table’ which exists outside of what we perceive as reality. Similarly, when we learn to read a written word, we have learned its essence.



When we have thoroughly learned a word, its recognition is automatic and is essentially a non-conscious process. (If we persist in thinking of this as a visual image we would eventually have the problem of who or what is ‘seeing’ the image and how; a maze we shall not explore.) It makes more sense to think of words learned like this as concepts, ideas or, in Piagetian terms, schemas. Nor should we forget that in the final instance all of this has to be translated, if you will, into the ‘wet stuff’ of the brain, unless we are Cartesian dualists. The ideas, concepts or schemas of written words, need to occupy a space in what we call ‘the mind’ that serves as the halfway house between the external world out there and the ‘wet stuff’ we have inside our heads that makes it all happen.

All of this adds weight to the point that continuing to refer to learned words as sight words causes conceptual confusion and misunderstandings, especially among those who are not privy to what underlies this sort of cognitive shorthand we employ in reading science. We do no favours to teachers and parents by continually giving the impression that reading is all about seeing when it is a far more abstract process than that.

We might speculate, without buying into Piagetian theory more generally

or its supposed utility in informing instruction, that Piaget’s ideas about assimilation, accommodation and schemas could perhaps provide a working framework to think about how these word universals are formed. We begin by learning or assimilating simple letter sound combinations so that we recognise the phonemes conveyed by the letters or letter combinations. We subsequently learn simple patterns of these as whole CVCs; we accommodate these assimilations into schemas that represent the whole word. We subsequently learn syllables as mini schemas which aid in the identification and learning of whole words. Learning to read words we know like ‘night’, ‘fight’, ‘flight’, ‘sight’, etc. leads us to be able to read, in the sense of decode, words we may not yet have previously encountered like ‘plight’ or ‘slight’.

Whether we choose to use Piagetian terminology or not, we really must rid ourselves of the term sight words and remember that skilled reading may be out of sight but not out of mind.

Kevin Wheldall, Joint Editor

Note: I would like to acknowledge the helpful discussions I have had with Molly de Lemos on this topic.

It is unlikely that we have learned words as simple visual images. What we have learned is far more abstract than that.

What we've been reading



Anna Desjardins

In recent months, I have veered from letting Favel Parrett's lyrical prose wash over me, to laughing out loud at the satirical wit of Maria Semple and dipping into the poetry of Mary Oliver.

Parrett's *When the Night Comes* follows the life of two siblings in Tasmania at a time when the Danish supply ship, the Nella Dan, was sailing regularly between Hobart and the Antarctic. Their lives are interwoven with the life of one of the sailors on board, and both the joys and the aching difficulty of day-to-day human experience are explored in a pared-back poetic style in which Parrett suspends us in moments of time with her characters – an interesting window into Australian Antarctic activity in the

1980s, coupled with a voice to be savoured.

Semple's book *Where'd You Go, Bernadette?* has recently been adapted into a film starring Cate Blanchett. I missed the cinematic experience, but the book did not disappoint – set in Seattle, we are given a front-row seat to Bernadette's internal monologue as she navigates a mid-life crisis in original style – reminiscent of Liane Moriarty's take on Sydney society types, but without the disturbing dark edge, Semple's text is littered with pithy observations about our modern lives that will resonate. Although it is funny (very funny), it is not frothy. Semple uses the humour to tap into what happens when life threatens to overwhelm us and how we manage to carry on carrying on.

And for a moment of time stolen in a playground after school, I have been keeping Mary Oliver's slim volume of Pulitzer Prize winning poems, *A Thousand Mornings*, in my bag. Best read outdoors, her resonant language speaks to a great love and deep understanding of the world and our place in it, inspiring us all to be 'full of earth-praise'.



Alison Madelaine

Sorry guys, but I finally read *Olive Kitteridge* by Elizabeth Strout, and I didn't love it, so won't be rushing to read the sequel or any more of her books. Another big fail for me this time was *Beloved* by Toni Morrison. I really wanted to love it, but decided to give up fairly early on as life is too short to read books that you are not enjoying (both the subject matter and the writing style are difficult). However, I did read lots of other great books in recent months. Some examples are *Where the Crawdads Sing* by Delia Owens, *The Weekend* by Charlotte Wood, *The Dutch House* by Anne Patchett, *Becoming* by Michelle Obama, *Little Fires Everywhere* by Celeste Ng (also enjoyed the TV series) and *The Lost Man* by Jane Harper.

Like many others this year, I read *Phosphorescence* by Julia Baird, and really enjoyed that one too (although some parts more than others). I read too many books to list this time. I must have done more reading than usual ... I wonder why? I recently donated a box of books to a charity shop, and of course I had to go in and have a look at what they were selling. I picked up a copy of *American Dirt* by Jeanine Cummins. There has been quite a bit of controversy surrounding this book, and I want to see what all the fuss is about. More about this next time.



Nicola Bell

As anyone who has been within a 10-metre radius of me in the last few months will attest, I recently watched (and re-watched and re-watched) the filmed theatre production of *Hamilton*. This inspired me to take a deep dive into all things Hamilton-related, including the full biography of Alexander Hamilton by Ron Chernow. (Seriously, quiz me.) I also listened to two audiobooks for the sole reason that they were narrated by Hamilton's creator, Lin-Manuel Miranda. These were *The Brief Wondrous Life of Oscar Wao* by Junot Díaz, and *Aristotle and Dante Discover the Secrets of the Universe* by Benjamin Alire Sáenz. Both movingly portrayed the experiences of Hispanic boys and men finding themselves; these are characters I probably wouldn't have otherwise read about, and I'm glad I stumbled across them.

Other books I've enjoyed over the last few months are *Dark Emu* by Bruce Pascoe, *Becoming* by Michelle Obama, and *The Dictionary of Lost Words* by Pip Williams. I've also been dipping in and out of *Yours*, *Plum: The Letters of PG Wodehouse*, which was edited and compiled by Wodehouse's friend Frances Donaldson. This book is a treasure; the letters Wodehouse (or 'Plum') writes to his to friends and family are just as good-humoured, clever and essentially British as his fiction works. I'll never not think he's a genius.



Jennifer Buckingham

My reading list over the past months has been typically haphazard: books I have picked up in second-hand shops; books I have been given as gifts; books I have given as gifts to others (and no, I did not read them first!); the manuscript of a friend's first novel; and some re-reads. One of the books I was given as a gift was Tom Kenneally's *The Daughters of Mars*. I have read a couple of Tom Kenneally's novels over the years. I usually quite like them but they rarely leave a lasting impression. This one is about two Australian sisters who enlisted as nurses in WWI. It was entertaining and I learned some things – perhaps a bit too much about the gory details of treating wounded soldiers. So many adjectives. My friend's unpublished

book is also an historical novel and not too far removed from Kenneally's style but I thought it was better. It will feature again here if/when it is published. The characters in *Olive Kitteridge*, which has become a discussion point among the members of MRU, reminded me of the characters in Irish author Colm Toibin's books such as *Nora Webster*. I found the people quite difficult to like but still wanted to know what happened to them. I did grow fond of Olive herself, though, so I'll be reading more. I don't know what to say about another Irish author's new book – *Love* by Roddy Doyle. I had no idea what was going on throughout most of it. Coming back to the historical theme, I re-read *Why Johnny Can't Read* which Rudolph Flesch wrote in 1955. It's much more acerbic than I remembered, describing whole word reading instruction as an "inhuman, mean, stupid way of foisting something on a child's mind". Hard to argue with that even if I might not put it quite the same way.



Meree Reynolds

Recently I have read *Normal People* by Sally Rooney, a story about the lives and experiences of two Irish teenagers from very different backgrounds. I thought the book was really well written and make me reflect on my relationships and experiences at high school and during tertiary education. There certainly wasn't much in common! I have also read *The Seven Deaths of Evelyn Hardcastle* by Stuart Turton. While I generally like murder mysteries, I found the complicated plot and the alternating characters difficult to keep track of, probably because I only picked the book up for a brief time each night. I kept wishing that I had taken notes as I was reading so that I could keep track of the intricacies. It's the sort of book that demands full attention and large chunks of reading time, but is worth the effort. Finally, I have just finished reading Jane Harper's new book, *The Survivors*. I really like the way Jane Harper depicts Australian landscapes and characters in her novels. This crime mystery, set in a small coastal community in Tasmania, is a great read, but I felt that it was not quite as enthralling as *The Dry* or *The Lost Man*, two of Jane Harper's previous books.

What we've been reading



Sarah Arakelian

I enjoyed reading Khaled Hosseini's *The Kite Runner* so much that I went on to read one of his later books, *A Thousand Splendid Suns*. Though neither are happy stories, they both struck a chord with me in their descriptions of the culture and lives of those living in (and escaping) Afghanistan prior to and during the fall of the monarchy, the Soviet occupation and the rebellion and eventual oppression by the Taliban. In particular, *The Kite Runner's* description of the relationship between a wealthy widowed businessman and his son were highly reminiscent of some very dear people in my life. At times, I felt that they were the ones telling the story to me. These stories are a very pertinent reminder to be thankful for

all the blessings in our lives, even when difficulties threaten to overwhelm us.

For a change in pace, I read *The Alchemist* by Paulo Coelho and found the storytelling style to be reminiscent of another book that I have previously read (*The Christmas Mystery* by Jostein Gaarder) and loved. Iain Banks' *Wasp Factory*, on the other hand, was less to my taste. I did not get very far into this story before I had to put it down. Strangely, though I could handle very graphic descriptions of war-torn Afghanistan, I could not get past the very vivid descriptions of the actions of the main character and his brother.

Not having watched the movie, I found *The Lovely Bones* by Alice Sebold to be at times confusing, but the perspective interesting and the characters relatable. I couldn't help wondering often where it was all leading, which is perhaps why I found the ending to be a little anticlimactic.



Kevin Wheldall

Looking to expand my horizons and reading pleasure, a few months ago I took out a subscription to an audiobook club. I now have about a dozen or more audiobooks paid for but unread. Why? Because listening to audiobooks only rarely works for me. It works in the car on long journeys but under COVID this does not happen very often. If I sit, or worse, lie down to listen at home, I tend to fall asleep! Same with most podcasts. And if I hear half of the book being read after a car journey, and I am really enjoying it, I buy the hard copy anyway and finish it off.

So it was with *Scrublands* by Chris Hammer, which I strongly recommend. It comes tagged with the label Australian noir, following in the footsteps of Jane Harper's terrific books (*The Dry*, *Force of Nature*, *The Lost Man*, *The Survivors*). He follows up with *Silver*, and *Trust* which I have yet to read. *Silver* is perhaps overly long and does not pack quite the punch of *Scrublands* but he is a fine writer. And we certainly do have some great writers emerging in Australia currently; a new golden age, perhaps.

I have also read a couple of books on Royal Crown Derby china paperweights, my new obsession, but I won't bore you

with those. Instead, I'll praise Jonathon Coe's *Middle England*, especially if you have a strong affiliation with and knowledge of England. A treasure. I also thoroughly enjoyed Tom Keneally's *The Dickens Boy* about one of Dickens' sons in Australia and Hilary Mantel's *The Mirror and the Light*, the third and last book in her trilogy about Thomas Cromwell.

I have also (re)read three of Patricia Highsmith's Ripley books – *The Talented Mr Ripley*, *Ripley Under Ground*, and *Ripley's Game* – but I am not sure that they have truly stood the test of time, fine writer though she was.

For Beatles fans, *4321* is a must read but not if you do not want to have your illusions shattered. Loveable moptops? Perhaps not, but all too human. As I have written before, in spite of all of his 'Working Class Hero' protestations, Lennon was the most middle class of the fab four and ... not really a very nice man.

And, finally, please excuse this blatant plug for a first novel written by one of my dear daughters writing under the penname Rhiannon Hartley and published on Amazon. Entitled *Faking it with the Demon*, it is Book 1 in a series of 'paranormal romcoms' called Raising Hell Down Under. So, if you are into feelgood romcoms and/or paranormal stuff (and preferably both) you might want to have a look. But be warned: I have only been allowed to read an expurgated version!



Robyn Wheldall

Some time after everyone else, I got around to reading *Eleanor Oliphant is Completely Fine* by Gail Honeyman and discovered just why it was so popular. There is no need to reprise the storyline here except to say that the aftermath of a traumatic past and a gradual unravelling of fantasy as a defence is a skilfully told tale.

Similarly behind the times, I have recently read *Dark Emu* by Bruce Pascoe. I was aware of his thesis prior to reading the book – that rather than being hunter-gatherers, Australia's First Peoples engaged in sophisticated production techniques and cultivation. Pascoe's account based on his own analysis and drawing on the journal entries by early European visitors and inhabitants is compelling. To me, it makes much more sense of how Indigenous Australians lived on, and with, the land of this vast and often inhospitable continent. As many have said, this book should be essential reading for all Australians.

The Last of the Bonegilla Girls by Victoria Purnam brought me into more contemporary times but also took me back to a time when Australia was much less multicultural and when the waves of European migration after World War II were in full swing. On arrival, some families were housed at Bonegilla Migrant Camp on the Murray River in rural Victoria until work and housing became available to them. This is the story of a friendship that develops among four teenage girls, one of whom was the daughter of the camp's director. The familiar ancient Australian landscape and climate is the canvas for this complex story of new arrivals, new beginnings and hope and the harshness and disappointments that this also brought.

Phosphorescence by Julia Baird was released earlier this year and, for once, I was on the same reading wave with everyone else with this one. The subtitle of the book, 'on awe, wonder and things that sustain you when the world goes dark' is prescient in this time of COVID-19. Baird could not have known that her book would land on our shelves when the world was facing a major challenge in knowing how to live in these uncertain times. A call to pause, to observe beauty, and to be grateful could not have come at a better time. Enormously popular, it is a deeply personal book, part memoir, but in my opinion also an 'everyman' book – a stunning achievement and for me, one that I should reread from time to time.

A little light relief

"OK guys; listen up. It's that time of year again. Yeah, the dreaded Phonics Screening Check.

I know, I know; tell me about it. It's a pain. We all know that. And completely pointless too. Total waste of time.

Look, I agree ...

If they would only tell us the 20 nonsense words they want the kids to learn, it would be so much more straightforward. But no; no chance. It's a secret. And so we have to teach them all the nonsense words. Now is that fair?

No, listen. This year I have a cunning plan to beat them at their own game. Instead of teaching them all the nonwords, we're going to teach them a trick.

What trick? Well if you listen, you might learn something ...

OK, so this is how it works. This is my brilliant trick. We teach the kids the sounds of the letters and letter combinations and then how to put them together to form words. Then the kids will be able to read any nonsense word they throw at us. How good is that?!

I told you it was brilliant. You know, it makes you wonder why they didn't tell us to do that in the first place."

– Kevin Wheldall

Cueing systems vs. context analysis

Tim
Shanahan



Teacher question:

I attended your recent webinar and you said that students should figure out the meanings of words from context and that they needed to be able to deal with syntax. But I've also read that you are against the three-cueing systems. Isn't that a contradiction? It seems hypocritical to criticise teachers for teaching three-cueing and then to turn around and recommend that they do just that.

Shanahan responds:

Ralph Waldo Emerson wrote that, "Foolish consistency is the hobgoblin of small minds."

What I said may seem inconsistent, but it would be foolishly so if I had ignored the fact that two distinctly different processes have to be developed in reading – word reading/decoding and reading comprehension. That these two processes have different purposes and operate somewhat differently shouldn't be beyond the grasp of even the "small minds" among us.

The idea of cueing systems comes from analyses of oral reading errors (or miscues), and a theory of how words are read that simply has not held up to scrutiny. The late Kenneth Goodman examined word reading and found that when words were misread, you could categorise the errors. For example, a student is reading a sentence like: "The man drove his automobile into the drive."

But instead of saying "automobile", he reads "car". This error obviously shows no attention to the orthographic/phonological characteristics of the word (its letters and sounds), but car and automobile are both nouns (so they are syntactically similar) and they are synonyms or have similar meanings (which brings in semantics).

From this, Goodman (1973, p. 9) theorised that a reader collects as little visual information as possible when reading; that he guesses or predicts what is coming based on the semantics and syntax and then "sampl[es] the print to confirm his prediction". In Goodman's theory, the best readers minimise the amount of orthographic/phonemic processing that they do and figure out the words as much as possible based on context.

The problem with that theory is that it isn't right. It turns out to be inconsistent with what we learned about how words are processed during reading. For instance, we know that readers don't "sample the print" in that way; in fact, studies show that we look at pretty much every letter in a text, including those words that would be highly predictable from context.

Additionally, readers are able to recognise words in about a ¼ second, too fast to allow for the amount of neural processing that would be needed to sample all of these types of information. *And we also know* that the best readers are the ones who are proficient with orthographic/phonological processing, and poor readers are the ones who rely on alternative ways to read the words.

If the reader could have read “automobile” he would have, but since he couldn’t, he used the syntactic and semantic information to make a best guess. (The reader found a workaround since he couldn’t really read the word.)

Teaching kids to use these cueing systems to figure out the words is essentially an effort to teach them to read like poor readers. Good readers avoid using anything but the letters and sounds to figure out the words; the poor readers lack this facility so do the best they can.

Eye movement studies, speed of processing studies, neural processing studies, instructional studies, and so on, all concur. Good readers recognise words by translating letters to phonemes, and poor readers are stuck relying on pictures and semantic and syntactic contexts to do the best they can under the circumstances.

I do not support the idea of teaching students to read like poor readers, even if this was an interesting and provocative idea in 1965. (And, I’m stunned by people who refuse to change their minds after the accumulation of 55 years of contradictory evidence – talk about ‘flat-earthers’.)

But reading is not about recognising words alone. It is also about comprehending and using the information in text.

Reading the words properly enables us to make sense of the message in a text – but that making sense requires additional processing.

That’s why we need to teach

Good readers recognise words by translating letters to phonemes, and poor readers are stuck relying on pictures and semantic and syntactic contexts to do the best they can under the circumstances

phonemic awareness, phonics, and oral reading fluency so thoroughly and so well. We want readers to have automaticity with these; that is, we want them to read the words accurately, but with little conscious attention. This allows readers to devote their cognitive energies to thinking about the ideas in text.

What do we do to comprehend?

One thing comprehenders do is to figure out word meanings. For words we already know, we simply retrieve meanings from long term memory. In other cases, figuring out a word meaning (not the word, but its meaning) may entail the use of a dictionary, guessing based on context, analysis of the morphemes, or asking somebody for help.

Comprehenders also need to make sense of sentence structures and text structures, and to track ideas across

a text. They need to bring their prior knowledge about the content to bear on the text, too, and to apply their critical senses to the information (is the information true?).

Word reading needs to be automatic and instantaneous. That’s why you don’t guess words using syntactic and semantic information.

Comprehension, on the other hand, is slower and more consciously thoughtful. It requires analysis, reflection, critical thought, and consideration of the language and the content.

My research-based advice is to teach kids both to decode words and to comprehend texts. Those are different things, they entail different abilities, and therefore sound teaching advice is going to differ for each.

When it comes to word reading, I’m going to teach students to decode. When it comes to figuring out word meanings, I’m going to teach students to use context to make sense of the words (and morphology and references). Just like the research says.

That’s wisdom, not inconsistency!

Timothy Shanahan is Distinguished Professor Emeritus at the University of Illinois at Chicago and was formerly Director of Reading for the Chicago Public Schools, and president of the International Literacy Association. He is a former first-grade teacher and is a parent and grandparent. His website www.shanahanonliteracy.com is popular with parents and teachers.



Rebooting behaviour after lockdown

**Tom
Bennett**



Delivering effective instruction – or even just making the classroom run smoothly – is difficult when educators are struggling with behaviour issues. These 10 tips may help to get things back on track.

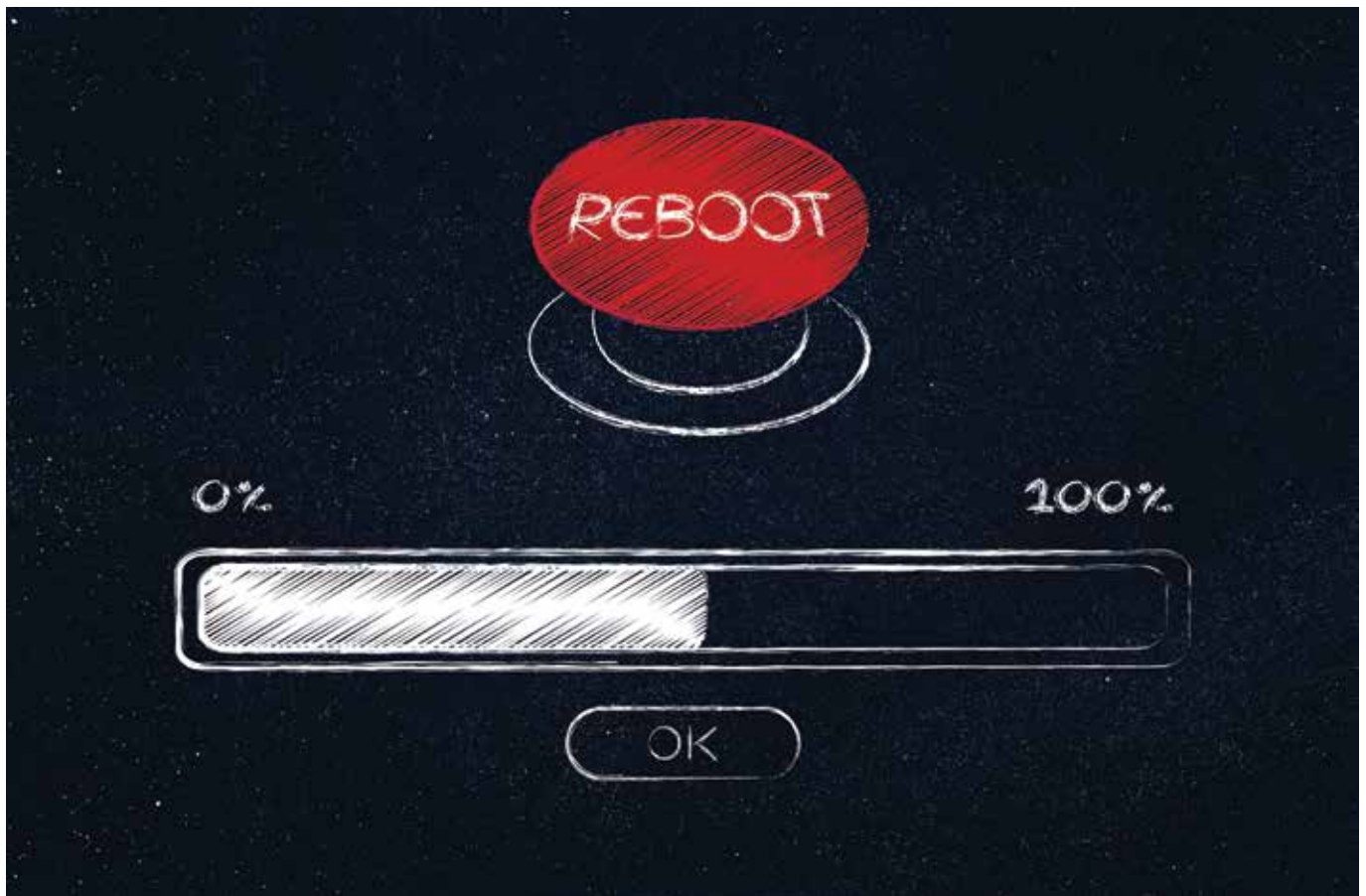
Better behaviour is the beginning of everything

Good behaviour is the core mission for every school, whatever age or stage. Get behaviour right and everything else is possible. And now, with this year's disruptions to school attendance, behaviour matters more than ever.

- Students may have partially or entirely lost the habits that enable them to flourish as learners and as member of the school community. This will matter more for some than others.
- Staff may also be a little rusty, and uncertain. This is perfectly natural. They will have been coping with a variety of new anxieties.
- Students will have to observe far higher standards of respiratory and tactile hygiene than ever before.
- Many students – especially young children – will already have hygiene habits that we would probably describe as less than ideal, that become dangerous in the current climate.
- Staff too will have to observe not only this type of virological etiquette but also be expected to train and maintain these behaviours in others.

Rather than ask every school to reinvent this wheel simultaneously, here is my list of 10 ideas about how schools manage it.

- 1 **Define what you mean by good behaviour.** There is an opportunity here for schools to re-evaluate what they actually want their behaviour to look like. Students have very different ideas and habits of how to behave. Staff do too. Teachers should define what behaviour they think is ideal in their classrooms; leaders, in their schools. Be concrete.
- 2 **Good behaviour must be taught, not told.** The best teachers and schools actively teach the behaviour they want to see as if it were a curriculum.
- 3 **Routines, habits and norms.** All staff dealing with students must consider these questions:
 - a) What behaviour do I want them to think is normal?
 - b) What habits do I want them to develop?
 - c) What routines do they need to learn in order to succeed as learners and human beings? This is crucial. In order for it to be as easy as possible to behave, students should be taught the specific sequences of behaviour they are expected to demonstrate.



- 4 **Don't wait for pupils to misbehave – be proactive.** This is particularly important for students who would be more at risk of sanction or exclusion due to insecure behavioural habits.
- 5 **Make boundaries meaningful.** Students need to know that deliberately misbehaving will result in consequences; the school must develop immediate/fast responses. When behaviour is poor, or fails to meet the standard, it must be challenged. Most consequence systems fail because they are inconsistently applied by individual teachers or across a school community.
- 6 **Rewrite your behaviour policy and consequences to reflect the current circumstances.** Unhygienic behaviour has to be reclassified from a misdemeanour to something much more serious. And malicious, deliberate acts of transmission (e.g., spitting, coughing) must be treated with the greatest seriousness.
- 7 **Train staff first.** Teach – don't

tell – the behaviour staff need too. Leaders need to spend time with staff before students, and front load their professional development so that they both understand and know how to implement the new routines and are able to teach it to children.

- 8 **Insist on implementation.** New norms and standards can be taught, but unless someone monitors and maintains these standards, they quickly wither.
- 9 **Reboot your expectations constantly.** Behaviour needs to be a state of constant re-creation. This means a) continually, on a day-to-day basis; and b) formally, in a targeted way.
- 10 **High expectations means high support.** Everyone, from staff to students, have been through difficult times. The higher the expectations – and they must be higher now – the higher the support required to achieve them. Staff training, calm student induction, checking for understanding, consistent repetition

of norms, demonstrated and corrected where necessary: these are the foundations of good behaviour.

Final thought

Be aware that students with the most challenging behaviour may need a more targeted approach, pastoral support, therapeutic strategies, and so on. We should not assume that students are returning to school traumatised, and equally nor should we assume they are fine. Students need to see adults being positive, hopeful and in control of themselves – whether we feel it or not.

Tom Bennett is the founder of researchED, a grassroots organisation that raises research literacy in education. Since 2013, researchED has visited three continents and six countries, attracting thousands of followers. In 2015 he became the UK government's school 'Behaviour Czar', advising on behaviour policy. He has written four books about teacher training, and in 2015 he was long-listed as one of the world's top teachers in the GEMS Global Teacher Prize.

Change management: The science of reading

**Stephanie
Le Lievre**



“I want to align my practice to the Science of Reading, but I don’t have support from my administration team or colleagues ... what do I do?”

“I am a school leader and would like to start the process of aligning our practices to the Science of Reading, but I just don’t know where to start, HELP!”

These sentiments are echoed by administrators and teachers alike. The Science of Reading (SoR) refers to the vast body of research conducted in laboratories and classroom settings which (should) inform educators, clinicians, university lecturers and so on, about reading development and effective literacy instruction. The SoR has gained a lot of traction in recent years, but with this movement also comes a lot of opposition. You are probably familiar with the ‘Reading Wars’, but if it’s your first time hearing this, read Alison Clarke’s take on it [here](#). Emina McLean has a nuanced take on the Reading Wars, which you can read in this edition of *Nomanis* (pp. 22).

As a teacher, curriculum leader and school consultant, I have had my fair share of change management projects in the school setting, particularly those pertaining to evidence-based literacy practices. I’ve had many failures and successes, so I would like to share with you some things I have learnt along the way.

I will structure the rest of this article with a focus on two different perspectives: that of the **classroom teacher** who wants to make the change ‘from the bottom up’, and that of an **administrator/school leader** who needs to get staff onboard. Both approaches would be rather different, so it’s important I address the different experiences. When instigating change within a school, I believe it’s important to follow a change management model. I am choosing to use Dr John Kotter’s [Eight Step Change Model](#) for the purpose of this article.

Classroom teacher perspective	Administrator perspective
STEP ONE: Create urgency. Get staff to see the need for change.	
<ul style="list-style-type: none"> • Gather your information. Get upskilled in the SoR. It's important you can have robust discussions about what cognitive psychology and reading science tells us about effective literacy instruction. I have provided a list of recommended reading material to start you on this journey (see the end of the article). Learning the SoR is never-ending. I have been reading about this topic for years and I still learn something new most days. Be kind to yourself, and start with my recommended reads first, so you don't feel like 'Alice down the Rabbit Hole'. • Keep sharing your knowledge with staff members. You are planting the seed by regularly bringing up the SoR when appropriate to do so (maybe not at staff drinks, you might get left on your own). • Talk about your learnings and ideas with a positive/ forward thinking mindset. Don't get bogged down in how terrible certain programs/approaches are. Instead focus on what you CAN do to make a difference to student outcomes. 	<ul style="list-style-type: none"> • This is the same advice regardless of your role in the school. Get upskilled with the fundamentals of the SoR. See my recommended reads at the end of this article.
STEP TWO: Form a powerful coalition. The coalition can help you to spread messages and ensure there is support for the change school-wide.	
<ul style="list-style-type: none"> • Arrange a formal meeting with the administration team. Be transparent about your intentions, with a focus of whole-school improvement. If they are open to furthering their knowledge, provide them with some readings and podcasts (see below) to get them started on their SoR journey. <ul style="list-style-type: none"> ○ If you are given the green light, you can continue down this change management path. ○ If you are given a red light, you will need to continue 'planting the seeds' until your administration team are on board. • Do you have an English or curriculum-focused Professional Learning Community? Is it effective? Do they meet regularly? What a perfect opportunity to start sharing what you have learnt about evidence-based literacy instruction. Reflect on the things your school is already doing that reflect the SoR. Maybe some teachers are using decodable texts for early readers? Maybe others are incorporating phonemic awareness into their phonics instruction? • If you don't have Professional Learning Communities or project groups at your school, approach your administration team. You may even want to volunteer to lead it! 	<ul style="list-style-type: none"> • Arrange a formal meeting with the administration team. Be transparent about your intentions, with a focus of whole-school improvement. • Do you have Professional Learning Communities? Are they effective? Do they meet regularly? Most administrators are aware of the importance of shared responsibility and distributed leadership model. • If there isn't a current leader of the English Professional Learning Community, appoint a staff member/s who demonstrates reflective practice and shows interest in the SoR.

Change management: The science of reading

Classroom teacher perspective	Administrator perspective
STEP THREE: Create a vision for change.	
<ul style="list-style-type: none"> • Don't do it alone! Within your coalition/Professional Learning Community, develop a vision. Where do you want to see the school in five years? Two years? One year? Make short-term and long-term goals which reflect the SoR. I have included some example goals in a longer version of this article. • Reflect on the current assessment schedule. The right data can be a huge driver of change, so the school's assessment procedures need to reflect the SoR. Please see the Reading Science in School Assessment scope and sequence, containing (mostly free) assessments for reading, spelling and oral language. 	<ul style="list-style-type: none"> • Don't do it alone! You may be the leader of the change, but you need to have a shared responsibility amongst your coalition (and eventually the whole staff). • Within your coalition/Professional Learning Community, develop a vision. Where do you want to see the school in five years? Two years? One year? Make short-term and long-term goals which reflect the SoR.
STEP FOUR: Communicate the vision and build the knowledge of the staff around the SoR.	
<ul style="list-style-type: none"> • You need to communicate the vision to the whole school staff, with assistance from your leadership team and Professional Learning Communities. • Share specific articles, blogs and podcasts you found to be most powerful (see end of article for suggestions). • Handle people's concerns with sensitivity and understanding. • Seek feedback, feedback, feedback. Listen to staff and implement feedback when devising the implementation plan. • Discuss with your administration team how you can build the knowledge of the staff. 	<ul style="list-style-type: none"> • Devise a plan to build the knowledge of your staff. The success of any program within the school will ultimately depend on the staff buy-in. They need to be provided with the knowledge and have opportunities to directly (and immediately) apply this knowledge. I highly recommend seeking external professional learning, or appointing a leader in the school who has an in-depth knowledge about the SoR to lead this process. If your budget is tight, there are a range of courses and presentations available online to get your started. • Seek feedback, feedback, feedback. Listen to staff and implement feedback when devising the implementation plan. • Remember too much information at once will result in cognitive overload. Effective professional learning must have a direct classroom application which is followed up with mentoring, coaching and support. • Structure your staff professional learning gradually, focusing on one area at a time. • Communicate the vision to parents and the wider school community – parent information night, P&C, School Board meetings etc.
STEP FIVE: Address obstacles.	
<ul style="list-style-type: none"> • If you are faced with negativity and/or resistance by fellow staff members, always remember to 'keep your cool' and try to approach the conversation from a place of understanding. • Seek feedback 	<ul style="list-style-type: none"> • Work with your staff members who are resistant to the change. Suggest that they observe others, or potentially even lead a particular aspect of the change (for example, using decodable readers to develop decoding fluency). • Seek feedback

Classroom teacher perspective	Administrator perspective
STEP SIX: Generate and celebrate short-term wins.	
<ul style="list-style-type: none"> • Discuss the successes you are having in your own classroom. Use data to assist. When you hear of other teachers experiencing success, celebrate this as a team. • Discuss and celebrate the short-term wins within the Professional Learning Communities. Make sure the administration team know about it! • Share your wins with the parents. Continue explain the WHAT and the WHY to parents, when describing the change. • Seek feedback 	<ul style="list-style-type: none"> • The school implementation plan needs to contain short-, medium- and long-term goals. Celebrate individual successes amongst staff as well as whole school progress along the way. Remember – progress, not perfection!! • Share the school wins with the parents and wider school community. Continue to explain the WHAT and the WHY to parents, when describing the change. • Seek feedback
STEP SEVEN: Build on change.	
<ul style="list-style-type: none"> • Continue supporting staff in the process. Within the Professional Learning Committees, refine the short-, medium- and long-term goals in the implementation plan once you achieve others. • Seek feedback 	<ul style="list-style-type: none"> • Staff need continual coaching, mentoring and support for the changes to be sustained. • Always discuss and reflect on the progress of the SoR staff meetings. • Seek feedback
STEP EIGHT: Anchor the SoR into the school culture.	
<ul style="list-style-type: none"> • Once the school is fully underway and is implementing programs and pedagogies which align to the SoR, you need to work with your colleagues to embed it firmly into the school culture. • Every staff member should be able to explain what the SoR looks like in the school. • The assessment schedule, operational plans and school targets should all demonstrate that the school follows the SoR. • Think about a display for the staff room. A SoR display may include Scarborough’s Reading Rope, the Simple View of Reading, as well as the school practices which align to the SoR. 	<ul style="list-style-type: none"> • The SoR should become part of the school culture, communicated to the larger school community and be reflected by all programs and pedagogies in the school. • Succession planning is imperative to ensure the sustainability of the changes – continually identify and support future leaders in the school to ensure the sustainability of the programs and pedagogies. • The school business plan, assessment schedule, operational plans and school targets should all demonstrate that the school follows the SoR. • Ensure your school website contains information on the research aligned programs and practices within the school. • Continue to share the progress with the parents and wider school community.

To conclude ...

As clichéd as it may sound, remember it’s about the *journey*, not the destination. Effective and sustainable change takes time and involves a shared responsibility among staff. Below I have included some readings (and viewings and listenings) I recommend to start your journey in the SoR. In the [longer version of this article](#), I have also included some EXAMPLES of short-, medium-, and long-term goals. Every school’s journey will be different, and will all be starting at different points, so it’s imperative you create your own implementation plan with your staff based on your context.

Free resources I recommend to share with your administration team and colleagues when initially introducing the SoR:

- [Video presentation](#): PaTTAN Literacy Symposium 2020, by Emily Hanford
- [Podcast episode](#): ‘At a Loss for Words’, by Emily Hanford
- [Article](#): ‘Why Jaydon Can’t Read’, by Jennifer Buckingham (*Learning Difficulties Australia Bulletin*)
- [Article](#): ‘Reading IS Rocket Science’, by Louisa Moats.

This is an edited version of a blog post that originally appeared on [The Speechie Teach](#) (June 17, 2020).

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Primary literacy teaching: A detective story

**Beth
Budden**



Detective dramas are quite the rage, but you need look no further than the humble schoolbook for a mystery that even the most discerning sleuth would find tricky to unravel, says UK teacher Beth Budden.

Put your best deerstalker hat upon your head, perch your glasses at the end of your nose and get your notebook ready: this is the curious case of the missing capital letters and full stops.

The mystery unfolds

For teachers of all age groups, getting children to use capital letters and full stops consistently and correctly is a job that never seems to come to an end. Weary teachers up and down the country hunch over exercise books every day, only to find that those most basic of writing elements seem to have gone astray. Few pupils use them correctly all the time, some not at all, and the rest drop them sporadically over nearly every piece.

Why this happens is a mystery. Because, as early as the end of Key Stage 1* (KS1) in the UK National Curriculum, this knowledge should be secure for most. The KS1 teacher assessment framework, or TAF, states that pupils reaching the expected standard by the end of Year 2 should “demarcate most sentences in their writing with capital letters and full stops”.

So, what’s going wrong?

Making initial enquiries

We should start our investigation in Reception*. Careful: these kids ask difficult questions.

According to the UK National Curriculum, capital letters and full stops are not required to be taught until Year 1; however, most Reception teachers will introduce these through the modelling of writing simple sentences, as well as drawing children’s attention to them while reading. Which is a good thing.

In addition, Reception teachers will verbally model full sentences and encourage pupils to do the same.

Again, this is a good thing. A surprising proportion of pupils start school unable to speak in complete sentences and, as writing is so closely connected to speech, being able to speak in sentences is an important prerequisite for the written sentence.

At the same time as all this is going on, children in Reception are immersed in learning phonics, whereby they will learn the lower-case grapheme correspondences for the sounds of each letter through daily focused sessions. Although most children will be taught capitals as well, the emphasis is, of course, on lower-case letters.

Here’s your first clue: teachers are therefore working with a natural default to lower case from there on in.



To Year 1, Watson!

Walk down the corridor and into the slightly more formal setting of Year 1.

Here, the children still ask awkward questions. In Year 1, teachers begin to teach pupils to demarcate simple sentences through a range of methods. Modelling simple sentences with a capital and full stop is a principal approach, as is continuing the ‘talk for writing’ from Reception.

Many teachers accompany clear written modelling with a kinaesthetic approach, or what is more commonly known as ‘kung-fu punctuation’.

With the intention to embed sentence punctuation into pupils’ memories through movement and voice, pupils physically punctuate sentences with hands in the air when they begin the sentence to signify a capital, then end the sentence with a powerful kung-fu air punch for the full stop, accompanied with a loud “ha!”.

Children love this, and initially it reminds them how to open and close a sentence when saying it out loud; however, when young pupils sit down to write, their focus is often consumed by coping with the physical skills needed for writing, along with organising their ideas, rather than demarcating a sentence correctly.

When young pupils sit down to write, their focus is often consumed with coping with the physical skills needed for writing, along with organising their ideas, rather than demarcating a sentence correctly

Usually pupils will have to return to sentences to correct them, inserting the absent capital letter and full stop later.

Now, as mentioned earlier, you will notice something different about this classroom. It’s worth remembering that, in Year 1, five- and six-year-olds are making the transition from the more child-led, free-flow learning in Reception to the more formal ‘sit-down’ education. This can and should take time; let’s not forget that in some countries, formal learning begins much later.

So, capital letters and full stops tend to get lost in the whole transition. Thus, for lots of children, getting sentence structure correct at that stage is beyond them. By the time many pupils reach Year 2, the use of the capital letter and full stop is taking shape, but rarely ever secure.

Onwards, to Year 2

We’re getting close, dear reader. We are approaching a breakthrough. Enter that Year 2 classroom and see what happens.

Rather than using the remaining year in KS1 focusing on developing and consolidating pupils’ understanding of the simple sentence, teachers also have a statutory requirement to introduce the use of commas to make a list, as well as apostrophes to mark contractions and show possession, even though pupils are



Teachers often begin explicitly teaching additional punctuation such as commas and apostrophes before most pupils have got to grips with capital letters and full stops

not required to use these to reach the expected standard. Yeah, I know – who makes these rules?

With pressure from leaders to maximise the number of pupils reaching greater depth where use of these features is required, teachers often begin explicitly teaching this additional punctuation before most pupils have got to grips with capital letters and full stops. This is despite the fact that it might be preferable to expose pupils to these implicitly through shared reading and writing, where pupils who are ready tend to pick them up.

You might ask why schools with limited resources feel the pressure to focus so much on maximising the number of pupils reaching greater depth at all when there are children struggling to meet expectations. It would be a good question.

So, in Year 2, we encounter a collection of very young children unable to embed basic sentence structure because more complex material comes at them from all directions. While many leaders believe that if you aim high and teach to the high-attaining pupils it will raise standards for everyone, it can often serve to create easily forgotten, surface learning for the many.

Don't stop, we're getting close ...

But is that all? I am afraid not. Look closer and you will see that, rather than supporting pupils to grasp simple sentence structure through writing “simple, coherent narratives about personal experiences and those of others (real or fictional)”, as the TAF describes, teachers often feel the need to use over-complicated, unfamiliar but “exciting” contexts more likely to overload pupils.

While these very young pupils should be writing about what they know and what is deeply familiar, they often find themselves having to write about parts of the world they've never been to, or imagining life from the point of view of a person or even an animal of which they may have very little understanding or knowledge.

The truth is, little minds can't always process all of this and basic sentence structure at the same time. Hell, big minds can't either – have you seen my notebooks?

In the UK, the Great Fire of London is a popular topic for Year 2. Here, pupils are often asked to write in role as Samuel Pepys. Consequently, not only must they organise their ideas and use appropriate adjectives to describe London ablaze, but they also need to think like a 400-year-

old diarist. No wonder the full stop and capital letter get lost.

Follow the lead!

Oh, we're not done. Did you think we'd nailed it? Not yet, not yet ...

When pupils start Year 3, they have a wobbly idea of a sentence, then, lo and behold, inverted commas for speech arrive, and our capital letter and full stop are lost again.

Teachers keep saying, "Don't forget your capital letters and full stops," and yet children forget them every day because they're thinking about what they've been asked to: recording speech.

And so the capital letter and full stop are confined to the subs' bench once more. Unloved and unused. Bless them.

And so, we've cracked the case

So, we know why they go missing. You got it, right? Now we have to work out how to find them again.

Teachers in Key Stage 2* (KS2) try all manner of methods to coax those capital letters and full stops back into pupils' minds.

One teacher I know always told his pupils to read their work aloud, then when they took a breath to use a full stop and start a new sentence. This had some initial success, except with the children who could hold their breath for three whole paragraphs.

Other teachers, myself included, also try more technical approaches by expounding definitive rules, such as that a sentence always contains a verb. This can help, but then what happens when they write sentences like, "What a commotion!" and "How about some pudding?" What then?

It's important to teach the basic rule, but also the exception as well.

Another useful technique is for children to physically cut up short pieces of text into sentences and examine how each sentence is structured. I also find that giving pupils text without capitals and full stops for them to correct helps them to recognise their own errors when they come to edit their work.

It's vital to encourage pupils to go back to edit and improve writing. Some teachers get pupils to use different colours for capitals and full stops, which draw children's attention to when they are absent.

So what's the best method? There isn't one. It's more likely that a range of different approaches is required to remind children to punctuate sentences.

But whatever teachers try, one thing is clear: capital letters and full stops must be returned to time and time again throughout KS2 if pupils have a hope of leaving primary school with these secure.

Is that case closed? Not quite. To my mind, all this searching for our elusive capital letter and full stop is more likely to be unnecessary if writing in KS1 is focused on the expected standard outlined in the TAF, such as simple sentence structure and familiar contexts for writing, rather than leapfrogging towards higher content taught within obscure contexts.

Only then can the case of the missing capital letter and full stop be closed.

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**Editor's note: According to the UK National Curriculum, Key Stage 1 covers Years 1 and 2 (students aged 5-7 years old), while Key Stage 2 covers Years 3 through 6 (students aged 7-11 years old). The UK's 'Reception' year is equivalent to Australia's 'Foundation' year (e.g., Prep). Very similar requirements for grammar and punctuation are outlined in the Australian Curriculum (e.g., Year 1 achievement standard: '[Students] use capital letters and full stops and form all upper- and lower-case letters correctly'; [ACARA, 2020](#)).*

When pupils start Year 3, they have a wobbly idea of a sentence, then, lo and behold, inverted commas for speech arrive, and our capital letter and full stop are lost again

How to teach: It is bigger than the Reading Wars

**Emina
McLean**



The Reading Wars may be positioned as phonics vs. whole language, but within the phonics camp, there is still significant conflict about what constitutes effective instruction.

What are the Reading Wars?

A quick Google will tell you that most major newspapers have written about the Reading Wars here in Australia and overseas, and there are countless blogs and articles promoting various opinions and positions.

According to the [National Education Association](#) in the United States (2019): *A debate about the ‘best way’ to teach reading has been raging for decades. In what is often described as the ‘reading wars’ by academic and policy insiders, there are opposing factions of experts, policy makers, and politicians who champion ‘phonics’, on the one side, or ‘whole language’, on the other. Each faction declares their respective approach as the key to effectively teaching all children to read.*

As reported by the [ABC](#) (2019) in Australia:

On one side of the debate are advocates of phonics who favour teaching reading by starting with breaking down combinations of letters into the sounds they represent. This, they argue, enables children to read unfamiliar words. On the opposing side are educators who favour the ‘whole language’ approach, which holds that learning to read is like learning to speak and students immersed in literature can learn to guess the meaning of unfamiliar words from their context.

I don’t really want to spend too much time on the erroneous characterisation of each “side” in the “war”, but it should be clarified that:

- No one, absolutely no one, thinks teaching phonics alone is teaching reading. There is no phonics side. There are certainly many who advocate for phonics to be taught as one of the five (or six) keys to reading.
- Whole language as it was originally positioned and defined, is becoming less common, with most schools teaching phonics in quantities ranging from homeopathic to appropriate. This is balanced literacy.

What’s the problem here? Robust debate about educational practices is healthy, right?

Anne Castles, Kathy Rastle and Kate Nation wrote in their recent comprehensive paper, [Ending the Reading Wars: Reading Acquisition from Novice to Expert](#) (2018, p. 5), “There is intense public interest in questions surrounding how children learn to read and how they can best be taught. Research in psychological science has provided answers to many of these questions but, somewhat surprisingly, this research has been slow to make

inroads into educational policy and practice. Instead, the field has been plagued by decades of ‘reading wars’. Even now, there remains a wide gap between the state of research knowledge about learning to read and the state of public understanding.”

Fierce debate and taking sides are certainly odd when there is significant research evidence and expert-based consensus about how to teach, and how to teach reading and writing. The real issue in this ‘war’ is poor research translation that impacts both Initial Teacher Education (ITE) and classroom practice.

I am constantly flabbergasted and frustrated by the following two conversations I observe on Twitter and elsewhere:

- 1 *We need to teach phonics, phonemic awareness, vocabulary, fluency and reading comprehension.* YES, ALMOST EVERYONE AGREES! THERE ARE NO READING WARS.
- 2 *We need to teach phonics, phonemic awareness, vocabulary, fluency and reading comprehension directly and explicitly, following a scope and sequence.* NO, WE DON’T AGREE! COMMENCE THE READING WARS!

The argument is therefore not so much about what to teach, but rather about how to teach it. It is not whether we teach phonics, for example, but how it should be taught that provokes. As I have said, in my experience it is becoming rarer for people to oppose some form of phonics instruction. Discourse deteriorates when scope and sequence, direct and/or explicit instruction, or programs are mentioned. And this debate about how to teach is not unique to literacy. It seems to plague many learning areas. I only write about language and literacy because those are the areas I know.

What we teach and how we teach it

The what and when come from our curriculum, scope and sequence and/or program. The how comes from our instructional or pedagogical choice. There is significant research supporting direct and explicit teaching methods. The research translation failure regarding effective pedagogy is as depressing as that of effective reading instruction. I have been ruminating on the failure of how with respect to literacy for some time now, and Greg Ashman wrote a timely blog, [Explicit teaching – what’s in a name?](#), regarding some recent dialogue on Twitter about pedagogical terms. Lorraine Hammond has also written about explicit instruction [here](#) and Greg has written more about it [here](#) too. I am looking forward to Greg’s forthcoming book, *The Power of Explicit Teaching and Direct Instruction*.

The terms can get confusing, but whether we are talking about direct or explicit instruction, we are talking about lessons that are teacher-led, highly structured, sequential, and interactive, and they have a clear learning intention as well as an ‘I do, we do, you do’ sequence. Explicit instruction is not an ad hoc strategy. It is a deliberate approach to teaching and learning.

Direct instruction (di) and explicit instruction (ei) are teacher-led instructional approaches. Barak Rosenshine is probably best known for work in this space, including his *Principles of Instruction*.

Direct Instruction (DI) is a program-based approach to teaching. Its origin is in the work of Siegfried Engelmann and Wesley Becker. DI programs are scripted and systematic.

Explicit Instruction (EI) is an instructional method that largely comes from the work of Anita Archer. It is a systematic, direct, engaging, interactive and success-oriented approach to teaching.

Explicit Direct Instruction (EDI) is an instructional method that comes

The real issue in this ‘war’ is poor research translation that impacts both Initial Teacher Education (ITE) and classroom practice.

from the work of John Hollingsworth and Silvia Ybarra. They have a particular approach to lesson design, informed by the work of Barak Rosenshine and others.

[A meta-analysis completed in 2018](#) found that Direct Instruction resulted in positive, statistically significant (moderate to large) effects in reading, spelling, language, and mathematics, as well as other subject areas. Not only were DI programs found to be effective, there was little to no decline during maintenance phases, and the more the students were exposed to the programs, the greater their impact. Two key quotes for me from this meta-analysis are:

The findings of this meta-analysis reinforce the conclusions of earlier meta-analyses and reviews of the literature regarding DI. Yet, despite the very large body of research supporting its effectiveness,

How to teach: It is bigger than the Reading Wars

DI has not been widely embraced or implemented. In part this avoidance of DI may be fuelled by the current popularity of constructivism and misconceptions of the theory that underlies DI. As explained in the first part of this article, DI shares with constructivism the important basic understanding that students interpret and make sense of information with which they are presented. The difference lies in the nature of the information given to students, with DI theorists stressing the importance of very carefully choosing and structuring examples so they are as clear and unambiguous as possible. Without such clarity students will waste valuable time and, even worse, potentially reach faulty conclusions that harm future progress and learning. (p. 502)

Another reason that DI may not be widely used involves a belief that teachers will not like it or that it stifles teachers' ability to bring their own personalities to their teaching. Yet, as described in earlier sections, proper implementation of DI does not disguise or erase a teacher's unique style. In fact, the carefully tested presentations in the programs free teachers from worries about the wording of their examples or the order in which they present ideas and allow them to focus more fully on their students' responses and ensure their understanding ... Fears that teachers will not enjoy the programs

or not be pleased with their results do not appear to be supported by the evidence. (p. 502)

By definition, a scope and sequence is what will be taught, and the sequence within which it will be taught, over a set period of time. Unfortunately, at least here in Victoria, if and when they exist, they tend to be very brief overviews of the ideas or concepts that will be taught, as guided by the curriculum. There is a lot of work yet to be done to ensure they are up to scratch across primary and secondary schools, at least in the areas I am familiar with. The beauty of DI programs is that the planning is done for us; not only the what, but the how, and in which sequence.

Formal training in DI programs is usually a requirement to purchase them, as a way of ensuring a level of expertise. We then follow the program, making appropriate adjustments for students who are struggling or excelling. If we don't use a program, it is painstaking work creating scopes and sequences across the literacy syllabus. It is worthwhile, but painstaking. Then we also need to plan the lessons. Some of the schools I collaborate with or have the privilege of visiting have created their own reading and writing scopes and sequences, but within them they are using various DI programs to save time and safeguard fidelity. It seems to work well.

The questions I ask myself about any scope and sequence I design with teachers and school leaders are:

Reading Table

Reading	Explicit and/or direct instruction e.g. including DI programs	Other approaches e.g. incidental, in-context, student-directed, discovery
Detailed scope and sequence and/or script for phonics (which PGCs will be taught and when)	Yes	No
Detailed scope and sequence and/or script for morphology (which bound grammatical and lexical morphemes will be taught and when)	Yes	No
Detailed scope and sequence and/or script for phonemic awareness (when will blending, segmenting and manipulating be taught and practised?)	Yes	No
Detailed scope and sequence and/or script for vocabulary (Tier 2 and 3 words and when they will be taught)	Yes	No
Detailed scope and sequence and/or script for fluency (rate, prosody and word reading instruction and practice)	Yes	No
Detailed scope and sequence for reading comprehension (which strategies will be taught and when)	Yes	No

Writing Table

Writing	Explicit and/or direct instruction	Other approaches e.g. incidental, in-context, student- directed, discovery
Detailed scope and sequence for handwriting	Yes	No
Detailed scope and sequence and/or script for spelling (GPCs, morphology, word families, irregular words)	Yes	No
Detailed scope and sequence and/or script for concepts of print and punctuation	Yes	No
Detailed scope and sequence for text generation (sentence and sentence combining levels)	Yes	No
Detailed scope and sequence for text generation (extended text level including text type, audience, purpose and structure)	Yes	No
Detailed scope and sequence for planning, revising, editing, summarising and organising written information	Yes	No

- Does this sequence make sense? Is it cumulative/sequential? How does it link to what has been previously taught and to what else is being taught?
- Is there enough detail?
- How will it be linked to how the concept(s) should be taught and/or are staff supported to design lessons that will have maximal impact?
- Is there a research evidence aligned program (usually DI) that is already available in this learning area to prevent reinventing the wheel?

Very briefly and basically, in the tables left and above, I have detailed what ideally should be included when teaching reading and writing in primary school. When we compare an explicit approach to other approaches, we can see where the problem arises. Using an explicit teaching approach, with a well-designed scope and sequence (or program), is the best way to be able to monitor what has been taught and when, and it puts us in the best position

to offer appropriate differentiation and additional support to those who are excelling or struggling.

In closing

It is hard to understand sometimes why there so much discourse that is anti DI programs and di/ei instructional approaches when we know that they are effective and efficient. DI and di make differentiation easier, not harder, and there is no evidence to support the notion that they stifle teacher (or student) creativity or individuality. We know exactly what has been taught and what is yet to come. Students can receive additional instruction in what they are struggling with, and those who are excelling can progress beyond their peers.

The best explanation is that there is poor research translation when it comes to teaching pre-service and in-service teachers about how learning happens more broadly. Direct and explicit methodologies work because they have consideration for the cognitive processes involved in learning, especially for novices. I therefore often find it helpful when advocating

for better reading instruction, to have conversations instead about how learning happens. Once there is a degree of agreement about that, explicit, sequential phonics, morphology or spelling teaching, for example, makes sense.

What we teach matters. How we teach it matters. The Reading Wars seem to be more about pedagogy than they are about content, but we need to make sure we get the content right as well. Using the most effective instructional methods is essential across all learning areas. Explicit instruction demands a detailed, evidence-informed, scope and sequence, and a detailed, evidence-informed scope and sequence demands explicit instruction. Let's make it happen, to give every child the best chance of developing the reading and writing skills school and life demand.

“Literacy and numeracy are not the goalposts. They’re the entrance to the field. Without them you don’t get to play the game.” (David de Carvalho, 2019, researchED Melbourne)

Books on teaching and learning

The main book I have used to refine my teaching practices is Hollingsworth and Ybarra’s (2017) *Explicit Direct Instruction: The Power of the Well-Crafted, Well-Taught Lesson*. I also use Tom Sherrington’s (2019) *Rosenshine’s Principles in Action*.

The main books that have bettered my understanding of the cognitive processes involved in learning, and therefore how we should teach for maximal effect, are Weinstein and Sumeracki’s (2018) *Understanding How We Learn: A Visual Guide*, and Kirschner and Hendrick’s (2020) *Understanding How Learning Happens: Seminal Works in Educational Psychology and What They Mean in Practice*.

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The magical art of magnetic resonance imaging to study the reading brain

Nora Maria Raschle
Réka Borbás
Carolyn King
Nadine Gaab

This article, published in *Frontiers for Young Minds*, a journal which makes scientific articles accessible for younger audiences, discusses how magnetic resonance imaging (or MRI) can be used to study the secrets of the human brain, including how it looks, works, grows and learns. The young people in your life may find it interesting!

Introduction

Do you like to read? Have you read the Harry Potter books? Reading is an ability that is learned through instruction (e.g., a teacher or parent teaching you) and needs much practice at home or in school. Many different things help us become great readers. As we grow up, we have many experiences, and our bodies, our thinking, our feelings, and the environment around us are always changing. Early in life, we learn the easier skills, like understanding the meaning of certain sounds, recognising faces, or walking. In fact, learning starts even before we are born! As we grow, we learn more complex skills, like speaking words and sentences, reading, and how to interact with others. Learning new skills goes hand-in-hand with the development of the brain. But many different things can affect how we develop, including changes in our environments, our learning experiences, or even our DNA, which is the biological information that our parents pass on to us.

This is also true for reading. Reading is an ability that we practise for a long time before we become good at it. But this practice starts long before we pick up our first book or go to school. Before we are even born, we start listening to sounds and hearing basic parts of language. These experiences shape areas of the brain that later help us to develop reading skills. In 1983, [a professor named Jeanne Chall said](#) that learning to read happens in several stages (Figure 1). Today we know that many different factors can affect these reading stages and that learning to read can differ among individual children and across the globe. [Such differences exist because](#) many things can affect reading development, like where we grow up, which language we speak, the vocabulary of our language, our ability to play games with speech sounds (e.g., say “banana” without saying the sound /b/), and how good we are at understanding stories.

How the brain learns to read

Brain imaging techniques, such as magnetic resonance imaging (MRI) make it possible to study how the brain learns. MRI is like a big camera that can take images of different parts of the body – for instance, the brain. MRI works by measuring signals coming from water molecules in the body. Every single part of the body is a little bit different, and because of that, the MRI signal coming from each part differs a bit, too. Using computers scientists can create detailed

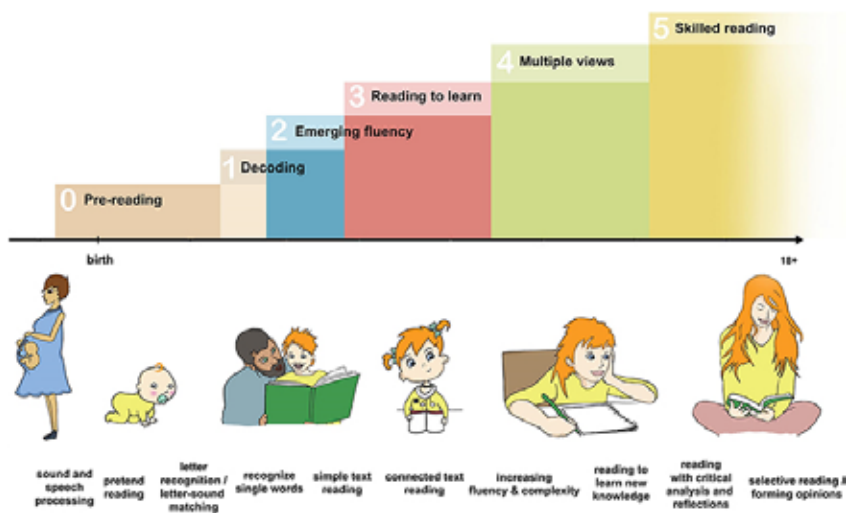


Figure 1. Step-by-step, we learn to read. There are several stages that we may take to become fluent readers. Learning to read starts from the time a baby starts growing and continues throughout schooling and until young adulthood

(Illustrations: N. M. Raschle; the top part of this graphic is adapted from [Chall](#)).

images from these signals (if you are interested in reading more about the physics of MRI, you can read [‘The physics of MRI and how we use it to reveal the mysteries of the mind’](#) written for children by Kathryn Broadhouse). MRI allows us to study both how the brain works while we are doing or feeling something (the brain’s function), as well as how the brain is built (its structure).

When the brain grows and learns, connections between different parts of the brain are created. Over time, these connections build networks. Networks are different parts of the brain that work together. Like a well-trained musical group, brain networks help us learn skills like reading. While we learn, the cells of the brain (called neurons) connect to each other by reaching out their tiny arms (called axons) or even by growing new arms. Over time, many axons connect to each other and build long highways, called white matter tracts. These highways allow information to travel from one part of the brain to another. Using MRI, scientists have learned that we can read because different parts of the brain become more active and communicate with each other as we learn. These brain areas have funny-sounding names: occipitotemporal area, or the ‘letter box’ of the brain (where we process letters and words); temporoparietal area (helps us to play with the sounds of our language, such as figuring out that ‘banana’ without the sound /b/ is ‘anana’); and inferior frontal region (the ‘captain’ that directs us). When brain areas talk with each other often, the highways can become stronger.

An important highway for reading

is a collection of axons that we call the arcuate fasciculus, because it is shaped like an arc. Within the network of brain areas that help us to read, paths like the arcuate fasciculus allow the transportation of information from one area to another. In children who struggle with reading, the brain’s reading network is sometimes built a bit differently or the information takes other

routes. In some brains, the highways transporting the information between the reading areas may be narrow, like having just one lane of traffic instead of two. Or the highways may be less smooth, like a road with a bumpy surface or many traffic lights. These differences make communication between the brain regions challenging and, in some children, reading becomes a difficult task (Figure 2).

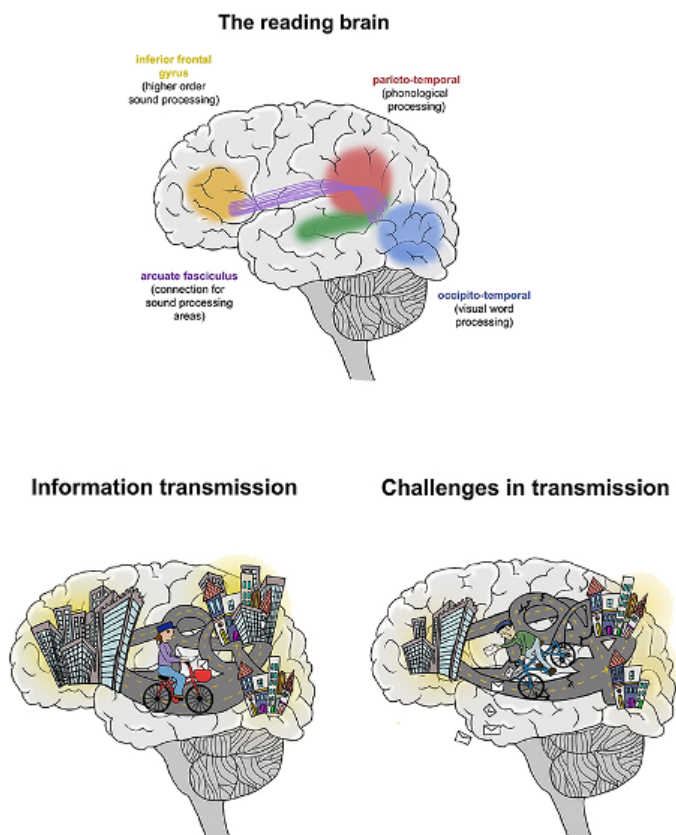


Figure 2. The reading brain. At the top, you can see the names and functions of brain regions that are used for reading. Together, these brain regions form the brain’s reading network. During reading, these areas become more active and talk with each other. Sometimes information transmission in this network goes smoothly (bottom left), but sometimes it can be more challenging (bottom right)

(Illustrations: N. M. Raschle).

The magical art of magnetic resonance imaging to study the reading brain

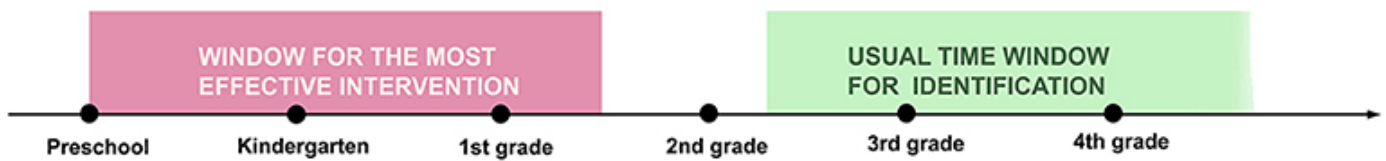


Figure 3. The dyslexia paradox. In most children, reading problems are not discovered until the second or third grade (green area). However, the best and most effective window for helping them is much earlier (pink area).

Developmental dyslexia and the dyslexia paradox

The development of the human brain is complex, and it is not surprising that some brains develop differently than others. Sometimes these differences can have consequences that are discovered only much later in life. In a regular school class, about one or two in a class of 20 children find learning to read extremely challenging. Many researchers would like to be able to predict, as early as possible, which children may struggle with reading. It is much easier to help a child when the problems start than to wait and try to help them years later. When we are young, our brains are much more flexible for things like language, and this makes it easier to learn new things and address problems. Also, if help comes very late, some struggling children may become sad, frustrated, or experience bullying and may even stop wanting to learn. Some parents may become impatient and think their child is not trying hard enough. These are important reasons why scientists want to help identify these children as early as possible.

Some children who have reading difficulties may be diagnosed with developmental dyslexia, which is a type of reading disability. Usually, this diagnosis is made after the children have been trying to learn to read for quite some time (like in second or third grade). The struggle to read has nothing to do with missed practice, laziness, or lack of trying. However, by this time, children need to catch up quite a bit to do well in school, which is a big challenge. As mentioned before, research has shown that the best time to help children with reading is in kindergarten or first grade, when

the brain is a lot more mouldable. The difference between when we identify children who struggle with reading and when they could best be helped is called the dyslexia paradox, because it is something that contradicts itself (Figure 3).

Scientists have shown that we can detect early signs of reading difficulties through spoken, written, or computer tests. We were curious to know whether MRI could also be used to detect early differences in the brains of children who would ultimately have difficulty reading. We found that *young children* who later *struggle with learning to read* seem to have a *different reading network*. But, with support and the right teaching, this can be changed.

The magic of helping others

Unlike the wizards in Harry Potter, scientists cannot read people's minds or use any other forms of magic. But we have come up with various methods and technologies to study the learning brain, one of which is MRI. MRI has allowed scientists to study the parts of the brain that enable us to read and has shown us what might be happening in the brains of children who struggle with reading. With each study, scientists learn more about how we learn and why it is harder for some people to learn than it is for others. Eventually, this information may help us to support each child to reach his or her goals. And being able to do so is true magic.

Glossary

MRI: Stands for magnetic resonance imaging. MRI allows scientists to take images of all parts of the human body. It works with strong magnets and radio waves.

Neuron: Nerve cells within the brain or spinal cord.

Axon: A part of the nerve cell that can connect with other cells and in this way transport information from one cell to another cell.

White Matter Tract: A collection of many axons connecting different brain areas with each other.

Dyslexia: A learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words.

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Acknowledgments

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“Look at the picture”: cognitive load theory and Reading Recovery

Using cognitive load theory, this article seeks to explain the failure of Reading Recovery as an effective instructional technique.



Ian Milligan

What is Reading Recovery?

Reading Recovery (RR) is a one-to-one reading intervention for six- to seven-year-olds. It is based on a ‘constructivist’ belief that reading is a natural, meaning-making process, akin to learning to speak, of which phonics and decoding are only an incidental aspect. [Early readers are encouraged](#) to make use of a ‘multi-cueing’ system, wherein they are taught to process the semantic, syntactic and visual information in highly predictable and repetitive (mostly narrative) texts, in order to be able to read with increased fluency. The text is often ‘speech-like’ and words are often remembered as whole units. In practice, if readers can’t process particular words, they are most often directed away from the grapho-phonetic information. Instead, they are prompted to look at the corresponding picture, to consider, “What would make sense here?”, to look at the first letter of a word and ‘strategically reason’ what the word could be, to think about what is happening in the sentence or narrative or about how the character is feeling, and so on. The above instruction in attending to ‘meaning, structure and visual’ (MSV) elements is made explicit to learners and is used in preference to them being systematically and explicitly taught sound-letter correspondence. [The latter is regarded](#) as essential for writing, but not for reading.

What is the evidence?

There is, in fact, a paucity of quality evidence supporting RR. [The National Clearing House in the US](#) found that only three studies out of 202 were sufficiently well-constructed to be included in their resource base. Those three (with a total of 227 students) all showed short-term benefits, but did not measure long-term effects. As a NSW-based teacher, this author is familiar with, and shall summarise below, [a quality NSW study](#) published in 2015 by the Centre for Education Statistics and Evaluation (CESE) part of the NSW Department of Education (NSWDoE). This study was a longitudinal evaluation of the reading progress of thousands of children – one group treated by RR and another cohort matched for achievement and socio-economic status but not treated by RR.

[The study found that](#), after receiving RR in their second year of schooling, these students, having ended their first year of schooling with the same broad level of reading achievement as the matched non-RR cohort, were significantly worse off by the time a nation-wide, standardised reading assessment was administered in the fourth year of schooling.

The table opposite, from the CESE evaluation, summarises the relatively poor reading performance of the cohort treated by Reading Recovery.

Reading Texts level at Term 4 K	RR effect of NAPLAN Reading score	p-value
Level 1 or below	-25.2	<.001
Level 2	-24.9	<.001
Level 3	-53.1	<.001
Level 4 or above	-86.7	<.001

Note. Results coloured in red show that RR students achieved lower NAPLAN reading scores compared to non-RR students.

Cognitive load theory and Reading Recovery

Which tenets of cognitive load theory (CLT) could explain this failure?

Biologically primary and biologically secondary learning

This concept, [introduced by Geary](#) and now enmeshed within CLT, holds that biologically primary skills such as speaking grammatically in one's native language, walking, recognising faces etc. do not need to be taught. Any skill that humans have not evolved to learn effortlessly may be difficult to acquire and need specialised instruction. Schools were invented to teach these biologically secondary skills, which include reading. By regarding learning to read as similar to learning to listen to a first language, advocates for RR are ignoring the distinction between biologically primary and secondary knowledge. As a consequence, instead of explicitly teaching phonemic awareness leading to word decoding skills, RR proponents encourage learners to talk and guess their way through books, often at the expense of accurate word reading. For example, it would be appropriate in RR for a reader to utter "home" when the word is actually "house". Learners thus fail to develop word decoding skills they will later need when texts are less repetitive and predictable, and where the context is less obvious. ["Constructivist" teaching deliberately withholds important information](#), such as sound-letter correspondence, from learners. It is clear that reading is not acquired naturally and needs to be taught directly, explicitly and systematically for the vast majority of early readers.

The problem with problem solving

Beginning reading is problem solving. CLT has pointed out – and in fact owes its genesis to the observation – that solving a problem does not necessarily lead to learning. Problem solving is a biologically primary skill. Humans are primed to use means-end analysis, a generalised attempt to reduce the difference between goal states (e.g., finishing and understanding a simple book, reading and understanding a simple word or sentence) and present states (e.g., seeing a series of squiggles

Requiring learners to attend to irrelevant, redundant foci on a page is encouraged through RR instruction

on a page). A means-end analysis approach to problem-solving means that learning may not occur if the learning goal is to solve the problem itself (reading and understanding the text), rather than to enhance long-term memory storage about how to solve that problem (learning how to decode written text).

By effectively being prompted to talk and guess their way through books by referring to pictures and a highly predictable and repetitive storyline in an obvious context, RR pupils are often at risk of being left with little or nothing in long-term memory at the end of a learning sequence. They have uttered the words "look(ing)" and "owls" because they are repeated multiple times in [a highly predictable story with corresponding pictures](#), but will not recognise "took/cook" or "howls/down" in a different context, because these are beyond their word-reading ability and they have been taught nothing about the sound-letter correspondence. Of course, failure of long-term memory storage can happen with any learning, but the multi-cueing system of RR instruction, the lack of explicit instruction in phonics and the high level of text predictability make this failure more likely.

Redundancy effect

Providing unnecessary information comes at a cost, as a learner has to devote precious cognitive resources to processing information that is actually not needed for the task. Somewhat

counter-intuitively, [several researchers have found](#) that beginning readers learn to read better when there is no picture provided. By continually expecting readers to refer to pictures that correspond closely to the written text, RR requires readers to do additional mental processing, imposing a higher cognitive load than desirable.

Requiring learners to attend to irrelevant, redundant foci on a page is encouraged through RR instruction. It directs students to take their attention away from the written word towards a picture, or to cogitate on semantic, syntactic or contextual information, then expects students to mentally integrate them. Attending to irrelevant information makes automatic word reading less achievable. [As Stanovich et al. have noted](#), automatic, context-free word recognition is the fundamental difference between weak and strong readers. Anyone who has sat with a struggling 6- or 7-year-old reader knows that the first thing most do when they don't recognise a word is to look at the picture. The second thing is to appeal to the teacher. Neither assists in learning to decode written text but for many students treated with Reading Recovery-type methodology, this happens so automatically, it presents like disordered learning behaviour.

Element interactivity/isolated elements effect

[Requiring beginning readers to simultaneously consider](#) diverse elements of language (semantic, syntactic, contextual, grapho-phonetic) in order to 'read' words imposes a heavy cognitive load, as readers then have to process these elements simultaneously in working memory. Conversely, beginning reading instruction is more successful when element interactivity is kept low, i.e., by only requiring readers to consider one element at a time when word reading – primarily the grapho-phonetic information. [Word recognition needs to quickly become](#) a low-cognitive-demand skill – stored in long-term memory and accessed automatically. The acquisition of such skills should not be over-complicated by using working memory for other purposes more than is necessary.



Intrinsic and extraneous cognitive load

All of the above factors contribute to the imposition of an extraneous cognitive load. [Intrinsic cognitive load](#) refers to the content to be learned, while extraneous cognitive load refers to the instructional procedures used to learn/teach that content.

Learning to read necessarily comes with a high intrinsic cognitive load; that is to say, the process of deciphering an alphabetic code to automaticity is long and daunting. A greater than desirable extraneous load is placed upon RR pupils, who are subject to instructional procedures which overload working memory and withhold important information. Start trying to learn to read Russian, Hindi, Thai, Chinese etc. without being given sufficient information about what the symbols mean and you will walk in the shoes of a RR student.

Learning science or an educational flat-earth?

No one, least of all this author, is claiming RR pupils learn nothing, but it is clear [they make less reading progress](#) than early readers who are explicitly and systematically taught phonics or even than readers who are taught anything but RR methodology, as the NSW study makes clear. RR proponents are like the

historical believers in a flat earth. The science has continued to move beyond them, but they can't accept the evidence. They teach weak readers the word-reading methods that are used by weak readers – to guess, to be over-reliant on context and to ignore grapho-phonetic information in words.

Unfortunately, the above reading pedagogy has become dominant in the early years of school in most anglophone countries, leading to high levels of unnecessary reading failure. Even where teachers do not receive Reading Recovery training, they too often learn to teach reading as a multi-cueing guessing game, sometimes through whole-class offshoots like Language, Literacy and Learning (L3) in NSW.

Cognitive load theory is an important contribution to the scientific framework which can account for both the failure of Reading Recovery-based pedagogy and the greater efficacy of phonics-based reading instruction for beginning/struggling readers.

Notes

- 1 The quote "Look at the picture" from this article's title comes from a common prompt given to RR pupils, and also to their common response when asked what they should do if they can't read the word.

- 2 The NSWDoE evaluation was the first and only time they had attempted to determine the value of the tens of millions of dollars spent every year for decades on RR. The NSWDoE, to its credit, accepted the evidence and stopped centrally funding the program, although still permits schools to spend taxpayer funds on RR if they so choose. How many (or few) RR teachers in NSW have read this evaluation, much less accepted its findings?
- 3 Reading Recovery spawned a whole-class offshoot, Language, Literacy and Learning (L3) in NSW, where all students in a class/school are treated with a RR methodology. Until very recently, this approach was generously funded, despite having no evidentiary basis.

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Screen vs. paper: The effects of text medium on reading comprehension

Nicola
Bell



As a reading researcher, I spend a lot of time thinking about the factors that affect reading comprehension. As a person who reads, I'm also interested in the factors that affect *my* reading comprehension.

Most of what I read (emails, texts, articles) is presented via a screen, which suits me fine. That said, if the page length gets too hefty, I tend to want a printed version. And while e-books have been around for a while now, I've never felt the same attraction to that kind of text medium as I've felt towards real, 'proper' books. This has led me to wonder whether there is any actual difference in reading performance that is attributable to text medium.

Screen vs. paper

Attitude-wise, *the majority of people also prefer* printed books over digital or e-books. For me, part of this is due to the feeling of owning books – especially when I've bought them while on a holiday. They are artefacts. Mementos. It makes me happy to look up from my desk and lovingly peruse a shelf of old P.G. Wodehouse books that were purchased from various second-hand stores.

But, beyond having them as keepsakes, printed books have physical qualities that somehow make them superior to their digital counterparts. Each one has a weight and thickness that represent how long you can be expected to spend reading it, and each page-turn therefore signifies tangible, observable, concrete progress.

In contrast, navigating through a digital text involves scrolling or tapping; you are still progressing from the start to the end in an abstract kind of way, but *it's more difficult to place* any one passage in the context of the entire text, *or to backtrack* and read the same passage again to solidify its meaning.

So, does the absence of a tactile reading experience translate to an actual reduction in reading comprehension performance?

The answer is yes, though with caveats. According to Garland and Noyes (2004), *there is little difference* in immediate recall of information when adult readers are presented with exactly the same material via print versus screen. However, in their study, the quality of comprehension knowledge differed, depending on the medium. Information presented via print was better assimilated into long-term memory. It was known, rather than remembered.

Children, too – our so-called digital natives – also seem to be *slower* or *less accurate* to comprehend long, linearly structured text via a screen, rather than in print.

As mentioned, this is partly due to difficulties with navigating screen-based text. In addition, the light and angle of computer monitors mean *there are higher optical demands* associated with screen-reading, which means the reader is more likely to experience eye fatigue.



Shallow vs. deep reading

There is also the question of [whether our general reading behaviours](#) have been affected by exposure to more screen-based text over time. Have we, as a society, unlearned the skill of deep reading? According to [Tanner \(2014\)](#),

It requires patience to learn from a text, patience to follow an author's logic through unfamiliar territory, and patience to constantly review new concepts to confirm one's understanding. A computer might not be conducive to such effortful deliberation. (p. 6)

Prominent reading researcher [Professor Maryanne Wolf](#) also has concerns about the broader implications of becoming a population of superficial readers:

If a growing number of our best and brightest students of literature have begun to shun some of the finest works in our past literacy legacy because the texts are too long, and because the students no longer possess the perseverance to 'suffer through' them, who will we, the rest of us become? Who will we be if huge portions of our past literacy traditions become less incorporated in the corpus of what the educated person reads and

writes and is taught? ... Our ability to understand ever more sophisticated text furthers our ability to comprehend the varied, often complex, and cognitively demanding issues that are at the heart of human character and indeed of a democratic society. (p. 150)

I'm not sure whether I hold such a pessimistic view of the future state of our screen-tastic world, but maybe that's because – as a borderline-millennial – digital media is too much a part of my DNA for me to have an unbiased opinion.

If I'm honest, I do think I'm an impatient reader. I would much rather have already read most things than do the actual reading. And that tendency to absorb text shallowly is a pretty weighty weakness that, I would imagine, is shared with a lot of other people.

But like it or not, screens aren't going anywhere, and that's not an entirely bad thing. In terms of reading comprehension, screens allow for factors like font size, lighting contrast and spacing to be adjusted according to the readers' preferences, which [may be of particular benefit to older adults](#).

There's also no denying the accessibility of digital media. What we got in exchange for our patience towards long written texts is a vast heap of online content. Is the trade-off worth it? Twenty minutes on Twitter will convince you that it isn't. But then again, you probably found this article via a screen, so it can't be all bad.

Convenience vs. concentration

When it comes down to it, reading comprehension is not a straightforward metric. At a basic level, [it certainly relies](#) on the reader's word recognition and language comprehension, and for that reason, these skills need to be incorporated into children's literacy instruction.

As we've seen, presentation medium also plays a role in reading comprehension – at least when the written text is long and linearly structured. In such cases, paper seems to be the better choice.

On the other hand, screens win on convenience of access, and they can be useful when the goal is to comprehend bite-sized and/or time-sensitive text correspondences.

On the other hand still, audiobooks are useful when the goal is comprehending text while cleaning the fridge. And e-readers are useful when the goal is comprehending text while staying minimalist.

As a species, we have prioritised convenient access to a range of different text format options. Research has yet to show conclusively whether, by doing so, we're forfeiting the ability to gradually and concentratedly build knowledge by engaging with written text.

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Why all children need school

Elizabeth Stone



I have the clearest memory of watching my two-year-old son exploring the back garden. A very thin twig was poking out from the hedge. He picked up a rock about the size of my fist and slowly, with infinite care, he held the rock gently on the top of the trembling twig ... and let go. The rock thumped to the ground, and my son learnt something about gravity and the relationship between the diameter and strength of a tree branch.

The evolutionary psychologist David Geary described these basic ideas about material objects as ‘folk physics’. Children learn folk physics easily, simply by playing and exploring the world. What goes up must come down. An object doesn’t disappear just because you can’t see it, and so on. Similarly, all cultures have developed ‘folk biology’ (structured ways of observing living things and reasoning about them), and ‘folk psychology’ (how to understand and cooperate with other people).

It is easy to see why such knowledge would be essential to human evolution, and Geary argued that human brains have evolved so that such knowledge could be acquired rapidly and seamlessly from infancy. Those things that would have been essential to the survival of early hominids are, to this day, learnt by children with little effort. Toddlers don’t need English lessons – they acquire language by being spoken to. Children figure out how the material world works by mucking around in the garden. They learn about human behaviour and how to collaborate by simply playing together.

Knowledge that we learn naturally and without effort is, in Geary’s model, ‘biologically primary’. A great deal of knowledge, however, is essential in the modern world although it was not required throughout human evolution. Algebra, a basic tool of modern mathematics, technology and engineering, was unknown until a few hundred years ago. Even reading is only a few thousand years old, far too recent to have played any part in evolution. In fact, most of what we learn in school is ‘biologically secondary’ knowledge – which makes sense, because if it were biologically primary we’d pick it up without help, anyway.

Our brains are not inherently suited to this secondary knowledge, so the process of learning is much harder. In effect, we have to hijack cognitive architecture (roughly, ‘brain circuitry’) which originally developed for ‘folk’ knowledge and retrain it for new purposes such as reading. We usually have to be explicitly taught secondary knowledge but even if we acquire it by ourselves, it is always an effort.

So what is the significance of the primary/secondary distinction?

Most people recognise intuitively that it has explanatory force. It explains why parents don’t have to teach their children to speak, but do have to read to them every night for years before they become fluent readers. It explains why lots of playtime is fantastic for pre-school aged children who are busy



acquiring folk knowledge at an extraordinary pace with brains designed specifically for that purpose. It also explains why no ordinary child is going to acquire a solid grasp of trigonometry without extended, focused effort and a skilled guide.

Watching small children grow and learn is a daily miracle. It seems so effortless – it is so effortless – that we naturally want to replicate that learning process in school. Why can't we just let children learn by doing? Wouldn't that be more fun – and even more effective? Why can't we just put them in a room full of interesting things, answer the odd question, and watch them emerge as confident mathematicians, historians, artists and writers at the age of 18? Geary and his successors have a somewhat deflating answer: "Because the brain doesn't work that way." The knowledge we are describing is biologically secondary, and that means it's going to take good teaching and hard study.

The implications of this distinction are profound. Immersion and play are not effective ways of learning secondary knowledge. This explains, for instance, why 'digital natives' (young people who have grown up immersed in technology) are no better than us oldies in using digital technology for complex tasks. They have the same brains that we do, but less knowledge and experience.

Their ape-like ancestors never needed this skill. The model also explains why it is not enough simply to surround children with beautiful books and adults who love reading. They need explicit teaching over an extended period and years of practice and correction to acquire this biologically unnatural skill.

It's important to note that our biological systems aren't perfect. We may acquire (biologically primary) social skills instinctively, but we don't acquire them all at once or at the same pace. Some seem to have lower EQ than others; they take longer to mature into these relationship skills. It's possible that some explicit pointers can help them get there faster. But we can still see that this is in a different category from, say, the rules of symbolic logic, for which no natural process of maturing will suffice.

The academic curriculum embodies biologically secondary knowledge. It's hard to learn. That's why we teach it within a clear structure, with skilled teachers carefully guiding students through a specific sequence of ideas which are explicitly introduced at each step. There are opportunities to play with ideas, and to explore in a much less structured way, but generally these are effective for advanced students rather than beginners.

We also recognise how important

it is for students to learn to navigate relationships, communicate well and collaborate effectively. They will bring a certain level of skill with them, but these skills need to be enhanced and refined as they grow towards adulthood. This is why a rich extra-curricular program, with opportunities to learn how to lead, how to follow, how to communicate and how to listen, is equally important to a student's education. When their intellectual development is matched by their capacity for leadership and service, that's when we have prepared them for life.

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Summer learning loss in reading? Not necessarily

James
Chapman



The fabled ‘summer learning loss’ may not be cause for concern, according to the results of two new studies in New Zealand.

Concerns about a summer learning loss (SLL) have been expressed over many years. [Atteberry and McMechan \(2020\)](#) note that “there is a common understanding among policymakers, researchers, and practitioners that during the summer students lose some of the knowledge and skills acquired during the school year” (p. 4). Such concerns have become heightened, especially in the United States, because of the school closures due to the COVID-19 pandemic.

Notwithstanding the devastating effects of COVID-19 across all aspects of life, renewed discussion about summer learning loss warrants some further examination, especially in countries that have shorter school summer vacations (e.g., Australia, New Zealand, UK). In this article, I present data from two New Zealand studies that call into question whether there is a SLL in regard to reading. Neither of these studies was designed to examine summer learning loss. Rather, they provided data that addressed this issue as children transitioned from the end of Year 1 to the start of Year 2, with the summer vacation in between the transition.

New Zealand data on the issue of SLL are relatively sparse. [McNaughton, Jesson, Kolose, and Kercher \(2012\)](#) reported that it is “well known” that a summer learning effect occurs in New Zealand (p. 2). Similarly, [Turner and Tse \(2015\)](#) asserted that there is an SLL effect in New Zealand and implemented summer reading programmes to counter that effect.

Study 1

Data for the first study were available from five schools in the wider Auckland region in New Zealand. All schools were classified as ‘low decile’ (deciles 1 to 3). Decile rankings are based on the predominant SES status of families in each school’s neighbourhood, with decile 1 indicating a very low SES neighbourhood and decile 10 a very high SES neighbourhood. Four of the five schools were supplementing their Year 1 reading programmes with the Quick60 ([Iversen, 2013](#)) programme, which is designed to teach the necessary early literacy skills in an explicit way. The other school used the regular literacy programme which was whole language in orientation.

Reading data were collected in November, towards the end of Year 1, and in February, at the start of Year 2. These data consisted of scores on the Burt Word Test and Reading Book Level, which is determined by means of a running record. The Burt test was administered by a research assistant, whereas book levels were assessed by classroom teachers. Scores on both measures were analysed by means of analyses of variance with repeated measures.

Scores on the Burt test revealed that children in the Quick60 schools (N= 61) increased from a mean of 18.98 points at the end of Year 1 to 23.31 in February of Year 2. Children in the regular literacy programme (N=24) had lower scores, but also increased from 11.88 to 15.41 over the same testing occasions.



Burt scores were also used to group readers as low (less than 11), average (11 to 21), and high (over 21). All three groups showed increases in mean Burt scores at the early Year 2 assessment occasion compared to the end of Year 1 scores: 'low' children increased by 1.31 points; 'average' children also increased by 1.31 points; 'high' children increased by 3.18 points.

For book levels, Quick60 children (N=47) increased from 10.85 to 11.71 over the two testing occasions, whereas children in the regular programme (N=25) showed a slight decrease from 6.34 to 6.04. These changes weren't statistically significant.

Although boys scored lower than girls on average, both made similar changes on the two measures from the end of Year 1 to early in Year 2.

Of further interest are the findings in terms of home background. Classroom teachers were asked to rate each child's home background as either 'normal' or 'difficult'. Homes rated as 'difficult' involved issues known to teachers such as parental illness, unemployment, drug problems, and relatively high rates of school absenteeism.

Both groups showed increases in Burt scores: 19.33 to 22.67 for children from 'normal' backgrounds and 13.55 to 15.91 for children from 'difficult' backgrounds. In terms of book levels, changes were from 9.53 to 10.43, and 7.30 to 8.22 respectively for children from 'normal' and 'difficult' backgrounds. Clearly, children whose home backgrounds are rated by teachers as difficult were

Data from this study indicate that there is no evidence of a summer slide in reading either for children receiving the Quick60 programme or for those receiving the regular whole-language oriented programme

achieving at lower levels than those whose backgrounds were considered to be normal.

In sum, data from this study indicate that there is no evidence of a summer slide in reading either for children receiving the Quick60 programme or for those receiving the regular whole language-oriented programme during their first year of schooling. Similarly, there is no evidence in these data that children from 'difficult' home backgrounds or those whose word reading was comparatively low at the end of Year 1 suffer from a summer slide in reading performance.

Study 2

The second study involved children who were participating in an intervention study funded by the New Zealand Ministry of Education (see [Chapman et al., 2018a](#); [Chapman et al., 2018b](#)). All children turned five years old during the few

months prior to entering school at the start of the school year in February. The study was undertaken in 39 schools in the lower North Island. Schools were randomly allocated to either an 'intervention' group or a 'comparison' group. The intervention comprised four one-day professional learning and development (PLD) workshops and one two-day workshop during the course of the year for those teachers working with Year 1 children. The workshops focused on providing teachers with the knowledge and skills to adopt explicit and systematic word-decoding teaching strategies in their literacy instruction. Teachers in comparison schools carried on with their regular literacy programme, which was typically whole language in nature. Attrition, the withdrawal of one school, and incomplete data reduced the number of students included in the various analyses.

To examine evidence for a summer reading loss, data from the Burt test collected in November of Year 1 were compared with Burt scores collected during February of Year 2. The Burt test was administered by trained research assistants. Book levels were not available. Complete data for the two testing occasions were available for 522 children.

There was an overall increase in mean Burt scores from 17.96 at the end of Year 1 to 19.94 early in Year 2. Mean score changes were similar for both the Intervention (N=270) and Comparison (N=252) children, with the Intervention children obtaining slightly higher gains than Comparison children: Intervention = 17.38 to 19.08; Comparison = 17.25 to 19.44. These results were combined



for two separate cohorts of 'intervention' teachers.

The second cohort of teachers received a modified PLD workshop programme based on changes made to the programme for the first cohort. Results for children whose teachers were in the second cohort were better than for those in the first cohort: intervention (N=104) = 19.41 to 20.42; comparison (N=57) = 14.04 to 15.79. Of particular interest were results for Intervention children who were in the low band of Burt scores: Intervention = 6.57 to 7.43; Comparison = 4.24 to 4.92. During the course of Year 2, the Intervention children went on to outperform Comparison children on a range of measures (phonological awareness, alphabetic coding, language processing, word reading and spelling).

Consistent with the results for Study 1, children in each of the three decile bands of schools showed increases in Burt scores between the end of Year 1 and early in Year 2: low = 13.23 to 18.76; middle = 18.15 to 20.36; high = 20.93 to 22.55. The greater increase for children in low decile schools was due primarily to higher Burt scores obtained by children in the Intervention group in contrast to those in the Comparison group.

Although boys tended to obtain lower Burt scores than girls in both the Intervention and Comparison sample, roughly similar gains of around 1 to 1.5 score point differences between the two testing occasions were made for boys and girls.

Conclusion

The purpose of this article was to identify data from two studies to show whether or not there was evidence of a summer slump in reading performance in New Zealand children. Compared to other studies, these data do not reveal such a slump. Rather, there was a general tendency for children to increase word reading and reading book level scores between the end of Year 1 assessments in November, and the start of Year 2 assessments in February.

There is no obvious answer to the question as to why no summer slump in reading was found in these two data sets. Being part of an intervention study or not was not associated with a slump; being in a low decile school and/or having low Burt reading scores at the end of Year 1 was not associated with a slump; and being a boy (or a girl) was also not associated with a slump. Perhaps importantly, coming from a home background considered by teachers to be 'difficult' also was not associated with a slump. That said, there are ongoing disparities in reading achievement between children from low compared to high SES backgrounds. And in line with many other countries, boys tend to perform less well on reading assessments than girls.

It's hard to believe that New Zealand children engage more with reading-related activities over the summer break than children in other countries. Consider that the summer break in Southern Hemisphere countries coincides with the Christmas vacation. In New Zealand, most likely in line with other southern countries, people typically engage in family time and holidays over the Christmas/New Year period. Perhaps literate cultural capital is enhanced for some children with home-based literacy activities and trips to the library. But not all children have access to such resources.

Further, it is unlikely that early childhood experiences in New Zealand provide a better literacy foundation for children prior to school entry than other countries, thereby mitigating the risk of a summer slump in reading. Systematic pre-reading literacy activities in most New

Zealand pre-schools and kindergartens are discouraged in favour of *informal play-based programmes* with a holistic approach to curriculum planning. Policies and curriculum for early years in New Zealand do not favour explicit instruction in early reading-related skills.

Despite the lack of a ready explanation for the results of these two studies, *summer reading 'clinics'* can provide children with the opportunity to further enhance their skills in this area. And parents who are able to can also assist children further develop their literacy skills over the summer vacation. Children who do not have these opportunities have to rely on teachers to provide quality literacy instruction.

Over the last four decades most New Zealand teachers have adopted a whole language approach to literacy instruction, with a strong reliance on the three-cuing system of early word identification. That is how teachers have typically been trained in education colleges to teach reading.

Despite there not being an obvious summer slump in reading, much remains to be done in New Zealand in terms of adopting contemporary scientifically based approaches to literacy instruction in the early years of schooling. Significant changes are underway as a result of recent and current research to change the predominant, whole language approach to literacy instruction. Hopefully these changes will benefit all children and ensure that the results of the studies in this article showing no summer slump in reading are widespread and persist.

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Sight words, orthographic mapping, phonemic awareness

What, exactly, are sight words? How are they created? How are they related to orthographic mapping? What phonemic awareness skills are necessary for a child to become a competent reader and speller? And what method of teaching most facilitates sight word creation and orthographic mapping?



**Stephen
Parker**

To better understand these topics, some specialised vocabulary is helpful. Let's get that bit of housekeeping out of the way first.

A brief glossary

Phonological lexicon: A storage system in the brain consisting of individual word pronunciations.

Semantic lexicon: A storage system in the brain consisting of individual word meanings.

Orthographic lexicon: A storage system in the brain consisting of individual word spellings.

[Note: We're born with the ability to start acquiring the first two of these lexicons, without any explicit instruction, as a ready-to-go gift of evolution. The orthographic lexicon, however, is created and linked to the other two, if and only if, we engage in the process of learning to read.]

Phoneme: The most elemental unit of sound in a given language (usually designated by slash marks). For example, /a/ (lowercase) is the first sound you can hear in the word APPLE (before you close your mouth to articulate the P sound). The sound /A/ (uppercase) is the first sound you can hear in APRIL (long A). The words CAT, SHED, CHEAP, and TAUGHT (for example) have three phonemes each, despite the fact that they have three, four, five, and six letters respectively:

CAT = /k/ + /a/ + /t/

SHED = /sh/ + /e/ + /d/ (lowercase /e/ = short E)

CHEAP = /ch/ + /E/ + /p/ (uppercase /E/ = long E)

TAUGHT = /t/ + /aw/ + /t/

Grapheme: A letter (or a group of letters) that symbolise a single phoneme. Nearly all graphemes consist of one or two letters (as shown in the above examples). Be careful though: SH (no slash marks) is a grapheme that symbolises the phoneme /sh/ in the word SHED. CH and EA are graphemes that symbolise the phonemes /ch/ and /E/, respectively, in CHEAP. Other common two-letter graphemes are TH and OA (THIN and ROAD). IGH is an example of a three-letter grapheme. It symbolises the long I sound in a word like SIGH and FIGHT.

Sight words, orthographic mapping, phonemic awareness



There are a few four-letter graphemes as well such as AUGH, OUGH, and EIGH. The first two of these symbolise the phoneme /aw/ in words like TAUGHT and BOUGHT (3 phonemes each). EIGH symbolises the long A sound in words like EIGHT and NEIGHBOUR. For any given word, the number of phonemes and graphemes are equal.

[Note: For a more complete list of phonemes and graphemes, see Table 1 and Appendices P & Q in any of [my free books](#). For a full discussion of the Alphabetic Code and all its phoneme-grapheme correspondences, see my blog [here](#).]

Decoding: To see a written word, to assign a phoneme to each of its graphemes, and to smoothly blend those phonemes (left to right) to form a pronunciation – thereby ‘sounding out’ the word. If the word is then recognised by the child, because it’s in his or her spoken (or listening) vocabulary, this process is also called reading.

Encoding: To hear a spoken word, to segment it into all its constituent phonemes, and to assign a grapheme to each of those phonemes – thereby spelling it.

Phonemic awareness: To become conscious of the phonemes in everyday speech. Most illiterate children (and adults) are unconscious of phonemes. Children develop an awareness of

phonemes as they learn to read. Decoding and segmenting both require phonemic awareness.

Sight word: A written word that is recognised at a glance. A written word which no longer needs to be identified by decoding (sounding out).

Orthographic mapping: A process which involves making explicit the connections between the graphemes in a written word and the phonemes in its pronunciation. Orthographic mapping automatically creates sight words.

The brain’s language centre

Children are born with a system already in place for acquiring spoken language. It’s a gift resulting from a million years of evolution. As a result, children don’t need formal instruction on how to speak or how to comprehend speech. Simply place them in a speaking environment, and their language will begin to develop spontaneously.

Input to this system is via the ears and consists of coarticulated phonemes, that is, phonemes which seamlessly blend together in any given word. With each new word a toddler learns, the sound of the word, with its individual phonemes sequenced automatically, is stored in the brain’s phonological lexicon, while the meaning of the word is stored in the semantic lexicon.

Toddlers can easily hear and understand the difference between PET

and GET (words differing only in the first phoneme), PET and PAT (differing only in the second), and PET and PEN (differing only in the last phoneme). When a toddler wishes to speak, her brain’s language centre automatically and unconsciously gathers, orders, and coarticulates the necessary phonemes:

KITTY CAT = /k/ + /i/ + /t/ + /E/ + /k/ + /a/ + /t/

Throughout an individual’s life, spoken words are constantly being added to his or her phonological and semantic lexicons.

What is a sight word?

The brain’s language centre, however, has no built-in circuitry for reading and spelling (cf. Sally Shaywitz, *Overcoming Dyslexia*, Ch 5). The ingenious code that underlies those skills is a human invention which developed only a few thousand years ago. That’s a blink of an eye in evolutionary terms – and too recent for evolution to have developed specialised brain circuits for handling symbolic speech whose characters (letters) enter the brain via the eyes instead of the ears.

As a child starts learning to read and spell, a third lexicon is created in the brain and linked to the two already there. This orthographic lexicon will slowly (at first) accumulate the exact letter sequence of each word the reader learns to recognise at a glance, that is, without decoding it (sounding it out).

So, for example, if CAT becomes a sight word, its spelling (C, A, T) gets linked to the pronunciation (/k/ + /a/ + /t/) and meaning (furry animal that purrs) that have already been stored in her brain since she was two. She'll never again have to sound out CAT to read it, or segment CAT to spell it.

A sight word, then, is one that a reader instantly and automatically recognises without conscious effort. She doesn't need to analyse it, decode it, or sound it out. Rather, as soon as she sees the word, she recognises it; its sound and meaning are immediately available to her. If instead, she first hears the word, its spelling and meaning are immediately available. And of course, if meaning comes first, spelling and sound instantly follow. For mature readers, most words are sight words.

[Note: Any word encountered by a reader, high-frequency or low, phonetically regular or irregular, can and should become a sight word.]

Creating sight words the hard way

Sight words are clearly useful, but how are they created? There's a hard way and an easy way – and both are necessary for skilled reading and spelling to develop. The hard way is to rote-memorise the spelling of the word visually, without regard to the sound value of its letters. For a longer word, this is akin to memorising passwords or phone numbers.

Here are some examples of words (or other symbolic representations) where rote-memorisation of the accompanying sound is a necessity: OF, ONE, CHOIR, YACHT, COLONEL, 7, @, \$, and ♀. The five words in this list are so irregular that sounding them out is not feasible. (To be regular they would have to be spelled OV, WUN, KWIRE, YOT, and KERNAL.) The four non-alphabetic symbols have no possibility of being decoded, yet, when we see them, we instantly 'hear' SEVEN, AT, DOLLAR, and FEMALE.

All nine of these symbolic representations of sound are sight words for most mature readers (as are most of the words in this blog). So why not have new readers learn all words this way, visually, without regard to sound? This would effectively make our alphabetic system into a logographic

A sight word is one that a reader instantly and automatically recognises without conscious effort. She doesn't need to analyse it, decode it, or sound it out

one – similar, one might assume, to Chinese script. There are three huge problems with trying to do this:

1. No purely logographic writing system has ever existed. Chinese characters (hanzi) are usually accompanied by a phonetic component to help with pronunciation and/or a semantic component (a radical) to help with meaning. Similarly, Japanese characters (kanji) are usually accompanied by pronunciation helpers (called katakana and hiragana) that symbolise syllables like 'ma' and 'ka'. Notably, for both Chinese and Japanese, memorisation of around 3000 characters is all that's needed for basic literacy. (See [here](#).)

The trouble is, it takes 12 years of schooling to achieve this monumental feat of memorisation – even with the above phonetic helpers. That's about 250 characters per year – and it requires a level of intensity, drilling, and homework that would be unacceptable in most Western schools.

Suppose, for a moment, that our children could visually memorise 3000 sight words by the end of high school. Where would that leave them? They would be functionally illiterate. That's because English has over a million words, and a skilled, educated reader of English has a personal orthographic lexicon of [50,000](#) or more sight words. Do the math: $3000/50000 = 0.06$. Conclusion: relying on visual rote-memorisation for sight word acquisition would, under the best possible circumstances, equip our children with only 6% of the sight words needed to become skilled readers. The reality? Most of our children do not learn even 100 sight words per year in this manner.

2. Self-teaching, in the sense of adding new sight words independently to one's orthographic lexicon, would be an impossibility. If the connection between spelling, on the one hand, and sound/meaning on the other, is visually rote-memorised, then, when a child comes across an unknown word, he must either guess the word's pronunciation (and meaning) or ask someone else what the word says.

That this is a critical issue can again be understood with a little math. If



unknown written word, CHEAP for example. Let's assume he knows the three graphemes in this word are CH, EA, and P. Let's assume he correctly matches each grapheme with the correct phoneme: /ch/, /E/, and /p/ respectively. And, finally, let's assume he blends these three phonemes into the correct pronunciation and says proudly: "CHEAP! The word is CHEAP! I know that word! It means you hate to spend money!"

This child has made all the connections possible between the graphemes he sees in the spelling of CHEAP and the phonemes he just blended into a pronunciation. By making these connections explicit, the word CHEAP will become a sight word for him, automatically and unconsciously, after only 1-4 exposures to its written form. CHEAP easily becomes a sight word because his brain (like all brains) craves logic and because "making connections" is how brains work. Such connections are made explicit in the process of decoding.

When grapheme-phoneme (letter-sound) connections are explicitly made for a given word (CHEAP), its exact orthography (spelling), C-H-E-A-P, is directly 'mapped' into the brain's language centre and linked to the brain's sound lexicon and meaning lexicon. Essentially, by connecting individual phonemes and graphemes in this manner, he's training himself to accept specific words input, not through the ears, but through the eyes. Here's how Ehri explains it in one of her many [publications](#):

[B]eginners remember how to read sight words by forming complete connections between graphemes seen in the written form of words and phonemes detected in their pronunciations. This is possible because they understand how graphemes symbolise phonemes in the conventional spelling system ... In applying this knowledge for forming connections in sight words, spellings become amalgamated or bonded to pronunciations of words already in memory ... [Beginners have] the ability to decode words never read before, by blending

a skilled reader of English has about 50,000 sight words in her orthographic lexicon after 12 years of schooling, she must have been memorising words at the rate of 50,000/12 or 4,166 new words each year. That's 23 new words, on average, per school day! No teacher is accomplishing that with her students and no student is consciously memorising sight words at such a phenomenal rate. (For more information on self-teaching, see [here](#).)

3. To begin reading instruction with rote-memorisation of sight words is difficult and demoralising for many children. It gives them the false but unmistakable message that the skill of learning to read is not based on logic, but rather on blind memorisation and word-guessing. After a year of this type of 'schooling', many of them get frustrated and give up. Though these children are actually instructional casualties, they often end up classified as 'learning disabled' or 'dyslexic'.

Creating sight words the easy way: orthographic mapping

Calling this second way of creating sight words 'easy' is a bit of a misnomer – at least at the beginning. At the beginning, this manner of creating sight words is difficult too, as it has

some requisite skills that themselves take time and effort to master. Researchers call this second mode of sight word learning orthographic mapping – OM for short. Let's see what it involves.

[Note: The two most prominent researchers in this space are Linnea Ehri and David Share. If you wish to learn more about orthographic mapping than is covered in this blog, these are the two people to read. (For Ehri, see [here](#) and [here](#). For Share, see [here](#) and [here](#).) If you completed your teacher training in the past two decades and you've never heard of these two authors, your school of education did you a significant disservice.]

Orthographic mapping is simply a process whereby a word's exact spelling is stored in permanent, long-term memory as a sight word. Words are mapped, one at a time, into an individual's long-term memory (orthographic lexicon) if that reader has the skills needed to make all the connections between the graphemes seen in an unknown word's written form and the phonemes heard in that word's pronunciation

But this is precisely what happens in the process of decoding a word. Suppose a child comes across an

letters into a pronunciation. This knowledge [blending] enables [them] to form fully connected sight words in memory... Although [they] are able to decode words, this [blending] strategy for reading words is supplanted by sight word reading for words that are practised sufficiently often. (pp. 21-22)

In short, orthographic mapping (automatic sight word formation) will begin to occur as soon as children are able to decode. Decoding, in turn, has two prerequisites:

- 1 Knowledge of grapheme/phoneme (letter-sound) correspondences. For example: the letter A says (symbolises) the sound /a/, M says 'mmm', and N says 'nnn'.
- 2 The skill of blending. For example: the teacher places M A N on the board and demonstrates, explicitly, how to smoothly blend the sounds represented by these letters into the spoken word MAN.

[Note: A third skill, segmenting, is also useful here. Segmenting reinforces the 'complete connections' between graphemes and phonemes necessary for orthographic mapping, but it does so from the opposite direction: spelling rather than reading (encoding rather than decoding). Segmenting also helps students spell unfamiliar words (words not yet mapped as sight words).]

Phonemic awareness

Clearly, blending phonemes and segmenting phonemes requires children to have an 'awareness' of phonemes. But is there more to the topic of phonemic awareness (PA) than blending and segmenting? Should PA training be done without letters, as oral-only exercises? Should PA training include phoneme manipulations such as deletion, substitution, and reversal? What's essential and what isn't? Let's see what top reading researchers, and national inquiries in the US and UK, have to say:

The US [National Reading Panel](#) (2000):

The process of decoding words never read before involves transforming graphemes into phonemes and then blending the

In short, orthographic mapping (automatic sight word formation) will begin to occur as soon as children are able to decode

phonemes to form words with recognisable meanings. The PA skill centrally involved in decoding is blending. Another way to read words is from memory, sometimes called sight word reading. This requires prior experience reading the words and retaining information about them in memory. In order for individual words to be represented in memory, beginning readers are thought to form connections between graphemes and phonemes in the word. These connections bond spellings to their pronunciations in memory. (2-11)

[Note: If these last two sentences sound familiar, it's because Linnea Ehri was one of the Panel members.]

Various types of phoneme manipulations might be taught. However, two types, blending and segmenting, are thought to be directly involved in reading and spelling processes. Blending phonemes helps children to decode unfamiliar words. Segmenting words into phonemes helps children to spell unfamiliar words and also helps to retain spellings in memory. (2-21)

Programs that focused on teaching one or two PA skills yielded larger effects on PA learning than programs teaching three or more of these manipulations. Instruction that taught phoneme manipulation with letters helped children acquire PA skills better than instruction without letters. (2-28)

It is important to note that acquiring phonemic awareness is a means rather than an end. PA is not acquired for its own sake but rather for its value in helping children understand and use the alphabetic system to read and write. This is why including letters in the process of teaching children to manipulate phonemes is important. PA training with letters helps learners determine how phonemes match up to graphemes within words and thus facilitates transfer to reading and spelling. (2-33)

Teaching students to segment

Sight words, orthographic mapping, phonemic awareness



and blend benefits reading more than a multiskilled approach. Teaching students to manipulate phonemes with letters yields larger effects than teaching students without letters, not surprisingly because letters help children make the connection between PA and its application to reading. Teaching children to blend the phonemes represented by letters is the equivalent of decoding instruction. (2-41)

England's [Rose Report](#) (2006):

Having considered a wide range of evidence, the review has concluded that the case for systematic phonic work is overwhelming and much strengthened by a synthetic approach, the key features of which are to teach beginner readers:

- grapheme/phoneme (letter/sound) correspondences in a clearly defined, incremental sequence
- to apply the highly important skill of blending (synthesising) phonemes in order, all through a word to read it
- to apply the skill of segmenting words into their constituent phonemes to spell
- that blending and segmenting are reversible processes.

The sum of these represent 'high quality phonic work'. (paragraph 51)

[Note how these next two researchers refer to one another.]

[Linnea Ebri](#):

To form connections and retain words in memory, readers need some requisite abilities. They must possess phonemic awareness, particularly segmentation and blending. They must know the major grapheme-phoneme correspondences of the writing system. Then they need to be able to read unfamiliar words on their own by applying a decoding strategy... [Doing so] activates orthographic mapping to retain the words' spellings, pronunciations, and meanings in memory to support reading and spelling.

David Share referred to this as a self-teaching mechanism. With repeated readings that activate orthographic mapping, written words are retained in memory to support reading and spelling. When readers can read words from memory rather than by decoding, text reading is greatly facilitated. Readers are able to read and comprehend more rapidly and to focus their attention on meanings while word recognition happens

automatically. (p. 7)

[David Share](#):

Since training studies tend to show that neither letter-sound knowledge alone nor phonemic awareness alone are sufficient for substantial gains in reading ability, we can conclude that phonemic awareness in conjunction with letter-sound knowledge is a causal co-requisite for successful reading acquisition. (p. 192)

There is an important qualification, however, to this broad conclusion regarding the causal, co-requisite status of phonemic awareness. The pattern of results appears to depend on precisely which phonemic awareness skills (synthesis versus analysis) are taught. When phonemic awareness training includes a blending component (in addition, of course, to knowledge of grapheme-phoneme correspondences), trained groups consistently outperform controls. When phonemic analysis (segmentation) alone is trained (even in conjunction with symbol-sound knowledge), findings are consistently negative. The research clearly points to synthesis (blending) as the critical factor as far as reading is concerned. (p. 193)

In summary, there is strong

evidence for a causal role of phoneme synthesis (blending) as a twin co-requisite (alongside symbol-sound knowledge) for successful reading acquisition. This conclusion is supported by both laboratory and field studies. Additional support comes from research comparing initial programs of reading instruction. Phonics programs which explicitly teach blending produce superior results compared to 'analytic' programs which generally do not include a blending component ... It seems plausible that blending may be critical for reading but segmenting for spelling. (p. 194)

There is strong support for Ehri's view that spellings can only be memorised when linked to phonemes detected in pronunciations. The process of letter-by-letter decoding and blending (amalgamating) into an integrated spoken unit, or in short, bottom-up decoding, may be ideally adapted for orthographic mapping. Spelling, of course, is another such process which obliges the explicit processing of letter order and letter identity.

Re-cap: We've established what a sight word is and we've made the case there are two ways (both necessary) to create sight words. The hard way is to consciously rote-memorise a visual connection between the word as a whole and its sound and meaning. This is necessary only for a limited number of words whose spellings are seriously at odds with their pronunciations (for example: ONE, OF, COLONEL).

There is an easy way to create sight words but it requires the reader to master decoding and the two sub-skills that enable decoding: knowledge of letter-sound correspondences and blending (with letters). This set of skills, according to Ehri and Share, allow the novice reader to make 'full connections' between graphemes seen in the written form of a word and phonemes heard in the spoken form. Once these connections are made by the young reader, sight word creation becomes

easy, unconscious, and automatic. The process of making the connections necessary to create sight words in long-term memory is called orthographic mapping. Segmentation reinforces letter-sound connections and it allows the spelling of words which have not yet been orthographically mapped.

Blending and segmenting, both with letters, are the only two phonemic awareness skills necessary for teaching a child to read and spell ** IF ** that child is taught using synthetic phonics. (If a child is taught in some other manner, all bets are off.) Decoding is the key to orthographic mapping and skilled reading. It is, in fact, the sine qua non of reading acquisition. See [here](#).

Conclusion

Teaching the skill of reading is not as complex as many teachers and parents might believe. Written text is simply a code for our 44 speech sounds. We need only explicitly show our children how this code works, and most of them will, with delight, quickly catch on. Kids love codes. Kids love making weird sounds – sounds just like the 44 isolated phonemes. And kids especially love making weird sounds if their teacher or parent is willing to make those sounds with them. And, more than any other delight in the early stages of learning to read, kids love to determine what an unknown word is, all on their own, by decoding it.

Balanced literacy, a method for teaching reading used in many schools, starts reading instruction with sight words (learned the hard way) and guessing strategies (looking at pictures and 'three cueing'). Synthetic phonics, on the other hand, starts with isolated phonemes and blending instruction, leading directly to early decoding ability and orthographic mapping.

I've written about the superiority of synthetic phonics [here](#) and [here](#) so I won't repeat those arguments now. But only synthetic phonics takes sight word creation and orthographic mapping seriously. Synthetic phonics and phonemic awareness (blending and segmenting with letters) are inseparable,

right from the start of instruction. And lest you think any of this is new, it's not. Here, again, is the National Reading Panel:

It is important to note that when Phonemic Awareness is taught with letters, it qualifies as phonics instruction. When PA training involves teaching students to pronounce the sounds associated with letters and to blend the sounds to form words, it qualifies as Synthetic Phonics. When PA training involves teaching students to segment words into phonemes and to select letters for those phonemes, it is the equivalent of teaching students to spell words phonemically, which is another form of phonics instruction. These methods of teaching phonics existed long before they became identified as forms of phonemic awareness training. Although teaching children to manipulate sounds in spoken words may be new, phonemic awareness training that involves segmenting and blending with letters is not. Only the label is new. (2-34)

The paradox of reading instruction is this: decoding is necessary to activate orthographic mapping. Orthographic mapping is necessary to build a large sight word vocabulary. And only a large sight word vocabulary will (eventually) make decoding unnecessary.

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What is Response to Intervention?

Alison Madelaine and Kevin Wheldall

Statement of the problem

Traditional methods of identifying students with learning disabilities (US definition) such as the IQ-achievement discrepancy method are problematic. In addition, students who will need extra support in academic areas need to be identified early and to be given appropriate support in a way that makes the best use of available resources. More intensive intervention needs to be provided to students based on educational need rather than labels, to ensure that they do not 'fall through the cracks'.

Proposed solution/intervention

Response to Intervention (RTI) or multitier system of support (MTSS) is an approach to service delivery in schools (developed in the United States). RTI uses a system of tiered instruction to provide the appropriate intensity of intervention. This has been most commonly used in academic areas such as reading and mathematics, but RTI can also be applied in the area of problem behaviour.

The theoretical rationale

There does not appear to be any one set way in which the tiered instruction model may operate, but an example of Tier 1 instruction (Primary Prevention) would be exemplary initial reading instruction (ie. comprising phonological awareness, phonics, fluency, vocabulary and text comprehension) at the whole class level in the regular classroom. Students who do not 'respond' to this (say, the bottom 25%) are recommended for more intensive intervention. A Tier 2 intervention (secondary level) might involve small group instruction 3-4 times per week for 10-20 weeks. Students who are deemed nonresponsive to this level of intervention are given a Tier 3 intervention (tertiary level). This may involve 1:1 instruction with a special educator.

A central concept is how best to determine 'responsiveness'. The most common approach involves considering both level of performance AND slope of improvement (progress) with nonresponders being those students who are substantially below their peers on BOTH measures. Progress would usually be measured using curriculum-based measurement. As students improve, they may move back up through the levels to the regular classroom.

What does the research say? What is the evidence for its efficacy?

There is an enormous amount of support for RTI in the literature but, while it makes very good conceptual sense, there is relatively little scientific evidence about its effectiveness as yet in comparison to other models of identification and remediation. It is difficult to determine the efficacy of RTI, although there have been attempts at evaluation studies, with mixed results and methodological problems.

Conclusion

RTI may provide a more reliable and equitable means of identifying students with learning problems, and for providing timely intervention in academic areas. Note that the success of RTI depends on the presence of effective, research-based Tier 1 instruction.

Key references

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New series of InitialLit Readers now available

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Following the InitialLit sequence of sounds, this series includes both fiction and non-fiction titles, with colourful and charming illustrations to engage and entertain children as they put their developing decoding skills to work.

To find out more about this new series of Readers, visit www.multilit.com/initiallit-readers.

