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Bulletin

Special Issue: Speech AND Print

THE BULLETIN

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From the President

Lorraine Hammond

Western Australia is an interesting place to be based in 2021, and not only because we have been fortunate to be able to conduct face-to-face meetings and conferences for much of the pandemic. The professional development sessions I have been involved in have allowed me to enjoy a relatively new experience: a powerful sense of excitement in the world of literacy education.

One very wet and blustery Saturday in July this year, as the rain gauges in Perth inched closer to beating the wettest July record for a quarter of century, 250 dedicated teachers and administrators battled the weather to attend Learning Difficulties Australia's professional learning conference, *The Science of Effective Reading Instruction*, hosted by Edith Cowan University. The session was booked out early and a waiting list quickly formed. A month earlier, LDA had supported *Think Forward Educators* to host their inaugural face to face professional learning session at Edith Cowan University, which was also booked out as soon as it was advertised.

Ten years ago, this groundswell of interest from mainstream classroom teachers was unheard of; however, the impact of leading experts such as Dr Louisa Moats, Professor Maryanne Wolf and Dr David Kilpatrick, who presented for LDA across Australia, has steadily bridged the gap between research and practice. At the same time, the rise of social media has connected teachers to generous international and Australian researchers via list servs like *DDOLL*, LDA's *WWW webinars*, and an amazing range of podcasts and Facebook pages, further providing free professional learning and advice.

This appetite for knowledge is not unique to Western Australia. With more schools adopting Explicit Instruction as their signature pedagogy, teaching reading according to the research is slowly becoming common practice. Much credit is due to the many principals and teachers across Australia, many of them working independently to implement what has become known as the 'Science of Reading' and 'Science of Learning'. For me, these educators include those working with the support of the Kimberley Schools Project (WA), Association of Independent Schools in NSW and Catholic Education (Canberra-Goulbourn Diocese).

However, there is still much work to do. While the Science of Reading is fast becoming a settled ideology that inspires mainstream teachers and teachers who focus on supporting students with learning difficulties, it's how we put it into practice that counts. There are many teachers who still feel that their university training has left them unprepared to translate the new and exciting ideas into the day-to-day business of their classrooms.

This is why, starting in October, LDA will be offering six 90 minute online professional learning sessions on the *Science of Writing*. Arguably the poor relation of reading in terms of the attention it receives, teaching writing places a considerable impost on teacher knowledge.

Clary and Mueller (2021), authors of *Writing matters: Reversing a legacy of policy failure in Australian education*, a recent publication from the Centre for Independent Studies, also raise this concern. Clary and Mueller's paper outlines Australia's long history of ineffective writing instruction, laments declining NAPLAN data and reports that "with few exceptions, teachers report that their initial teacher education and professional development left them minimally prepared in all aspects of teaching writing." (p. 15)

See our new *www.ldaustralia.org* website for details of the *Science of Writing* seminars, and register early!

If you are not already a member of LDA, please consider joining – we need your support to remain viable. Our association produces two high quality publications, the *Australian Journal of Learning Difficulties*, which publishes peer-reviewed current research in our field, and this LDA Bulletin, which aims to provide a meeting place for researchers and practitioners as they work to support teaching and learning. LDA sources high quality presenters for our workshops and seminars, which are often accredited for professional development purposes. Our LDA leaders and members provide advocacy for both teachers and students in discussions with State and Federal Governments and teacher training institutions. And uniquely, we provide the LDA Consultant Membership option, which allows LDA to support those specialist teachers who provide services to vulnerable learners and their mainstream classroom teachers, all the while ensuring that their own competence meets the highest professional standards. For information on Consultant Membership, see: *https://www.ldaustralia.org/app/uploads/2021/03/Consultant-Member-Application-Information.pdf*

Reference

Clary, D. & Mueller, F. (28 July 2021, AP23). Writing matters: Reversing a legacy of policy failure in Australian education. *Centre for Independent Studies*. *https://www.cis.org.au/publications/analysis-papers/writing-matters-reversing-a-legacy-of-policy-failure-in-australian-education/*

Dr Lorraine Hammond is an Associate Professor at the School of Education at Edith Cowan University.

Council news

Sarah Asome, Secretary LDA and **Michael Roberts,** General Manager of LDA

LDA Professional Learning

In July 2021 LDA provided a face-to-face professional learning conference in Perth, *The Science of Effective Reading Instruction*. The event was a great success, and was sold out with 260 attendees. Thanks to Lorraine Hammond and the volunteers and presenters who contributed to the event.

The next LDA professional learning event is a *Science of Writing* online workshop, running for six weeks on Monday evenings during October to November 2021, with presenters Robyn Bartram, Lyn Stone and Jenny Baker. See LDA website for details.

Wednesday Weekly Webinars (WWW)

The second season of WWW concluded recently. There are now 30 quality webinars hosted on our YouTube Channel, which has almost 1,500 subscribers and almost 45,000 views. Search '*Learning Difficulties Australia*' on YouTube to access the full set. Many thanks to all our WWW presenters who have contributed their knowledge and expertise.

Website

The Association is delighted to see the launch of the new LDA website. It has been a long time in the making, and is the product of very hard work by the Website Committee, including council members Bartek Rajkowski, David Morkunas and especially Renae Watkins. Thank you to all the volunteers for their endless hours to get this off the ground. We hope that current LDA members, prospective new members and the public find the website easy to navigate and informative. Please contact LDA if you encounter any glitches, or if you have any comments about the website or suggestions for improvement.

Special General Meeting (SGM), held 21 June 2021

The recent Special General Meeting considered two resolutions:

1 To change the legal structure of LDA from an incorporated association registered in Victoria to a Company Limited by Guarantee (CLG), registered with ASIC. This change of legal structure also involved endorsing a new constitution, a draft of which was circulated to members prior to the SGM.

   The resolution was NOT passed by 75% of the members voting.

2 To change the association's name from Learning Difficulties Australia to Effective Teaching Australia.

   This resolution was also NOT passed by 75% of the members voting.

Further consultation with LDA members will take place regarding both motions.

Annual General Meeting (AGM)

The LDA AGM is set for Saturday September 18th at 11am. Although once again we are unable to run a face-to-face AGM, conducting a Zoom meeting does give the opportunity for members across the country to join in. Award winners will be announced, and they will contribute virtual presentations. The new 2022 Council will also be announced.

Council Member resignations

During the past few months David Morkunas, Priscilla Carlisle, and Lyn Stone have resigned as Council Members. LDA thanks them sincerely for their hard work and useful contributions.

In this issue of the Bulletin...

Ros Neilson, Editor, LDA Bulletin

This issue of the LDA Bulletin begins and ends with what will be the final Bulletin submissions from several well-known LDA faces: President Lorraine Hammond, General Manager Michael Roberts, Secretary Sarah Asome and Consultant Convenor Olivia Connelly. We thank these hard-working individuals for all their contributions to LDA and to past LDA Bulletins, and we look forward to introducing new faces and new perspectives from LDA Council in the next issue of the Bulletin.

The overall theme of this issue of the Bulletin is 'Speech AND Print', and the focus is on early literacy instruction. The concepts of speech and print are at the heart of the alphabetic code – the code that maps the sounds in spoken words onto written symbols.

The discussion is introduced by linguist and researcher Anna Desjardins, who provides a historical perspective to the way speech and print have been approached in literacy instruction. Anna argues that speech and print are essentially two sides of the same coin.

Jan Wasowicz, well known to many Bulletin readers as the moderator and facilitator of the *SpellTalk* listserv, provides an extended argument in favour of a speech-to-print approach to literacy instruction. Jan provides (with due disclosure) a behind-the-scenes look at the planning that has gone into the *Spell Links* literacy program, providing a detailed explanation of the nuances of one speech-to-print approach. We hope that the systematic phonics instructors who do not regard their programs as essentially 'speech-to-print' in nature, will find her discussion thought-provoking.

A forum of four submissions follows, addressing the issue of the use of decodable readers as part of early literacy instruction. Roslyn Neilson introduces the topic by considering the available evidence in relation to the context in which decodable texts are being used. Sue Lloyd and Sarah Wernham, the co-creators of *Jolly Phonics*, provide comments on the use of decodable readers – comments that are based on their submission to the Draft Australian National Curriculum review in May 2021. Educator Jocelyn Seamer contributes some practical ideas about the efficient implementation of decodable readers. Finally, Emeritus Professor Timothy Shanahan discusses a very important point raised by the use decodable readers and the challenge of teaching students a 'set for variability'.

The focus on early literacy instruction is put into a broader perspective by Wendy Moore's comprehensive review of, and commentary on, the important recent iteration of the Simple View of Reading – Hoover & Tunmer's (2020) publication, *The cognitive foundations of reading and its acquisition: A framework with applications connecting teaching and learning*.

We hope you enjoy reading the articles in this LDA Bulletin, and we invite you to join in with letters of comment to *bulletin.editor@ldaustralia.org*. Once again, thanks to the Bulletin Editorial team of Tom Nicholson and Molly de Lemos for their help in preparing this issue, and special thanks to the contributors.

Dr Roslyn Neilson
Editor, LDA Bulletin

Speech-to-print and print-to-speech: Two sides of a single coin – let's not devalue the currency

Anna Desjardins (Notley) introduces the speech-to-print and print-to-speech debate, providing a historical approach to the development of phonics teaching strategies, and arguing that pitting the two approaches against one another introduces a false dichotomy.

This article was originally printed in NOMANIS, April 2021. It is reprinted here with the kind permission of the author and publishers.

In the world of reading instruction, the terms print-to-speech and speech-to-print have become confusing and unnecessarily divisive. This is because they have been used to categorise both the composite skills required for competent reading and spelling, and whole frameworks within which these composite skills can be taught.

When referring to the *composite skills* involved in spelling and reading (at the word level):

- **Print-to-speech** skills are those required for **decoding**. To read words, graphemes (letters and letter combinations) must be translated into speech sounds, then blended together to produce spoken words in our vocabulary.
- **Speech-to-print** skills are those required for **encoding**. To write words, spoken words must be segmented into speech sounds and these sounds must then be translated into graphemes.

Both of these skills rely on a knowledge of **phonics** (how speech sounds correspond to graphemes) and, consequently, phonics instruction is one of the crucial elements required in any comprehensive approach to teaching literacy (alongside explicit instruction in phonemic awareness, fluency, vocabulary and comprehension).

So far, so good. We know children need to be able to translate from print-to-speech when reading, and from speech-to-print when writing. We can help them develop these skills by teaching them phonics. However, now we hit a snag, because phonics can be taught in different ways and, unhelpfully, a dichotomy has developed between phonics instruction categorised as 'print-to-speech' versus instruction categorised as 'speech-to-print'.

What do these labels mean in the context of instruction? Given the definitions above, you could be forgiven for thinking that in one approach children are taught only how to decode or read, while in the other they are taught only how to encode or spell. But this is not what is intended.

When used to categorise the whole *framework* within which phonics is taught:

- **Print-to-speech** approaches take as their starting point the graphemes of English and teach how these graphemes correspond to sounds.

A sequence of lessons is organised around the 70+ phonograms of English, along with a number of spelling rules (typically, these approaches will work on a simple to complex trajectory, starting with single letters of the alphabet, and then progressing to various letter combinations).

- **Speech-to-print** approaches take as their starting point the 44 phonemes (or speech sounds) of English and teach how these correspond to a number of different graphemes. This can be done in stages, teaching more frequent graphemes first and returning to the same phoneme later down the track to teach less frequent graphemes, or children can be presented with all possible grapheme representations for a single phoneme at once. These approaches will also typically include work on spelling patterns.

The development of these two modern instantiations of phonics instruction can be best understood by taking a look at the history of phonics instruction more broadly.

Phonics instruction can be traced back as far as the Ancient Greeks. The Greeks introduced vowels to their alphabet expressly to be able to represent the sounds of spoken language more efficiently and archaeological remains on shards of Greek clay pots testify to the fact

that the sounds different letters made were explicitly pointed out by means of syllable-building activities (Foster, 2004). Our Roman alphabet is descended from the Greek alphabet and the idea that phonics instruction would be a useful way to gain access to the Roman alphabetic code has similarly been around for a long time. For example, some of the oldest approaches to teaching reading in the United States in the late 1700s favoured a phonics approach and this remained the standard for over a hundred years. Then, in the 1920s to the late 1960s, the consensus in the U.S. turned towards teaching whole words by sight (Chall, 1989). Dissatisfaction with this whole-word approach grew, however, and a newer wave of phonics-based approaches began to appear by the 1950s.

Print-to-Speech Methods

The advent of a number of more modern phonics instruction techniques can be attributed to work done in the 1930s and 40s by Samuel Orton and Anna Gillingham (Nicholson, 2011). In particular, Orton wanted to move away from the then popular whole-word approach, because he thought that relying on visual processes alone was likely to cause reading problems. He recommended teaching children the sounds of the letters and how to blend the sounds together to reproduce the spoken form of the written word. Gillingham later put the Orton-Gillingham (OG) ideas into a manual written with Bessie Stillman (Gillingham & Stillman, 1960, 1997).

With the push to reintroduce phonics to reading instruction programs in the U.S. in the 1960s, various OG approaches sprang from Orton and Gillingham's work, and they are still around today. Though they differ quite substantially, they all tend to take a print-to-speech tack, teaching a list of phonics rules organised around the letters and phonograms of English. As OG approaches multiplied, however, they became a disparate bunch. They are perhaps best known nowadays for including a simultaneous, multisensory component to their instruction – children might trace a letter on paper, in the air or in sand, and they are instructed to pay attention to how their mouth feels when producing the sound a letter makes (at the same time as they see the letter and hear the sound). This kinaesthetic dimension of instruction has been suggested to be especially beneficial for children who are struggling to learn to read. However, even contributors to the handbook *Multisensory Teaching of Basic Language Skills*, concede that the research evidence supporting this position is, at best, inconclusive (Carreker, 2011; Farrell & Sherman, 2011).

Several reviews of studies investigating OG methods have found that the evidence-base for their effectiveness is inadequate (Ritchey & Goeke, 2006; Stevens et al., 2021) and when explicit, systematic phonics instruction methods with and without a multisensory component are directly compared, no advantage has been found for a multisensory approach, either for typically developing children or those with dyslexia (Schlesinger & Gray, 2017). Nonetheless, OG methods do teach phonics in a systematic way, and we *do* know that systematic phonics instruction (of some kind) is critical when teaching literacy (National Institute of Child Health and Development, 2000; Department of Education, Science and Training, 2005; Rose, 2006).

Unfortunately, by the 1980s, phonics was again largely abandoned in the U.S. and other English-speaking countries in favour of the whole-word approach (this time slightly modified and renamed 'whole language'). But as researchers have continued to amass a wealth of evidence demonstrating, incontrovertibly, the effectiveness of phonics instruction (and particularly of synthetic phonics instruction) for teaching reading, phonics-based approaches have begun to flourish again in the U.S, the U.K. and Australia. Now that phonics is becoming increasingly accepted, debate has turned to a more fine-grained issue: how best to organise and present the grapheme-phoneme correspondences that must be taught.

Print-to-speech approaches take as their starting point that the spelling system is stable over time and organise instruction around a systematic sequence of *graphemes*. However, note that although their sequence of instruction may be organised in this way, print-to-speech methods do not rule out using speech-to-print aspects of instruction; for example, they typically include phonemic awareness activities, designed to cue children into the speech sounds in words in the absence of print. It's also important to note that within this framework, children do not only work on the skill of decoding; they engage in both reading and spelling words.

Speech-to-Print Methods

Speech-to-print approaches, on the other hand, organise instruction around a systematic sequence of *phonemes*. These have developed, perhaps, in response to what can seem to be unnecessarily long lists of phonics rules in some print-to-speech approaches. The idea is that instead of organising instruction around 70+ phonograms, a sequence of lessons can be organised around the 44 phonemes of English. Similar to the print-to-speech methods, however, within the determined sequence of speech-to-print lessons, children engage in both encoding and decoding activities.

These methods take as their starting point that speech is primary: historically, speech preceded writing systems, and developmentally, speech is acquired before reading or writing skills. The idea of starting with what the child knows (speech) and mapping new knowledge (print) onto that seems like a good one. However, it's worth bearing in mind that knowledge of speech sounds is unconscious, so linking phonemes to graphemes is not necessarily any easier

than linking graphemes to phonemes. In fact, just like print-to-speech methods, speech-to-print methods need to be coupled with phonemic awareness activities to help children become consciously aware of the speech sounds in words.

It is also not necessarily straightforward to design a speech-to-print scope and sequence for synthetic phonics instruction. Think for a moment about what a sequence based *only* on considerations of speech might look like. Faced with choosing which of the 44 phonemes to teach first, it might seem logical to start with sounds that are maximally distinct from each other. This can certainly be helpful – teaching consonants that differ in voicing, place and type of articulation in close succession (e.g., the voiced bilabial nasal /m/ and the voiceless alveolar fricative /s/) will make distinguishing these sounds for children very easy as teachers engage in phonemic awareness activities. However, determining the sequence on these considerations alone will also lead to some illogical decisions. For example, the short vowel sound /i/ (as in 'igloo') is high and front in the mouth, with no lip-rounding. The vowel sound with the opposite characteristics, and therefore the most maximally distinct, is /aw/, which is low and back in the mouth, with lip-rounding. Should these two sounds be taught in close succession? This would involve teaching children the link between /i/ and the single letter 'i' and the link between /aw/ and at least one digraph 'aw' or 'au' or 'or' (or possibly an even more complex grapheme like 'ore', 'augh' or 'ough'). Rather, the complexity of various grapheme choices, along with the frequency with which they appear in words, need to be considered alongside speech sound differences.

Another possible instantiation of the speech-to-print approach is to teach all possible graphemes for a phoneme when that phoneme is introduced. This means children are presented with large amounts of information (e.g., learning six possible ways to read or spell the sound /aw/), some of which is not immediately useful to them and can lead to cognitive overload. Some spelling choices for a sound are infrequent; some may occur in words that are too sophisticated for 5-year-old children. Take the seemingly innocuous /i/ vowel example above. In an approach that teaches all possible graphemes for a sound, /i/ would need to be linked with both 'i' and 'y'. Although, as a single letter, 'y' is a relatively simple grapheme, it tends to be used to represent the /i/ sound in words of Greek origin which are outside the experience of most 5-year-olds (e.g., myth, symbol, system, oxygen, crypt, hymn, cygnet). This example illustrates that even when the complexity of the grapheme choices remains manageable (single letters), and the spelling choices appear in a large number of words, usefulness of those words to a child just learning to read should also play a role in determining what gets taught when.

In fact, Louisa Moats, who promotes a speech-to-print approach in her aptly titled book *Speech to Print* (2020) and elsewhere (Moats, 2021), does **not** recommend providing all of the graphemes that represent each phoneme at once. Instead, she recommends a simple-to-complex sequence, teaching common correspondences and patterns before less common ones. Following this advice, we would teach children the common /s/ – 's' association, before teaching them the less common /s/ – 'c' association in words like 'city', 'cement' and 'cymbal', for example.

Which Instructional Approach is Best?

In essence, the print-to-speech vs. speech-to-print debate has set up a false dichotomy in how reading should be taught. As should now be apparent, the distinction between the two frameworks is not dramatic, because **both approaches agree that a sequence of sound-grapheme correspondences needs to be taught explicitly and systematically. And both approaches, *if well-designed*, need to take into consideration both speech and print when determining that sequence.** While there is no 'gold standard' order of grapheme-phoneme correspondence (GPC) instruction, there is general expert consensus that GPCs should be introduced on the basis of:

- teaching graphemes that represent continuous speech sounds early to facilitate blending;
- teaching simpler graphemes before digraphs and trigraphs;
- teaching more frequent, common graphemes before those that occur less frequently;
- teaching graphemes that occur in useful words for young children before those of foreign origin that occur in more sophisticated vocabulary; and
- when possible, teaching graphemes that represent speech sounds that are easily distinguished from each other before those that are more similar.

While some children with reading difficulties may need to be taught every phoneme-grapheme association explicitly, the over-arching aim of either approach should be to move towards spending progressively less time on explicit phonics instruction and more time on reading connected text, to foster the self-teaching required for automatic reading skills to develop (Share, 1999).

Finally, in any good sequence of phonics instruction (be it a 'print-to-speech' method or a 'speech-to-print' method), children need to engage in phonemic awareness activities and in activities that require them to apply their phonic knowledge in *both directions*:

- From print-to-speech (e.g., by producing the sounds that individual graphemes make, by blending these sounds to read single words, and eventually by reading sentences and short passages)
- From speech-to-print (e.g., by identifying and writing the graphemes associated with phonemes, by segmenting spoken words into individual phonemes in order to spell words, and eventually by writing short sentences and passages).

These are reciprocal skills, based on the same underlying knowledge (Joshi, Treiman, Carreker, & Moats, 2008; Moats, 2005), and research has shown that instruction that includes encoding supports decoding (Gersten, Haymond, Newman-Gonchar, Dimino, & Jayanthi, 2020; Graham & Santangelo, 2014; Møller, Mortenson, & Ebro, 2021).

This link is backed up by brain-scanning research showing that there exists a neurological circuit for reading, and that this involves a fast and *bi-directional* connection between visual and phonological areas of the brain (Dehaene, 2013). In other words, there is physical support (in the shape of a bundle of axons) for the behavioural research – the implication is that to optimise the establishment of this circuitry during reading instruction, children should be systematically taught how letters map to speech sounds and vice versa, and should work on these connections in two directions: from print to speech, and from speech to print. There is no need for these two terms to be pitted against each other, when in fact, they are two sides of a single coin.

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Dr Anna Desjardins (Notley) is a researcher and linguist with a Ph.D. in Cognitive Science from Macquarie University. She has a strong interest in child language development, and currently works in the MultiLit Research Unit.

A Speech-to-Print approach to teaching reading

In this article **Dr Jan Wasowicz** argues that there are important differences to be considered between a 'speech-to-print' approach to literacy instruction and teaching that is based on 'print-to-speech'. In Part 1 she explains what is generally meant by a 'speech-to-print' approach to teaching synthetic phonics, with particular reference to the underlying design of *SPELL-Links™ to Reading and Writing*. Part 2 provides some practical examples of how a speech-to-print approach might be implemented.

Part 1: Speech-to-Print: The 'what' and the 'why'

Speech-to-print as an instructional method of teaching word-level spelling and reading is not new (Herron, 1995; McGuinness et al., 1996; Lindamood & Lindamood, 1998; Moats, 2000; Kelman & Apel, 2004). In recent years, however, this method of instruction and intervention has been more widely implemented as education professionals become more aware of this approach, and also become more tuned in to the behavioral and brain imaging research which reveal the close integration of the oral language, reading and writing systems. A strong research base is accumulating, too, that supports speech-to-print as an evidence-based method of teaching word-level reading and spelling (e.g., Roberts & Meiring, 2006; Wolter, 2009; James & Englehart, 2012; James et al., 2015; Conrad et al., 2019).

There are some notable differences among speech-to-print approaches and related commercial programs, although they share a common focus on spelling instruction as a gateway to improving both spelling and reading skills. An examination of their commonalities and differences is outside the scope of this paper, which, instead, explains general principles of a speech-to-print approach, then gives specific examples of how it might be implemented based on the research of Kenn Apel and Julie Masterson (among many others) and featured in the *SPELL-Links* program (Wasowicz et al., 2004).

What is meant by speech-to-print?

Very simply defined, speech-to-print refers to the process of mapping from phoneme to grapheme to spell (encode) the spoken word in written form. This is sometimes referred to as phonological encoding. A speech-to-print approach starts with a focus on the spoken word and moves from that starting point to the written word.

It is important to dispel the misconception that speech-to-print as an instructional approach is merely about teaching students how to spell words. It is much more than that. Speech-to-print instruction is the closely coordinated teaching of word-level reading *and* spelling in a manner that includes abundant orthographic mapping in the direction of phoneme to grapheme. Very importantly, this makes it consistent with the biological wiring and organization of the brain for oral language (Pinker, 1997). Ideally, if learning is to be maximized, speech-to-print instruction also includes simultaneous activation and integration of all language systems and modalities (Berninger, 2000). The approach, too, involves a focus on procedural and statistical learning of the interconnected sound-letter-meaning codes, with relatively less focus on declarative knowledge (Seidenberg, 2017).

The rationale of speech-to print: Who moved my socks?

To understand the nuances of speech-to-print as an instructional approach for teaching word-level reading and spelling, we need to begin in utero. As humans, we are biologically wired for oral language, for listening and speaking, but not for reading and spelling (written language). Think about it. No one had to sit us down or send us to school to teach us how to understand words spoken to us and for us to learn how to talk and express our ideas. We simply needed to be immersed in the spoken language of our social environment for the developmental processes of speech and language to unfold.

From birth to five years of age is a period of rapid speech and language development, and by the time young children walk through the doors on the first day of school, their phonological systems (the oral language systems which allow them to recognize and speak all the sounds of the language spoken in their environment) are completely or nearly completely developed. Moreover, assuming that they speak the same language, all students who show up on that first day of school have approximately the same phonological system. Why is this important? You will understand once we talk about your sock drawer. Yes, your sock drawer.

Think about how you organize the socks in your sock drawer. Or the teaching materials in your room. Or the files on your computer. Now, think about how you would feel and how well you would function if, while you are reading this article, someone goes into your sock drawer (or into your teaching materials, or into those files on your computer) and rearranges everything. They arrange your socks in a very well-organized manner; it's just that their system of organization is different from yours. How would you feel – confused? upset? lost? How well would you function? Would you have to fumble around, and would it take you longer to get dressed in the morning?

When students arrive at school on their very first day, they all come with the same sock drawer: a well-organised phonological system. With a speech-to-print approach, we begin reading and writing instruction there – with the phonology of their oral language system. A speech-to-print approach *first* teaches students to become aware of the phonemes of their language (that is, on the smallest parts of words that differentiate meaning) and then teaches them how to represent those phonemes with letters to write the words they say (phoneme-to-grapheme mapping, encoding).

In contrast, a print-to-speech approach introduces a sock drawer that may be well-organized, but that has a different organising principle. A print-to-speech approach begins by teaching students a whole new system – a man-made system of orthography based on letters, not sounds. In a print-to-speech approach, that is, reading instruction begins with letters, and students read the words they see (grapheme-to-phoneme mapping, decoding). A small percentage of students will easily adapt to learn the new (orthographic) system of organization, but many students will struggle, some more and for a longer time than others, to navigate their way around the new sock drawer. They will fumble, and some may never adapt very well to using this new, man-made system.

Speech-to-print instruction, therefore, is about leveraging the biological organization and sensitivity of the brain for phonological units of words (spoken language) to facilitate students' learning to read and spell words (written language). Spoken language is the gateway through which students learn to spell and read. This means that students engage in the spelling process (speech-to-print) first. But speech-to-print instruction is not only about spelling words, and it does not replace reading instruction. Instead, speech-to-print instruction uses a different system of organization to teach *both* spelling and reading.

There are several differences between speech-to-print instruction and more traditional print-to-speech instruction. This article will take

examples of these differences from five areas of literacy instruction, with Part 1 explaining what the differences are, and Part 2 providing examples of how a speech-to-print approach might be implemented. The five areas that will be discussed are:

- Phonemes and phonological awareness
- Orthographic mapping
- Sight words and irregular words
- Organisation and sequencing of instruction
- Syllable types, syllable divisions and spelling rules

Phonemes and phonological awareness

Although we are biologically wired for oral language and our phonological processing systems develop automatically during those early childhood years, direct and explicit instruction is almost always needed to develop a conscious awareness of the phonological structure of words. Phonological awareness (PA) is a metalinguistic skill: it's the ability to consciously analyze, identify, and manipulate (i.e., segment, blend, delete, add, substitute, sequence) the phonological components of spoken words, including spoken phonemes and spoken syllables. The critical role of phonological awareness instruction and skill is well-established (National Reading Panel, 2000).

Students who are receiving speech-to-print instruction will learn to analyze spoken words to identify the phonemes of their oral language system. For example, the word *max* has four phonemes: /m/-/æ/-/k/-/s/ and the word *match* has three: /m/-/æ/-/tʃ/. This is the way the brain is organized, and this is the way a speech-to-print approach teaches phonemes and develops phoneme awareness.

Print-to-speech programs often teach phonemes differently. In print-to-speech approaches, phonemes are taught in isolation, and are presented to students as sounds associated with graphemes, rather than as segments of spoken words. It's a different system; another sock drawer. It doesn't leverage what a student already has in place to facilitate student learning. Interestingly, this starting point in practice sometimes leads to errors in phoneme analysis – for example, students may be taught that the letter X represents one phoneme; or schwa sounds may not be explained clearly, with students being taught that the ER in the words *herd* and *mother* sound the same.

Orthographic mapping and orthographic learning

The phonological encoding involved in spelling instruction in a speech-to-print approach has a powerful impact on orthographic learning. To understand this power of speech-to-print instruction, it helps to understand how orthographic learning occurs.

Orthographic learning occurs through the process of orthographic mapping, which is the process of connecting the sounds of spoken words with the letters that represent those sounds in the written form of words. Orthographic learning occurs both during the decoding of words (Share, 1999; 2008) and the encoding of words (Conrad et al., 2019). However, orthographic learning is greater during the spelling of words than during the reading of words (Conrad et al, 2019; Roberts & Meiring, 2006). There is greater transfer of orthographic learning from encoding instruction to the decoding of the same words than from decoding instruction to the spelling of the same words. Moreover, spelling instruction yields complete transfer of orthographic knowledge to the spelling of new words, whereas decoding instruction yields only partial transfer of orthographic knowledge to the reading of new words. Compared with decoding, spelling also leads to more robust, more durable word-specific representations in long-term memory. These word-specific representations, also called mental graphemic representations (MGRs) and mental orthographic images (MOIs) (Apel, 2009), support automatic, fluent reading and writing (Ehri, 2005; Perfetti, 2007; Kilpatrick, 2015). Interestingly, orthographic mapping has also been shown to facilitate vocabulary learning (Miles & Ehri, 2019; Rosenthal & Ehri, 2008).

A speech-to-print instructional approach leverages what is known from the research to facilitate orthographic learning: it *begins* with orthographic mapping in the direction of mapping from spoken phonemes/rhymes/syllables to their corresponding graphemes (i.e., speech-to-print). Students increase their attention to the phonological structure of words, receive explicit instruction in segmenting a spoken word into its individual phonological units, and engage in repeated orthographic mapping from speech to print as they say the sounds and spell the words, always connecting the spoken and written words with their meanings. Within the same lesson, they also receive instruction and practice with orthographic mapping from the written form of the word to the spoken word as they decode/read words.

Speech-to-print reading instruction supports careful attention to the orthographic detail of the full word. There is no 'guess-and-go reading', i.e., guessing at a word based on the first or last letter(s) of the word or partial letter sequences within a word. Ideally, it also maximizes the amount of time students read out loud (vs. silently) to ensure that students fully engage the phonological system during the reading process. Even when reading silently, students may be instructed to pronounce unfamiliar words out loud to activate their phonological system and maximize orthographic mapping and orthographic learning (Rosenthal & Ehri, 2011.)

Conversely, in a print-to-speech approach, orthographic mapping takes place *first* in the direction of mapping from graphemes to phonemes (i.e., decoding); depending on the print-to-speech approach being used, there may be little or no inclusion of orthographic mapping from phoneme to grapheme within the same lesson, or at all.

Sight words and irregularly spelled words

'Sight words' are not the memorization of a string of letters. Orthographic mapping is required to build sight words. To become a sight word, the spelling (letters) of the word must be fully connected to the word's pronunciation (sounds) and meaning in memory (Ehri, 2014). When this word-specific representation of a word is fully developed and robustly stored in memory, the word is automatically, accurately recognized when reading, and automatically, accurately spelled when writing. The term 'sight word' is not accurately descriptive of the underlying processes involved, and is often misinterpreted and misused, leading to instruction that is not highly effective.

All words of the lexicon must become 'sight words', whether or not there are irregularities in their spelling. Reading and writing efficiency is achieved when complete, robust MGRs are stored in long term memory to be instantly activated during reading and writing. The length of time and

the number of meaningful encounters with a word that are needed before the word becomes completely and robustly stored in long-term memory depend on the word's frequency of occurrence in print (i.e., how many times an individual will encounter the written form of the word) and the regularity of the word's spelling. The less frequently a word appears in text (e.g., LAMPOON vs. SAT) and the more irregular its spelling (e.g., LAUGH vs. CAT), the more time and the greater number of encounters will be needed (Apel, et al., 2006; Henbest & Apel, 2018). However, as explained above, some encounters with a word are more impactful than others, and this is another reason why a speech-to-print approach is particularly beneficial for achieving reading and writing efficiency.

In a speech-to-print approach, a significant amount of instructional time is spent spelling (writing) words in a way that simultaneously engages all systems of language (Berninger, 2015) to facilitate word-level spelling *and* reading. As students segment and spell a word in context (i.e., with meaning), they must carefully attend to and simultaneously engage and integrate the phonological, orthographic, and semantic/morphological systems and codes to establish a robust MGR for the word. The process of encoding requires simultaneous attention to the phonological and orthographic codes; saying and writing the word additionally involves motor planning and adds motor memory to the learning process.

In contrast, in a print-to-speech approach, a significant amount of instructional time is spent decoding (reading) words. *If* proper decoding instruction is provided and *if* appropriate decoding is consistently used by students when they encounter an unfamiliar word, they will fully decode a word (no guess-and-go), thereby integrating the phonological, orthographic, and semantic/ morphological systems and codes to develop an MGR for the word. However, as previously discussed, spelling (vs. decoding) words leads to more robust MGRs for words. Moreover, many students, especially students with strong oral language skills, can correctly read all the words in a passage without fully decoding all the words.

Print-to-speech programs commonly teach words with uncommon spellings separately, not linked to the phoneme (phonological code) that contains the irregular orthographic code. They are often called 'red words', 'outlaws' or 'heart words', as well as 'sight words.' They often are taught through flash cards drills and brute memorization of the spelling of the word without direct phoneme-grapheme mapping, and sometimes without connection with the word's meaning.

In contrast, a speech-to-print approach typically includes irregularly spelled words (words with uncommon spellings of a phoneme) within that phoneme's lesson alongside teaching regular sound-letter correspondences for the target sound. For example, the word *any* in which the short vowel /e/ sound is spelled with the letter A may be included in the short vowel 'E' sound lesson. This organization of instruction by sounds vs. letters is consistent with the biological organization of the brain for phonemes (no new sock drawer) and links the phonological and orthographic codes. Whether the spelling is regular or irregular, students learn to pay attention to the phonological structure of the word and map from phoneme to grapheme (speech-to-print), copying from the correct spelling of the word, to fully connect the spelling of a word with its sounds as well as with its meaning. Students receive explicit instruction and additional repeated encounters with those words containing uncommon spellings to establish robust MGRs for reading and to support the use of established MGRs for spelling.

Organization and Sequencing of Instruction

The organization of lessons and the sequencing of instructional activities impacts student learning and how well students retain what has been learned (Van Patten et al., 1986). The International Dyslexia Association (2016) argues that structured literacy instruction requires that the material presented should follow the logical order of language, beginning with the easiest and most basic concepts and progressing systematically to more difficult materials. Of course, there are many factors to take into consideration when developing a scope and sequence, especially when one considers that the reading and spelling of words is a dynamic interplay of multiple linguistic, cognitive, and sensory/motor processes. A speech-to-print instructional approach is ideally guided by research conducted across multiple disciplines regarding the development of *spoken and* written language skills. Although it leverages the biological wiring of the brain for *oral* language, it sequences instruction with consideration of aspects of *both* oral language and written language.

One example of this is observed in the beginning lessons of a speech-to-print approach: early consonants are introduced and taught in a sequence based on features of the *spoken* letter name because these phonetic features facilitate learning to spell and read words (Treiman, 1993; Ehri & Wilce, 1985; Foulin, 2005). For this reason, the sequence of beginning spelling and reading instruction in a speech-to-print approach begins with words containing consonant letters in which the corresponding sound is heard at the beginning of the letter name (e.g., *pot*; easiest), proceeding to words containing letters in which the corresponding sound is heard at the end of the letter name (e.g., *men*; less easy), and finally to with words containing letters in which the corresponding sound is not heard in the letter name (*wag*; more difficult.)

In contrast, many print-to-speech programs introduce and sequence instruction for beginning consonants based on the visual features of the written letter, typically introducing visually dissimilar consonant letters in the same lesson and visually similar letters in different lessons, thereby not taking advantage of the natural tendency for students to use letter-name strategy in their early writing of words.

Going beyond early consonant instruction, a speech-to-print instructional sequence unfolds with consideration given to the development of *spoken and* written language skills. For example, when teaching students to segment words into phonemes, words in which the vowel is *not* followed by the letters R, L, M, N, NG or NK are introduced first because it is easier to segment vowel phonemes when they are *not* followed by the phonemes / r, l, m, n, ŋ / in the spoken word. Similarly, / s / clusters are taught before / r, l /clusters which, in turn, are taught before / m, n, ng / clusters because the segmentation of consonant clusters becomes more challenging across these phoneme groups (Treiman, 1993; Werfel & Scheule, 2012).

Across all lessons for spelling and reading single morpheme words (i.e., words that do not contain a prefix or suffix), the lessons frequently center around a single phoneme; in this way, a speech-to-print approach organizes the learning of sound-symbol associations in the same way the brain is already

organized (that biological sock drawer). Students first identify a sound and then learn the allowable spelling choices (orthographic representations) for that sound.

Syllable types, syllable divisions and spelling rules

The teaching of syllable types, spelling rules, and syllable divisions is yet another example of how a speech-to-print approach organizes reading and spelling instruction differently from a print-to-speech approach.

In a print-to-speech approach, syllable types, spelling rules, and syllable divisions are taught based on rules involving letter patterns. While declarative knowledge about syllable division and spelling rules can be helpful, at least for some students, there is research evidence that calls into question whether teaching memorization and application of these rules is a *necessary* and *most efficient* method of instruction. At least one study (Bhattacharya & Ehri; 2014) indicates that it is not, and instead supports flexibility with division of syllables as long as the vowels are assigned to separate syllables.

In a speech-to-print approach, by contrast, students do learn syllable types, spelling rules, and syllable divisions, *but these are not taught based on letter patterns (someone else's sock drawer)*. In a speech-to-print approach, students learn syllable types and spelling rules in a speech-to-print direction. They learn about open and closed syllables as they occur in speech (i.e., a closed syllable is a *spoken* syllable that ends with one or more consonant *sound*s). With some exceptions, they learn spelling rules by learning to pay attention *first* to the phonological structure of the word and then to how the phonological structure of the spoken word determines orthographic patterns in the written word (e.g., when I hear a long vowel sound in a closed syllable, the long vowel sound is almost always spelled with two vowel letters; when I hear "ch" at the end of a one-syllable word and "ch" immediately follows a short vowel sound, "ch" is almost always spelled with the letters TCH). As the student progresses to spelling multi-syllabic words, words are divided into syllables as naturally spoken (e.g., ca-bin vs. cab-in) and spoken syllables are mapped to their corresponding letters; the focus is on forming complete connections between the sounds and the letters of each spoken syllable (Ehri, 1992).

With less instructional time spent memorizing declarative knowledge, a speech-to-print approach focuses more instructional minutes on procedural learning and explicitly teaching alternative strategies to support reading and spelling of words, including 'set for variability'. Set for variability in this context is a form of linguistic problem solving, involving the ability to derive an approximate pronunciation for a printed word and then use context and lexical knowledge to correct an incorrect pronunciation (Venezky, 1999; Tunmer & Chapman, 2012). After decoding a word, students learn to attend to the phonological structure of the misread word and to apply alternative pronunciations of consonant and vowel letters and 'flex' syllable stress i.e., move the stress from one syllable to another (all advanced phonological awareness skills) to correct an incorrectly decoded word (Savage et. al. 2018).

Additionally, students spend ample time engaged with pattern-loaded and authentic text to support application and practice of their newly learned knowledge, skills, and strategies. Increasing the amount of time students are engaged with authentic text provides opportunities for statistical learning (Seidenberg 2107), the process by which readers learn by implicitly tracking statistical regularities in language, including the mappings between orthography and phonology. Several studies have documented the orthographic learning that takes place during exposure to authentic text (e.g., Apel, et al., 2006; Savage et. al 2018).

Part 2: The 'how': Implementing a speech-to-print approach

This section provides practical examples of how a speech-to-print approach might be implemented in the five areas of literacy instruction discussed in Part 1. Note that all the word study activities specified here ideally also include a semantic element as an essential component of the speech-to-print approach, with the student saying the word being studied, then using it in a spoken sentence.

Phonemes and phonological awareness

Ideally, in speech-to-print instruction, phonological awareness (PA) activities are a part of all reading/word study lessons. Instead of teaching PA as an isolated skill, PA is linked to and integrated with the reading and writing of words. In this manner, students simultaneously engage the phonological (sound), orthographic (letter), and semantic/morphological (meaning) processes involved in word-level reading and spelling. Importantly, PA activities are included across all grade levels to ensure that students develop the more advanced PA skills they will need to support their reading and spelling of words with increasingly complex phonological structures as they advance through the grades.

Before delivering phonemic awareness instruction, teachers should practice the correct pronunciation of each spoken phoneme (e.g., /p/ not "puh"), to ensure that correct pronunciation is modelled for students (e.g., General American English *https://www.spell-links.com/resources-pronunciationchart/*; Australian English phonemes are modelled here: *https://www.spelfabet.com.au/2015/05/what-are-the-44-sounds-of-english/*.

Teachers should support students, as needed, to correctly say the sounds of words as they encode or decode a word. Teachers should become familiar with articulatory *and* acoustic phonetics (speech production *and* speech perception) of the language of instruction (and the student's native language/dialect, if different) to better understand why a student may struggle, and to effectively support and move students from less challenging to more challenging words.

One common misconception when speech-to-print approaches are discussed is that students need to be taught *how* the different speech sounds are produced. With rare exceptions, we don't need to teach students about how sounds are produced. Students come to school already equipped with implicitly knowing how to say the sounds of the language or languages that they speak. It is important, therefore, to keep it simple. For example, instead of spending time feeling the throat and talking about vibration of vocal folds and introducing terms like voiced vs. voiceless, teachers can normally simply model the sound and say (for example), "/p/ is a whisper sound". All children know

what whispering is, and 99.9% of the time that's the only prompt they need. Done. Onward. To be clear, spelling and reading are *language* skills; teaching isolated speech sounds with focus on their sensory and motor attributes is not teaching language.

In a speech-to-print approach, PA skill development should be connected with the reading and writing of words in both encoding (spelling) and decoding (reading) practice and can be embedded within word study and vocabulary learning across all grade levels.

To work on encoding:

- After saying the word in a sentence, the student repeats the word and then sounds it out, one phoneme (or syllable) at a time, drawing one horizontal line as he or she says each sound/syllable.
- Display the written word and ask the student to sound it out again, one phoneme/syllable at a time and to copy the letter(s) that match the spoken phoneme/syllable onto the drawn lines as he or she says each sound/syllable.
- The student then says the word slowly and points to the letter or letters in the written word that represent each sound that is being spoken, checking to be sure that each sound in the spoken word is represented by at least one letter in the written word and that the sequence of letters in the written word match the sequence of the sounds 'coming out of the mouth'.

To work on decoding:

- Display a printed word and explain, if necessary, that the letters on the page represent the sounds of the word.
- Tell the student to place a finger under the first letter.
- Instruct the student to slowly read the word aloud, sliding their finger from left to right as they blend one sound into the next (no pauses between sounds).
- Tell the student to repeat the word naturally and then use it in a spoken sentence.

Orthographic mapping and orthographic learning

Orthographic mapping activities should be used within word study and vocabulary learning across all grade levels. Teach mapping of phonemes and rhymes at the single word level; introduce mapping of syllables as students move into multi-syllabic words.

- Begin instruction with orthographic mapping activities in the direction of speech-to-print (encoding/spelling words) and maximize the number of instructional minutes spent spelling words.
- Within the same lessons, coordinate spelling instruction with orthographic mapping activities in the direction of print-to-speech (decoding/reading words).
- Direct students to always say words out loud (during instruction *and* during authentic writing) as they write the corresponding words on paper, making sure they slide from one sound into the next without pausing between and simultaneously write the letter(s) that match the sounds 'coming out of the mouth' to tightly integrate phoneme-grapheme connections.
- Maximize the amount of time students read out loud in school and at home.
- Eliminate guess-and-go reading.
- Teach students to pronounce unfamiliar words out loud when reading silently.

Sight words and irregularly spelled words

Remember that all words should become 'sight' words as students learn to read, and that attention to spelling promotes the development of accurate mental graphemic representations (MGRs).

- Maximize the amount of time students spend learning to spell words and writing in general.
- Use phoneme-to-grapheme mapping for spelling words that contain both regular and irregular spellings of a phoneme, but provide additional practice with phoneme-grapheme mapping for the words that contain irregular spellings.
- Create a sound wall (see Fig. 1) to support student's spelling of words that contain uncommon spellings. A sound wall displays images representing the phonemes of a language (e.g., a picture of a hat represents /h/). Under each keyword picture, display spelling and vocabulary words that contain an uncommon/less common spelling of the phoneme (e.g., display the word WHO under the picture of the hat). When words are organized by sounds instead of letters, students can use what they already know—the sounds of a spoken word—to locate what they may not know—the spelling of certain sounds in a word.
- Make the sound wall a dynamic part of word study instruction and encourage students to use the sound wall to support their correct spelling of words during any writing task. Direct students to say the sounds of a word out loud as they *simultaneously* copy the corresponding letters from the word displayed on the sound wall to spell the word.
- Explicitly teach students across all grade levels how to develop orthographic representations of words (MGRs) when learning new

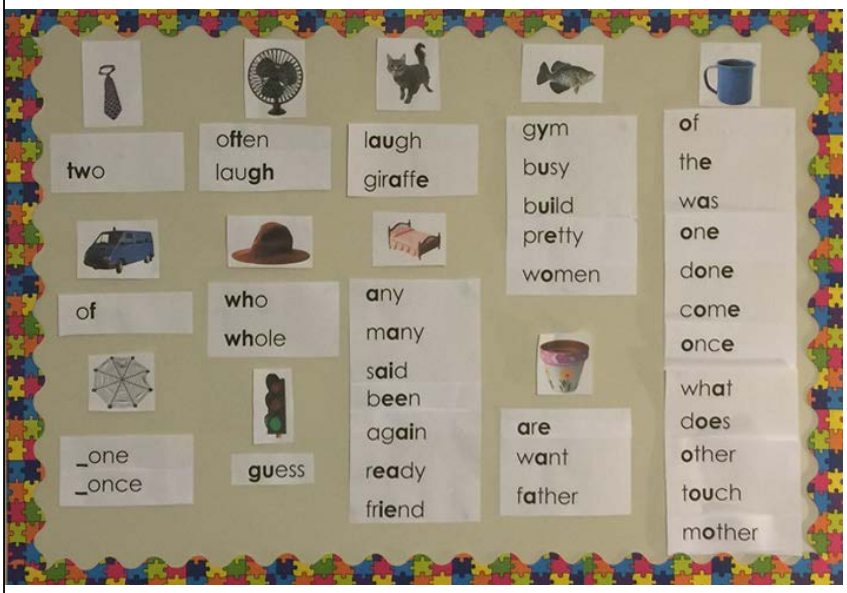

Figure 1. Sound wall

vocabulary words that contain spellings that do not conform to the common phonological, orthographic, and morphological patterns of the language.

- Explicitly teach students across all grade levels how to use their own MGRs to correctly spell a word that contains an irregular spelling. Sample activity:
  - After considering options to use spelling rules and/or word meaning to correctly spell the unfamiliar part of a word, instruct students to complete the spelling of the word using an allowable spelling for the corresponding sound. If their spelling of the word gives them a "yellow light" or a "red light" (i.e., it looks funny), tell the students to try different allowable spellings (alternative spellings of the sound), each time rewriting the word until they get a "green light" (i.e., the word looks correct).
- Spelling practice: Ensure that the student says the word in a sentence before and again after practising its spelling. Use the following steps for practising spelling:
  1. Trace: Softly sound out the word while simultaneously tracing the corresponding letters on writing paper provided.
  2. Copy: Softly sound out the word again while simultaneously copying the corresponding letters directly below on the next line of the writing paper.
  3. Cover: Cover the copied words with a note card and softly sound out the word once more while simultaneously writing the letters of the word on the next line of the writing paper; then uncover the word to check the spelling.
  4. Close eyes: After carefully examining the spelling of the word and positioning your pencil on the next line of your writing paper, close both eyes and softly sound out the word one more time while simultaneously writing the letters of the word; then open both eyes and check the word's spelling.

Organisation and sequencing of instruction

Teachers and practitioners should always establish the phonological structure of words and integrate this structure into the lesson, regardless of spelling pattern and grade level.

- Leverage letter-name spelling when teaching beginning consonant sounds.
- Organize spelling and reading lessons around a phoneme or group of related phonemes and follow a sequence of instruction that moves from phonemes and phonological units that are most simple to analyze and manipulate to those that are more complex.
- When teaching words that contain prefixes and/or suffixes and word roots, organize spelling and reading lessons by first teaching written morphemes that have a morphological counterpart in oral language, i.e., prefixes and suffixes (e.g., un-, -ed) that combine with a free morpheme (a word, for example *lock*, to spell *unlocked*) and later introduce written morphemes that do not have a morphological counterpart in oral language: bound morphemes (e.g., vis-) that combine with other morphemes (e.g., in-, -ible) to form a word (invisible).

Syllable types, syllable divisions and spelling rules

Teachers and practitioners should become familiar with open and closed syllables in *spoken* language. As a rule of thumb, most spoken syllables in English end with a vowel sound. It is also important to become familiar with letter patterns and spelling rules based on the phonological structure of a word One comprehensive resource is the *SPELL-Links Word Study Resource* – see *https://learningbydesign.com*.

Allow students to segment words into syllables as occurs naturally when speaking. Be flexible; what's most important when mapping sounds to letters is to be sure the student writes the letters that correspond to the sounds of the syllables as spoken in order to form sound-letter connections between spoken and written words.

Sample activities for working on syllables while encoding (spelling):

- After students have said the word and used it in a spoken sentence, instruct them to repeat the word and to write the number of syllables in the spoken word on their paper. If they do not correctly identify the number of syllables, direct them to place their fingers under the chin to feel the chin lower as each syllable is said.
- Show the written word to the students and tell them to repeat the word, saying one syllable at a time and simultaneously copying the letter(s) that correspond to the sounds 'coming out of the mouth'.
- When finished, tell students to check their spelling of the word to verify that each spoken syllable is represented by at least one vowel letter.

Sample activities for working on syllables while decoding (reading):

- Direct the student's attention to the 'vowel chunks' (i.e., the one or more vowel letters in each syllable of the written word).
- Tell the student to point to each vowel chunk while reading the word syllable by syllable, blending one spoken syllable into the next without pausing, and continuing until their finger has moved across all the syllables of the word.
- Tell the student to repeat the word naturally once it has been decoded in this way.
- Set for variability: Explicitly teach 'flexing' of consonant sounds, vowel sounds, and syllable stress and encourage the application of flexing when decoding. For example, if a student misreads CABIN with a long vowel *a* sound in the first syllable, ask them if they recognize the word as read. Next, direct the student's attention to the phonological structure of the word as read: "Listen to the vowel sound in the first syllable. Did you use a long or a short vowel sound?". Then, tell the student to re-read the word, flexing the vowel sound from long to short, to see if flexing results in pronunciation of a recognized word.

Once students begin reading and spelling words that contain prefixes and suffixes, explicitly teach them how to combine morphological analysis and knowledge with their phonological and orthographic knowledge and skills to support efficient reading and spelling of more complex words.

Conclusions

In summary, a collective body of behavioral and brain-imaging research has led to speech-to-print instruction being more widely implemented in classrooms and in intervention services as an evidence-based alternative to more traditional approaches for

teaching word-level reading. Student outcomes in reading and writing can be maximized by an approach to instruction that leverages the organization of the brain for oral language by emphasising phoneme-to-grapheme orthographic mapping, simultaneous activation and integration of all language systems and modalities, and procedural and statistical learning. Teachers and practitioners now understand that speech-to-print instruction is much more than spelling instruction – it is a powerful form of *reading* instruction, and it can be argued that there are many advantages of speech-to-print over print-to-speech instruction for improving both reading and writing performance.

In closing, I invite the reader to reflect on a simple question the next time they teach word-level reading and spelling: Whose sock drawer are we in?

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Disclosure: Dr Jan Wasowicz is founder and CEO of Learning by Design, Inc., publishers of SPELL-Links to Reading and Writing.

Forum on decodable readers: Introduction

The articles in this forum on decodable readers offer strong theoretical viewpoints, as well as practical discussions, relating to the implementation of decodable readers in the early years of schooling. Roslyn Neilson introduces the forum with a critical discussion of the relevant evidence, and a consideration of the context in which decodable readers are currently being used.

What kinds of books do we ask children to read in the classroom at the start of their literacy learning journey? The main choice, these days, is between 'decodable' and 'predictable' readers.

Predictable readers, often referred to as 'levelled' books, have been present in our early literacy classrooms for many years. Predictable readers for beginning readers are books written with simple, repetitive sentences and clues from the pictures that enable identification of all the content words in the text (e.g., 'I can see a [X].') Predictable books enable young children to carry out many of the reading-associated behaviours that are referred to as 'emergent literacy' (Strickland & Cullinan, 1990). These behaviours include turning the pages, looking at the pictures, reciting the text, and responding to comprehension questions, without doing any independent decoding at all. This approach to reading instruction was introduced as part of the Whole Language movement that envisaged reading as primarily a 'meaning-making' process. There is, however, no empirical evidence that I know of that shows that there are benefits in teaching young school-age children to carry out reading-associated behaviours in the absence of decoding skills. Concerns have been raised, on the other hand, that the emphasis on guessing words can steer young children way from the insight that text may actually be decodable (see, for example, *https://www.readingrockets.org/blogs/right-read/predictable-books-purpose-written-guessing*).

Decodable readers, by contrast, are books composed of words that use the letter-sound relationships that children have learned, plus a few high-frequency words to enable the syntax to flow. These books are intended to allow children to practice decoding independently as they read connected text. Decodable readers have been criticised by Whole Language proponents for using stilted language, with the concern being raised that this could put children off reading (e.g., *https://foundationforlearningandliteracy.info*). This negative effect has, however, not been documented. Besides, many modern decodable readers are rather engaging, with exemplary narrative structure and vocabulary choices (Dixon, 2016).

Empirical evaluation of the use of decodable readers at this stage is rather limited. A systematic review by Cheatham and Allor (2012) concluded that giving children decodable texts made it more likely that students would learn how to use a decoding strategy when reading words. There was a suggestion that decodable books led to increased reading accuracy, at least in the short term. But the review also concluded that other text characteristics should be taken into consideration when choosing books for students to read.

There is one research study, however, that found no clear positive effect for decodable texts (Jenkins et al., 2004). This study evaluated the effect of using more versus less decodable texts as part of a major phonics teaching intervention for first grade children receiving supplemental phonics lessons at school. It is worth taking a closer look at this research in order to evaluate the implications of the results.

The Jenkins et al. (2004) study involved three groups of first grade children, all of whom were at risk for reading failure (scoring below the 25th percentile on the WRAT at the start of the research). Children were assigned randomly to one of the three groups. The two experimental groups received individual systematic synthetic phonics lessons, delivered by trained tutors, for 100 sessions during the school year – 25 weeks, 4 days per week, 30 minutes per day. The two experimental groups differed in only one component of the phonics lesson: book reading. One of the experimental groups read decodable books – that is, texts that matched the letter-sound correspondences that were being taught in their individual tutoring sessions. The other group read texts that were largely not decodable on the basis of the letter-sound correspondences that had been taught. The control group served as a business-as-usual classroom condition, with no supplemental phonics lessons.

It is important to note that although the reading texts differed in the two experimental groups, both groups were clearly taught to pay attention to print and not use guessing strategies during the reading component of the phonics lesson. Both groups were given the same feedback from tutors while they were reading the texts:

> *If students hesitated for more than 5 seconds, or misread a word, the tutor prompted them to use previously taught phonic skills (e.g.,*

isolated specific letters in the word and coached the student to figure out the word), or supplied a letter sound or word, as needed. Following a correction, students read the word, then reread the sentence (Jenkins et al., 2004, p. 62).

The results showed, perhaps unsurprisingly, that both experimental groups performed significantly better in reading at the end of the year than the control group who had received no extra phonics coaching. There were, however, no significant differences between the group who read the more decodable books and the group who read the less decodable books. What this implied was that, for children learning systematic phonics, more decodable books did not confer an extra advantage over less decodable books.

But does this Jenkins et al. (2004) study support the generalisation that using decodable books never makes a difference? What this study did not evaluate was the use of more-decodable versus less-decodable texts in instructional contexts where, although phonics instruction may occur in the classroom, the scope and sequence of the instruction is not systematic. In many classrooms, too, there is a disjunction between the phonics instruction and the prevailing book reading strategies, which encourage 'making meaning' via guessing rather than using phonics skills to decode words (Chapman, 2018). How will decodable texts work in this case?

My concern about the relevance of the instructional background within which decodables are used brings me to the context in which this forum was set up: the current use of decodable readers in Australian classrooms.

When the Australian National Curriculum was put up for public comment in the first half of 2021, it generated many submissions arguing for the introduction of decodable texts – for example, *https://maxcoltheart.wordpress.com/letter-to-acara/*. The current Australian English Curriculum, however, simply recommends the use of both decodable and predictable texts in the early stages of literacy learning. The curriculum fails to clarify issues involved in choosing between the two kinds of texts, instead presenting them as equivalent options that enable the development of equivalent reading skills, with a clear emphasis on the importance of 'meaning'. This, for example, is the relevant Foundation Year Content Description, ACELY1649:

Read decodable and predictable text, practising phrasing and fluency, and monitor meaning using concepts about print and emerging contextual, semantic, grammatical and phonic knowledge. https://www.australiancurriculum.edu.au/Search/?q=ACELY1649

In July 2021 the NSW Department of Education entered the fray, announcing that they had purchased decodable readers for all NSW public schools with primary student enrolments.

The outcome of the introduction of decodable readers in NSW has still to be assessed, and no doubt any evaluation of the venture is complicated by the pandemic lockdowns that have happened during the year. Although a good deal of online information about decodable readers accompanied the NSW announcement – see (*https://bit.ly/NSWDeptEdDecodables*), it is very likely that, in the context of the current Australian Curriculum, there exists a wide range of instructional practices into which decodable readers have been introduced.

Box 1, below, is a screenshot of a text message that was sent by a NSW classroom teacher to a parent who contacted me because she was concerned that her Year 1 child was having difficulty with reading (note that autocorrect has an annoying habit of changing 'decodable' to 'decidable').

The optimism of the teacher who sent that text message is encouraging - but even if the teacher fully understood the implications of 'the new way of teaching', I suggest that it is highly unlikely that the parents understood what she meant, and even more unlikely that they were confident about what to do to help their child practise reading at home.

My own assessment of the child referred to in the text message indicated that even if she knew many individual letter-sound correspondences, she still had only rudimentary and laborious phonemic segmenting and blending skills, and she clearly found each page in the decodable texts quite exhausting. Unfortunately, the only intervention the school had recommended at that point was not extra practice in phonemic segmenting and blending, but rather 'neurofeedback therapy' to address the child's obvious tendency to become distracted.

> This year we have started using decodable readers for our reading lessons. We have adopted a new way of teaching reading this year which is working super well and it is helping [redacted] a lot! These decidable readers have more of a focus on the sounds letters make which then gets the kids to sound out words they know.

Box 1. Text message from a NSW teacher to the parent of a Year 1 child who was having difficulty reading, July 2021

My conclusion, therefore, is that when it comes to early reading material for young learners, there is a lot more research to be done, as well as a lot of work to be done translating research into practice.

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The Australian curriculum and the role of decodable readers in systematic synthetic phonics (SSP) programs

Sue Lloyd and **Sara Wernham**, co-creators of Jolly Phonics, made a submission to the Draft Australian Curriculum in May 2021 that included an explanation of their view on the use of decodable readers as part of systematic phonics teaching. They have contributed their comments about decodable readers for publication in this issue of the *LDA Bulletin*.

Undoubtedly the aim of Australia's new Literacy Curriculum will be to raise standards by improving the reading and writing skills of every Australian child. When we were shown the Draft New Australian Curriculum in 2021, however, we were very disappointed to see that the phonics guidance that it provided was very limited. We felt that the Draft Curriculum included examples of policies that failed to follow the raft of scientific evidence linked to the teaching of phonics', and we submitted a response to the Draft Australian Curriculum in May 2021. We emphasised that it is well known that most reading problems, in the initial stages, are decoding problems, rather than a problem with comprehending simple texts. Children who struggle to get the new words off the page will continue to fall behind, and it is important to ensure that they are taught sufficient letter-sound knowledge and are given sufficient practice at blending regular words.

In our response to the Draft Australian Curriculum, we picked out several specific problems that we saw with the phonics guidelines. This note will focus only on our comments regarding the issue of decodable texts – comments that we realise were not addressed as the curriculum was finalised.

The Draft Australian Curriculum stated that children learning to read should *"Read texts which may be decodable and/or predictable."*

We felt that this is clearly a case of trying to keep everyone happy by saying both predictable and decodable texts are acceptable. Predictable texts, for many children, cause reading problems while decodable texts prevent the problems developing.

Systematic synthetic phonics teaching has been mandated in the UK since 2007, and the recent supporting documentation about decodable texts provided by the UK Department for Education in April 2021 presents quite a contrast with the approach in the Australian Draft Curriculum. The UK core criteria document includes the following directive regarding

the place of decodable texts within systematic synthetic phonics programs:

> *The texts and books children are asked to read independently should be fully decodable for them at every stage of the programme. This means they must be composed almost entirely of words made up of grapheme-phoneme correspondences that a child has*

> *learned up to that point. The only exceptions should be a small number of common exception words [. . .] that the child has learned as part of the programme up to that point. In the early stages, even these should be kept to a minimum. Practising with such decodable texts will help to make sure children experience success and learn to rely on phonic strategies.*

https://www.gov.uk/government/publications/phonics-teaching-materials-core-criteria-and-self-assessment/validation-of-systematic-synthetic-phonics-programmes-supporting-documentation#note2

Based on our experience with producing and implementing *Jolly Phonics*, we welcomed this UK directive. Decodable readers are a key component of the *Jolly Phonics* program. Our decodable readers use only letter sounds and tricky words that the children have been taught. They go from simple to complex code, with a controlled vocabulary. The books do not have 'predictive text', as the children should be able to decode (read) the words, not just repeat a sentence or phrase and add in a word or two by looking at a picture. The point is that by only using the code knowledge that the children know, they are then encouraged to use the skill of blending for reading and not to start guessing at words or using clues from pictures.

It is important to remember that decodable readers are written and designed for children learning to read, to allow them to read independently and to feel confident in their own ability. They are not written for adults or teachers to read.

Any scheme can have decodable readers, but if a child has not been taught or has not learned the letter sounds and tricky words used in that book, then it is not a decodable reader for that child. 'Mixing and matching' books from different schemes can be extremely problematic and confusing for children at such a critical, early stage in their learning. Teachers need to be very careful and check that the order of introducing the various alternatives and tricky words is either the same as the scheme they are using, or that all the alternatives and tricky words in the books have been taught to the children that the books are being given to.

Decodable readers are only needed at the beginning of children's reading journeys, when they have a limited knowledge of sounds and graphemes and need to practise their blending. Once children have learnt 70-80 main letter-sound correspondences and are fluent at blending, then they can read anything that is suitable for their age. They have cracked the alphabetic code sufficiently well for reading.

We would all do well to remember that **all** books are decodable once the alphabetic code has been learned.

Sue Lloyd is the founding author of Jolly Sue Lloyd and Sara Wernham are co-authors of Jolly Phonics. They developed the Jolly Phonics program while teaching in a school in Suffolk, UK. They are also both committee members of the UK Reading Reform Foundation.

Commercial disclosure: Sue Lloyd and Sara Wernham, as co-authors of Jolly Phonics, have a commercial interest in Jolly Learning Ltd.

The role of decodable texts in learning to read

In response to the July 2021 announcement that all NSW Foundation classrooms had received a delivery of decodable texts, **Jocelyn Seamer** published a timely blog on the use of decodable texts on her site www.jocelynseamereducation.com. She has provided a summary of that blogpost for publication in this issue of the *LDA Bulletin*.

Although it is now widely accepted that decodable texts of one sort or another are a key part of a systematic approach to reading instruction, their use often generates heated debate. It is important to explore the what, when, who and how of decodables in learning to read.

What are decodable texts?

Decodable texts are simple texts that contain limited graphemes and irregular high frequency words so that students are only asked to read material that they can sound out. There is no guessing, no looking at pictures and no 'thinking about what makes sense' to lift the words from the page when reading decodable texts.

Decodables sometimes get a bad rap being labelled as impoverished, boring and as encouraging 'barking at print' without any attention being paid to other skills of reading. Let's be clear. The earliest decodables aren't rich literature. They aren't meant to be. The primary role of these early texts is to help children get runs on the board and develop the beginnings of fluency at the basic sentence level. When we begin to play football, we don't just start playing in a professional side where the game is fast and complex, and we are in real danger of injury. As children, we play a modified game and attend training sessions to learn fundamental skills. It's the same with reading. We can't just throw children in the deep end with books containing the whole alphabetic code and complex sentences and think that they'll 'pick it up'. We need to carefully scaffold experiences through decodable texts to allow children to experience success at each phase of the reading acquisition process. This approach, working from simple to complex, prevents cognitive overload and ensures that children's attention remains focused on the internal structure of the word rather than trying to remember words based on global shapes; an approach we now know is flawed (Dehaene, 2020). It also focuses students on blending all through the word instead of using other 'cues' to lift the words from the page, such as contextual or linguistic cues that yield much poorer results for weak readers (Kilpatrick, 2015).

Decodable texts are not all 'the cat sat on the mat'. Quality decodables contain dialogue, a range of sentence structures, rich vocabulary and engaging story lines. There are, of course, poorer quality decodable texts that do not. Just as with any text, we need to be discerning in our choices and use the best quality texts we can access.

When do we need to provide decodable texts?

I could say 'in the early years', but that would assume that all children learn to read in the first three years of school. So instead, I'm going to say, 'Until they have learned the core 75 graphemes of the alphabetic code (Eide, 2011) and are reading at approximately 70-90 words per minute'. Now, that doesn't mean that we have to hold off giving students a variety of sentence structures, rich vocabulary and engaging story lines. It simply means that until students have reached the important milestones mentioned above, we need to be very mindful that we aren't putting students in the position of having to guess in order to decode. That means that if a student is 10 years old and reading at a rate of 45 words per minute, they would likely benefit from practice with decodable texts. If they are 7 years old, have knowledge of the full code and are reading at 110 words per minute, it's time to move on. The supply of decodable texts is not about age, it's about reading development.

Who needs decodable texts?

The short answer is 'everyone'. The long answer is a little more complex. While all children move through the same phases of development in learning to read (Moats, 2020), they do so at different rates and with different levels of ease. My own observations of students have led me to develop four categories of students.

1. **The 'Easy Peasy Lemon Squeezy' Students.** These learners seem to acquire reading without difficulty or too much instruction.
2. **The Average Children.** These are students who seem to cope with a broad range of instruction in reading. While they benefit greatly from a systematic approach (and it will certainly accelerate and strengthen learning), they do make progress with sight word lists and predictable texts. They will find it easier to build strong foundational skills with decodable texts, but predictable texts aren't the end of the world for them. After all, this is how the argument, "But balanced literacy works fine" has held on for so long.
3. **The Vulnerable Readers.** With almost 20% of year 9 students not meeting minimum requirements for NAPLAN in writing and 10% not

meeting minimum standards in reading (ACARA, 2021), it's clear to see that a large proportion of our students fall into this category. While 'average' children appear to be okay with balanced literacy, the vulnerable readers are not. These students may not have a diagnosable reading difficulty, but being taught three-cueing strategies with predictable texts is an impediment to them becoming proficient readers and they end up reaching the upper primary years of school 'behind' or 'struggling'. Characteristics of this group in their early stages of learning to read may include:

- Slow development of effective blending. They may take a long time to develop beyond decoding sound by sound.
- Reading rate may be very slow and significantly affect comprehension.
- Many more exposures may be needed to learn to develop phoneme-grapheme correspondence (letter sound knowledge).
- Weaker working memory.
- 'Immature' spoken grammar.
- Becoming discouraged very easily. Being reluctant to read at all.
- Knowing how to read a word on one page, but not the next (beyond what is normal at the very early stages of reading).
- Having difficulty recalling graphemes to write them down.

Without systematic, explicit teaching of phonics and reading, these students are at real risk of reading failure. Vulnerable readers require decodable texts right through the reading instruction process. I have observed that asking vulnerable readers to read less controlled texts too early results in a definite backward-tracking in reading rate and comprehension. As soon as the students cannot easily decode the words, they resort to guessing. Decodables are required until full confidence with the alphabetic code develops.

4 **Students with a reading difficulty.** These students will present with some (or all) of the characteristics of vulnerable readers, but will struggle significantly to acquire fundamental skills. Predictable texts are a disaster for these students, who require a systematic approach for a longer period of time than their peers, delivered with greater intensity and skill.

Just as these four groups of children have different learning needs, they also have a different 'relationship' with decodable texts. The challenge for teachers is that we can't tell which student will fall into which category when we meet them. It is easy to make assumptions based on factors such as how verbal a student is, how confident they are, a student's socioeconomic background or the profession of their parents. Conducting a quick risk/benefit analysis shows us that it is a reasonable proposition to simply provide decodable texts to every student. Nobody is disadvantaged by the practice and all students are advantaged by receiving a strong, systematic approach right from the start.

How to use decodable texts

Decodable texts (either physical books, digital books or sentences/passages printed on A4 paper) can be a part of every student's reading instruction. While I explained in the previous section that one size does not fit all, that doesn't mean that some children don't need decodables. Students need access to the right decodables for their stage of reading development, so confining students to texts simply because they match their grade level isn't effective practice. It's also not effective practice to simply 'hand out' any old decodable texts and say, "Look, we have decodables!". Texts need to be carefully matched to the phonics being learned at the time, but only after a student has developed automaticity with the graphemes contained in the book. So, if you were learning to read the graphemes 'ay', 'ee', 'igh', the decodables you read as you learn them probably wouldn't contain too many words with these graphemes. Instead, you would practise these graphemes at word and simple sentence level until you have automaticity and *then* you read longer decodables that contain them. The choice of decodables in instruction needs to be targeted and intentional.

Providing decodables does not mean that children don't have access to any other books. In fact, I'm a huge advocate for supporting children to spend time with any old book they want to, but that doesn't mean they have to decode them themselves. Children need to develop a sense of themselves and their relationship with books. If they want to borrow *Diary of a Wimpy Kid* from the school library and look at the pictures, sounding out the occasional word, let them. If they want to have a go at reading *Billy B Brown* or a picture book, don't interfere. If they are an 'easy peasy lemon squeezy' or 'average' student with a sound knowledge of the complex code, there's a good chance they'll be able to decode the book, and all will be well. If a book is too hard, the student will soon choose something else. If it's their own free-choice time, let them have free choice and of course, continue reading to children for as long as you can. What I'm describing is low-stakes, no-pressure personal time with books. It's not instruction. Instruction requires texts that are intentionally and carefully matched to a students' current needs to enable students to build skills to mastery.

The use of decodables, as with any aspect of teaching, is nuanced and complex. The easy bit is knowing that decodable texts will accelerate reading acquisition for all students if used correctly. The harder bit is appropriately adjusting instruction to meet the needs of the children in your class.

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Decodable readers in the context of teaching 'Set for Variability' skills

Timothy Shanahan gave permission for the *LDA Bulletin* to print a revised version of a posting he had made on the SpellTalk listserv on 24 February 2021. His comments sounded a cautionary note about the use of decodable readers in relation to teaching a 'set for variability' – an essential component of learning to decode in English.

The importance of a mental set for variability in decoding was first recognized by researchers during the early 1960s (it was referred to as "set for diversity" at the time). Harry Levin and his colleagues conducted studies showing that the leaners who developed a clear understanding that English orthography does not possess a simple one-to-one correspondence between letters and sounds did best in reading. They found that teaching consistent correspondences rather than conditional, variable, or diverse ones led to poorer transfer of these skills to reading. Later, Levin and Eleanor Gibson's now-still-germane, *The Psychology of Reading* (1975), was published which explains the issue clearly.

During that period, Richard Venezky (the scholar who proved the English spelling system had a great deal of consistency – if one paid attention to letter position and morphology), showed that presenting young students with a reading diet emphasizing consistency over diversity may have unfortunate long-term decoding consequences (Venezky & Johnson, 1974). He examined reading textbooks of that time, that exposed students to a steady diet of hard c words (rather than providing the nearly equal appearance of hard and soft c words in the English language); the overly consistent representation of English spelling led to an inappropriate reading bias in favour of hard c pronunciations. These issues continue to be explored today in the statistical learning literature (e.g., Seidenberg, 2017) and examinations of the important role that expectations for variability play in reading (Cartwright et al., 2017).

Explicitly teaching students alternative pronunciation choices is important, but it is also best not to overuse decodable text with kids. Such text may provide valuable concentrated practice with sound-symbol relationships and spelling patterns but may also mislead students as to how English orthography works. That's why I have long counselled teachers to avoid relying heavily on a single system for simplifying beginning reading, since a steady diet of any such system has the potential to mislead. Try using decodable texts in combination with controlled vocabulary readers with a lot of word repetition or student dictated language experience stories. Those are also simplifications with a potential to mislead but by varying the type of simplification a teacher may prevent students from being deceived by any of them.

It is worth noting a more general fundamental insight drawn from a substantial body of work in educational psychology. The provision of overly consistent patterns during any kind of training appears to speed learning but then undermines later performance when students attempt to transfer the ability in authentic situations (National Research Council, 1994). Short term gains may come at the cost of long-term disruption. This is especially important in this case given the lack of evidence of clear learning benefits due to the use of decodables (Jenkins, Peyton, Sanders, & Vadasy, 2004).

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By-line: Dr Timothy Shanahan (http://shanahanonliteracy.com), Distinguished Professor Emeritus at the University of Illinois at Chicago, is well known for his leading role on the 2000 National Literacy Panel. He is a premier educator and advocate in the area of literacy instruction and comprehension. He was inducted to the Reading Hall of Fame in 2007 and is a former first-grade teacher.

Book review: The cognitive foundations of reading and its acquisition: A framework with applications connecting teaching and learning.

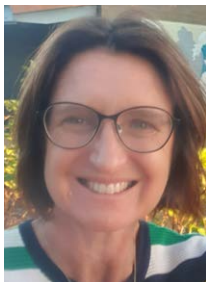
In this extended book review and commentary, **Wendy Moore** reflects on the evolution of the original Simple View of Reading into a much more comprehensive theoretical framework as outlined by Hoover and Tunmer in their new book, *The Cognitive Foundation of Reading and its Acquisition* (2020). Wendy reflects on how the 'cognitive foundations' framework presented in this book can be used to inform and support educational practice, and on how it relates to other views of reading instruction.

The cognitive foundations of reading and its acquisition: A framework with applications connecting teaching and learning.
Wesley A. Hoover and William E. Tunmer
Springer Nature, 2020

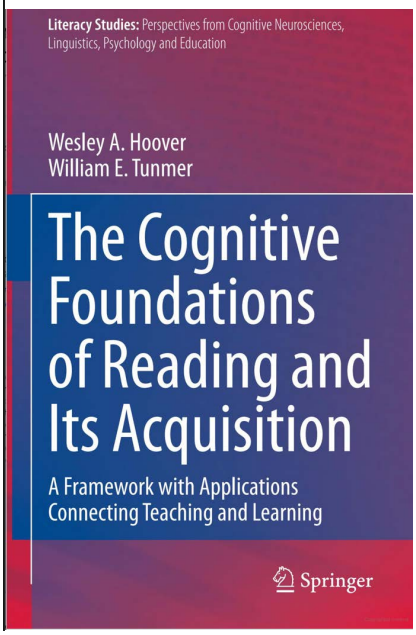
Context of this review

As a school leader, a critical part of my role is to translate the research in education and the sciences into information and guidance for teachers in my school. I need to make sure that what happens in classrooms is aligned and effective. Teachers are generally very keen to understand the science that informs good practice and to optimise their students' learning. Like many others, I have made convenient use of the term the *science of reading* to remind educators that research evidence should underpin practice, and to highlight some established research findings. Likewise, I have used the *simple view of reading* to frame teacher professional learning and to position the crucial elements of mainstream classroom instruction and intervention for students with learning difficulties.

It is in this context – as a tool for explaining reading acquisition and what that means for teachers – that I offer this review of the *cognitive foundations framework*, as outlined by Hoover and Tunmer in their new book. The framework has also been described in a paper in the *Australian Journal of Learning Difficulties* (Tunmer & Hoover, 2019). Both authors were instrumental in developing and testing the hypothesis of the simple view, and are well qualified and positioned to offer this elaboration on the original. I have focused in this review on the framework's utility for teachers, school leaders and teacher educators, and on the book's success in communicating this.



The book provides a careful and comprehensive treatise, with the framework itself as its focus. There is nothing here that is ground-breaking or sensational. There are no urgent calls to arms; there is no finger-waving, and there is no promotion of intervention packages to fix problems in education. The text requires attention and patience. Conjecture is avoided; established knowledge is laid down methodically and logically, with areas requiring further elaboration identified. Overall, the framework provides a useful addition to an educator's toolkit for planning the what, when and how of teaching students to read.



From whence it came: The simple view of reading

As we know, the *simple view of reading* (Hoover and Gough, 1990) represents the hypothesis that reading comprehension – the ability to understand printed text – is essentially dependent on two separate skills: the ability to decode words (i.e., recognise them quickly and accurately in print) and the ability to understand spoken language (such as conversations, or stories read aloud). The simple view predicts that reading comprehension is the product of these two skills; word recognition skill multiplied by listening comprehension skill will equate to reading comprehension ability (D x C = R).

Many research studies have confirmed that these two factors do indeed combine to predict reading comprehension skill (e.g., Lonigan, Schatschneider, & Burgess, 2018). However, the strength of the relationship depends on a whole range of variables, such as how decoding skill is measured, what components of language comprehension are used, and what else is considered or controlled for (Snow, 2018). Sometimes these two factors alone are considered enough to explain how well students read (Braze et al., 2016); in other studies, researchers have attempted to identify additional or overlapping factors that provide better predictions of reading outcomes (e.g., Duke & Cartwright, 2021; Francis, Kulesz, & Benoit, 2018).

The simple view is appealing because of its clarity. Teachers can understand its argument intuitively, and it fits with their professional observations of their students. They readily confirm that their poor readers have limited decoding skill, or difficulties with listening comprehension, or both. In contrast to the simple view, the cognitive foundations framework is better positioned to help teachers and curriculum planners decide what (and how) to *teach* reading. In particular, it provides useful information about the 'listening comprehension' component of the equation, thus providing similar weight to the increasingly important commitment of schools and systems to effective word decoding instruction. The new cognitive foundations framework outlined in this book is designed to clarify the subskills that lead to word recognition ability and language comprehension ability. This makes it easier to identify which components are being considered and which are being controlled for, or indeed overlooked, in any particular research study. It also allows teachers to identify component skills that they can help learners to strengthen to improve their reading skills.

The Cognitive Foundations framework: Operationalising the simple view

Maintaining the simple view as an overarching organisational structure for the cognitive foundations framework has both benefits and drawbacks. As can be seen in Figure 1, the framework is organised, consistent with the simple view of reading, with two top level factors: language comprehension and word recognition. Both of these components depend on other, independent skills or knowledge sets.

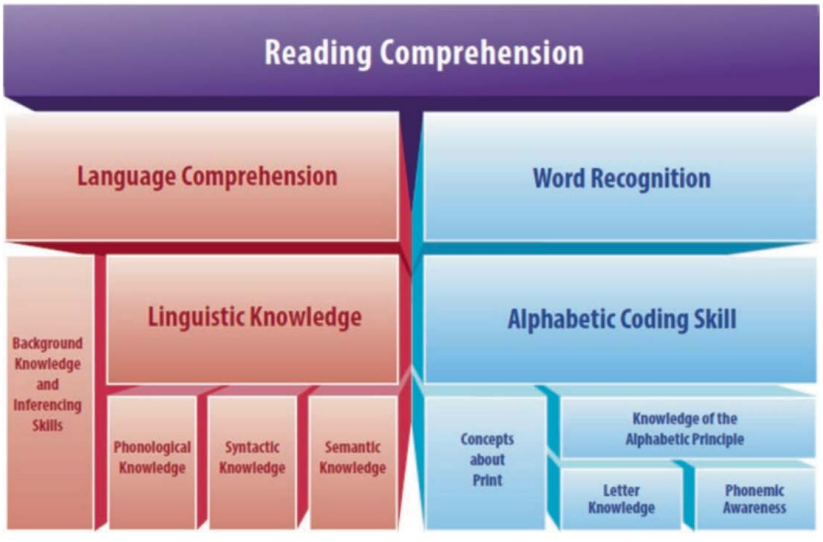
Hoover and Tunmer point out that each of the component skills is independent of others in the same row of the framework, and that the framework is hierarchical. In other words, adjacent components can be assessed independently of one another – they represent distinct skills. Components higher in the framework depend on skills below them in the framework, but do not develop in learners in a strictly sequential manner. For example, knowledge of the alphabetic principle relies on letter knowledge, but once the alphabetic principle is consolidated, it primes the student for even more advanced orthographic learning.

The components are not 'elemental,' because each of the individual components in the bottom row could be further broken down into subskills (for example, letter knowledge could incorporate both knowledge of the phonemes associated with particular vowel digraphs and knowledge of 'rules' which predict which spelling will be used in particular words). However, Hoover and Tunmer have chosen not to complicate the framework by adding additional detail, as they argue that this would obscure the main relationships evident in the model.

The components of language comprehension

Hoover and Tunmer tease out the three components of linguistic knowledge (phonological, semantic and syntactic) in the fourth chapter of their book. They use examples from cognitive psychology and neurolinguistic research to explore each of these domains, which are acquired and applied when we learn our first language, without conscious effort or awareness. Their overview summarises how our brains process the speech that we hear, turning acoustic signals into phonemes and then words, and using our in-built knowledge of grammar rules to make these individual words make sense – or not – depending on the order and combinations in which they are spoken.

Hoover and Tunmer point out that children acquire mature linguistic knowledge in these three domains tacitly, without direct teaching or intervention. They argue that children do not require instruction to acquire this fundamental knowledge of our language system; it develops in any social context in which children interact with others.



Reproduced by permission from Springer Nature, from: *The cognitive foundations of reading and its acquisition* by Hoover, W. A & Tunmer, W. E. (2020), p. 86.

Despite this claim, children do not all come to school with the same levels of phonological, semantic and syntactic knowledge (Nation, 2019; Tomblin et al., 1997), and it is perhaps unfortunate that this point is not made more clearly by the authors. Delays and disorders in language acquisition in both phonology and syntax are relatively common, and even children from rich linguistic environments can find it relatively difficult to learn and recall new words (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). Some children require more support than others to develop mature linguistic systems: some are corrected or scaffolded by adults around them; some participate in therapeutic interventions; some retain immature or disordered expressive and receptive language skills well into adolescence. Language acquisition is biologically primary, but is simultaneously a social construct that is dependent on meaningful and intentional input from family, peers and teachers (Dehaene, 2019; Tomasello, 2003).

Despite this quibble, the cognitive framework does not presume an even field at school entry. While the authors brush over developmental language disorders, they do acknowledge the significant impact of the relative richness or paucity of a child's early environment, as well as the impact of dialectal variation. Hoover and Tunmer note that children without the strong combination of decoding skill, linguistic ability and background knowledge are vulnerable to reading difficulties and to Matthew effects. Matthew effects occur when students with poor reading skills read less often and less well, thus limiting the development of their vocabulary, text knowledge and general knowledge. When this occurs, they fall further behind their peers, and make slower progress with listening comprehension, thus impeding their reading comprehension and producing a cycle of increasing disadvantage.

In discussing language comprehension, Hoover and Tunmer have been careful to include in the framework the influence of background content knowledge, an attribute that they note is independent of linguistic knowledge. They remind us, however, that the ability to comprehend a text will depend in no small measure on our knowledge of the topic that has been written about. This element is an important adjunct to the simple view of reading. It situates the development of reading comprehension within a student's overall home and school context, and reminds us that, as educators, it is our business to teach children about the world so that they can read, and to teach children to read so that they can learn about the world.

Hoover and Tunmer also note in their discussion, but not within the model per se, an additional dimension: that of the informal – academic continuum. Academic language (whether presented orally in a lecture or speech, or in written form in a textbook or research article) is much more complex, syntactically and semantically, than the informal everyday language of conversation or quick text messaging. Even if most children develop the bulk of the linguistic skills that typify everyday conversation by school entry, these skills are only adequate in familiar social contexts. Schooling itself – through exposure to and instruction in academic language – is a powerful means for further developing the sophisticated semantic and syntactic knowledge required for adequate reading comprehension. While phonological knowledge might well be fully developed for most students by school entry, the syntactic system inherent in academic language will develop throughout primary and secondary school, and semantic knowledge will continue to be acquired throughout the lifespan. The more deliberately that teachers attend to these developing areas of linguistic knowledge, the more effectively they will be able to support their students' language comprehension and thus their reading ability.

Information about the cognitive underpinnings of our phonological, syntactic and semantic systems is very useful to teachers to help inform their understanding of what and how to teach. Chapter Four of the book provides a very brief overview of some basic psycholinguistic research that illustrates the three linguistic systems. Chapter Six briefly touches on the development of oral language from birth, as well as revisiting the importance of intact oral language comprehension for reading. Given the goal of understanding reading acquisition and connections to teaching and learning, I would have loved to have seen each of these chapters expanded to more comprehensively explore typical and atypical development in syntax and semantics during the early years of school, these being skillsets that the framework emphasises as crucial for adequate reading acquisition.

The components of word-level decoding

Although 'concepts of print' occupies a biggish box all on its own in the framework (as it is represented graphically in this book and in Figure 1 above), Hoover and Tunmer suggest that development of this cognitive component need occupy only a minor fraction of actual classroom teaching time. There is a small and discrete set of concepts to be acquired. It was always a frustration to me that so much time was spent on this notion throughout the 'Reading Recovery' era, so this is a welcome clarification. Once students understand that print is organised top to bottom and left to right, and that spaces mark word boundaries, they are ready to make use of the 'big two' – phonemic awareness and letter knowledge – which are the critical building blocks for word decoding.

While theoretically independent, letter knowledge and phonemic awareness ideally develop synchronously during the pre-Foundation, Foundation and Grade 1 years of school (around ages 4 to 6) when children are exposed to intentional literacy teaching. The more explicit, comprehensive and carefully sequenced the instruction in these two skills during the early stages, the more effectively they are acquired. Hoover and Tunmer distinguish *phonological knowledge* – the implicit knowledge that allows us to process speech sounds as words (on the 'language' side of the framework') – from *phonemic awareness*, which is required for literacy, and is part of the 'decoding' side. This is the higher order ('metacognitive') understanding that phonemes can be isolated, manipulated, and represented with symbols, to create both real and pseudo-words.

The framework provides a model for the independent skills that are required for developing efficient and reliable word recognition. However, as Hoover and Tunmer point out, the framework is not a model of the 'in-real-time' process of word decoding, which includes three steps: looking at text, processing the letters in a word, and generating its pronunciation and meaning. Chapter 3 explains that this process – decoding – happens in the brain via two co-existing cognitive routes: the analytic and the automatic. These two routes are active in all readers, with the bulk of the work transferring from the slow lane (analytic) to the fast lane (automatic) over time. When we come across an unfamiliar

written word, all readers make use of analytic processing to decode it. Words are recognised after the letters (or groups of letters) appearing in the word are translated into phonemes. These phonemes are then mentally blended together to create an approximation of the pronunciation of the word, which – if familiar – is then recognised and paired with a meaning. For beginner readers, the majority of words are recognised and pronounced this way. The letters are sounded out – either vocally or sub-vocally, and the phonemes articulated, at which point the spoken word is matched with a meaning. As students practise reading individual words, the automatic pathway comes to dominate for that particular word, with the analytic route taking back stage, without ever fully de-activating. With practice, this process becomes very efficient, until typically only a few exposures are required before new words are decoded principally via the automatic pathway.

How then does this model of the process inform early reading instruction? It makes it clear that teachers must ensure that the prerequisites are in place: the skills of phonemic awareness and letter-sound recognition. It also makes clear that before students can decode words efficiently, they need to practise this alphabetic coding skill by *combining* phoneme awareness skills with letter knowledge during word reading practice. Reading words in isolation – frequently and repeatedly – builds the necessary automaticity to move to the fast lane and reduce effort, freeing up the cognitive space required for linguistic processing.

Implications for instruction

Tunmer and Hoover argue that explicit and systematic phonics approaches are useful as a 'kick start' for learning, but that they should be fully integrated within a literacy curriculum that provides ample opportunity for reading of connected text which promotes 'set for diversity' - in other words, using approximations to come to a likely pronunciation. They argue that once students have acquired the alphabetic principle, wide reading should be enabled and encouraged and that direct instruction from an increasingly obscure menu of grapheme-phoneme relationships might not be required or beneficial. The argument is thus that 'self-teaching' should ideally be the primary mechanism for developing automatic decoding once sound understanding of the alphabetic principle has been achieved.

The later chapters use the framework as an audit lens for reviewing typical school assessment regimes and published literacy programs and state-wide curricula. The authors then consider the framework's reach in relation to three significant US reports: the recommendations of the National Reading Panel (National Institute of Child Health and Human Development & National Institutes of Health, 2000) and the subsequent practice guides for foundational skills (Foorman, 2016) and reading comprehension (Shanahan et al., 2010). As typifies the entire book, observations and claims are cautious, balanced and respectful, but are possibly not of direct relevance to Australian teachers.

What *is* of more interest is the overlay of the framework on the National Reading Panel's five key instructional components, the so called 'Big Five': phonological awareness, phonic knowledge, reading fluency, vocabulary and comprehension. This can be summarised as follows, with the components of the framework italicised and the Panel's focus areas in bold:

1. The cognitive foundations framework identifies **phonemic awareness** as an essential skill in reading acquisition, and this aligns directly with the Panel's recommendation to directly teach it.
2. The Panel found strong evidence for **phonics** instruction; the Cognitive Foundations Framework is aligned (only) to the extent that instruction teaches *letter knowledge* along with *phonemic awareness*, enabling students to grasp the *alphabetic principle* and develop *alphabetic decoding skill*.
3. The Cognitive Foundations Framework does not directly address **fluency**. While the Panel found limited evidence for the impact of directly teaching fluency, Hoover and Tunmer argue that it is enabled via progression from analytic to automatic *word decoding*. This relies in turn on *concepts of print* and knowledge of the *alphabetic principle* when they are practised both in isolation and in connected text.
4. Although the Panel found limited evidence that teaching **vocabulary** directly improves comprehension, when vocabulary is introduced in the context of meaningful curriculum content and texts, it is clearly a focus that supports both *background knowledge* and *semantic knowledge*, components that the Cognitive Foundations Framework identified as necessary for *language comprehension*. The consensus of the research is that the majority of vocabulary development occurs during reading practice and curriculum delivery, rather than in preparation for either. Explicit vocabulary instruction might well be a useful adjunct to curriculum programs and reading comprehension activities. Supporting students to become familiar with the vocabulary and structure of academic discourse is thus aligned with the framework, and recommended.
5. The final instructional focus for the Panel is **reading comprehension**, which is both an instructional focus for the Panel, and presumably, its whole purpose. It is also, explicitly, the epitome of the cognitive foundations framework. The Panel recommends specific instructional strategies – essentially metacognitive strategies – by which students can monitor and attend to their own comprehension. From the perspective of the framework, this includes development of domain specific knowledge, otherwise conceptualised as curriculum knowledge, or *background knowledge and inferencing*. This content can be developed either through text-based information or through oral modalities.

What does the Cognitive Foundations Framework add?

The framework developed by Hoover and Gough and described in this book provides a way of understanding the skills that students must have to develop reading comprehension. It is encouraging that the simple view has been elaborated; it is even more encouraging that the new framework is a considered work and not an affirmation of contemporary memes that simplify research to the point of misrepresentation and privilege particular approaches and programs while denigrating others. Some clear messages for me as an instructional and school leader:

1. The early and explicit teaching of phonemic awareness, paired with

letter knowledge, needs to focus on supporting literacy learners to understand the alphabetic principle and develop automaticity in word level decoding.

2 The development of language comprehension is critical, and is dependent upon both a broad and ambitious curriculum that focuses on engagement with rich content, and intentional exposure to, and engagement with, academic language and text structures. In both cases, this needs to be provided from the first years of school.

3 Students should be reading rich and meaningful texts or having them read to them as soon as possible in order to develop word decoding automaticity, vocabulary, familiarity with academic language, and content knowledge.

4 Teachers need to understand each of the requisite subskills for reading acquisition and provide this instruction routinely in Tier 1, whole class contexts.

5 School systems must provide timely and effective supplementary instruction in *both* decoding *and* language comprehension in order to support students at risk. It is not sufficient to simply offer a phonics program and ignore the difficulties that develop and snowball if students' background knowledge, syntactic knowledge and semantic knowledge are inadequate for academic learning.

I enjoyed engaging with this book. A thoughtful re-conceptualisation and elaboration on the simple view has long been overdue. The framework achieves this, and the book explains it. Rather than replacing the simple view, it strengthens it. It is testament to the careful work of its authors as they have tested and explored the implications of the simple view hypothesis and incorporated more recent research evidence. It is respectful of the contributions of researchers from a range of disciplines, as well as policy makers and expert practitioners working in the field. The book does not gallop along, but it is not designed to. I argue that we should all take the time required to digest research findings carefully, communicate them cautiously, and make recommendations based on an acknowledgement that all is not yet known in our quest to ensure that our students are able to read effectively. The cognitive foundations framework has already assisted me to work productively with colleagues to distil the known from the popular, and ensure that decisions made at school level are made with a level head.

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Consultant notes

Olivia Connelly, Convenor, Consultants Committee

As I write this, Melbourne is enduring its sixth lockdown. The ramifications of the COVID pandemic are being felt by all children in schools, especially our most vulnerable children. Whilst schools appear, overall, to be better equipped to deliver remote education curriculums than last year, parents and children who are yet again thrust into home schooling are experiencing significant levels of fatigue and anxiety.

We don't yet have longitudinal studies that can chart the impact of the crisis on children's education, but a recent study has been published by UNICEF, titled Living in Limbo *https://www.unicef.org.au/our-work/unicef-in-emergencies/coronavirus-covid-19/living-in-limbo*. This study surveyed over 1,000 young people aged 13-17 years across Australia to understand how the pandemic has impacted our younger generations, and it revealed that the proportion of young Australians who feel they are coping at this time is decreasing. When the survey was completed in April, the COVID-19 pandemic had already directly impacted almost every young person surveyed. The three most common impacts were: having to stop seeing their friends; their education being disrupted or stopped; and having to stop their usual extracurricular activities.

The direct quotes from children who contributed to the UNICEF survey bring to life the issues that young people are experiencing. For example, a girl from regional Tasmania reported: *"This limbo that we're living in it feels like it's going to go on for the rest of the year. ...I don't think I could do it for another year ... I don't have any aspirations at the moment ... We're just missing out too much."*

Interestingly, a number of young people raised a concern that not all students were impacted equally by the move to remote learning. A girl in regional NSW commented: *"Everyone likes to say we're all in the same boat. But different schools are really giving out different levels of help to the students."*

Just under half of young people report that COVID-19 has negatively impacted their levels of stress and anxiety, including one in six who say that they have been very negatively impacted. *"I know for me specifically my stress levels have just gone through the roof..."* said another girl from regional NSW.

The survey finishes with a summary of five strategies we can all implement to support young people through this crisis. These strategies cover:

- Ensuring access to mental health and wellbeing services
- Providing clear, unambiguous communication with children about the pandemic
- Taking account of the experiences of young people
- Addressing inequities, such as digital access
- Acknowledging the contributions that young people have made during the pandemic.

As an LDA consultant, my own work with both primary and secondary students mirrors the above findings: I am seeing far higher levels of long term stress and reduced motivation to engage in everyday activities such as exercise and contacting friends, as well as even further reduced motivation to complete homework tasks. Whilst my work has always encompassed elements of counselling support to students, I am spending far more time in my sessions with students listening to their concerns as they attempt to navigate their education from the confines of their bedrooms. I spend more time assisting with planning daily schedules and checklists to include basic self-care activities such as getting outside for some fresh air, planning online activities with friends as well as our usual intervention work. The academic work itself has changed too; I now find myself having to include far higher levels of scaffolding and support to students who are experiencing a decreased ability to complete any tasks independently. It is my years of experience as a specialist teacher that allow me to make these necessary adaptations to students' work. I find I am also using my experience as a specialist teacher to help me adapt my work with teachers, providing evidence-based advice to ensure that they remain cognisant of the higher negative consequences of remote learning on students with learning challenges.

The UNICEF survey shines a light on how COVID-19 is impacting young people around Australia. It also reminds me that, as we emerge from this pandemic and begin to plan how to accelerate learning for those who will experience educational disadvantage as a result of COVID-19, we must continue to listen to young people and hear their perspectives on how they have been affected. I am constantly amazed at how well young people are able to articulate and voice their concerns when given the chance.

A final note from me: This is my last set of Consultant Notes for the *LDA Bulletin*, as I step away from the Consultant Convenor role to focus on supporting my family through this pandemic. I would like to thank the Consultant Committee for their unwavering support during this time and I wish all readers a healthier and happier rest of 2021.

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