Systematic and explicit phonics instruction: A scientific, evidence-based approach to teaching the alphabetic principle

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This chapter explains how beginning readers are taught the alphabetic principle using systematic and explicit phonics instruction in the first few years of school. The purpose of this type of instruction is to teach all beginning readers how to decode and recognise words accurately, independently and automatically. This is achieved by directly and systematically teaching children letter–sound correspondence in a planned sequence. Word recognition is described as one component of skilled reading alongside comprehension, but it is the component that represents the foundation of future reading success.

INTRODUCTION

The hallmark of skilled reading is fast *context-free* word identification. And rich *context-dependent* text understanding.

(Perfetti, 1995)

Written over twenty years ago, this quote from Perfetti still elegantly summarises the state of the art with regard to reading instruction. Since it was written, considerable further research has continued to accumulate in support of Perfetti's statement (Castles, Rastle & Nation, 2018).

But it is still important to emphasise, at the outset, that teaching children to read involves so much more than teaching efficient, rapid decoding. Advocates for the importance of a phonics-based approach to teaching the alphabetic principle are often unfairly criticised for recommending phonics only, to the exclusion of other techniques, but this criticism is misplaced.

Phonics is a body of knowledge about the relationship between the sounds of spoken language and the letters used to represent them in writing. Phonics instruction teaches children this knowledge and how to apply it when reading, but it is most effective when used in combination with other, complementary strategies. Nonetheless, the focus of this chapter is clearly with the first part of Perfetti's observation: 'fast *context-free* word identification'.

Reading is a complex cognitive process. Unlike speaking, reading is a skill that does not typically develop spontaneously in children. This significant understanding underpins the scientific evidence of how children learn to read. There is evidence that children who are raised in language-rich homes with frequent exposure to books will be more likely to learn to read early, but not always (Puglisi, Hulme, Hamilton & Snowling, 2017). Many children in such enriched home-literacy environments struggle with reading, and the corollary is also true that many children from language- and literacy-impoverished home environments learn to read with little difficulty at school. Early language experience is a predictive, but not determining, factor (Buckingham, Beaman & Wheldall, 2014).

THE ROLE OF THE ALPHABETIC PRINCIPLE IN LEARNING TO READ

The key to understanding how reading skill develops is understanding how beginners learn to recognize written words accurately and automatically.

(Ehri, 2005, p.168)

The alphabetic principle is the understanding that letters and letter clusters in written words represent the sounds in spoken words, and that letter–sound correspondences are predictable and reversible. It is the understanding that written English is a code invented to record and communicate spoken English, and that the code is systematic and largely consistent. Hence, acquisition of the alphabetic principle is essential for learning to read and write. When children begin to learn to read, they are building neurological connections between parts of the brain that store letters (visual information) and sounds (phonological information). These connections are formed by knowledge of the alphabetic system.

Beginning readers access the meaning of a word via a phonological pathway in the brain; that is, through the sound of the word, not its shape. Over time, with multiple exposures to written words, readers build up a mental lexicon of sight words that allows them to make direct, or at least rapid, connections between print and meaning (Castles, Rastle & Nation, 2018). Therefore, the ability to convert the written word to the spoken word through phonological decoding is crucial in the early

development of reading. According to Nation (2017), 'there is clear consensus that in alphabetic languages, phonological decoding is at the core of learning to read words'.

The Simple View of Reading

The Simple View of Reading (Gough & Tunmer, 1986) is a model of reading that has been tested and supported in dozens of experimental studies (Vaughn, 2018). It does not suggest that reading is a simple process; rather, the model is conceptually simple, separating the complexity of reading comprehension into two distinct component parts: the product of word identification and language comprehension (see Feez, Chapter 2, this volume).

A note on terminology

In the original paper on the Simple View of Reading, Gough and Tunmer (1986) use the term 'decoding' instead of 'word identification'. However, as noted by Hoover and Tunmer (2018), decoding is usually used in reading research literature as shorthand for phonological decoding. The word-identification component of the model is not limited to phonological decoding (it may occur via sight-word recognition); therefore the broader term 'word identification' is often used to avoid confusion.

Using this model, it is clear that if either the ability to identify words or comprehend language are impaired or absent, then reading comprehension will suffer. In plain language, if a child cannot work out what a written word is, then they cannot make meaning and they are not reading. Likewise, if they can read a word aloud but do not know what it means, they are not reading. Numerous studies have found that the combination of word identification and language comprehension (as measured by either vocabulary or listening comprehension) accounts for the majority of variation in reading comprehension (Tilstra, McMaster, Van den Broek, Kendeou & Rapp, 2009; Lonigan, Burgess & Schatschneider, 2018; LaRRC, 2018).

The word-identification component of the Simple View is described by Wheldall (2011) as 'the ability to translate or decode the marks on the page or screen into words'. Decoding takes place at the *grapheme subword* level (see Feez, Chapter 2, this volume); research has shown that both beginning and skilled readers attend to all of the letters, as well as their position, when reading a word (Rayner, White & Liversedge, 2006; Grainger, 2008). Likewise, eye movement studies show that when people read a text, their eyes land on practically every word (Rayner & Pollatsek, 1989). These studies show that readers do not 'sample' text or memorise whole words by their shape; rather, they store words in their long-term memory via a process called orthographic mapping (Kilpatrick, 2015).

Comparing phonics with other approaches

These features of beginning and skilled reading explain why using phonics to decode unknown words is a more efficient and accurate strategy than using cueing systems that prioritise semantic (meaning) and syntactic (grammatical) context (Kilpatrick, 2017). A recent systematic review states that using semantic and syntax context cues before phonological decoding is 'little better than guessing, since they often lead to learners producing words other than the target' (Torgerson, Brooks, Gascoine & Higgins, 2018, p.2).

Learning the alphabetic principle and becoming proficient at using it for phonological decoding has two key benefits for learning to read. First, it facilitates the storage of words in long-term memory so

they can be retrieved instantaneously as *sight words*. Letter–sound knowledge (phonics) is the mnemonic system that bonds written words into long-term memory as sight words. ('Sight words' in scientific reading research refers to words which have been stored in memory by repeated exposure and are recognised automatically, not to lists of high frequency words that are taught by rote.) When readers acquire sufficient knowledge of the alphabetic system, they are able to learn sight words quickly and remember them long-term (Ehri, 2005).

Knowledge of the alphabetic principle and letter–sound correspondences also helps children to develop their vocabulary. Studies have shown that children are more likely to remember the meanings of words if they know how to spell them (Ricketts, Bishop & Nation, 2009; Rosenthal & Ehri, 2008).

Therefore, early acquisition of this knowledge is essential for children to begin to read accurately and independently. Early accurate reading facilitates reading volume, which in turn develops reading ability in a positive reciprocal relationship (Sparks, Patton & Murdoch, 2014).

HOW DOES LETTER–SOUND KNOWLEDGE DEVELOP WHEN CHILDREN ARE LEARNING TO READ?

Acquisition of the alphabetic principle depends on children having developed at least some facility with phonemic awareness (the ability to hear and discriminate the individual sounds – phonemes – in spoken words). Without phonemic awareness, it is difficult for children to map print to sound and vice versa (Melby-Lervag, Lyster & Hulme, 2012). Most children have developed sufficient phonemic awareness for phonics instruction to begin in the first few weeks of formal school education, but some need a limited amount of explicit phonemic awareness instruction prior to phonics instruction. Phonemic awareness continues to develop with phonics instruction. Likewise, many children will have some knowledge of the alphabetic principle before they begin school, either of letter names, letter sounds, or both.

According to Ehri (2005), development of the alphabetic principle occurs in four phases (see Table 4.1). Children become adept at decoding words when they move from the partial alphabetic to the full alphabetic phase. Making this transition requires them to learn a great deal of information that is largely abstract; the shape of a letter contains no clue to the way it is pronounced in words. The letter–sound associations must be learnt to the point of automaticity in order for children to fluently and seamlessly blend letter–sounds to make words. This multimodal (sight and sound) paired-association memory task is cognitively demanding and often effortful (Seidenberg, 2017).

The consolidated alphabetic phase is achieved when children have sufficient word-reading fluency and proficiency to generalise their decoding skills to read and learn new words independently in a process described by Share (1995) as 'self-teaching'. At this stage, children's reading comprehension becomes constrained by their oral vocabulary or language comprehension, according to the Simple View of Reading.

Many children begin to learn about letters and the alphabet from the age of two or three years, and it is beneficial to introduce some structured phonemic awareness and letter–sound activities in early education settings and at home. However, there is strong evidence that the acquisition of knowledge and skills required for fluent phonological decoding and word reading is most likely to occur early and successfully with systematic and explicit instruction in phonics in the first few years of school. Such instruction uses a carefully developed sequence of letter–sounds that has been developed to minimise confusion while the alphabetic principle is consolidating in a beginning reader (Stuart & Stainthorp, 2016).

Table 4.1 Four phases in the development of the alphabetic principle (Ehri, 2005).

PHASE	CHARACTERISTICS
Pre-alphabetic	Children recognise words in their environment that have a distinctive shape but do not pay attention to the individual letters
Partial alphabetic	Children know a few letters and sounds and use them to predict words; this phase is typified by invented spellings that use only consonants
Full alphabetic	Children know all the major letter–sound correspondences and are able to blend and segment all of the phonemes and graphemes in a word, and are building a sight-word vocabulary
Consolidated alphabetic	Children blend whole words and parts of words using their grapho-phonological properties into chunks or units of information, and retain them as sight words in the form of unique letter strings

There is no accepted 'best' sequence for the systematic teaching of letters and sounds, but there are some research-based criteria (Carnine, Silbert & Kame'enui, 1997):

- Introduce single letter–sounds first, and progress to the more complex code of digraphs and trigraphs (speech sounds of two and three letters, respectively)
- Begin with a small set of letters that can be combined to make a number of simple vowel-consonant and consonant-vowel-consonant words, in order to facilitate blending and segmenting
- Introduce letters at a rate of 3–6 a week, teaching cumulatively
- Teach high-frequency letters first
- Separate the teaching of visually and auditorily similar letters.

These criteria characterise a 'systematic synthetic phonics' (SSP) approach to instruction in the alphabetic principle, as opposed to non-systematic approaches (such as 'phonics in context') or instruction that works on larger sub-word units such as onset–rime analysis (see Feez, Chapter 2, this volume). The SSP pedagogy is explained in more detail below.

PHONICS IN THE CURRICULUM

Given that the alphabetic principle is the basis of our English language, it makes sense that having a firm grasp of this knowledge, and the skills that are associated with it, is fundamental to learning how to read. This is particularly important in the beginning stages of learning to read. As has been described earlier, the alphabetic principle gives rise to phonics instruction – teaching students how to match a sound in our language (a phoneme) to its representation on paper (a grapheme). This is why *grapheme–phoneme correspondences* (GPCs) are central to a phonics approach to teaching reading. This foundational skill for learning to read is reflected in the Australian Curriculum: English (ACARA n.d.a) and in the National Literacy Learning Progression (ACARA n.d.b). Being such a critical skill, it is not surprising that the features of teaching the alphabetic code appear early in the Curriculum and in the progression.

The Australian Curriculum: English is built around the related strands of Language, Literature and Literacy. The Literacy strand is the most pertinent here, and we have italicised key words and terms in the following extracts.

From the Foundation year, students are expected to 'engage with a variety of texts for enjoyment'. The Foundation Year Level Description (the highest level) for English states that students:

> listen to, *read* and view spoken, written and multimodal texts in which the primary purpose is to entertain, as well as some texts designed to inform . . . They participate in *shared reading*, viewing and storytelling using a range of literary texts, and recognise the entertaining nature of literature.

Moreover, the English Curriculum Level Description (next level from highest) mandates the types of text that should be used by beginner readers:

> Literary texts that support and extend Foundation students as beginner readers include decodable and predictable texts that range from caption books to books with one or more sentences per page.

The Curriculum prescribes the use of texts that 'can be decoded phonically'. These are, of course, in addition to a range of literary texts to foster and develop other capabilities. They are by no means intended to be the only books to which young children are exposed. The inclusion of the use of decodable books highlights the importance of phonological recoding in the very beginning stages of reading. This skill draws directly on the alphabetic principle.

This requirement to read decodable and predictable texts continues into Year 1, with the inclusion of words that need to be 'decoded phonically'. By Year 2, the Level Description specifies that teachers should use literary texts 'that support and extend Year 2 students as *independent readers'*, (our emphasis) and any reference to the use of decodable and predictable text has disappeared.

The Curriculum provides descriptions with accompanying codes to guide the skills that students need to gain and thereby inform the instructional approaches of teachers. Many of these relate to the skills that arise from the alphabetic principle. For example, ACELA 1440, Phonics and word knowledge, states, 'Recognise and name lower-case letters (graphemes) and know the most common sound that each letter represents'.

As another example, the Curriculum Content Description for the Foundation year ACELY1649, Interpreting, analysing, evaluating, states that children should be able to:

> Read decodable and predictable texts, practising phrasing and fluency, and monitor meaning using concepts about print and emerging contextual, semantic, grammatical and phonic knowledge.

To read decodable texts, most children need to be taught phonics. While some children do appear to deduce the phonic code for themselves, the vast majority require this to be taught explicitly.

It has recently been argued that the requirement to use two types of text in the beginning stages of learning to read draws on two different theories of reading – the whole-language method and a code-based method (phonics), based on the alphabetic principle – that are in conflict with each other (Pogorzelski & Wheldall, 2018). At best, this is highly confusing for teachers. More research is needed in this area, but there is mounting evidence that decodable texts are more useful in the beginning stages of learning to read than are predictable books (Mesmer, 2005; Cheatham & Allor, 2012). What is not debatable is that phonics is the most direct route to skilled reading, as explained earlier.

The requirement for children to understand and become proficient with the alphabetic code is also reflected in the National Literacy Learning Progression. This emphasis can be found in the Reading and Writing element, specifically the 'Phonic knowledge and word recognition' (PKW) sub-element. There

are, of course, as the Progression document states, particular links between this sub-element and the sub-elements Phonological awareness, Spelling, and Understanding texts (ACARA, n.d.b). The Literacy Progression sub-element PKW provides detail on how phonic knowledge can be developed sequentially. It, understandably, provides more fine-grained detail of the skills that are required for students to become fluent in using alphabetic knowledge than is provided in the Curriculum and General Capabilities. To this end it may be more useful for teachers in supporting children to become skilled and independent readers.

Decoding

It is worth looking at the definition of decoding in the Australian Curriculum, as this is likely to cause some confusion. It is as follows:

> *Decoding*
>
> A process of working out a meaning of words in a text. In decoding, readers draw on contextual, vocabulary, grammatical and phonic knowledge.
> Readers who decode effectively combine these forms of knowledge fluently and automatically, and self-correct using meaning to recognise when they make an error.
>
> *(ACARA n.d.a, Glossary)*

This is not a widely-accepted definition of the term decoding. As noted earlier, in research literature based on scientific studies of reading, the term decoding is most frequently used as shorthand for phonological decoding (which is also sometimes called phonological recoding) (Hoover & Tunmer, 2018). This is a much narrower definition than that proposed in the Curriculum, which more closely describes the 'three cueing systems' approach to word recognition, which encourages children to use context-based cues before phonic cues to read unfamiliar words (see Cox, Feez & Beveridge, Chapter 1, this volume). In this chapter we use the word decoding to mean phonological decoding.

TEACHING THE ALPHABETIC PRINCIPLE

It has now been established, by scientific reading research carried out over the last 30–40 years, that phonics instruction is the best way to teach the alphabetic principle. It is now beyond reasonable doubt. As Stanovich (2000, p.415) puts it:

> That direct instruction in alphabetic coding facilitates early reading acquisition is one of the most well established conclusions in all of behavioural science.

Three national committees of inquiry, from the USA (NRP, 2000), the UK (Rose, 2006) and Australia (Rowe, 2005), have all concluded that phonics is the best way forward. In Australia, the committee argued strongly for empirical evidence to be used to improve the manner in which reading is taught in Australia (Hempenstall, 2016).

However, the recommendations of these reviews have not been adopted widely in policy or by extension in Australian schools (Australian Government Expert Advisory Panel, 2017). Many Australian teachers do already make some use of phonics in their reading instruction; however, the nature and quality of this instruction varies. It is important, then, to define clearly what is meant by the term 'phonics', or the form of phonics instruction, advocated here.

According to these three inquiries, phonics teaching in the alphabetic principle should be structured and systematic. This does not include 'incidental phonics' taught on the run or 'phonics as the last

resort', as part of the three cueing systems. Central to effective phonics instruction is the systematic teaching of letter–sound correspondences in a logical sequence, so that *all* correspondences and blends are taught.

It has sometimes been argued that analytic and analogic phonics can be taught in a structured and systematic way. In these approaches, the phonemes associated with particular graphemes are not pronounced in isolation (that is, outside of whole words), and students are asked to analyse the common phoneme in a set of words in which each word contains the phoneme being introduced. The lesser overall effectiveness of analytic phonics instruction may be due to a lack of sufficient systematic practice and feedback usually required by the less able reading student (Hempenstall, 2016; Wheldall, Snow & Graham, 2016). These differences may be due to confusion regarding terminology, so it is important to define, then, exactly what SSP means.

Systematic synthetic phonics (SSP)

The use of the word 'synthetic' is a cause for confusion to some. In this context, it does not mean fake or artificial, like nylon or plastic. It refers to the notion of *synthesising* learned letter sounds to 'sound out' or 'read through', the word. So, once a child has learned the sounds associated with S, M, T, I and A, for example, they are encouraged to *blend* the sounds together to form 'sat', 'mat', 'sit', 'Sam, 'Tim' etc. The child is also shown how to *segment* words, by replacing a letter sound and thereby changing the meaning: for example, from 'sat' to mat', by changing one letter.

One of the most alarming concomitants of misunderstanding the real meaning of synthetic phonics is the myth that it refers to the teaching of non-words or pseudo-words. In England, this has led to some teachers attempting to teach lists of pseudo-words in preparation for the Phonics Screening Check (discussed later), rather than teaching phonic decoding (sometimes known as phonological recoding) *per se*.

An effective program of early literacy instruction will have at its core an explicit and systematic phonics component to teach the alphabetic code. This should be included daily for at least 20–30 minutes until the full code has been taught. Well-designed programs will provide multiple engaging activities within this session to ensure that children's attention is sustained. In addition to phonics instruction (which would also address phonemic awareness and fluency), there should also be an extensive focus on oral language, vocabulary and comprehension using quality children's literature so that all elements of the Five Big Ideas (see Feez, Chapter 2, this volume; Armbruster, Lehr & Osborne, 2008; Snow, Burns & Griffin, 1998) are addressed. InitiaLit is an example of such a program (MultiLit, 2017, 2018). A wealth of free resources and information on teaching the Five Big Ideas is also available on the FIVEfromFIVE website (http://www.fivefromfive.org.au/).

Explicit instruction is an evidence-based pedagogy in which the teacher:

- explains, models and demonstrates the content or skill to be learned
- has a stated learning objective for each lesson, and
- uses clear and unambiguous language.

Systematic instruction means that there is a planned sequence of phonics elements that comprises a logical progression of skills and knowledge, with sufficient practice and cumulative review for mastery to be achieved. Synthetic phonics is highly explicit and systematic, and is characterised by a number of steps involving grapheme–phoneme correspondence (GPC) (being able to match a phoneme to a grapheme and vice versa):

- Clearly define a sequence of letter–sound (grapheme–phoneme) correspondences (see above).

- Introduce new GPCs cumulatively.
- Start with single letters and a sound for each, moving onto common digraphs (*sh*, *oo*) and larger grapheme units (*eigh*, *air*, *igh*).
- Introduce blended phonemes for reading with the first set of GPCs, adding more GPCs as they are taught.
- Introduce segmented phonemes for spelling with the first set of GPCs, adding more GPCs as they are taught.
- Introduce the most common spellings for sounds first, and then the alternative sounds for spellings and alternative spelling for sounds.
- Introduce strategies for reading and spelling high-frequency words containing unusual letter–sound correspondences.
- Provide opportunities for applying word-reading skills in reading decodable books matched to the phonics sequence to support students in using phonological strategies as a first approach to reading.

Once children have some basic knowledge of letter–sound combinations and can blend and segment words with three phonemes (or sounds), they can quickly begin to read small decodable books for themselves by using the decoding skills that they have learned to 'lift the words off the page'.

This early engagement with books that children can read for themselves is very motivating for beginning readers. Of course, decodable books are only a small part of the diet of books that children should be experiencing both before they commence school and after (see Pogorzelski & Wheldall, 2018). Decodable books only need to be used in the early stages of beginning reading, when children are mastering the alphabetic code, but they do provide a bridge to reading more natural language text and allow children to practise their growing alphabetic knowledge. The sooner we can teach the alphabetic code, the sooner children can become independent readers and will be able to read a wide variety of texts. This way children develop their vocabulary and increase their knowledge of the world, a key element in reading comprehension.

WHICH STUDENTS BENEFIT FROM THIS APPROACH?

In essence, all children benefit from learning the alphabetic principle but not necessarily to the same extent or in the same way, best summarised in this oft-quoted (and sometimes misquoted) statement by Snow and Juel (2005, p.518):

> In our view, then, the findings from a wide array of sources – studies of reading development, studies of specific instructional practices, studies of schools and teachers found to be effective – converge on the conclusion that attention to small units in early reading instruction is helpful for all, harmful for none, and crucial for some.

A small minority of children learn to read with either no or minimal instruction, often before they even begin school. We might speculate that these children are neurologically wired so that tasks like learning to decode written words, to lift words off the page, are part of their biological make-up, but we know of no research to test this idea.

We do know that humankind has been using written forms of language to communicate for only a short time in evolutionary terms (compared to using oral language), and it is highly unlikely that humans have developed specific neural organisations dedicated to reading. It is more likely that neural pathways and mechanisms dedicated to other purposes (such as pattern recognition) have been brought into service in the cause of reading and writing (Dehaene, 2009). Some children, by no means necessarily the most

intelligent, appear to be able to make use of these mechanisms more readily than others. For some (the lucky few) learning to read appears effortless; they seem to work out learning to read by themselves.

A far greater proportion – the majority of children – will not work out how to read without some sort of instruction. Most children appear to learn to read after attending school for a few years, whether there has been a strong phonics focus in their instruction or not. Some of these will have been able to build a model of the alphabetic principle for themselves, while others may have amassed a large reading vocabulary of words learned as whole words. The difficulties for this latter group become apparent when they reach Years 3 or 4, when the number of words they need to be able to read becomes so large that they can no longer handle the volume and they 'hit the wall', struggling to make further progress.

Finally, there is a sizeable minority (perhaps a quarter) of all children who will always struggle to learn to read – especially (but not exclusively) children from disadvantaged and at-risk populations, and children with learning difficulties and disabilities such as dyslexia – without explicit and systematic phonics instruction as part of a comprehensive literacy program. Many of these children will be disadvantaged in the school learning environment from day one, compared to their more middle-class peers (Buckingham, Beaman & Wheldall, 2014).

Response to Intervention approach

An approach to literacy education known as Response to Intervention (RtI) is designed to meet the needs of all students. In the standard three-tier model of RtI (see Figure 4.1), all children beginning school receive high-quality, evidence-based instruction addressing all of the Big Five Ideas of reading in the universal Tier One (whole class) program, including explicit instruction in letter–sound correspondences. This affords every child with the opportunity to learn to read, but some will make faster progress than others.

RtI has become the alternative to the 'wait to fail', or reading discrepancy method, of identifying children struggling to learn to read. In 'wait to fail', children were deemed to be in need of support if, and only if, their reading performance was judged to be significantly inferior to what might be expected from a knowledge of their overall cognitive ability (usually measured by an IQ test). A particularly disturbing aspect of this approach was the fact that children with poor reading skills supposedly on a par with their overall low cognitive ability were judged to be less in need of support than children with average reading ability but whose cognitive ability was above average.

The Three-Tier RtI model posits that 80 percent of children will make good progress as a result of this universal exemplary instruction. The remaining 20 percent identified as making less-than-adequate progress are offered Tier 2 level instruction, usually in small withdrawal groups of three to four children, where a similar approach to Tier 1 is deployed, again based on the best available scientific evidence, but provided in greater intensity and more capable of addressing the specific reading problems these children are experiencing. Tier 2 programs of this kind are usually able to get three-quarters of these struggling children (or 15 percent of the total cohort) back on track and returned to the classroom.

This leaves about five percent of children in the year group in need of further, even more intensive, one-to-one, individualised instruction, preferably by a skilled reading expert. Again the most effective scientific, evidence-based methods are employed, with even greater intensity and specificity.

This model may be regarded as a form of differentiated instruction in many ways and is likely to lead to only about 2–3 percent of the overall age cohort in need of further ongoing remedial support. This small group of children may be regarded as the true dyslexics, if we wish to use that label. Note however that this form of differentiated instruction differs in terms of intensity and specificity, rather than by difference in terms of generic pedagogy or curriculum. This is in line with the non-categorical model of instruction (Wheldall, 1994; Wheldall & Carter, 1996) discussed below.
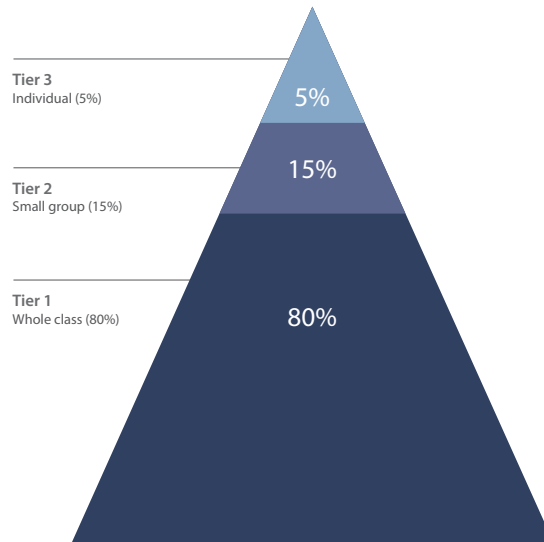
Tier 3
Individual (5%)

5%

Tier 2
Small group (15%)

15%

Tier 1
Whole class (80%)

80%

Figure 4.1 The Three-Tier model of Response to Intervention (RtI)

Finally, it is important to emphasise that all children should be offered explicit instruction in the alphabetic principle, including those who come to school apparently already able to read. There is no way of knowing ahead of time which students will struggle to learn to read, and so it is best practice to provide structured, systematic instruction to all children beginning school.

MEETING THE NEEDS OF ALL STUDENTS

Systematic, explicit phonics instruction within an RtI model may be considered as a 'non-categorical approach' (Wheldall, 1994; Wheldall & Carter, 1996). It is beyond the remit of this present chapter to consider the non-categorical conceptual model in detail but it is an important predicate to a more general understanding.

In brief, the non-categorical model argues that instruction should not be tailored to the perceived needs of *categories* of students but rather to the specific instructional needs of the individual child. In this sense, it is truly 'child-centred'. Advocates of this approach argue that while it may seem like useful information to be able to diagnose a child's difficulties as stemming from their dyslexia, autism or Down Syndrome, for example, this very rarely leads to specific information about how best to teach a particular child. There is likely to be more variation within categories than there is between them. Children with these disabling conditions do not need programs based on their condition but rather a program that is based on the best scientific evidence for efficacy of instruction. This is sometimes rendered as 'instruction is instruction is instruction'.

Decades of research on so-called aptitude-treatment interaction has failed to provide convincing evidence that different children need different instruction based on their categorical denomination (Wheldall & Carter, 1996). For example, Wheldall, Beaman and Langstaff (2010) have demonstrated that low-performing Aboriginal children learn to read just as readily as similarly low-performing non-Aboriginal children when afforded appropriate instruction based on the principles advocated in this chapter. They do not need programs specifically geared towards the needs of Aboriginal children since all children learn in the same way.

Similarly, considerable research on the learning styles of children has failed to demonstrate that so-called visual learners, auditory learners and kinaesthetic learners benefit differentially from specific instruction provided in their preferred modality (Wheldall & Carter, 2018). In spite of all the evidence, this myth of learning styles is still remarkably pervasive.

How then may children with different profiles best be taught? The answer is to use the scientifically proven, most effective methods of instruction for all children. This is not to say that 'one size fits all' but rather to argue that 'a coat should be cut according to the cloth'. The same established instructional principles, in many cases the same programs, may be deployed with all children. What differs is their initial placement and the progress that they may make. Some children, regardless of profile or category, may need more, and more-intensive, instruction than others. Some children will quickly master the sequence of instruction after having been taught a new letter–sound combination only once, while others may need many repetitions. The RtI model, described earlier, provides a paradigm for this, the appropriate tier of instruction being determined by continual monitoring of student performance and progress, as discussed below.

ASSESSING STUDENT PROGRESS

The assessment and monitoring of student performance is central to a systematic and explicit approach to reading instruction. Both formative and summative assessments are deployed in what we may roughly categorise under four headings: two formative (placement and progress monitoring) and two summative (criterion and norm-referenced) measures of student achievement in reading. All of these measures have advantages and disadvantages but are used for different purposes. It is important to use them and the data they provide for the appropriate purpose.

Curriculum-based assessment

The first concern is to determine what a child already knows or does not know; that is, where in the instructional sequence the student is to be placed to begin or continue instruction. This requires what is known as curriculum-based assessment or CBA (Hosp, Hosp, Howell & Allison, 2014). CBA determines how far along a scope and sequence of instruction (in this case of the alphabetic principle) a child has reached. It may also highlight gaps in the child's acquisition of the sequence. Many, if not most, structured, sequenced programs of reading instruction will include a placement test comprising test items at each of the levels of the scope and sequence of the program – see, for example, the placement test for the MiniLit small group, Tier-2 remedial program for children struggling to maintain progress after their first year of schooling (Buckingham, Wheldall & Beaman, 2012). By giving the child the placement test, the teacher gains knowledge of how far in the sequence the child has progressed and any gaps in knowledge of the sequence that additionally need to be addressed.

Curriculum-based measurement

Curriculum-based measurement or CBM determines how far the child has progressed overall in learning academic skills (Hosp, Hosp & Howell, 2016). The CBM of reading is a reading fluency measure, reading fluency having been shown to be highly correlated with overall reading development. Depending upon how far the child has progressed in learning to read, the CBM may comprise a list of non-words, single words or a text passage, the criterion assessed being the number of single words (or non-words) the child is able to read in one minute (Reynolds, Wheldall & Madelaine, 2009). When students have progressed even further, measures of the number of words a child can read from carefully written passages of text (stories) are more appropriate (Wheldall & Madelaine, 2006). The series of CBM tools

known as DIBELS offers a comprehensive selection of measures that are already being used in some Australian schools (see https://dibels.uoregon.edu/assessment/dibels).

Criterion-referenced assessment

Criterion-referenced assessments include more global measures of reading achievement such as the National Assessment Program – Literacy and Numeracy (NAPLAN). Essentially a measure of reading comprehension, students are assessed in Years 3, 5, 7 and 9 on the same scale (albeit using different test items). For each age, a criterion is set for the minimum band (of nine bands) students are typically expected to exceed.

More pertinent for the present purposes of assessing progress in achieving the alphabetic principle is the Phonics Screening Check (PSC) developed and used in England for assessing students at the end of Year 1 and now being implemented in South Australia (Buckingham & Wheldall, 2018). The PSC comprises 40 items – 20 regular words and 20 pseudo-words (or non-words). Those failing to meet the criterion score (32/40 in England, 28/40 in South Australia) are offered additional instruction. The aim of the PSC is to ensure that all children master the alphabetic principle and hence are well on the way to having learned to read in their first few years of schooling.

Norm-referenced assessment

In contrast to criterion-referenced tests are standardised norm-referenced tests such as the well-known Neale Analysis of Reading Ability (NARA) (Neale, 1999) and the more recent York Assessment for Reading Comprehension (YARC) series of tests (Snowling et al., 2009). The most pertinent measure for early reading is the YARC Early Reading Test (Hulme et al., 2012) which measures letter–sound knowledge, early word recognition, and phoneme awareness. Norm-referenced tests like these are based on testing large representative samples of children to generate norms according to age (or stage) which allows children to be compared using standard scores or (less reliably) reading ages. Measures like these may also be used for comparing the efficacy of different approaches to teaching the alphabetic principle, such as synthetic phonics instruction compared with analytic phonics instruction.

PHONICS IN THE LITERACY PROGRAM

Mastering the alphabetic code that sits behind our spoken language is essential to becoming a skilled reader in English. While being central, it is by no means the only factor or skill required. As is often said, it is 'essential but not sufficient'. This point cannot be emphasised enough. There is often a distracting element in the discussions that are referred to as 'the reading wars' (Castle, Rastle & Nation, 2018). While phonics is an essential element of any literacy program that aims to develop independent reading skills in children, it is by no means the only element that is important.

Much has been written about the Five Big Ideas in reading: phonemic awareness, phonics, fluency, vocabulary and comprehension (see Feez, Chapter 2, this volume). This construct recognises the key elements that are required for children to become skilled readers. Teaching the alphabetic code via explicit and systematic phonics is one way to ensure that all children have the skills they need to become confident readers. Teaching phonics using a synthetic approach appears to be the most efficient way of doing this (Johnston, McGeown & Watson, 2012).

As noted earlier, the so-called Simple View of Reading model (Gough & Tunmer, 1986) reflects the complex cognitive skills that are involved in reading. To reiterate, skilled reading is the product of decoding (by which we mean word recognition) and language comprehension. This model is useful educationally because it helps us to recognise the elements that need to be addressed in instruction

when we are teaching children to read. Clearly, for the decoding component of the model, word recognition is developed optimally by using explicit and systematic synthetic phonics instruction.

Scarborough's Reading Rope (see Figure 4.2) represents these processes in a very helpful diagram. The diagram combines elements of language comprehension and word recognition, including decoding using the alphabetic principle, in an increasingly entwined 'rope' that results in skilled reading. All elements of the Five Big Ideas are represented in Scarborough's rope, resulting in 'fluent execution and coordination of word recognition and text comprehension' (Scarborough, 2001). The alphabetic principle is fundamental to this process.

Teachers need to ensure that children entering the school system are provided with the most effective ways of developing the skills they need to become independent and confident readers and spellers. If this does not happen early on, children can experience lost opportunities for learning across the curriculum as they are delayed on their reading journey. However, it is never too late to address lack of progress in reading, and the best place to start is with the mastery of the alphabetic principle. Decoding skills remain important and relevant throughout all the years of schooling, particularly when the student is faced with unknown technical words in specific subject areas (Snow, 2018).

HOW EFFECTIVE IS THE ALPHABETIC PRINCIPLE?

There is abundant evidence that explicit and systematic teaching of the alphabetic principle and phonological decoding is the most effective way to teach children to read words accurately and fluently. Systematic reviews have reached a consensus on this point (Castles, Rastle & Nation, 2018; Torgerson et al., 2018). They are cautious about concluding that synthetic phonics is more effective than other systematic approaches; however, it is not clear that alternatives to synthetic phonics meet the criteria for systematic and explicit teaching. These are the critical characteristics that are overwhelmingly supported in scientific research and expert reviews.

Language comprehension

Background knowledge
(facts, concepts, etc.)
Vocabulary
(breadth, precision, link, etc.)
Language structures
(syntax, semantics, etc.)
Verbal reasoning
(inference, metaphor, etc.)
Literacy knowledge
(print concepts, genres, etc.)

Word recognition

Phonological awareness
(syllables, phonemes, etc.)
Decoding
(alphabetic principle, spelling–sound correspondences)
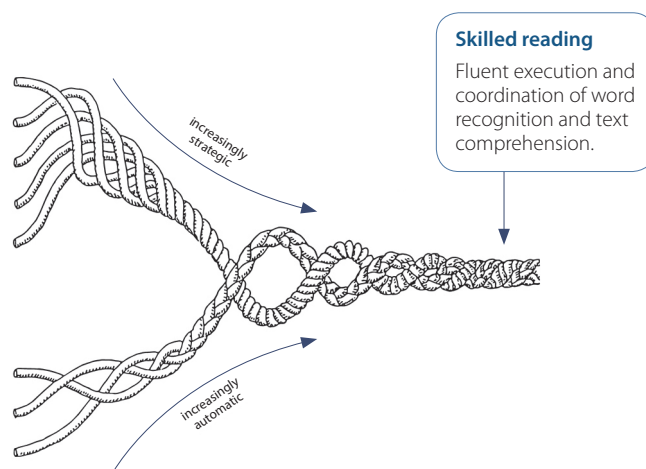Sight recognition
(of familar words)

increasingly strategic

increasingly automatic

Skilled reading
Fluent execution and coordination of word recognition and text comprehension.

Figure 4.2 Scarborough's Reading Rope

Republished with permission of Guilford Publications, from Scarborough (2001); permission conveyed through Copyright Clearance Center, Inc.

In 2000, the USA National Reading Panel (NRP, 2000) presented the largest, most comprehensive evidenced-based review ever conducted of research on how children learn to read. Its findings were drawn from the most methodologically sound research from the approximately 100,000 reading studies that had been published since 1966, and from another 15,000 earlier studies.

As outlined by Feez (Chapter 2, this volume), the NRP found that the Five Big Ideas of reading instruction – phonemic awareness, phonics, fluency, vocabulary and comprehension – were crucial. The recommendations were that they should be taught explicitly and systematically. The NRP found that children as young as four benefited from instruction in phonemic awareness and the alphabetic principle when the instruction was presented in an interesting and entertaining, albeit systematic, manner.

This finding was recently supported in a South Australian study involving typically developing preschool children and children with spoken language difficulties. It found that both groups of children had higher levels of phonemic awareness and letter–sound knowledge after participating in teacher-led, systematic, developmentally appropriate instruction than a control group of children. Preschool literacy skills are highly predictive of successful early reading (Carson, Bayetto & Roberts, 2018).

For school-age children, the NRP recommended that schools should teach phonemic awareness and phonics emphases directly, rather than incidentally, as effective instruction in both skills leads to strong early progress in reading and spelling. Expecting students to deduce these skills with only minimal guidance results in an avoidable wide range of learning outcomes.

The NRP review of the research on phonics instruction came to the following conclusions:

- Systematic phonics instruction makes a bigger contribution to children's growth in reading than alternative programs providing unsystematic or no phonics instruction (2.84)
- Various types of systematic phonics approaches are significantly more effective than non-phonics approaches in promoting substantial growth in reading (2.85)
- Phonics instruction taught early proved much more effective than phonics instruction introduced after first grade (2.85)
- Systematic phonics instruction is significantly more effective than non-phonics instruction in helping to prevent reading difficulties among at risk students and in helping to remediate reading difficulties in disabled readers (2.86).

In Australia, the National Inquiry into the Teaching of Literacy (Rowe, 2005, p.37) produced similar recommendations:

> In sum, the incontrovertible finding from the extensive body of local and international evidence-based literacy research is that for children during the early years of schooling (and subsequently if needed), to be able to link their knowledge of spoken language to their knowledge of written language, they must first master the alphabetic code – the system of grapheme–phoneme correspondences that link written words to their pronunciations. Because these are both foundational and essential skills for the development of competence in reading, writing and spelling, they must be taught explicitly, systematically, early and well.

On the basis of strong scientific evidence, the report argued strongly for empirical evidence to be used to improve the manner in which reading is taught in Australia:

> The Committee recommends that teachers provide systematic, direct and explicit phonics instruction so that children master the essential alphabetic code-breaking skills required for foundational reading proficiency.

The 2006 Independent Review of Early Reading in the UK, led by Sir Jim Rose (the 'Rose Review'), found that a synthetic phonics approach was more effective than analytic phonics, particularly for those at risk of having problems with reading (Rose, 2006). The review stated that, 'the case for systematic phonic work is overwhelming and much strengthened by a synthetic approach', the key features of which are to teach beginner readers:

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

But perhaps the clearest findings in favour of synthetic phonics come from the powerful and long-lasting effects reported from Clackmannanshire in Scotland (Johnston, McGeown & Watson, 2012). In this study, school beginners were taught by either synthetic or analytic phonics programs for 20 minutes per day over an intensive 16-week period from school commencement. All students completed the programs by the end of their first year. They were then re-assessed annually.

At the end of the first year, those taught by the synthetic phonics method were seven months above their chronological age in reading and similarly advanced beyond their analytically taught peers. In the 2003 follow-up, the synthetic group's word-reading ability was three-and-a-half years ahead of the analytic group, and almost two years ahead in spelling. Disadvantaged children achieved a similar rate of progress as their more advantaged peers. Only 5.6 percent of the students taught synthetic phonics were behind in word reading at the five-year follow-up.

In a follow-up study, students taught by the two methods were re-assessed at age 10:

> Overall, the group taught by synthetic phonics had better word reading, spelling, and reading comprehension . . . After 6 years at school, children taught by the synthetic phonics approach read words, spelt words and had reading comprehension skills significantly in advance of those taught by the analytic phonics method . . . Maintaining the gain in word reading for age would have been noteworthy, but in fact it increased over time, leading to a high level of attainment at the age of 10.
>
> (Johnston, McGeown & Watson, 2011, p1381)

Obviously, without such instruction some students can learn to read, but seriously at-risk students are likely to fail. Machin, McNally and Viarengo (2018) analysed student performance in the first five years after the English government mandated synthetic phonics and found that there was a significant improvement in reading among 5- and 7-year-old children across the board, with significant improvement for children from disadvantaged non-English speaking backgrounds at age 11. This study was conducted prior to the introduction of the Year 1 Phonics Screening Check (see earlier) and the more detailed phonics teaching specifications.

An Australian study by Christensen and Bowey (2005) found significant advantages for systematic synthetic phonics over analytic phonics in reading and spelling for students in their second year of school. Studies of high-performing primary schools in England and in Perth, Western Australia, have found that these schools were using synthetic phonics as part of their early literacy programs (Louden, 2015; OFSTED, 2010).

CONCLUSION

The multi-disciplinary evidence supporting the efficacy of explicit and systematic instruction for teaching children the alphabetic principle, and how to apply it to achieve accurate and fluent word reading, is extensive, rigorous and remarkably consistent. If the goal of teachers is to ensure that as many children as possible learn to read early and successfully, so they can begin to read independently and with enjoyment, synthetic phonics is an essential component of a comprehensive early literacy program.

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