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Understanding the reading process

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Introduction

Learning to read is the most important educational outcome of primary education. Reading is a complex process that builds on oral language facility, and encompasses both specific skill development (phonemic and decoding strategies) and the use of comprehension strategies. The precise ways in which these processes combine need to be understood if teachers are to identify their students' needs and teach most effectively.

Over the past four decades, numerous large-scale reviews of research into the effective teaching of reading have occurred in North America, Britain and Australia in an attempt to provide definitive and evidence-based guidelines for education systems (Adams, 1990; Anderson, 1985; Chall, 1967, 1996; DEST, 2005; NICHD, 2000; Rose, 2006). There is a compelling consistency in the findings and recommendations of these meta-analyses. This paper brings together those findings within a framework containing six major components. While it is somewhat perilous to reduce a complex behaviour such as reading into a small number of component parts, for the purposes of clarity and ease of understanding, the framework is offered here as one way of synthesising the major findings of an enormous number of empirical studies into the components of an effective reading program.

Each of the following six components will be expanded in future papers that will provide key messages and strategies for classroom implementation.

The Big Six

1. Oral language

About 98% of human teaching and learning is mediated by – or passes through – language.

(Manzo, Manzo & Thomas, 2006, p. 616)

Oral language provides the foundation for learning to read, and is related to overall reading achievement throughout primary and secondary schooling (Snow et al., 1995; Wise et al, 2007). From the moment of birth, a child is immersed in an environment that will have an immense impact on his or her long-term facility with oral and written language. Children who are surrounded by, and included in, rich and increasingly complex conversations, have an overwhelming advantage in vocabulary development, in understanding the structures of language, and in tuning into the sounds of the English language. Oral language is important for both reading and writing. To understand language at the printed level oral language competency is a necessity. Children need strong vocabularies to understand the broad range of words in texts; they require strong grammatical skills to understand the complex sentences present in many texts; and they require the ability to reason and infer so that the necessary links between information in texts can be made.

Experiences with books and other forms of print, and seeing people reading and writing as part of their everyday lives also prepare children for reading. Children are not born with the understanding that marks on a page can represent language; that we read English from left to right, and from the top of the page down, or even the way to open a book. This awareness develops gradually from a very young age if young children observe people around them reading for pleasure and for a variety of other purposes, opening and closing books, turning pages, and responding to what they read. And if young children are fortunate enough to have stories read to them, and if individual words are pointed out as the stories are read, the process by which spoken language is transformed into written language becomes apparent. Some children also learn much more – they begin to recognise what print looks like, how letters differ from punctuation, and to identify some letters and commonly-occurring letter patterns.

Unfortunately not all children have the benefit of a language-rich and print-rich environment. These children enter school with significant disadvantage. They will be further disadvantaged if this is not understood and acknowledged by their school.

All young children need a stimulating language environment at school, but for children from less literacy-rich backgrounds, the need is urgent and paramount.

For more information access **paper 1.1** in this series at www.decs.sa.gov.au/literacy/files/links/UtRP_1_1.pdf

2. Phonological awareness

> *Faced with an alphabetic script, the child's level of phonemic awareness on entering school may be the single most powerful determinant of the success she or he will experience in learning to read and of the likelihood that she or he will fail.*
>
> (Adams, 1990, p. 304)

Phonological awareness is a broad term that refers to the ability to focus on the *sounds* of speech as opposed to its meaning, and it has a number of different levels or components. It is the realisation that a continuous stream of speech can be separated into individual words, that those words can also be broken up into one or more syllables, and that syllables are made up of separate, single sounds.

The most significant of these components for reading development is awareness of the individual sounds or *phonemes*, that is, *phonemic awareness*. The phonemic awareness of preschool children is the single best predictor of their future reading ability, better than either socioeconomic status (SES) or intelligence quotient (IQ) (Adams, 1990; Bowey, 2005; Ehrie et al, 2001, Snow et al, 1998; Stanovich & Stanovich, 2003; Wasik, 2001). Being able to *blend* together and to *segment* phonemes are the most crucial phonemic skills for reading and spelling.

Some children find it very difficult to hear the separate phonemes because the continuous nature of speech compresses them into a series of overlapping sounds through a process called *coarticulation*. Speech must be rapid and continuous to be comprehensible, and coarticulation facilitates this process. Even in a very lengthy series of words, the gaps disappear, and the message is delivered in a smooth and seamless manner. However, while making it easy for the listener, coarticulation disguises the underlying segmental nature of speech. To detect separate phonemes, the ability to "pull apart" the process of coarticulation to perceive speech as a series of separate sounds is required. If children cannot hear the separate sounds, they cannot relate those sounds to letters – an enormous stumbling block in learning to read and spell an alphabetic language.

Most children's early oral language and literacy experiences help them tune in to the sounds of their language, and prepare them for leaning to read. For many children this might begin with nursery rhymes or rhyming games. The ability to recognise and produce rhymes is an early indication that children are developing phonemic awareness. Most children readily learn the meaning of the word *cat* and can relate that word to a small furry animal – the extent to which they can recognise and produce rhyming words such as *mat*, *fat* and *sat*, and break the word up into the sounds c-*at* and eventually *c-a-t* reflects their developing phonological skills. They are then ready for the next important step. Children without these core experiences will have much greater difficulty identifying the separate sounds in words, and further difficulties when faced with translating those sounds into an alphabetic script. Sound phonemic awareness skills prepare children for the next stage.

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3. Phonics

In summary, deep and thorough knowledge of letters, spelling patterns and words …are of inescapable importance to both skilful reading and its acquisition.

(Adams, 1990, p. 416)

Once children understand that words can be broken up into a series of sounds, they need to learn the relationship between those sounds and letters – the "alphabetic code" or the system that the English language uses to map sounds onto paper. There is no way to bypass the decoding step in the reading process. An understanding of the predictable relationship between sounds and the letters that represent them (graphemes) is at the heart of reading an alphabetic language. This letter-sound relationship is referred to as the *alphabetic principle*, or more commonly, phonics.

How and when to teach phonics

Most teachers and researchers now agree that phonic elements need to be taught as part of a beginning reading program, but debate continues around how and when they should be taught. The empirical evidence currently available supports a synthetic approach to teaching phonics for beginning and struggling readers (Johnston & Watson, 2003, 2005; NICHD, 2000; DEST, 2005; Rose, 2006). A synthetic approach teaches the single letters and common letter combinations in a discrete, systematic and explicit manner, and in an order that facilitates blending (synthesising) from the first weeks of school. The early blending component is critical and begins as soon as the children know letters that can be blended into simple vowel-consonant (vc) or consonant-vowel-consonant (cvc) words. As the letter-sound relationships are learned, they are practised in easy decodable text. This step is most important for children who do not pick up these relationships quickly, but in fact most beginning readers benefit from immediate practice of their new skills to build automaticity and confidence.

The recommendation to use this approach is not to suggest that children should not read other types of texts. In fact, the research literature makes it very clear that children should be using their newly developing phonic skills in the context of motivating, connected text as soon as possible and that they should continue to have high quality texts read to them.

The teaching of letter-sound knowledge also includes quite sophisticated content such as affixes, Greek and Latin roots, and the teaching of spelling rules – essentially *word structure*. Learning the structure of words at the syllable and morpheme levels supports word recognition, spelling, and vocabulary development. These later elements of phonic knowledge can be taught in a more embedded or analytic manner, because the important principles of blending and segmenting are secured early, and are easily transferred. This teaching can extend into middle and upper primary school.

Some teachers have concerns that a recommendation to explicitly teach letter-sound knowledge detracts from a "balanced approach". Explicit phonics instruction is essential for most beginning and all struggling readers, but should always be combined with the many other elements of an effective reading program, such as rich oral language instruction, and modelled and guided reading. Explicit and systematic phonics instruction should never, for example, take more time in a day than other elements of the literacy program, but it must be addressed – it is acknowledged as "necessary but not sufficient" on its own. The essence of a balanced approach is providing the fundamental elements of instruction that children need so they have the best possible chance of becoming independent readers. It is true that *some* children readily acquire the skills of independent reading when exposed to embedded or analytical approaches to phonics teaching, but if "balanced" is interpreted as offering *all* children only an embedded approach to phonics instruction, those most in need will be further disadvantaged (DEST, 2005; NICHD, 2000; Rose, 2006).

The other part of letter-sound knowledge – sight words

While phonic instruction is necessary to help children become independent readers, it will not help them when they encounter irregular or "sight" words such as *said*, *was* and *saw*. Unfortunately these words are some of the most frequent words in the English language, and those that young children meet very early in their literacy journey. These words must be learned to the point of *automaticity*, that is, learned so well that the visual patterns of these words are stored in the children's visual memories or *mental lexicons*, and thus immediately recognised when encountered in text. Rapid retrieval of whole words from the mental lexicon

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is where comprehension starts, and the larger the pool of words in a child's mental lexicon, the better equipped he will be to comprehend what he is reading. Sight words should also be taught explicitly and systematically, rather than attempting to teach them when encountered in text. The latter method means children are trying to focus on one word among many, and in the context of a story – it is actually more efficient and easier for most children, especially those children who are struggling, to learn these words initially as a separate and discrete exercise.

Recognising words in isolation, however, does not necessarily mean that they will be recognised as quickly in connected text (Ehri, 1997). For this reason, it is very important to give children regular practice of their newly learned words in context. To repeat an important point – initial instruction in these skills should not be completely embedded in reading, as this has not been found to be as effective as explicit teaching (Snow, Burns & Griffin, 1998) but once explicitly taught, sight words need immediate consolidation and practice in text.

The importance of automaticity

The goal of teaching letter-sound knowledge – both phonics and sight words – to the point of automaticity is rapid word recognition. It is of great importance for fluency and understanding that common letter combinations and sight words are not only learned, but that they are learned so well that they are recognised immediately. When an unknown word appears in text, children will feel more confident if parts of that word are immediately recognised. This greatly increases the likelihood that the whole words will be successfully decoded, and eventually that the whole words are recognised on sight. Reading comprehension starts with the immediate and accurate recognition of words as this allows the reader to concentrate on the meaning of the text rather than on decoding.

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4. Vocabulary

Vocabulary is a principal contributor to comprehension, fluency, and achievement. Vocabulary development is both an outcome of comprehension and a precursor to it, with word meanings making up as much as 70–80% of comprehension.

(Bromley, 2007, p.528)

Although the relationship between vocabulary and reading comprehension was recognised many decades ago (Davis, 1944; Thurstone, 1946; Singer, 1965; Spearitt, 1972), it was the Report of the National Reading Panel (NICHD, 2000) that more recently refocused teachers' attention on the importance of vocabulary to reading acquisition and comprehension.

Vocabulary is a key component of reading for meaning. If children know the meaning of a word, they are far more likely to be able to read it and make sense of it within a sentence. For example, assume the words *demand* and *disturb* are within the oral vocabulary of a young reader and he has mastered basic decoding skills. If he encounters the sentence "Tom's teacher demanded to know what had caused the disturbance", he will almost certainly be able to decode and process the meaning of the words *demanded* and *disturbance*. If the reader is not familiar with the meaning of those words, the sentence will be largely incomprehensible, even if some decoding attempt can be made. And this will be the case for every sentence the child tries to read – word knowledge contributes in a major way to reading comprehension.

Vocabulary is, for the most part, learned indirectly through repeated exposure to new words in conversations, by listening to stories, by reading and through the media (Senechal, 1997). Exposure to words in meaningful contexts is enough to make their meaning clear and so the process of vocabulary acquisition occurs (Nelson & Van Meter, 2006). Different groups of children, however, have very different outcomes from learning via these indirect routes.

Some children arrive at school as highly competent vocabulary users. "Typically developing" children are able to absorb words easily. They find learning new words easy and immersion approaches will be successful for them. These children are more likely to acquire the skills of reading easily, whereupon they can begin to read for themselves and build an even stronger vocabulary. Other children, however, come to school with small vocabularies and they are often not skilled in learning new words.

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Those children who come from rich literate backgrounds will have the benefit of being exposed to a wider and richer vocabulary and so will gradually learn the meaning of many words through this process. If they are being read to regularly, they will also learn a more "literate" vocabulary. Children from less rich literate backgrounds will hear a far more restricted range of words (Biemuller, 2005); have less access to the vocabulary of books, will consequently be more likely to have difficulty acquiring the skills of reading, and less opportunity to use their own reading skills to develop their vocabulary further.

Relying on indirect avenues of vocabulary development alone is not enough to help close the gap between different groups of children. Fortunately, there is now evidence that direct instruction is effective for vocabulary learning (Beck & McKeown, 2007; Tomeson & Aarnoutse, 1998; Rinaldi, Sells & McLaughlin, 1997), and this is required if children from less advantaged backgrounds are going to make substantial gains in this important area – in fact, direct instruction of vocabulary has been found to add to the vocabulary growth of all children (see Beck, McKeown & Kucan, 2008, p.4 for a brief discussion of related research).

While the vocabulary demands of secondary school rise dramatically as students are faced with extensive content-area vocabulary, primary school is the place where a rich store of words useful across many contexts needs to be developed. This requires "rich and robust" (Beck & McKeown, 2002) vocabulary development that extends far beyond the typical dictionary definition or "use it in a sentence" exercises. It requires careful choice of words for instruction, and strategies that develop deep understanding, regular use, and an increasing "word consciousness" in all students.

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5. Fluency

Fluency is the ability to read connected text rapidly, smoothly, effortlessly and automatically, with little conscious attention to the mechanics of reading, such as decoding.

(Singleton, 2009, p.47)

Fluency reflects a pivotal point in reading development – that point where all the component skills of learning to read are in place and occurring without overt attention, so that cognitive energy can be focused on determining the meaning. It is truly the point where "learning to read" transforms into "reading to learn". Fluency encompasses more than reading rate: it also includes appropriate phrasing and intonation, which reflect comprehension of the material being read. Fluency and comprehension have a symbiotic or co-dependent relationship: it is only possible to read fluently if comprehension is occurring so that the reader can adjust phrasing appropriately. Similarly, if the reading is not fluent, comprehension will be compromised.

Children who read very slowly and haltingly are devoting most of their cognitive attention to the subskills of decoding and word recognition. This places such a load on their working memory that they have no cognitive capacity remaining to attend to what the text actually means. Memory limitations also mean that if a message is not transmitted within a certain timeframe, meaning will be compromised. A reading rate of at least 90–100 words per minute is required for reading comprehension (Armbruster et al. 2001, p.29), a rate that usually develops by the end of Year 2 for simple text.

Fluency emerges from extensive reading practice of independent level text. This is necessary to ensure that the skills can become automatised and the number of words that can be read instantly on sight increases substantially. This highlights the importance of ensuring that children have access to motivating texts *at their independent reading level* to practise their developing skills.

Unfortunately, the children who need to practise most are those who avoid it because they find it so difficult and laborious. They need *extended* practice at the intermediate step of reading easily decodable texts. Books that have been constructed with a controlled vocabulary, that is, specifically written to include many examples of particular letter combinations and sight words, provide the additional opportunities for practice that are necessary for automaticity and fluency to develop. Such texts provide "quick wins" (Rose, 2006) – opportunities for children to practise and gain confidence from reading a whole book. Some teachers believe that these texts are inappropriate, especially for older struggling readers, but there are increasing numbers of titles available that match older children's interests with simple vocabulary and regular repetition of target words. Struggling readers will not develop fluency without practice at their independent level so we must find material that matches their needs.

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Because these texts, for very good reason, have relatively simple vocabulary, and, being mindful that vocabulary is one component of the Big Six, teachers need to be creative in providing other opportunities for development of this important element. Exposure to more sophisticated words can occur through oral language development and an emphasis on "word consciousness" in the classroom. Most older students also still enjoy being read to, so teachers may have opportunities to read texts that engage and motivate while simultaneously developing more advanced language structures and vocabulary.

Although extensive independent reading is recommended to build fluency, one finding from the National Reading Panel's review of research deserves discussion. The Panel could find no evidence supporting the effectiveness of encouraging independent silent reading as a means of improving reading fluency and comprehension for *poor readers*. This means that the common practice of Sustained Silent Reading (SSR) or Drop Everything and Read (DEAR) may not have the intended effect of developing the skills of poorer readers. Those students who can already read fluently usually enjoy this part of the school day immensely but there has been no demonstrated effect for students who have not already integrated the component parts of reading. Those precious minutes may be better spent with the teacher working with the students who cannot read fluently, ensuring that the component reading skills are secure.

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6. Comprehension

The culminating goal of reading is, of course, comprehension, and it rightly takes its place at the pinnacle of the Big Six pyramid. Being able to "crack the alphabetic code", while essential for comprehension, is not sufficient. Comprehension will not occur if children do not have an adequate understanding of the vocabulary in the text; the relevant background knowledge; familiarity with the semantic and syntactic structures that help predict relationships between words; and the verbal reasoning ability to help "read between the lines". Comprehension requires engagement with the text at a deep level, and an array of skills that go far beyond simple word recognition.

Researchers have concluded that readers who are skilful in gaining meaning from text at different levels engage in certain behaviours and employ a range of strategies that help them engage with the text.

Comprehension requires engagement with the text at a deep level, and an array of skills that go far beyond simple word recognition.

Typically, good readers:

Understand the purpose of their reading

Good readers understand whether they need to skim the text to get a general idea of the context, scan for specific information, or read closely to obtain detail. Understanding the purpose of their reading allows the readers to choose a broad reading strategy for maximum effectiveness.

Understand the purpose of the text

Proficient readers are aware of the way an author's purpose can be reflected in a text. Different text types, such as those written to entertain, inform, advertise, persuade, or for a number of other reasons, have particular characteristics. Being aware of these assists the development of the mature and critical reader.

Monitor their comprehension

Monitoring comprehension assists readers to integrate what they are reading with their existing knowledge; focus on the relevant parts of the text; distinguish major content from detail; evaluate content; and monitor their predictions. These ongoing strategies are critical if meaning is to be maintained throughout the text.

Adjust their reading strategies

As a result of monitoring their comprehension, good readers are able to adjust their reading strategies. They may need to go back and reread if there is some confusion; slow their reading rate if sentences are long and complex; or use chunking and decoding strategies in combination with their vocabulary knowledge if they encounter an unknown word among a range of other strategies.

These high level cognitive activities facilitate comprehension, and enable the competent reader to draw meaning from the text by identifying and remembering critical information, and understanding relationships and connections. Many children who have mastered the decoding aspect of reading do not develop comprehension skills easily. These need to be explicitly taught, especially to struggling readers, if they are to develop skills that will allow them to engage fully in society as literate individuals.

For more information access **paper 1.6** in this series at www.decs.sa.gov.au/literacy/files/links/UtRP_1_6.pdf

Conclusion

Reading is without question a highly complex cognitive process. Debate about how best to teach reading has preoccupied teachers, researchers and even legislators for many decades, but there is now overwhelming evidence that points us towards the critical elements of reading programs that are most successful with most children.

It is acknowledged that many children will learn to read whatever method is used – these are the children who arrive at school with the great advantages of a wide vocabulary and regular and positive experiences with books and print and life experiences. Nevertheless, it is the unequivocal conclusion of the major reviews into effective reading instruction that most children benefit from systematic and explicit teaching of each element of the Big Six.

> *The incontrovertible finding from the extensive body of local and international evidence-based reading research is that children during the early years of schooling must first master the alphabetic code via systematic, explicit and intensive instruction in phonemic awareness, phonics, reading fluency, vocabulary, and reading comprehension strategies. Because these are foundational and essential skills for the development of competence in reading, writing and spelling, they must be taught early, explicitly, and taught well.*
>
> (DEST, 2005, p.25)

The children who will be most disadvantaged if they do not participate in such programs are those from less language-enriched backgrounds. Most of these children will simply not learn to read independently without an explicit and systematic approach in a balanced and integrated literacy program.

Teachers need to become experts in reading instruction. Broadening the base of expertise in all teachers, so that every child benefits from quality teaching, is the most effective way to reduce the need for intervention. A consistent whole site approach, indeed a consistent approach across regions and the state, is seen to be desirable in focusing human and material resources and political energy in order to provide the best outcomes for all students.

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