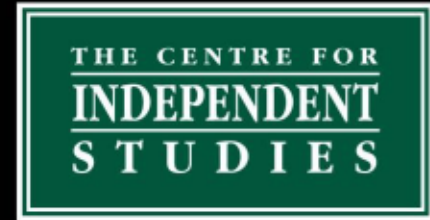


FIVE from FIVE: Effective reading instruction in every classroom, every day

*Dr Jennifer Buckingham
Senior Research Fellow*





What is FIVE from FIVE?

FIVE from FIVE is an initiative of The Centre for Independent Studies to bridge the gap between classroom practice and the research on effective reading instruction.



Why do we need FIVE from FIVE?

As many as **one million children** have literacy levels below the standard required for educational progress.

Literacy levels have barely improved despite billions of dollars spent.

Many schools are not using proven evidence-based teaching methods despite an extensive body of evidence on effective reading instruction.



Why is it called FIVE from FIVE?

Forty years of rigorous research has shown that children need explicit instruction in **the five essential components** of reading — **phonemic awareness, phonics, fluency, vocabulary and comprehension** — in the first year of school when they are five years old.

Educators, policy makers and parents need to know what effective, evidence-based reading instruction is, and how to use it.



How will FIVE from FIVE achieve this?

Website

Events, forums, roundtables, meetings

Research and publications

Media

Alliance of people and organisations



Who is FIVE from FIVE for?

Teachers

Principals

Parents

Policy makers

Researchers



Get all children reading...
Give them the five keys to literacy
from the age of five.



Five Keys to Reading



How to Teach Reading



Five From Five Video



Publications



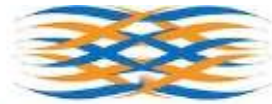
Events



Alliance members



THE AUSTRALIAN



NSW Parents' Council



Great Teachers. Effective instruction. Every child





Outline:

- What contributes to individual differences in literacy development?
- How do children learn to read?
- What is effective, evidence-based reading instruction?
- What is effective, evidence-based reading intervention?

What factors contribute to literacy development?

- Genetic and neurological factors (eg. phonological awareness, dyslexia)
- Child health
- Early home learning environment
- Early childhood education
- Reading instruction
- School attendance & mobility

Genetic & environmental interactions

- In the family context, an impoverished home environment prevents a child's innate ability from being fully realised – the 'bioecological model' (Bronfenbrenner & Ceci, 1994).
- In the school context, poor teaching has the same effect:

'When teacher quality is very low, genetic variance is constricted, whereas, when teacher quality is very high, genetic variance blooms.'

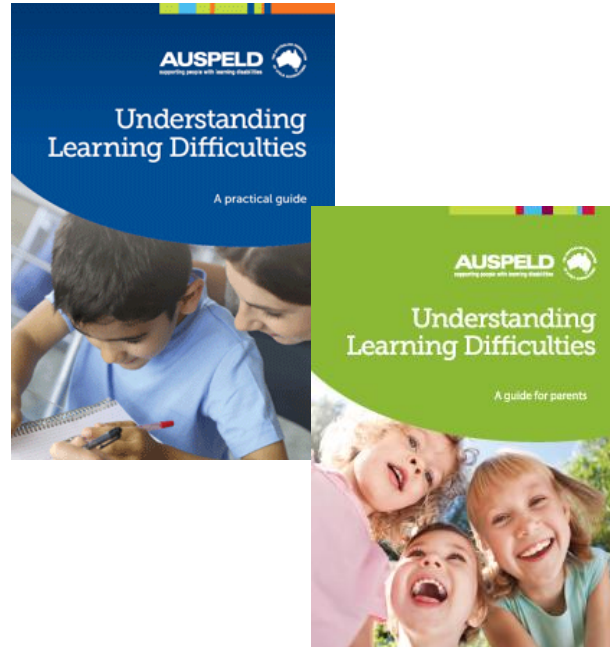
Taylor, Roehrig, Soden Hensler, Connor, & Schatschneider (2010).

Learning difficulties and learning disabilities

Learning difficulties – 15-20% of children

Underachievement arising for a wide range of reasons including sensory impairments, socio-psychological problems, absenteeism, or ineffective teaching.

AUSPELD GUIDES



Learning disabilities – 3-5% of children

Difficulties in specific academic areas as a result of an underlying neurological disorder arising from a combination of genetic, epigenetic and environmental factors. The difficulty is persistent and severe.

Genetic and neurological factors

Dyslexia

Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

(AUSPELD)

Impact of socioeconomic disadvantage

- SES – tripartite index comprising family income, parent education and parent occupation.
- These characteristics, including family income, have a positive but relatively small impact on literacy.
- SES is a distal factor – it influences literacy via its association with numerous proximal factors, including HLE.
- Mediated by different factors at different ages.

Home learning environment (HLE)

A high quality HLE develops the key foundation skills for language and literacy development:

‘Inside-out’:

phonological awareness and letter-sound knowledge.

‘Outside-in’:

vocabulary, oral language, and conceptual knowledge of print.

Different types of home literacy activities contribute to the development of these skill groups – both of which are necessary for successful early reading.

Phonological awareness (PA)

- **Phonological awareness (PA)** is the understanding that the spoken word is made up of a series of discrete and distinguishable sounds.
- **Phonemic awareness** is a specific skill within the broader skill set of PA.
- Children who can identify and orally manipulate phonemes - the smallest unit of sound in speech – display phonemic awareness.

Phonological awareness

- PA is a powerful predictor of reading ability.
- Poor PA is characteristic of most children with reading difficulties.
- It also has a reciprocal relationship with reading.
- PA training is only effective in improving reading when connected to print.
- Phoneme-grapheme correspondences must be explicitly taught.

Vocabulary and oral language

- Vocabulary and oral language skills (such as semantics, grammar and syntax) also significantly predict reading ability.
- Direct and indirect relationships with early and later literacy.
- Also a reciprocal relationship with reading.
- Again, longitudinal studies do not prove causation but strongly indicate predictive pathway.
- Powerful predictor of later reading progress

What factors contribute to school-age literacy achievement?

- Mediated to varying extents by proximal environmental factors:
 1. early literacy ability
 2. health and sleep
 3. attendance and mobility
 4. home environment
 5. quantity and quality of reading
 6. effectiveness of teaching

Early literacy is strongly predictive

- Literacy abilities at school-entry are strongly predictive of later literacy achievement.
- For the reasons outlined previously, children from low SES families are less likely to begin school with the skills necessary for early reading success.

Home environment

- Once children reach school age, most formal learning takes place in the classroom but home factors can still be influential.
- The strongest predictors are:
 1. aspirations and expectations
 2. encouragement of intellectuality and reading - 'scholarly culture'

Quantity/quality of reading

- Moderate, positive relationship between time spent reading, quality of reading material and literacy achievement.
- Poor readers spend less time reading for enjoyment and are more likely to read magazines or newspapers than books.

Effectiveness of teaching

- Easier to identify and describe '**effective teaching**' than an '**effective teacher**'.
- Effectiveness of reading instruction in the early years of primary school has significant impact on literacy scores through primary school.
- Effectiveness of reading instruction has most impact on low ability readers.

Reading instruction

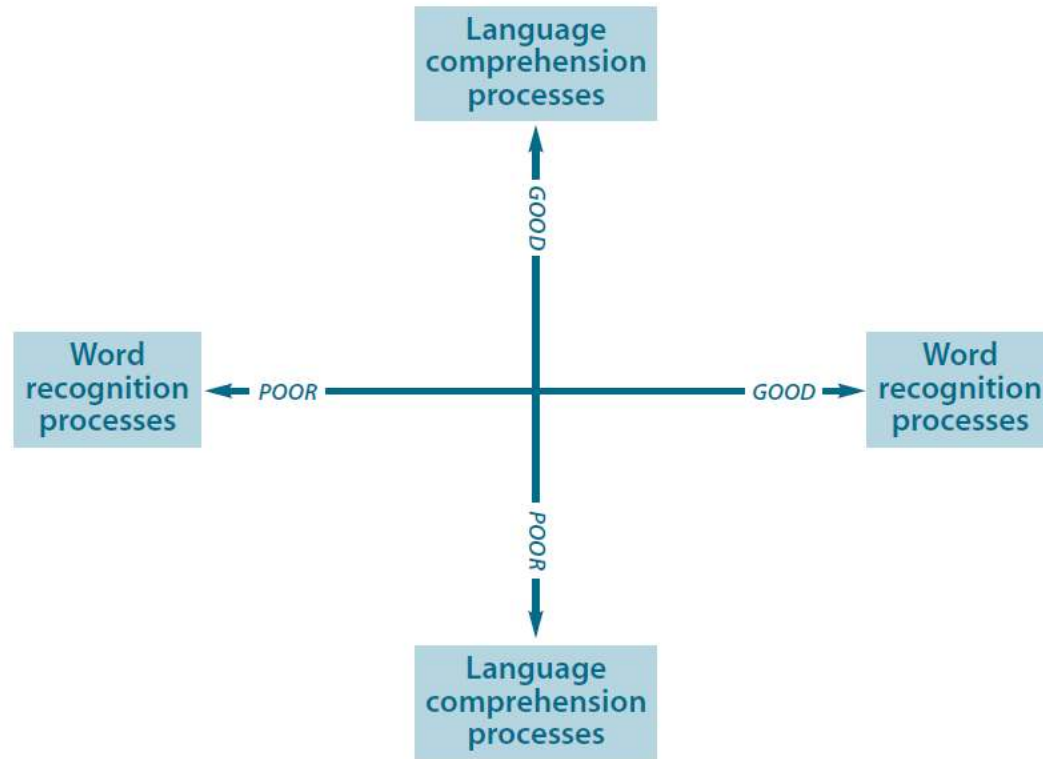
- Low ability readers benefit most from high quality, intensive early reading instruction which includes phonics.
- High quality initial reading instruction has been shown to significantly narrow literacy gaps associated with SES.
- Early and well-targeted intervention is crucial.

The '*simple view*' of reading

Reading has two essential cognitive requirements – word identification and comprehension (Gough & Tunmer, 1986).

“In order to be able to read written text, there are two basic, vital processes to be mastered. Firstly, we need to be able to translate or decode the marks on the page or screen into words, and secondly we need to be able to make sense of those words. There is no point being able to decode, even to decode fluently, if we have no idea of what the words actually mean. Similarly, no matter how vast our vocabulary, general knowledge and facility with the English language, we shall make no sense of the written word if we cannot decode the letter strings into words in the first place.”

Emeritus Professor Kevin Wheldall



Rose (2006). Independent Review of the Teaching of Early Reading

The '*simple view*' of reading

- **Word identification** is strongly related to phonemic awareness, which is highly heritable but susceptible to environmental factors.
- **Comprehension** is strongly related to vocabulary and language, which is heavily influenced by HLE.

Reading and the Brain

Written language is a new ‘technology’ as far as the evolution of the brain is concerned. It is not naturally acquired like spoken language.

There is no ‘reading’ part of the brain. Making sense of the printed word requires making connections between regions of the brain that were originally devoted to other processes.

Whole language teaching assumes that learning to read involves switching on the reading centre in the brain. It’s not that simple. A complex set of neuronal circuitry needs to be deliberately created.

Reading and the Brain

The neuronal connections that are made are specific to the language being learned. Learning to read Chinese uses different neuronal pathways than those used for learning English (Wolf, 2007).

Two aspects to reading: biological and personal/intellectual. The biological part is the literal process of reading text – decoding and retrieval of word meanings. The personal/intellectual is the semantic dimension. The extent to which this emerges and develops depends on the knowledge and experiences we have stored (Wolf, 2007)

Read: Maryanne Wolf (2007) *Proust and the Squid*.

'Reading can be learned only because of the brain's plastic design, and when reading takes place, that individual's brain is forever changed, both physiologically and intellectually.'

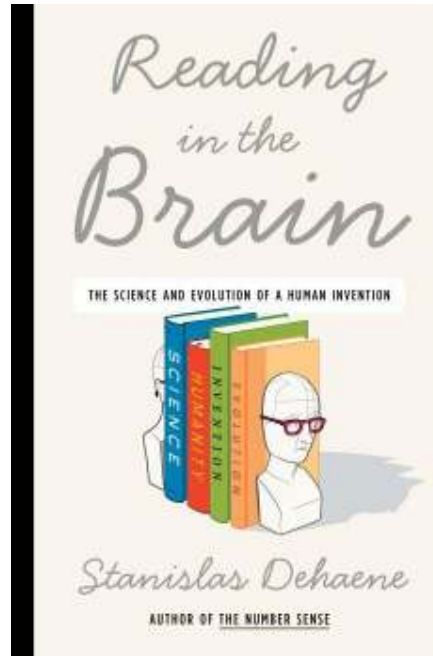
Dr Maryanne Wolf, Tufts University

See Maryanne Wolf at
'Tales of the Reading Brain'
Sydney, 7 September 2016
www.ldaustralia.org



Reading and the Brain

“Our visual system progressively extracts graphemes, syllables, prefixes, suffixes, and word roots. Two major parallel processing routes eventually come into play: the phonological route, which converts letters into speech sounds, and the lexical route, which gives access to a mental dictionary of word meanings.”



“Reading rests upon primitive neuronal mechanisms of primate vision that have been preserved over the course of evolution. Collectively, these neurons contain a stock of elementary shapes whose combinations can encode any visual object. Above all, we now understand why the whole-language method deluded so many psychologists and teachers, even though it does not fit with the architecture of our visual brain.”

<http://readinginthebrain.pagesperso-orange.fr/figures.htm>

Five 'keys' to reading

1. Phonemic Awareness

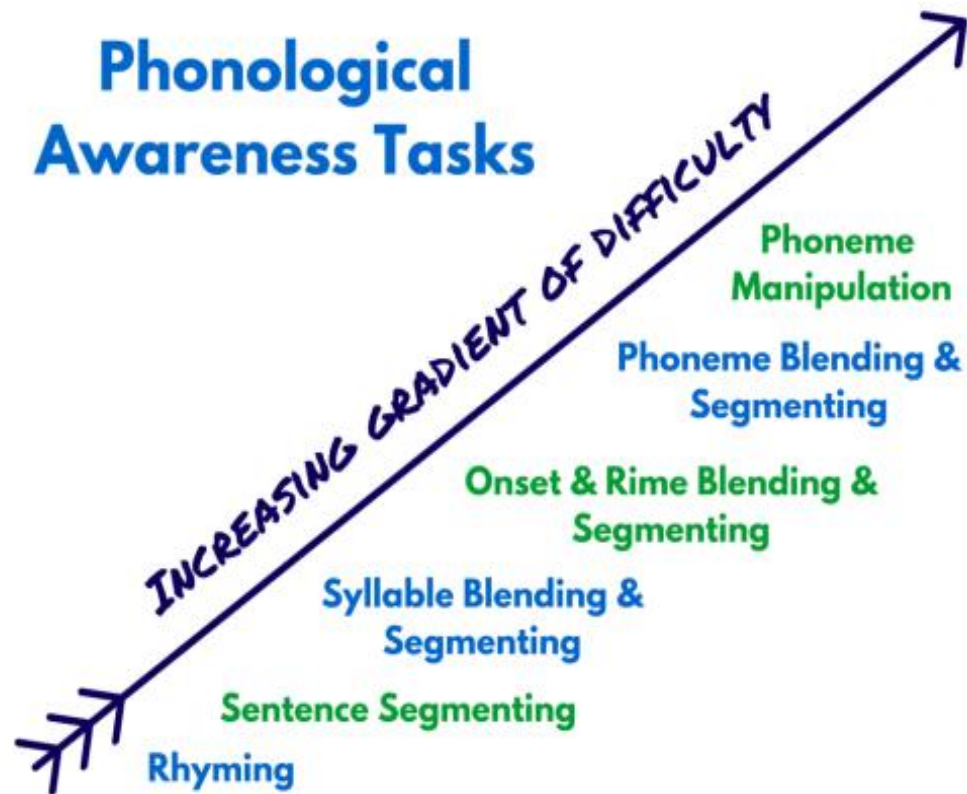
The ability to identify and manipulate the smallest individual sounds in spoken words: 'phonemes'.

Five 'keys' to reading

1. Phonemic Awareness

The ability to identify and manipulate the smallest individual sounds in spoken words: 'phonemes'.

Phonological Awareness Tasks



PA is a strong predictor of reading ability

National Early Literacy Panel (2009)

Meta-analysis of 500 articles

Phonological awareness in preschool and kindergarten was a moderate to high predictor of later decoding and comprehension. Phonemic awareness had strongest correlation.

Melby-Lervag, Lyster & Hulme (2012)

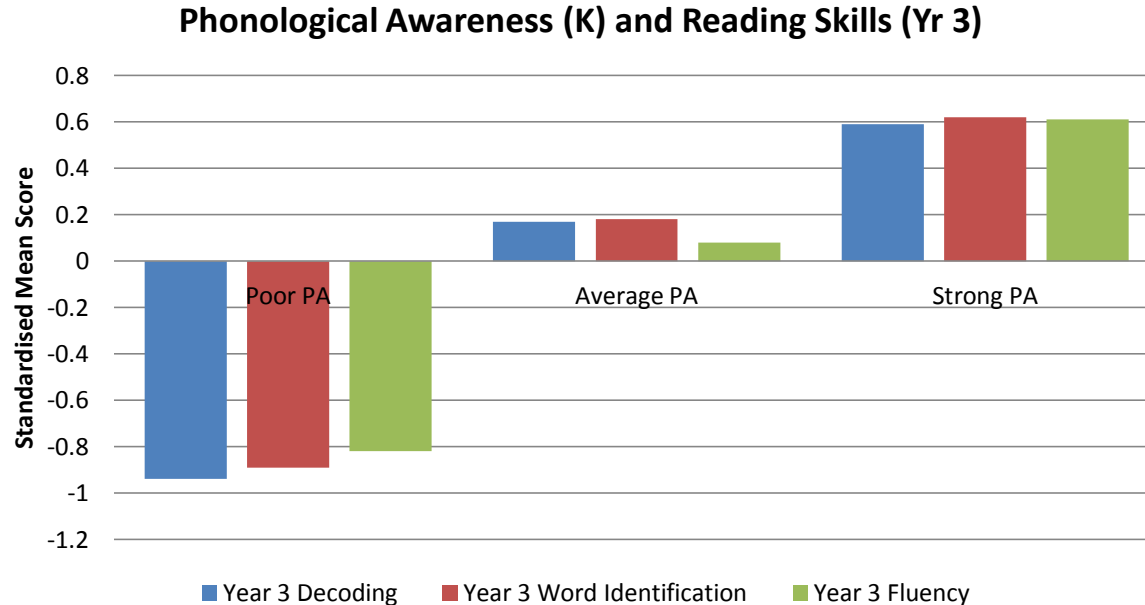
Meta-analysis of 235 studies

Phonemic awareness was the strongest correlate of individual differences in word reading ability and this effect remained reliable after controlling for variations in both verbal short-term memory and rime awareness.

McNamara, Scissons and Gutnech (2011)

Longitudinal study of 382 children

PA significantly correlated with later word reading and fluency



Five 'keys' to reading

1. Phonemic Awareness

2. Phonics

- *the relationship between speech sounds and their letter symbols: **grapheme-phoneme correspondence (GPC)***
- *the methods used to teach GPC*
- *the process of using GPC to sound out (decode) words*

Phonics

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

Prof Keith Stanovich (2000)

‘Phonics instruction is powerful in the process of learning to read—both for reading skills and for comprehension.’

Prof John Hattie (2009)

English is a complex language

English has a deeper orthography (written language system) than other alphabetic languages. It uses 26 letters to make 250 graphemes to represent 44 phonemes. Finnish and Italian have 1:1 GPC (Moats, 2010).

English has multiple origins – German, Anglo-Saxon, Latin and Greek – each has unique orthographical features. New words are constantly added to the lexicon.

Nonetheless, most words follow spelling rules: 50% follow GPC rules, another 36% have one variation to GPC rules, 14% have two variations to GPC rules (Moats, 2010)

This complexity makes it *more* rather than *less* important to teach reading explicitly and systematically – the rules of language are not self-evident.

Read: Louisa Cook Moats (2010). *Speech to Print* (2nd edition)

Teaching Phonics

Implicit or Incidental Phonics

GPCs pointed out during reading of text. GPC, segmenting and blending skills and metalinguistic concepts (eg. split digraph rules) are not taught in isolation from text reading.

Analytic Phonics

Teaching begins with whole words. GPCs are taught by breaking down words into component parts and drawing comparisons between similar words.

Synthetic phonics

Instruction is systematic and sequential, building up from the simplest and most common GPCs to more complex and less common GPCs. Sequence is carefully planned for minimal confusion and to achieve decoding quickly. Blending is introduced early.

Systematic Synthetic Phonics (SSP)

Clackmannanshire Longitudinal Study

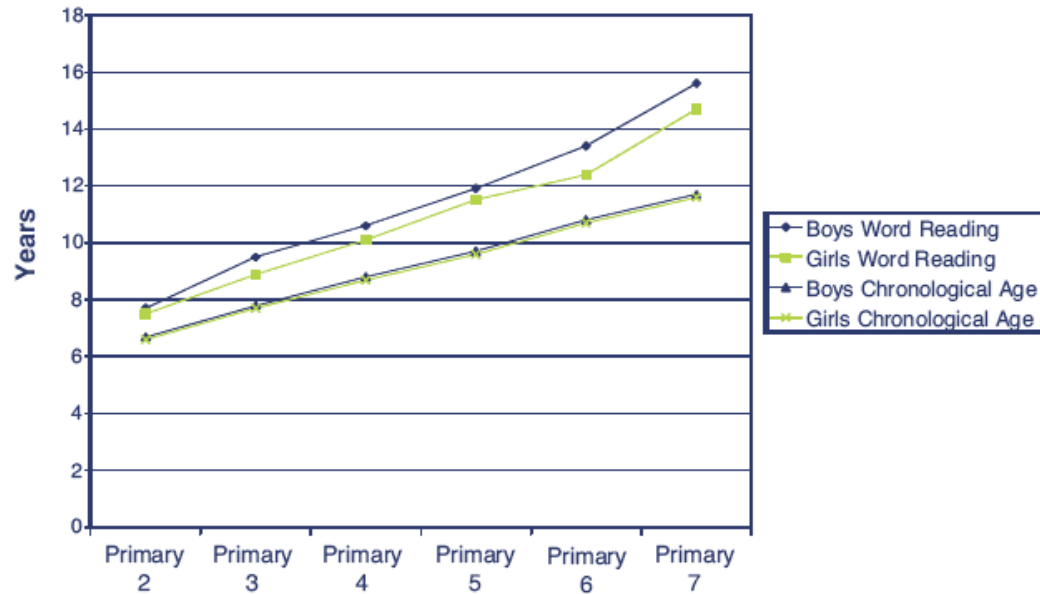
Year 1 students: one group synthetic phonics, one group analytic phonics

After 16 weeks: synthetic phonics group reading age was 7 months above the analytic phonics group; synthetic phonics group spelling age was 8 months above analytic phonics group.

Analytic phonics group was then given the 16 week synthetic phonics program and the students were tested again each year for the next six years.

Clackmannanshire Longitudinal Study

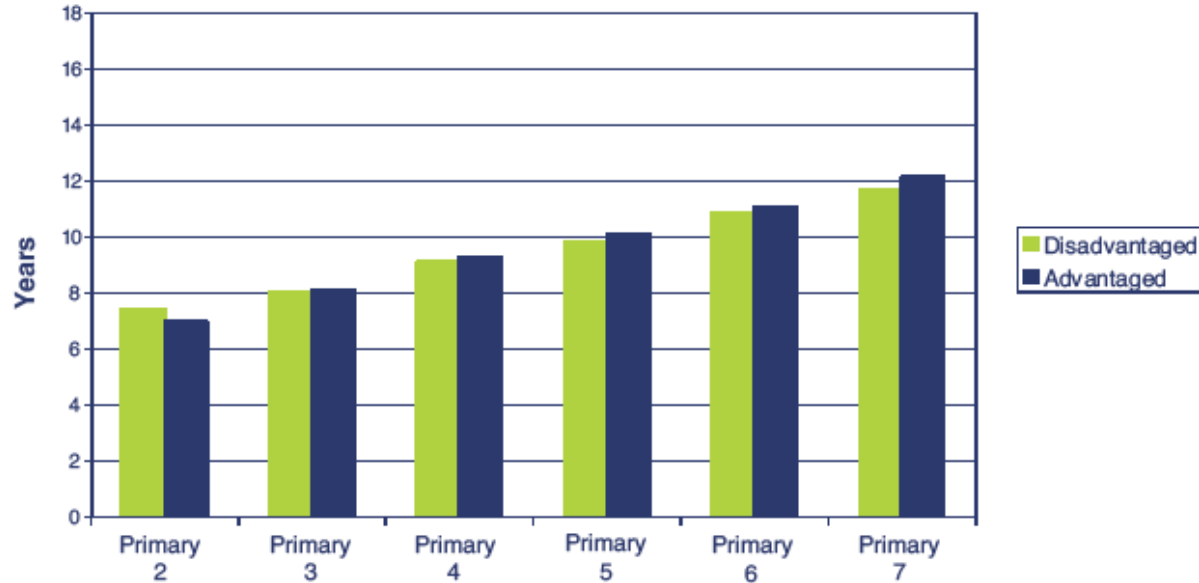
Figure 1 Comparison of word reading from Primary 2 to Primary 7, boys versus girls



Johnston & Watson (2005)

Clackmannanshire Longitudinal Study

Figure 6 Comparison of reading comprehension from Primary 2 to Primary 7 for the advantaged and disadvantaged children



Johnston & Watson (2005)

What about sight words?

Teaching 'sight words' is highly contested among reading specialists.

Teaching sight words does not mean 'sight reading'. It means teaching students a selection of words that they can recognise automatically.

Most common view is that it is helpful to teach children a *small and carefully selected* list of high frequency words that are not easily decodable using common GPC patterns (eg. you, was, said, one) so they can begin reading simple connected text as quickly as possible. (Castles, 2015)

Giving children a large amount of high frequency words that are easily decodable (and, the, is, am) is unnecessary and unhelpful.

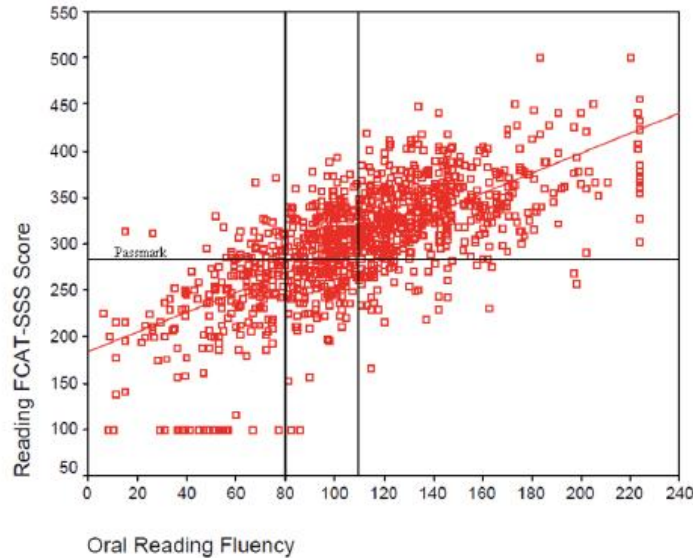
Five 'keys' to reading

1. Phonemic Awareness
2. Phonics
3. Fluency

'The ability to read quickly, accurately and with expression'.

Fluency

Fluency is highly correlated with reading comprehension.



Barger (2003):

Third grade readers' performance in DIBELS Oral Reading Fluency to their scores on state assessments of reading comprehension.

81% of those students who scored below 80 wcpm on ORF failed the comprehension test.

Fluency

Fluent readers are able to focus on reading for meaning because their decoding is automatic and almost effortless.

Neuro-imaging techniques found that dyslexic boys used four to five times as much physical energy (oxygen, glucose) as the capable readers in order to complete the same phonologically-based reading tasks. (Richards, 2000)

Fluency

Reading fluency difficulties have been shown to be the single biggest concern for more than 90% of children with under-developed reading comprehension (Duke, Pressley and Hilden, 2004).

Fluency does not always develop from mastery of decoding. Explicit teaching of fluency is necessary for some students— for example, speed drills, modelling, repeated reading.

Students struggling with reading require multi-component interventions using direct instruction methods (Rasinski, Homan and Biggs, 2009).

Five 'keys' to reading

1. Phonemic Awareness
2. Phonics
3. Fluency
4. Vocabulary

Oral vocabulary is the words children recognise or use in listening and speaking.

Reading vocabulary is the words children recognise or use in reading and writing.

Vocabulary

On school entry, approximately 20% of Australian students are deficient in the vocabulary domain. In disadvantaged areas, this percentage rises to nearly 30%.

Early vocabulary gaps tend to persist over time, and are a factor in further disparities in students' subsequent educational careers.

Vocabulary size is both a contributor to, and a function of, reading volume.

Five 'keys' to reading

1. Phonemic Awareness
2. Phonics
3. Fluency
4. Vocabulary
5. Comprehension

'Reading comprehension is extracting and constructing meaning from written text using knowledge of words, concepts, and ideas.'

Comprehension

The main factors related to comprehension are *fluency* (which is dependent on decoding ability) and *vocabulary*.

In a study of over 400,000 students from Year 1 to 3, it was found that among students whose decoding and vocabulary were developing normally, less than 1% displayed reading comprehension problems (Spencer, Quinn and Wagner, 2014).

Comprehension

Most children who struggle with reading comprehension will have a deficit in one or both of these aspects so they should be investigated first.

Comprehension strategies will be ineffective if these weaknesses are not addressed.

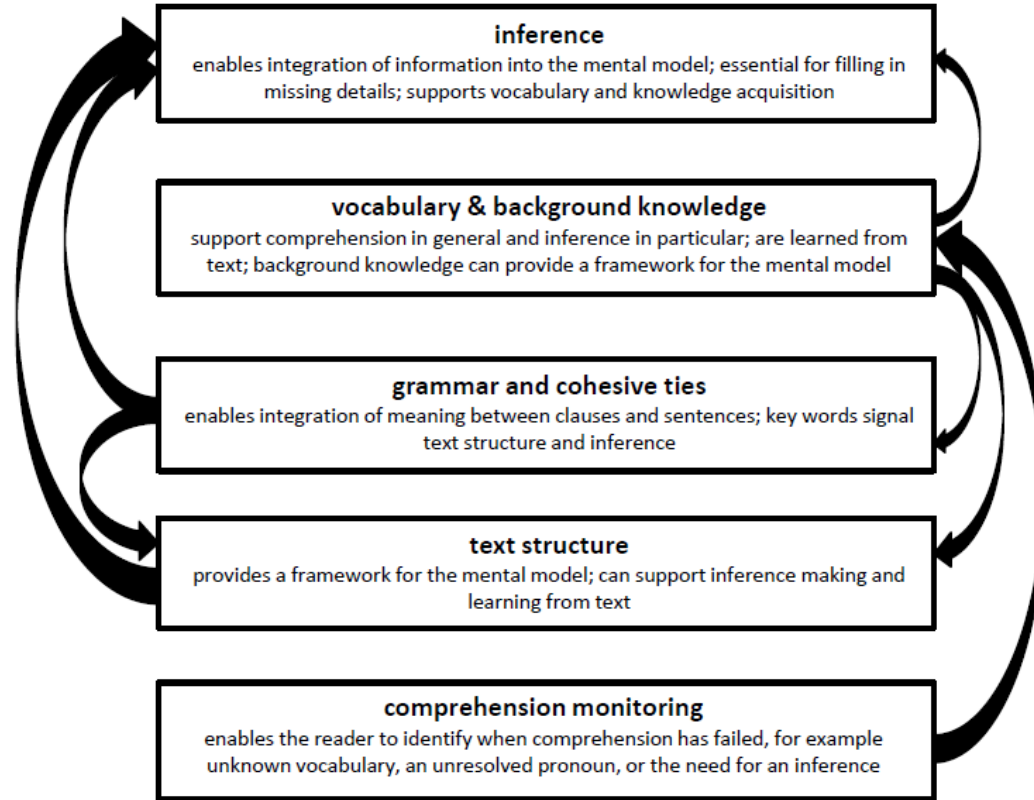
A randomised controlled trial found that an intervention using explicit instruction methods to build vocabulary was more effective at improving reading comprehension than an intervention to teach comprehension strategies (Clarke, Snowling, Truelove, & Hulme, 2010).

Comprehension

Comprehension for older students is more complex and involves multiple factors:

Fluency/Decoding	Making inferences
Fluency/Prosody	Monitoring understanding
Vocabulary	Domain knowledge
Syntax	Text structure
Working memory	Attention allocation

Beyond the 'simple view' of reading



Comprehension strategies

Even proficient readers benefit from explicit teaching in comprehension strategies but they are all the more important for struggling readers and students with learning difficulties.

Research-based explicit instruction strategies include:

Reciprocal teaching	Predicting	Questioning
Summarising	Mapping	Clarifying
Sentence combination	Inference-making	Think aloud

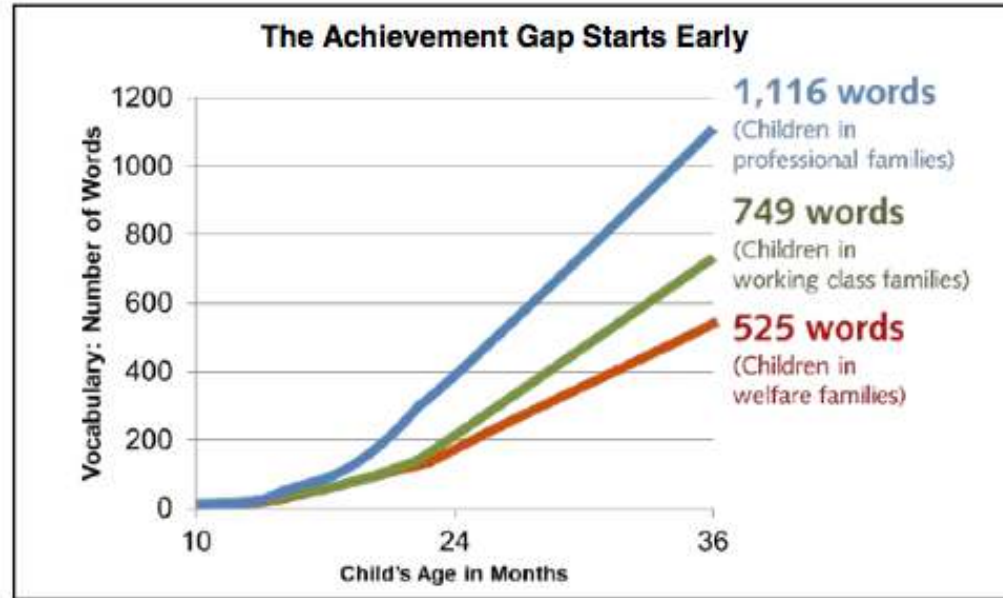
Cooper, McWilliams, Boschken, & Pistochini (1997); Mason (2013); Elbro & Buch-Iversen (2013)

However, there is a 'dosage effect' (Willingham, 2006)

‘Matthew’ effects

- ‘Matthew effect’ – rich get richer, while the poor get poorer (Stanovich, 1986).
- Decoding ability is essential for early word reading accuracy and fluency but its influence on individual differences in comprehension decreases over time (Oakhill, Cain & Elbro, 2015)
- Vocabulary is stronger contributor to Matthew effects because it is an unconstrained variable – growth is almost unlimited (Pfost et al, 2014).
- Reciprocal relationship between reading ability and reading volume creates spiral of achievement.
- Think back to Wolf’s model – ‘semantic riches’. The biological aspect is eventually overtaken by environmental inputs.

30 Million Word Gap: Matthew effects in early vocabulary development



Hart & Risley, 2003

Effective interventions

- Effective interventions are based on the same theoretical and evidence base as effective instruction for all children.
- For children with learning difficulties and children with specific learning difficulties in language impairment (eg. dyslexia), effective interventions will usually be based on the same instructional principles as whole class teaching but with varied levels of intensity and duration.
- Response to Intervention

Reading Recovery

There are hundreds of published studies of Reading Recovery but few meet high standards of evidence about the program's efficacy.

A What Works Clearinghouse (WWC) review in 2013 found *limited and inconclusive* evidence for positive impacts of Reading Recovery on reading achievement. This finding supported an earlier review by Australian researchers (Reynolds & Wheldall, 2007).

Since the WWC 2013 evaluation, further studies and evaluations have been published in Australia, United States, United Kingdom and New Zealand. None has found Reading Recovery to be effective, especially given its high cost.

Reading Recovery

Every Child a Reader Follow-Up Study 2012

RR students were performing no better than non-RR students in the same school in Year 6. Both RR and non-RR students performed better than students in non-RR comparison schools but the effect size was small.

Review of NZ National Literacy Strategy 2013

The review finds that “data from RR annual monitoring reports and other sources indicate that RR has had little or no impact on reducing New Zealand’s relatively large literacy achievement gap.”

It argues that RR is not effective for the groups most at risk of failing to learn to read—low income and Maori/Pasifika students—and it either excludes or withdraws from the program students with the very lowest reading levels.

NSW CESE Evaluation Report 2015

Participation in RR resulted in substantially lower literacy achievement in both the short term (end of Year 1) and medium term (Year 3) for almost all students on almost all measures. Students with relatively higher baseline scores were the most disadvantaged by participation in RR.

Reading Recovery

i3 Scale Up Study Evaluation 2016 (US)

The effect size for RR on the Iowa Test of Basic Skills in the immediate impact evaluation was 0.37. (Lower than the effect size threshold of 0.4 proposed by Hattie for a 'real-world' difference in student achievement.)

The effect size for the Clay Observation Survey is very high, but Tunmer et al (2013) argue that the tasks in this measure are integral to RR and the OS is therefore biased toward students who have been in the program.

No effect was found for RR in Grade 3 reading tests. The sample size for the follow up study is smaller than the RCT but it is still relatively large by educational research standards, so lack of statistical power is not the only factor.

Effective interventions

Evidence-based	Based on current scientific research. Proven effectiveness in independent studies using valid assessments.
Explicit instruction	Content is taught clearly and directly. Explicit instruction directs student attention towards specific learning in a highly structured environment.
Multisensory	Teach using all the senses: hearing, seeing, saying and doing to ensure learning is retained.
Sequential and cumulative	Builds on what has already been learned and previous learning receives further practice
Repetitive	Regular systematic review of concepts and over-learning to ensure learning is retained in long term memory

Effective interventions

Systematic	Concepts and skills are taught in a step-by-step manner. For example, in a structured synthetic phonics program, a complete set of phoneme-grapheme relationships are taught sequentially, cumulatively and systematically.
Appropriate pace	Introduce concepts and skills in small steps but at a reasonable pace. Each component is taught on its own with ample opportunity for practice.
Covers all content	Phonemic awareness, phonics, decoding, fluency, comprehension, spelling (writing).
Assessment	Regular ongoing assessments of concepts taught to ensure the student is provided with instruction, resources and activities at the right level.
Expertise	Developed or endorsed by academics/practitioners who have recognised specialist expertise eg. speech pathologists, linguists, cognitive scientists.

Effective interventions

AUSPELD recommends:

Sounds-Write
Phonics Books UK
MiniLit and MultiLit
Letters and Sounds
Jolly Phonics and Jolly Grammar
Alpha to Omega
Read Write Inc
Words Their Way

Also:

Corrective Reading
QuickSmart

Reading is not magic; it is more like ‘rocket science’

“Teaching reading is a job for an expert...The knowledge base for teaching reading is hidden, extensive and complex.”

Dr Louisa C Moats

“It took roughly 2000 years to develop and make the cognitive breakthroughs necessary for reading and writing; children have to make those same breakthroughs in roughly 2000 days.”

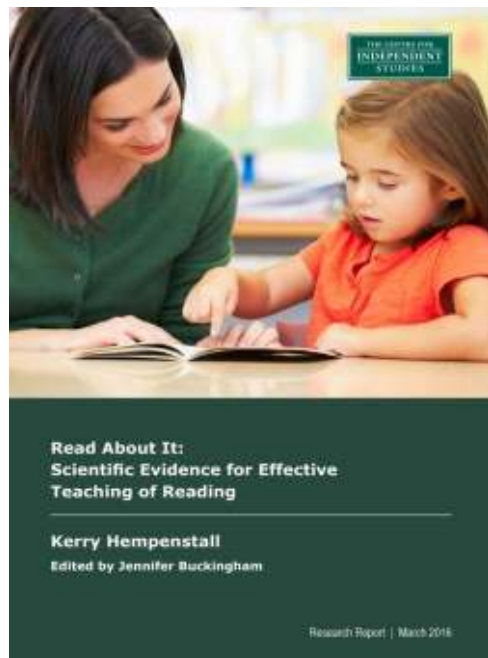
Dr Maryanne Wolf

“The apparent effortlessness of fluent reading belies the complex synchronisation of a variety of cognitive and textual processes”.

Dr Kerry Hempenstall



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