Preventing & Overcoming Reading Failure

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Other materials and articles may be downloaded from Kerry's webpage at:
http://www.rmit.edu.au/departments/ps/staffpgs/hempens.htm

Keynote handout
Morning session: pp 1-42 *International trends in enhancing literacy attainment*
Afternoon: pp 42-83 *Establishing effective school-based literacy interventions for students at-risk*

International trends in enhancing literacy attainment

There are too many students failing to learn to read.

There is a significant problem with the attainment of literacy in Australian schools.

Incidence of reading problems in Australia
Brendan Nelson (Federal Education Minister): **Whatever the reading methods that are being used to teach our children in Australian schools, it is failing far too many children** (ABC 7.30 Report 03/02/2005 Child literacy in Australia under scrutiny)

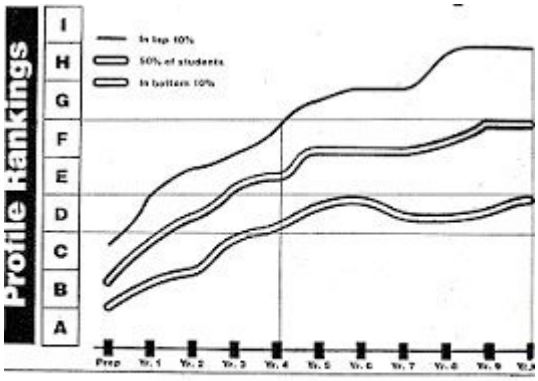
There is little evidence to indicate positive effects of recent initiatives to 'improve' the literacy achievement outcomes of students in Victorian Government schools at any Year level – particularly for underachieving students (p. 32).
Performance Audit of Literacy Standards in Victorian Government Schools, 1996-2002. Report to the Victorian Auditor-General's Office June 2003 Ken Rowe and Andrew Stephanou, Australian Council for Educational Research

Literacy Standards in Australia noted that 27 per cent of Year 3 and 29 per cent of Year 5 students did not meet the required standards in reading while the corresponding figures for writing were 28 per cent and 33 per cent.
Australian Council for Educational Research, Literacy Standards in Australia, Canberra, 1997.

Australian survey data indicate that 30% of Australian teenagers have "not attained mastery in the important area of reading." (p. 17)
Marks, G. N., & Ainley, J. (1997). *Reading comprehension and numeracy among junior secondary school students in Australia*. Melbourne: Australian Council for Educational Research.

30% of Australian students fail to become effective readers.
Louden, W., Chan, L.K.S., Elkins, J., Greaves, D., House, H., Milton, M., Nichols, S., Rivalland, J., Rohl, M., & van Kraayenoord, C. (2000). *Mapping the territory—Primary students with learning difficulties: Literacy and numeracy* (Vols. 1-3). Canberra: Department of Education Training and Youth Affairs.

In Australian schools, unacceptably low levels of literacy occur for 20-50% of students in schools serving educationally disadvantaged areas.
Hill, P. & Russell, J. (1994). *Resource levels for primary schools.* Report prepared as part of a review by the Commonwealth Government of recurrent funding for government primary schools. The University of Melbourne, Vic: Centre for Applied Educational Research.



By Year 10, students at the 10th percentile in reading had progressed no further than Year 3 students at the 50th percentile.

The gap between achievement levels of different groups of students increases during the subsequent years of schooling. By Year 10, the lowest 10% have made no reading gains since Year 4.
Hill, P.W. (1995). School effectiveness and improvement: Present realities and future possibilities. Inaugural Professorial Lecture in *Dean's Lecture Series* Faculty of Education, Parkville, Vic: The University of Melbourne.
Rowe, K.J. & Hill, P.W. (1996). Assessing and recording and reporting students' educational progress: The case for 'student profiles'. *Assessment in Education*, 3, 309-352.

Current incidence of reading problems in Australia depends on the benchmarks that are selected.
2003 Budget noted that 22% of Year 1 students would be funded for Reading Recovery.

Reading Recovery is provided to up to 100 per cent of students in any one school (notably small schools) and the average is 40 to 50% of students, well above the intended 20 per cent (Section 7.43, p.90) of students. In 2000 and 2001, 60 per cent and 57 per cent, respectively, of Victorian government schools allocated further funds to Reading Recovery from their School Global Budget.
Victorian Budget amounts:1999 ($27M), 2000 (28M), 2001 (31.4M), 2002 (30.6M), 2003 (28.7M)
Office of the Victorian Auditor General. (2003). *Improving literacy standards in government schools.* Retrieved 10/10/2004 from http://www.audit.vic.gov.au/reports_par/Literacy_Report.pdf

By adolescence, less than 25% of Victorian students who struggled in Year 2 had recovered.
Prior, M. (2001). Preparing early for success. The Age, Education Age, p.12-13.

In a study of 3000 Australian students, 30% of 9 year olds still hadn't mastered letter sounds, arguably the most basic phonic skill. A similar proportion of children entering high school continue to display confusion between names and sounds. Over 72% of children entering high school were unable to read phonetically regular 3 and 4 syllabic words. Contrast this with official figures. In 2001, the Australian public was assured that 'only' about 19% of grade 3 (age 9) children failed to meet the national standards.
Harrison, B. (2002, April). Do we have a literacy crisis? *Reading Reform Foundation, 48*. Retrieved April 11, 2003 from http://www.rrf.org.uk/do%20we%20have%20a%20literacy%20crisis.htm

- **Australia's rate of early school leaving has not improved over the last decade**
- **poor literacy and numeracy skills are among factors accounting for early school leaving**

Business Council of Australia. (2003). The cost of dropping out: The economic impact of early school leaving. Retrieved 12/2/03 from http://www.bca.com.au/upload/The_Cost_of_Dropping_Out.pdf

60% of the 13 to 16 year old adolescents in a Smith Family study of 500 disadvantaged families had not progressed beyond a grade 4 reading level.
Orr, E. (1994). *Australia's literacy challenge: The importance of education in breaking the poverty cycle for Australia's disadvantaged families.* Camperdown, NSW: The Smith Family, Research and Training Dept.

Indigenous students remain the most educationally disadvantaged group of young Australians.

Marks, G., McMillan, J., Ainley, J., (2004, April 20). Policy issues for Australia's education systems: Evidence from international and Australian research. *Education Policy Analysis Archives, 12*(17). Retrieved [Date] from http://epaa.asu.edu/epaa/v12n17

Only 40% of indigenous students achieved at least proficiency Level 3 in reading.
Lokan, J., Greenwood, L., & Cresswell, J. (2001). *15-up and counting, reading, writing, reasoning : How literate are Australian students? The PISA 2000 survey of students' reading, mathematical and scientific literacy skills.* Melbourne, Australia: ACER Press.

The National School English Literacy Survey indicated that 27 per cent of Year 3 and 29 per cent of Year 5 students did not meet the agreed standard in reading. The survey also showed that boys were well behind girls in terms of their literacy development and that many indigenous students could not read or write satisfactorily (p. 15).
Masters, G.N., & Forster, M. (1997). *Literacy standards in Australia*. Commonwealth of Australia: Canberra, ACT.

The school progress of older low-progress readers (Years 5 to 8) who are at least two years behind in terms of reading skill, and who do not receive intensive remedial support, typically make progress at about half normal rate.
Wheldall, K., & Beaman, R. (2000). *An evaluation of MULTILIT: 'Making Up Lost Time In Literacy'*. Canberra: Department of Education, Training and Youth Affairs. Retrieved 3/6/2003 from http://www.dest.gov.au/schools/literacy&numeracy/publications/multilit/summary.htm

66% of Australian employers consider that high-school leavers are not sufficiently literate to enter the workforce.
Croucher, J.S. (2001, July 21). Number crunch (*The Age*, p.13).

30% of students do not complete school (quote from Professor Peter Hill).
Our Desperate Schools. The Age 5/8/2000.

In Australia efforts to improve student performance need to be directed to less-successful students within schools rather than to improving particular schools.
Marks, G., McMillan, J., Ainley, J., (2004, April 20). Policy issues for Australia's education systems: Evidence from international and Australian research. *Education Policy Analysis Archives, 12*(17). Retrieved 20/4/2004 from http://epaa.asu.edu/epaa/v12n17.

In Victorian primary schools, **differences among classrooms within schools were greater than differences among schools.** Differences between classrooms are important, and it is **what individual teachers do that is crucial for student learning.**
Hill, P., & Rowe, K. J. (1996). Multilevel modelling in school effectiveness research. *School Effectiveness and School Improvement, 7*(1), 1-34.

Australia's rate of early school leaving has not improved over the last decade - poor literacy and numeracy skills are factors accounting for early school leaving.
Business Council of Australia. (2003). *The cost of dropping out: The economic impact of early school leaving*. Retrieved 12/2/03 from http://www.bca.com.au/upload/The_Cost_of_Dropping_Out.pdf

Teachers themselves are not always good at rating student achievement, as their ratings tend to be strongly affected by student behaviour and motivation, crediting the most attentive and interested with higher achievement.
Goldenberg, C., Gallimore, R., Reese, L., & Garnier, H. (2001). Cause or effect? A longitudinal study of immigrant Latino parents' aspirations and expectations and their children's school performance. *American Educational Research Journal, 38*, 547-582.

Of particular concern, however, were the 10% of low progress readers who were not identified as such by their classroom teachers, and the 18% of teachers who identified, as low progress readers, students who were not in fact, very different from the lowest of the readers regarded as average (p.4).
Madelaine, A. & Wheldall, K. (2003). Can teachers discriminate low-progress readers from average readers in regular classes? *Australian Journal of Learning Disabilities, 8*(3), 4-7.

M:F ratio of referrals by teachers is about 4:1
Shaywitz, S. E. & Shaywitz, B. A. (1988). Attention-deficit disorder: Current perspectives. In J. F. Kavanagh & T. J. Truss (Eds.). *Learning disabilities: Proceedings of the national conference*. Parkson, MD: York Press.

Males and females are represented equally in the population with reading disability
Alexander, D., Gray, D.B., & Lyon, G.R. (1993). Conclusions and future directions. In G.R. Lyon, D.B. Gray, J.F. Kavanagh, & N.A. Krasnegor (Eds.), *Better understanding of learning disabilities: New views from research and their implications for education and public policies (p.1-13).* Baltimore: Brooks.

Shaywitz et al found a research-identified incidence of reading disability of 8.7% of boys and 6.9% of girls. However, a teacher-identified incidence of the same population identified 13.6% of boys and only 3.2% of girls. The authors suggested that greater reports of behavioral difficulties among boys in the classroom may have lead to this bias.
Shaywitz, S.E., Shaywitz, B.A., Fletcher, J.M., & Escobar, M.D. (1990). Prevalence of reading disability in boys and girls. *Journal of the American Medical Association, 264*, 998-1002.

Of 272 Victorian teachers (P-2), 77 % relied on whole language, and 6% followed a structured program. 51% had no specific teaching of phonics in their program, 22 per cent indicated that they included teaching of phonics as and when necessary (implicit phonics), while 27 per cent of teachers indicated that they included systematic teaching of phonics as a part of their teaching program.
de Lemos, M. (2002). *Closing the gap between research and practice: Foundations for the acquisition of literacy*. Camberwell: Australian Council for Educational Research.

In my sample of 340 teachers, both pre service and in service, only 54% knew what a syllable was and only 24% could correctly count the number of phonemes in a word. As for knowledge of schwas, diphthongs, voiced versus unvoiced sounds, forget it!
Fielding-Barnsley, R. & Purdie, N. (2005). Teachers' attitude to and knowledge of metalinguistics in the process of learning to read. *Asia-Pacific Journal of Teacher Education, 33*(1), 65-76.

"A person who is not at least a modestly skilled reader by the end of third grade is quite unlikely to graduate from high school." - *Preventing Reading Difficulties in Young Children*, National Research Council (1998).

See survey Rohl, M., & Greaves, D. (2005). How are pre-service teachers in Australia being prepared for teaching literacy and numeracy to a diverse range of students? *Australian Journal of Learning Disabilities, 10*(1), 3-8.

Federal government initiated survey
- Australia-wide
- 680 new graduates
- 307 schools' senior staff surveyed

Beginning primary teachers who felt unprepared to teach reading	36%
Beginning secondary teachers who felt unprepared to teach reading	51%
Beginning teachers rated by senior staff as unprepared to teach reading	49%
Beginning primary teachers who felt unprepared to teach phonics	57%

Beginning secondary teachers who felt unprepared to teach phonics 75%

Beginning teachers rated by senior staff as unprepared to teach phonics 65%

Beginning teachers' readiness to teach literacy to students with diverse needs?
Percentage of responses indicative of teacher confidence

	Primary	**Secondary**	**Senior staff confidence in beginning teachers' competence**
ESL	33%	26%	15%
Indigenous	38%	41%	12%
Low SES	45%	43%	22%
Disabilities	43%	45%	11%
Learning difficulties	54%	53%	17%

Aren't these failing students learning disabled?

A "significant number of children labelled learning disabled or dyslexic could have become successful readers had they received **systematic and explicit instruction and intervention far earlier** in their educational careers." California State Taskforce, 1999.
http://www.latimes.com/news/state/reports/specialeduc/lat_special991212.htm

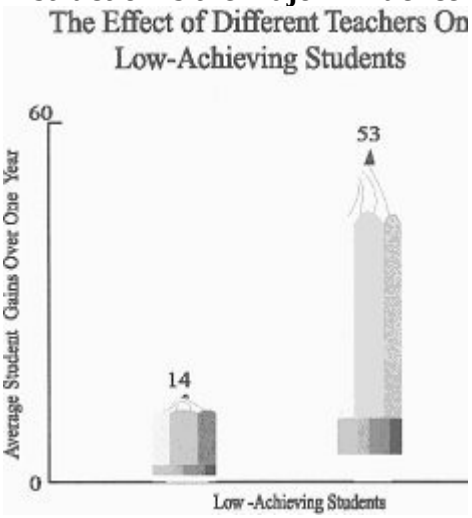
"Learning disabilities have become a **sociological sponge to wipe up the spills of general education**…. It's where children who **weren't taught well** go."
G. Reid Lyon, National Institute of Child Health and Human Development LA Times 12/12/1999
http://www.latimes.com/news/state/reports/specialeduc/lat_special991212.htm

The incidence of verbal learning disability lies between **3-6%** of the population.
Marshall R.M. & Hynd, G.W. (1993). Neurological basis of learning disabilities. In William W. Bender(Ed.) *Learning disabilities: Best practices for professionals*. USA: Butterworth-Heinemann.

The power of instruction

Adapted from: Hempenstall, K. (2004). The importance of effective instruction. In N.E. Marchand-Martella, T.A. Slocum, and R.C. Martella (Eds.), *Introduction to Direct Instruction* (pp.1-27). Needham Heights, MA: Allyn and Bacon.

Instruction is the major influence on struggling students



At-risk students in classes with effective teachers for 3 years in a row achieved 50% more learning than those in classes with poor teachers (not just in reading).

A growing body of research shows that the quality of the teacher in the classroom is the most important schooling factor predicting student outcomes (see, for instance, Ferguson 1998; Goldhaber 2002; Goldhaber et al. 1999; Hanushek et al. 1999; Wright et al. 1997). The impact of having a high-quality teacher can be profound. Hanushek (1992), for instance, finds that, all else equal, a student with a very high quality teacher will achieve a learning gain of 1.5 grade level equivalents, while a student with a low-quality teacher achieves a gain of only 0.5 grade level equivalents. Thus, *the quality of a teacher can make the difference of a full year's learning growth.*

In total, approximately **60% of the variation in the performance of students lies either between schools or between classrooms,** with the remaining 40% being due to either variation associated with students themselves or to random influences.
Cuttance, P. (1998). Quality assurance reviews as a catalyst for school improvement in Australia. In A. Hargreaves, A. Lieberman, M. Fullan., & D. Hopkins (Eds.), *International handbook of educational change, Part II* (pp. 1135-1162). Dordrecht: Kluwer Publishers.

Hattie's meta-analytic synthesis of the relevant evidence-based research drew from an extensive review of literature and a synthesis of over half a million studies. The answer lies in the person who gently closes the classroom door and performs the teaching act.
Hattie, J.A., Clinton, J., Thompson, M., & Schmidt-Davies, H. (1995). *Identifying highly accomplished teachers: A validation study*. Greensboro, NC: Center for Educational Research and Evaluation, University of North Carolina.

The proportions of IQ variance attributable to genes and environment vary nonlinearly with SES.
Heritability of IQ at the low end of the wealth spectrum is very low (0.10)
it is quite high for families of high socioeconomic status (0.72).
Genes can influence the effects of life experiences, and those life experiences can influence the manner in which those genes are expressed.
In disadvantaged families, 60% of the variance in IQ is accounted for by the environment.
This makes high quality teaching a much more important requirement for such students.

Opposite scenario is more likely to be found.
- advantaged students receive higher quality teaching than disadvantaged.
- advantaged students among studious peers in orderly classes & learn more
- teachers produce their best because not distracted and exhausted by discipline

Turkheimer, E., Haley, A. Waldron, M., D'Onofrio, B., Gottesman, I.I. (2003). Socioeconomic status modifies heritability of IQ in young children. *Psychological Science, 14*, 623-628.

The difference between teaching & learning
Average child, average teacher - contributions similar
Bright child lessens the need for strong teacher contribution
Lesser child contribution demands stronger teacher contribution

Recent Event in the USA and Great Britain

National Reading Panel reports a combination of teaching phonics, word sounds, and giving feedback on oral reading is the most effective way to teach reading. April 13, 2000
http://www.nichd.nih.gov/new/releases/nrp.htm

In the largest, most comprehensive evidenced-based review ever conducted of research on how children learn reading, a Congressionally mandated independent panel has determined that effective reading instruction includes teaching children to break apart and manipulate the sounds in words (phonemic awareness), teaching

them that these sounds are represented by letters of the alphabet which can then be blended together to form words (phonics), having them practise what they've learned by reading aloud with guidance and feedback (guided oral reading), and applying reading comprehension strategies to guide and improve reading comprehension.

For its review, the panel selected research from the approximately **100,000 reading research studies that have been published since 1966, and another 15,000 that had been published before that time.** Because of the large volume of studies, the panel selected only experimental and quasi-experimental studies, and among those considered only studies meeting rigorous scientific standards in reaching its conclusions.

The panel found that the research conducted to date strongly supports the concept that **explicitly and systematically teaching children to manipulate phonemes** significantly improves children's reading and spelling abilities. The evidence for this is so clear cut that this method should be an important component of classroom reading instruction.

The panel also concluded that the research literature provides solid evidence **that phonics instruction produces significant benefits for children from kindergarten through 6th grade** and for all children having difficulties learning to read. The greatest improvements in reading were seen from **systematic phonics instruction**. This type of phonics instruction consists of teaching a planned sequence of phonics elements, rather than highlighting elements as they happen to appear in a text. Here again, the evidence was so strong that the panel concluded that **systematic phonics instruction is appropriate for routine classroom instruction.**

For children with learning disabilities and children who are low achievers, systematic phonics instruction, combined with synthetic phonics instruction produced the greatest gains. **Synthetic phonics instruction consists of teaching students to explicitly convert letters into phonemes and then blend the phonemes to form words.** Moreover, systematic synthetic phonics instruction was significantly more effective in improving the reading skills of children from low socioeconomic levels. **Across all grade levels, systematic synthetic phonics instruction improved the ability of good readers to spell.**

President Bush's campaign pledge - make sure every primary school child can read. The White House is doling out millions of dollars to local communities for early-reading phonics programs - whole language programs are ineligible.
Federal reading plan funds phonics. Jimmy Kilpatrick 17 March 2002
http://www.educationnews.org/cgi-bin/webbbs/reading/reading_list.pl?rev=638

The ***No Child Left Behind Act*** ($6 billion over 5 years) provides grants for state and local school districts in which students are systematically and explicitly taught five key components of early reading.

- Phonemic Awareness: The ability to hear and identify individual sounds in spoken words.
- Phonics: The relationship between the letters of written language and the sounds of spoken language.
- Fluency: The capacity to read text accurately and quickly.
- Vocabulary: The words students must know to communicate effectively.
- Comprehension: The ability to understand and gain meaning from what has been read.

US Department of Education. (2002). *The facts: Reading achievement.* [On-Line]. Available:
http://www.nochildleftbehind.gov/start/facts/reading.html

Major changes in the United Kingdom

In the United Kingdom, the National Literacy Strategy (1998) prescribes that pupils must be taught to:

- discriminate between the separate sounds in words;
- learn the letters and letter combinations most commonly used to spell those sounds;
- read words by sounding out and blending their separate parts;
- write words by combining the spelling patterns of their sounds.

Lightfoot, L. (1998, Mar 20). Schools told how to teach reading. The Electronic Telegraph (London Telegraph).

- "The vast majority of English schools have now moved to an acceptance that phonics needs to be taught, both for reading and for spelling."
- The less successful schools lacked a consistent approach to phonics, with too many different methods in use in classrooms.
- “There is still much further to go before the **quality of the teaching** is good enough".
- OFSTED said teachers had not had enough training

Phonics teaching 'not sound enough' BBC News Monday, 29 October, 2001
http://news.bbc.co.uk/hi/english/education/newsid_1626000/1626512.stm

The new UK Government strategies:

- Research has proved that structured phonics is the most effective way to teach reading.
- **All primary schools to adopt *structured* teaching of phonics, and to abandon the present whole language system.**
- The WL practice of emphasis on familiar and predictable texts leads to an over-reliance on guessing from context.
- **Most schools claim to teach phonics as part of a "mixture of methods", but such *incidental* phonics is insufficient.**
- Funds are provided for in-service teacher training because the vast majority of teachers have not been trained how to teach phonics.
- **Schools to schedule daily, hour-long English lessons:**

2/3 class activities- choral reading, vocabulary, punctuation, grammar and spelling.
1/3 in small groups matched for skill level, the teacher giving **direct instruction** with one group while the remainder work independently.

Findings of the National Institute of Child Health and Human Development provided much of the inspiration for the National Reading Panel.

Lyon, G.R. (1999). The NICHD research program in reading development, reading disorders and reading instruction. Retrieved November 20, 2001 from http://www.ld.org/Research/keys99_nichd.cfm

Since 1965, the National Institute of Child Health and Human Development (NICHD), within the National Institutes of Health (NIH), has conducted and continuously supported research efforts to address three fundamental questions that must be answered if reading failure is to be understood and addressed successfully. These three questions are: (1) How do children learn to read? What are the critical environmental, experiential, cognitive, linguistic, genetic, neurobiological, and instructional conditions that foster reading development? (2) Why do some children and adults have difficulties learning to read? What specific cognitive, linguistic, environmental, and instructional factors impede the development of accurate and fluent reading skills, and what are the most significant risk factors that predispose youngsters to reading failure? (3) How can we help most children learn to read? Specifically, for which children are which teaching approaches and strategies most beneficial at which stages of reading development?

To answer these three questions, the NICHD has developed a research network consisting of **41 research sites** in North America, Europe, and Asia to study reading development, reading disorders and other learning disabilities, and reading instruction. During the past 33 years, NICHD scientists have studied the reading development of **34,501 children and adults**. Many studies have been devoted to understanding normal reading development, and **21,860 good readers** have participated in these investigations, many for **as long as 12 years**. Significant efforts have also been deployed to understand why many children do not learn to read. Within this context, **12,641 individuals with reading difficulties have been studied, many for as long as 12 years**. In addition, since 1985, the NICHD has initiated studies designed to develop **early identification methods** that can recognize those children during kindergarten and first-grade who are most at-risk for reading failure. These studies have provided

the foundation for several longitudinal prevention and early intervention projects now underway at 11 sites in the U.S. and Canada. Since 1985, **7,669 children** (including 1,423 good readers) have participated in these reading prevention, early intervention, and remediation studies, and 3,600 children are currently enrolled in longitudinal intervention trials in Texas, Washington, DC, Georgia, Massachusetts, New York, Florida, Colorado, North Carolina, and the state of Washington. These studies involve the participation of 1,012 classroom teachers, working in 266 schools and 985 classrooms.

The purpose of this report (http://www.ld.org/Research/keys99_nichd.cfm) is to synthesize the major converging findings that have been obtained by NICHD scientists for each of the three questions that have guided the reading research program. This synthesis is derived from an analysis of over **2,500 publications generated by NICHD scientists since 1965.**

To appreciate fully the significance of the NICHD findings, it helps to understand the level of scientific rigour used to guide the formation of conclusions from the research. Reid Lyon coordinates the parallel investigation of similar questions across several centers. Under Lyon's leadership, the researchers determine that the questions have been answered only when the findings replicate across researchers and settings. Findings with a high degree of replicability are finally considered incontrovertible findings and then form the basis for additional research questions. Funding is awarded the research centers through a competitive peer review process. A panel of researchers who are not competing for the research funds award the funds after evaluating competing proposals according to specific criteria. Each research study within the NICHD network must follow the most rigorous scientific procedures. The average length of a study has been eight years, with a range of 3 years to 31 years. In the decades-long studies, the growth of children from preschool through adulthood has been evaluated. Currently, several large-scale, 5-year longitudinal treatment intervention studies are underway. This longer-term design allows evaluation of the effects of different instructional variables on later reading performance.

- The ability to read fluently for meaning depends primarily on rapid, automatic decoding and recognition at the level of the single word.
- The basis of the reading deficit (phonological processing) should provide the focus for intervention.
- Efforts should be directed at explicitly and systematically teaching the connection between these phonological rules and the written word.
- A phonics emphasis provides advantages for disabled readers over a Whole Language approach.
- There are as many girls as boys with reading difficulty.

Children do not "catch-up"

Children who fall behind in first grade reading have a one in eight chance of ever catching up to grade level, given the usual interventions. Of children reading disabled in Year 3, approximately 74% will still be so in Year 9. Reading failure has far-reaching consequences.

What are the strong predictors of learning to read (P-2)?

- hours of television per week?
- parents education?
- kindergarten teacher's predictions?
- recognition of word meanings?
- gender or handedness?
- amount parents read to child?
- **letter name knowledge?**
- **phoneme segmentation ability?**
- history of preschool attendance?

Research-supported components of effective beginning reading instruction (USOE; NICHD)

- Create appreciation for the written word
- Develop awareness of printed language and the writing system
- Teach the alphabet
- Develop students' phonological awareness; develop phoneme awareness
- Teach the relation of sounds and letter
- Teach children how to sound out words
- Teach children how to spell words
- Help children develop fluent reflective reading

The importance of phoneme awareness to learning to read

- It is a foundation for learning an alphabetic writing system
- It is a predictor of reading problems
- It can result in fewer reading difficulties

What distinguishes a proficient reader?

- Ability to identify and manipulate the speech sounds in words at the phoneme level
- Ability to recognise a new printed word with very few exposures (1-4).
- Ability to link sound with symbol accurately
- Ability to process larger "chunks" of print
- Ability to recognise words with fluency (automaticity).
- Ability to focus on meaning because they are no longer "glued to print
- Ability to comprehend words, sentences

Phonology, reading and spelling: Known relationships

- Phoneme awareness predicts early reading and spelling proficiency (K-2).
- Phonological processing is independent of intelligence.
- Phonological skill is both inherited and learned.
- Children may not benefit from phonics instruction until they have rudimentary phoneme awareness.

The role of context in word recognition

- Poor readers over-rely on context because letter-sound knowledge is weak
- Context allows us to decode accurately only one word in ten overall.
- The content words in a passage tend to be less common, not in the sight vocabulary and must be decoded accurately
- Context alone can resolve ambiguity and sometimes supplies meaning for unfamiliar words.

Characteristics of poor and novice readers

- Over-reliance on context and guessing
- Limited phoneme awareness.
- Slow naming speed - lack of fluency in word recognition.
- Must devote attention to decoding process; limited attention available for meaning-making.

Three important components of phonological processing and sample assessments.

Component Skill	**Assessment**
Phonological awareness	E.g., say cat without the /t/ sound.
Phonological recoding in lexical access (Rapid naming)	Name objects, letters, colours quickly
Phonological recoding in working memory	Repeat sentences, words, or digits accurately.

Of these three major phonological processing skills, phonological awareness appears to be the most prevalent linguistic deficit in disabled readers, and the one most amenable to instruction.

The Panel refers to Phonemic awareness: What's it about?

To my mind, the discovery and documentation of the importance of phonemic awareness ... is the single most powerful advance in the science and pedagogy of reading this century.
Adams, M.J. (1991). Beginning to read: A critique by literacy professionals and a response by Marylin Jager Adams. *The Reading Teacher, 44*, 392.

Phonemic awareness: The conscious realization that words can be decomposed into discrete single sounds (phonemes). It enables the beginning reader to appreciate the logic of the alphabetic system.

A "phoneme" is a single sound - a distinctive linguistic unit that contrasts, or causes to be different, words such as *house, mouse, louse*. It is not simply hearing the differences but being able to identify them.

During this (prior to school) period, the word may be used but not noticed by the child, and frequently it presents things seemingly like a glass through which the child looks at the surrounding world, not making the word itself the object of awareness, and not suspecting that it has its own existence, its own aspects of construction.
Luria, A. A. in Dowling, J. (1979). *Reading and reasoning.* New York: McMillan.

Phonemic awareness: Comes naturally?

Nearly one third of first-graders fail to fully realize the phonemic structure of words (Adams, 1990). The proportion is much higher in disadvantaged children (Raz & Bryant, 1990; Robertson, 1993).
Teachers who are literate and experienced generally have an insufficient grasp of spoken and written language structure and would be unable to teach it explicitly to either beginning readers or those with reading/spelling disabilities.
Moats, L.C. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of Dyslexia, 44,* 81-102.

"Learning to read is not just one of the goals of schooling. It is essential if students are to succeed in any grade, in any subject. According to the National Reading Panel, only about 5% of children learn to read effortlessly. About 60% find early reading difficult, and of that number, 20-30% really struggle. By fourth grade, the seriousness of the problem for these children becomes obvious" p.34.
Lewis, L. & Paik, S. (2001). *Add it up: Using research to improve education for low-income and minority students*. Washington: Poverty & Race Research Action Council. [On-Line]. Available: http://www.prrac.org/additup.pdf

Coarticulation makes mastery difficult: The letter "p" in "pin" (which is aspirated and released) sounds different to the letter "p" in "spin" (which is neither aspirated nor released); likewise, the letter "k" in "keep" versus the "k" in "stack." The phonemes are influenced by their neighbors.

As much as 30% of the adult population, including teachers, fail to develop deep phonemic awareness.
Lindamood, P.C., Bell, N., & Lindamood, P. (1992). Issues in phonological awareness assessment. *Annals of Dyslexia, 42,* 242-259.

There is a pattern of less adequate literacy skills among students whose teachers had phonological deficiencies.
Lindamood, P.C. (1993). Issues in researching the link between phonological awareness, learning disabilities and spelling. In G. Reid Lyon (Ed), *Frames of reference for the assessment of learning disabilities. New views on measurement issues*. Maryland: Brooks Publishing.

The ability to isolate a phoneme from either the beginning or end of a word, the easiest of the phonemic awareness abilities also seems to be crucial to reading because nearly all children who could not adequately perform this task also had not achieved a pre-primer instructional level. p. 231.
Stahl, S. A. & Murray, B. A. (1994). Defining phonological awareness and its relationship to early reading. *Journal of Educational Psychology, 86,* 221-234.

When we gave this Auditory Analysis Test and other tests of phonemic awareness to a group of 15-year-olds in our Connecticut Longitudinal Study, the results were the same: even in high school students, phonological awareness was the best predictor of reading ability.
Shaywitz, S (No date). *Dyslexia.* [On-Line]. Available: http://www.sciam.com/1196issue/1196shaywitz.html

Among children identified as at-risk for later reading failure on the basis of poor letter naming in kindergarten, greater success in first grade reading was associated with a greater percent of classroom time devoted to phonemic awareness activities in kindergarten. p.32.
Mazzocco, M., Denckla, M., Singer, H., Scanlon, D., Vellutino, F., & Reiss, A. (1997). Neurogenic and neurodevelopmental pathways to learning disabilities. *Learning Disabilities: A Multidisciplinary Journal, 8*, 31-42.

With 15 minutes a day of direct instruction in phonological awareness activities, kindergartners can develop skills in phonological analysis at a faster rate than in a developmentally appropriate curriculum without this direct instruction. p.69.
Foorman, B., Francis, D., Beeler, T., Winikates, D., & Fletcher, J. (1997). Early interventions for children with reading problems: Study designs and preliminary findings. *Learning Disabilities: A Multidisciplinary Journal, 8,* 63-71.

Research confirms that the most successful phonemic awareness training programs provide instruction on segmentation & blending (Blachman, 1987; Wallach & Wallach, 1977; Williams, 1979, 1980). p. 42.
Spector, J. (1995). Phonemic awareness training: Application of principles of direct instruction. *Reading and Writing Quarterly, 11*, 37-51.

Although there is evidence that segmentation & blending can be taught successfully as auditory skills (e.g., Elkonin 1973; Lundberg, 1977; Lundberg, Frost & Petersen, 1988), the phonemic awareness programs that have had the most positive effect on reading achievement have been those that incorporate segmentation & blending training with letter-sound instruction (e.g., Ball & Blachman, 1991; Blachman, 1987; Bradley & Bryant, 1983; Byrne & Fielding- Barnsley, 1989, 1991; Clay, 1979, 1985; Treiman & Barron, 1983; Wallach & Wallach, 1977; Williams, 1979, 1980).
Spector, J. (1995). Phonemic awareness training: Application of principles of direct instruction. *Reading and Writing Quarterly, 11*, 37-51.

Segmentation training helps develop blending skills. Yopp (1988) suggests that segmenting & blending tap similar constructs but agrees with Perfetti, Beck, Bell, & Hughes, (1987) that blending is a simple precursor to reading while segmenting is a more complex metacognitive linguistic skill. p. 221
Uhry, J.K., & Shepherd, M.J. (1993). Segmentation/spelling instruction as part of a first-grade reading program: Effects on several measures of reading. *Reading Research Quarterly, 28*, 219-233.

How might its development begin prior to school? At home:

- Nursery rhymes,
- Sesame St,
- Playschool,
- I Spy,
- Pig Latin (junk becomes unkjay),
- Spoonerisms - letters or syllables get swapped, sometimes in slips of the tongue (or tips of the slung)
- Tongue twisters (Bill and Betty baked brown bread for Barbara's baby),
- Palindromes (Do geese see God?)
- Magnetic fridge letters
- Learning music.

Equal opportunity to develop PA?

	Child A		**Child B**	
	Daily	Total	Daily	Total
Parent Reading	½ hr	750 hrs	2 min	60 hrs
Sesame St/ Playschool	1 hr	1500 hrs	2 min	60 hrs

Word games, magnetic letters, crayons	1 hr	1500 hrs	2 min	60 hrs
TOTAL	**2.5 hr**	**3750 hrs**	**6 min**	**180 hrs**

Child A has 20 times as much opportunity for PA prior to school

Phonological awareness stages (in the absence of instruction)
Recognition that sentences are made up of words.
Recognition that words can rhyme - production
Recognition that words can begin with the same sound - production
Recognition that words can end with the same sound - production
Recognition that words can have the same medial sound(s) - production
Recognition that words can be broken down into syllables - production
Recognition that words can be broken down into onsets and rimes - production
Recognition that words can be broken down into individual phonemes - production
Recognition that sounds can be deleted from words to make new words - production
Ability to blend sounds to make words
Ability to segment words into constituent sounds

It's not so easy for adults!

- Is there an */l/* in *talk*, in *palm*, in *salmon.*
- Think of the word 'pink'. Now think of *pink* without the /k/. Do you hear *pin*?
- How many sounds can you hear in *sex* (the word, not the activity)?
- How many sounds can you hear in *pitch*?
- What is the 4th sound in the word *faxed*?
- What is the 3rd sound in *squabble*?
- How many sounds can you hear in *radio*?

Your knowledge of spelling gets in the way! To teach it you need to regress.

Early screening of PA?

Torgesen (1998) recommends an early screening procedure involving the administration of two tests:
1) a test of knowledge of letter names or sounds; and 2) a measure of phonemic awareness.
Measures of letter knowledge continue to be the best single predictor of reading difficulties, and measures of phonemic awareness contribute additional predictive accuracy. In our experience, tests of letter name knowledge are most predictive for prep children, and tests of letter-sound knowledge are most predictive for first graders. Since reading growth is influenced by non-cognitive factors such as attention/motivation and home background (Torgesen, et al., 1998), as well as specific knowledge and skills, scores from these objective tests might profitably be supplemented with teacher ratings of behavior and attention to identify children most at risk for subsequent difficulties in learning to read.
Torgesen, J.K. (1998). Catch them before they fall: Identification and assessment to prevent reading failure in young children. *American Educator,* Spring/Summer. [On-Line] Available at: http://www.ldonline.org/ld_indepth/reading/torgeson_catchthem.html

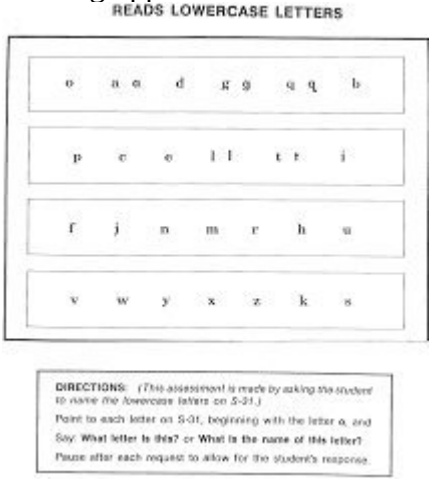
This early screening can point out those students at risk of failure before failure occurs with all its attendant additional problems. They can then be targeted for assistance immediately.

Torgesen (1998) suggests a *screening procedure* involving: 1) a test of knowledge of letter names or sounds, because letter knowledge continue to be the best single predictor of reading difficulties; and 2) a test of phonemic awareness. Torgesen's research indicates that, individually, knowledge of letter names is the stronger predictor

for Prep children, and knowledge of letter-sounds is stronger for first graders. McBride-Chang (1999) considers letter-sound knowledge to be more closely related to reading skills than is a grasp of letter names, because of the stronger phonological basis for letter-sound knowledge. Thus assessing letter names has predictive value because it is a marker for a range of useful literacy experiences, though letter-sound knowledge appears to have a causal rather than merely correlational relationship to reading progress.

One test is the Letter Identification subtest of the *Woodcock Reading Mastery Test-Revised* (Woodcock, 1987). It presents letters in several different fonts for which either the sound or the name is scored as correct. Its use of different fonts appears to be intended to enable the assessment of the concept of sound-symbol relationship, not simply the association between one letter-shape and its name/sound.

The *Comprehensive Inventory of Basic Skills -Revised (Brigance, 2000)* has several useful subtests. Visual discrimination of upper and lower case letters, Recitation of the alphabet, Reading upper and lower case letters, Printing upper and lower case letters in alphabetic sequence, and, Printing upper and lower case letters as dictated.


READS LOWERCASE LETTERS

o a e d g q q b

p c e l l t r j

r j n m r h u

v w y x z k s

DIRECTIONS: *(This assessment is made by asking the student to name the lowercase letters on S-31.)*

Point to each letter on S-01, beginning with the letter o, and

Say: **What letter is this?** or **What is the name of this letter?**

Pause after each request to allow for the student's response.

The *Neale Analysis of Reading Ability (Revised)* (Neale, 1988) has a supplementary test that assesses the names and sounds of the alphabet.


NEALE ANALYSIS OF READING ABILITY *REVISED*

Test 2

Names and sounds of the alphabet

"What are the names of these letters?"

and points to each letter in turn. As the child proceeds to name the letters, say

"Yes. Those are their names; tell me the names of these others."

and points to the rest of the letters.

If the child gives the sound of the letter rather than the name say:

"Yes, but can you tell me their names, for example (pointing to 'a') this letter is say."

Proceed through remaining letters. Then say:

"Now can you tell me the sounds that these letters make?"

a c o e

f t k h

p d b g q y

m w n r u v

s z x i j l

A H K F E L I T X

C G O Q P R D B J

M N U V Y W S Z

There is near-complete consensus among researchers that phonemic awareness is a very robust predictor of future reading progress, markedly better than is intelligence (Stanovich, 1991). As this awareness is also the major causal factor in early reading progress (Adams, 1990), assessment of current levels allows both a prediction of a child's likely progress in the absence of appropriate intervention, and a direction for any intervention to take.

DIBELS Preschool or early-Prep screen:

Letter Naming Fluency - a sheet with upper and lower-case letters. Name as many letters as possible in 1 min.

g N E Y R l V d H Z N d x S C n j H s S

E n G h c i h B b O Y F p D L i q c D Q

R v F J Z M P o p u l G A f V B P k m I

LNF < 2	At risk
2 ≤ LNF < 8	Some risk
LNF ≥ 8	Low risk

The "Get Ready to Read" screening tool
A screening tool for parents and caregivers of four-year-olds. 20 questions with on-line scoring and recommendations
http://www.readingrockets.org/getready/

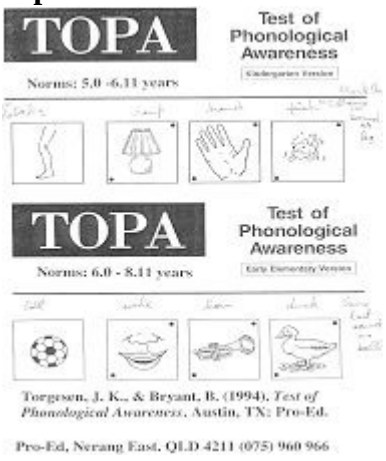
Examples of phonemic awareness tasks

Phoneme deletion: What word would be left if the /k/ sound were taken away from cat?
Word to word matching: Do *pen* and *pipe* begin with the same sound?
Blending: What word would we have if you put these sounds together: /s/, /a/, /t/?
Sound isolation: What is the first sound in *rose*?
Phoneme counting: How many sound do you hear in the word *cake*?
Deleting phonemes: What sound do you hear in *meat* that is missing in *eat*?
Odd word out: What word starts with a different sound: *bag*, *nine*, *beach*, *bike*?
Sound to word matching: Is there /k/ in *bike*?

Some phonemic awareness tests:

In a huge study (Hoien, Lundberg, Stanovich, & Bjaarlid, 1995), initial-phoneme and final-phoneme matching tasks (such as assessed by the *TOPA*: *Test of Phonological Awareness (Torgesen & Bryant, 1994*) were by far the most potent predictors of early reading acquisition. There are a number of screening tests available, but relatively few with norms, the *TOPA* being one that has an age range is 5.0 - 8.11yrs. Another advantage of this test is its facility for group-testing.

A phonemic awareness test:



The *Comprehensive Test of Phonological Processing* (CTOPP, Wagner, Torgesen, & Rashotte, 1999, Pro-Ed) assesses phonological awareness phonological memory and rapid naming. Persons with deficits in one or more of these kinds of phonological processing abilities may have more difficulty learning to read than those who do not. The CTOPP was developed to aid in the identification of individuals from kindergarten through college who may profit from instructional activities to enhance their phonological skills.

Another test is the *Phonological Awareness Screening Test* (Henty, 1993) developed in Tasmania for which the author has been attempting to obtain normative data. The *Sutherland Phonological Awareness Test* (Neilson, 1995) has norms (Australian) for Years P-3. The *Lindamood Auditory Conceptualization Test* (Lindamood & Lindamood, 1979) has norms for Years P-12. The Rosner *Test of Auditory Analysis Skills* (Rosner, 1975) is a 13 item test with norms for Years P-3. *The Yopp-Singer Test of Phoneme Segmentation* (Yopp, 1995) is a brief test for Prep/Year 1 students, designed for early screening purposes. Informal un-normed tests are available in *A Sound*

Way (Love & Reilly, 1995), *Sound Linkage* (Hatcher, 1994), *Phonemic Awareness Checklist* (Lewkowicz, 1980), *Phonemic Awareness in Young Children* (Adams, Foorman, Lundberg, & Beeler, 1998), among others.

Lindamood Auditory Conceptualisation Test (1979, Pro-Ed). It has adult norms, and assesses phoneme discrimination and comparing the number and order of phonemes. This test uses coloured blocks to allow the individual to visually present and manipulate representations of phonemes.

While we're talking about tests

Other phonological processes
Naming speed (aka speed of lexical retrieval or phonological recoding in lexical access)
Tasks measuring the speed of naming familiar stimuli (colours, letters, numbers or objects).
Rapid Automatized Naming test (Denckla & Rudel, 1974, 1976). How many items can be named in a minute. Noted a correlation between naming deficits and reading disability. A speed test - not knowledge assessment – the individual must be able to name the stimuli. Indicates how readily children can gain access to their stores of sounds, sound-sequences, and word meanings. Relevant to reading fluency

Double-Deficit hypothesis
- Difficulty only in phonemic awareness,
- Only in naming-speed,
- Or in both - a double-deficit.

These last - the most instructionally resistant students - having fewer compensatory resources.

Phonetic recoding in working memory
Working memory is a short-term holding system that enables the storage and manipulation of small amounts of information needed to complete a task. Phonetic recoding in working memory is a phonological ability. Reader needs to decode a series of letters, and remember them to allow blending. Also required for subsequent word-pronunciation, word- and sentence-comprehension tasks.

Any lower-order limitations can hinder the growth of vocabulary, phonological awareness (blending & segmenting), reading, syntactic abilities, and language comprehension.

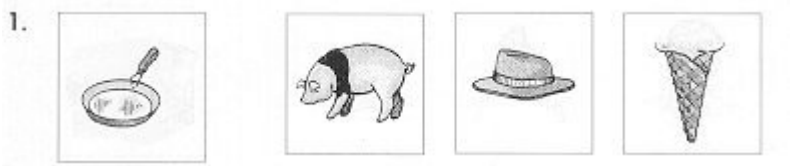
Tests: Digit span (oral and visual), sentence memory, non-word repetition (*burloogugendaplo)* used.

***Comprehensive Test of Phonological Processing (CTOPP)*:**
Three processes assessed: Phonological awareness, Phonological Memory, and Rapid Naming.

Phonological awareness
Elision - a phoneme deletion task.
"Say *bold."* After repeating "*bold*," the examinee is told, "Now say *bold* without saying /b/."

Blending Words - phoneme blending task. "What word do these sounds make: *t-oi*?"

Sound Matching - initial and final sound. Which word starts with the same sound as *pan? pig, hat,* or *cone?*



Blending Nonwords What made-up word do these sounds make: *nim-by*?
Phoneme Reversal After listening to the sounds *ood* repeat o*od* and then to say *ood* backwards.

Segmenting Words Say *beast* and then to say it one sound at a time.
Segmenting Nonwords Listens to the sounds *ren* repeats the nonword, then says the nonword one sound at a time.

Phonological Memory
Memory for Digits - listens to a series of numbers (2 per sec) & repeats them in the same order
Nonword Repetition - child repeats non-words e.g., *burloogugendaplo*

Rapid Naming.
Rapid Color/Digit/Object Naming

Rapid Letter Naming
a t s k c n

Rapid Object Naming

To read more about these other 2 phonological processes, see

Hempenstall, K. (No date). Beyond phonemic awareness: The role of other phonological abilities. Education News 5/9/2000. Retrieved 3/7/2003 from http://www.educationnews.org/beyond_phonemic_awareness.htm

Or
Hempenstall, K. (in press). Beyond phonemic awareness: What educational role for other phonological processes? *Australian Journal of Learning Disabilities.*

Dynamic Indicators of Basic Early Literacy Skills (DIBELS)

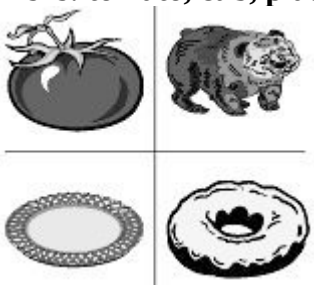
- Oral Reading Fluency - Mid First Grade to end of Third Grade
- Retell Fluency - Mid First Grade to end of Third Grade
- Nonsense Word Fluency - Mid prep to end of First Grade
- Phoneme Segmentation Fluency - Mid prep to end of First Grade
- Letter Naming Fluency - Begin Preschool to mid Prep
- Initial Sound Fluency - Begin Preschool to late Prep
- Word Use Fluency - Begin Preschool to end Third Grade

Preschool or early-Prep screen:
Letter Naming Fluency - a sheet with upper and lower-case letters. Name as many letters as possible in 1 min.
g N E Y R l V d H Z N d x S C n j H s S
E n G h c i h B b O Y F p D L i q c D Q
R v F J Z M P o p u l G A f V B P k m I

LNF < 2	**At risk**
2 ≤ LNF < 8	Some risk
LNF ≥ 8	Low risk

Initial Sound Fluency
Student shown for 1 minute a series of pictures.

This is: tomato, cub, plate, doughnut (point to the pictures).



Which picture begins with /d/?

ISF < 4	**At risk**
4 ≤ ISF < 8	Some risk
ISF ≥ 8	Low risk

Later Prep and early Year 1:

Phonemic Segmentation Fluency - Short words are said aloud for the student. The student must segment the words into phonemes for 1 minute.

Duck	/d/ /u/ /k/
Gone	/g/ /o/ /n/
Hat	/h/ /a/ /t/
Hear	/h/ /ea/ /r/
Punch	/p/ /u/ /n/ /ch/

PSF < 7	At risk
7 ≤PSF < 18	Some risk
PSF ≥ 18	Low risk

Some phonemic awareness programs

Adams, M.J., Foorman, B.R., Lundberg, I., & Beeler, T. (1998). Phonemic awareness in young children. Baltimore, MA: Brookes

Byrne, B., & Fielding-Barnsley, R. (1994). Sound Foundations. Peter Leyden, PO Box 77, Artarmon NSW 2064. (Around $130)

Catts, H. & Vartiainen. (1994). Sounds Abound. Helios Therapy Resources, Adelaide. Ph. (05) 232 0833
DaisyQuest & Daisy's Castle [Computer software]. (1994). Great Wave Software. Available at: http://www.planetmicro.com/great_wave.htm
Department of Education, Queensland. Metalinguistic Awareness Program. Logan West School Support Centre, PO Box 297 Woodridge QLD 4114.(Around $40)
Lindamood, C.H., & Lindamood, P.C. (1969). The ADD Program, Auditory Discrimination in Depth : Books 1&2 Hingman, MA: DLM Teaching Resources.
Hatcher, P.J. (1994). Sound Linkage : An integrated programme for overcoming reading difficulties. London: Whurr Publishers. (Around $80)
Love, E., & Reilly, S. (1995). A Sound Way: Phonological awareness - activities for early literacy. Melbourne: Longman Cheshire. (Around $35)
Pollard, M. (2000). Soundcheck. Australia: Learning Logic.
Pollard, M. (2000). Sylvester Snake's slippery syllables game. Australia: Learning Logic.
Solomons, B. Phonemic Awareness Training. Macquarie University, Special Education Centre. PO Box 6000
Parramatta NSW 2124. (Around $50 incl. video)
Torgesen, J.K., & Bryant, B.R. (1994). Phonological Awareness Training for Reading. Pro-Ed. PO Box 3161. Nerang East. QLD 4211. (Around $270)
Yopp, H.K. (1992). Developing phonemic awareness in young children. The *Reading Teacher*, *45*, 696-703.

Articles describing phonemic awareness programs

Ball, E.W., & Blackman, B.A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly*, *26*(1), 49-66.
Blachman, B.A. (1987). An alternative classroom reading program for learning disabled and other low-achieving children. In R. Bowler (Ed.), *Intimacy with language: A forgotten basic in teacher education* (pp. 49-55). Baltimore: The Orton Dyslexia Society.
Camp, L.W., Winbury, N. E., & Zinna, D.R. (1981). Strategies for initial reading instruction. *Bulletin of the Orton Society*, *31*, 175-89.
Lewkowicz, N. (1980). Phonemic awareness training: What to teach and how to teach it. *Journal of Educational Psychology*, *65*, 19-24.
Liberman, I.Y., Shankweiler, D., Camp, L., Blachman, B., & Werfelman, M. (1980). Steps toward literacy: A linguistic approach. In P. Levinson & C. Sloan (Eds.), *Auditory processing and language: Clinical and research perspectives* (pp. 189-215). New York: Grune & Stratton.
Lie, A. (1991). Effects of a training program for stimulating skills in a word analysis in first-grade children. *Reading Research Quarterly*, *26*, 234-250.
Rosner, J. (1975). *Helping children overcome learning difficulties*. New York: Walker and Co.

What is possible with effective early instruction?

Persistent reading problems can be reduced **to 2-5%** of at-risk students with early, appropriate and at times, intensive, instruction (Brown & Felton, 1990; Felton, 1993).

The instruction should be **structured and explicit** - greater explicitness results in greater gains. Less than **3%** of the population remained severely impaired after **intensive (80 hours)** of one-on-one instruction intervention (Alexander et al., 1997, Torgesen et al., 1997).

20 million (US) children today suffering from reading failure could be reduced by approximately two-thirds. Lyon, G.R. (2001). *Measuring success: Using assessments and accountability to raise student achievement.* Subcommittee on Education Reform Committee on Education and the Workforce U.S. House of Representatives Washington, D.C. [On Line]. Available: http://www.nrrf.org/lyon_statement3-01.htm

The overall rate of severe impairment dropped **to 3% after one semester and 1.5% after two semesters** of intervention (40-80 hours) in first year (Vellutino et al., 1996).

If you identify very-high-risk poor readers (bottom 20 percent of reading ability) in kindergarten and first grade and give them effective, evidence-based instruction, at least **75 percent of this 20 percent will read** (Lyon, 2000). Landauer, R. (2000). Facing up to infirmities in special ed. *The Oregonian*, December 2**.**

In studies in Houston, the overall rate of severe impairment for children who received such explicit instruction for one school year was **4.5%** of the total population (Alexander et al., 1997).

The early identification of children at-risk for reading failure coupled with the provision of comprehensive early reading interventions can reduce the percentage of children reading below the basic level in the fourth grade (i.e., 38%) to six percent or less.
Lyon, G. R. (2003). Why do some children have difficulty learning to read? What can be done about it? *Perspectives*, *29*(2). Retrieved 3/6/2003 from http://www.educationnews.org/Reading-Disabilities-Why-Do-Some-Children.htm.

Intensity, duration, and teacher training/monitoring are important program elements**.**
Report of The Charter G: Ad Hoc Special Committee On Persistent Reading Difficulties
http://www.readbygrade3.com/peer.htm

Are the new brain imaging techniques helpful?

Employing proton echo-planar spectroscopic imaging" (PEPSI), researchers showed that dyslexic and control children differ in brain lactate metabolism when performing language tasks, but do not differ in non-language auditory tasks. The **dyslexic students expend between 4 and 5 times the energy** as controls for the same phonological tasks in the left anterior, or frontal, lobe of the brain.
Richards et al. (1999). Dyslexic children have abnormal brain lactate response to reading-related language tasks. *American Journal of Neuroradiology, 20*, 1393-1398.

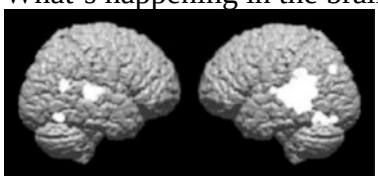
The boys were taught to analyze sound in spoken words, to attach sounds to letters automatically and to use phonological strategies for translating written words into spoken words. **Following treatment, brain lactate elevation was not significantly different from controls**. They made significant gains in analyzing sounds needed to decode words and in sounding out unknown words. After the workshop all but one of the boys could read grade appropriate passages.
Richards, et al. (2000). The effects of a phonologically-driven treatment for dyslexia on lactate levels as measured by Proton MRSI. *American Journal of Neuroradiology, 21*, 916-922. [On-Line]. Available: http://faculty.washington.edu/toddr/dyslexic2.htm

“Readers, asked to imagine "cat" without the "kah" sound, readily summon "at." And the MRI photographs show their brains lighting up like pinball machines. When the brain gets it, the light bulbs really do go on. Conversely, the brains of people who can't sound out words often look different on MRI pictures. **There is less blood flow to the language centres of the brain** and, in some cases, not much activity evident at all. But simply put, without the ability to sound out words, the brain is stumped.”
Lally, K. & Price, D.M. (1997). The brain reads sound by sound: 1997 SDX Awards. The Sun. On-Line at: http://www.sunspot.net/readingby9/initial.shtml

How do we know this phonological emphasis is not just the next fad?

Maybe brain-imaging techniques can shed light?

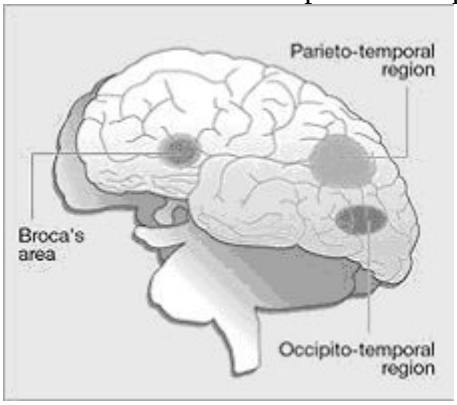
What’s happening in the brain when a good reader confronts text?



Right hemisphere Left hemisphere
Good readers use three areas in the left side of the brain - their function is to decode letters into sounds, fit them together to make words, and process them fluently.
Student learns

- The letters of the alphabet,

- the sounds that the letters represent,
- the sounds are blended to build words.
- The left brain's parieto-temporal region can then be used in decoding (sounding out)

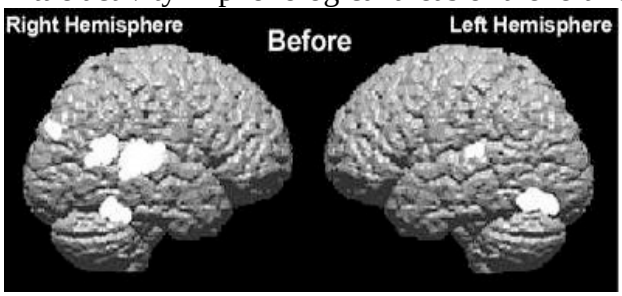


- then, progressively, as they see words in print, they start to build a *neural model* of that word.
- After they've read the word correctly a number of times, their *neural model* is an exact replica of the printed word.
- It reflects the way the word is pronounced, the way it's spelled, and what it means. In the exact neural model, all these features are bonded together.
- They clarify their internal representation, or neural model in the *occipito-temporal region.*
- That word is represented in the *occipito-temporal region*, and its recognition becomes instant & automatic - less than 150 milliseconds (less than a heartbeat).
- You can't go straight to the *occipito-temporal region* without building up the parieto-temporal region.
- On average, from 4-14 accurate sounding-outs will create the firm links necessary.
- For some children, it may take many times that number – not all children have a strong phonological talent.
- A genetic component and an environmental component may be involved.
- Those who struggle to read do not use the same brain regions for reading.
- Instead, they create an alternate neural pathway, reading mostly with regions on the right side of the brain - areas not well suited for reading

If this process does not occur - then children will be forced to employ less fast and accurate systems such as prediction from context and guessing from pictures and guessing from the first letter. Up to 40% of children will figure out the alphabetic principle for themselves quite readily - regardless of instruction, about 30% will get there - but slowly, about 20-30% will not make it without intensive, appropriate direct teaching.

What's happening when a poor reader confronts text?
For the ***poor reader*** there is compensatory activity in the visual centres of the right hemisphere - looking at words as if they were pictures.

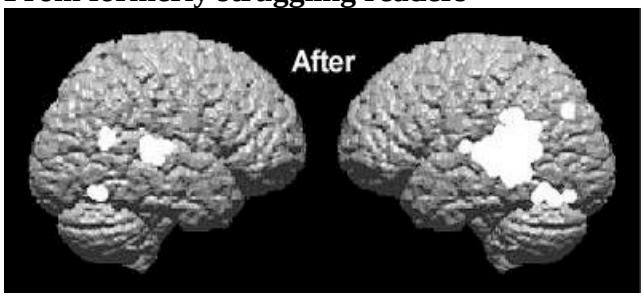
Little activity in phonological areas of the left hemisphere - where capable readers' activity is dominant



The brains of people who can't sound out words look different - less blood flow to the language centres of the brain. Without the ability to sound out words, the brain is stumped (Lally & Price, 1997).

After 60 hours structured intensive phonics teaching (Lyon & Fletcher, 2001)
Less right hemisphere involvement, more left hemisphere phonologically-based activity as reading improves. This also corresponds to the pattern displayed by good readers.

From formerly struggling readers



Right hemisphere Left hemisphere

A Shaywitz et al. 2004 study:
Poor readers were provided with 50 minutes of daily, individual tutoring that was explicit, systematic and focused on helping children understand the alphabetic principle. Increased fluency, accuracy and comprehension at post-test and at 1 year later. The occipitotemporal region continued to develop 1 year after the intervention had ended

Each lesson was built around a five-step plan that included 1) a review of sound– symbol associations (e.g., giving the name, sound, and key word for each letter, as in "a says /a/ as in apple"); 2) practice in phoneme analysis and blending by manipulating letter cards or scrabble tiles to make new words (e.g., changing *sat* to *sap* to *sip* to *slip*); 3) timed reading of previously learned words to develop fluency; 4) oral reading of stories; and 5) dictation of words with phonetically regular spelling-sound patterns (e.g., *chap, spin*).

In this last step, children were encouraged to stretch out the word (say it slowly) before spelling it, to emphasize the phonologic and orthographic connections. In the final few minutes of the lesson, tutors could add extended activities, such as additional text reading, writing, or games to reinforce skills.

Children practiced reading both decodable books (books that include a high percentage of words with phonetically regular spelling-sound patterns) and trade books that do not emphasize phonetically regular text (e.g., traditional stories that appeal to children of this age, such as the *Arthur* series by Marc Brown). As reading proficiency increased, the amount of time spent reading phonetically controlled text decreased, and a wider variety of both narrative and expository texts were introduced to increase fluency, comprehension, and a sense of enjoyment.

Shaywitz, B.A., Shaywitz, S.E., Blachman, B.A., Pugh K.R., Fulbright, R.K., Skudlarski, P., Mencl, W.E., Constable, R.T., Holahan, J.M., Marchione, K.E., Fletcher, J.M., Lyon, G.R., & Gore, J.C. (2004). Development of left occipitotemporal systems for skilled reading in children after a phonologically- based intervention. *Biological Psychiatry, 55,* 926-33.

The program employed was:
Blachman, B.A., Schatschneider, C., Fletcher, J.M., & Clonan, S.M. (2003). Early reading intervention: A classroom prevention study and a remediation study. In B.R. Foorman (Ed.), *Preventing and remediating reading difficulties: Bringing science to scale* (pp. 253–271). Timonium, MD: York Press.

How consistent with these research findings are our government's views on literacy in Victoria

"The Curriculum and Standards Framework (CSF11) provides a strong focus for teaching and learning (i.e., the curriculum) and the standards expected of successful learners. The result is a framework that achieves comparability with the highest Australian and international standards. The English key learning area is organised in three strands: Speaking and listening – Reading – Writing".
http://www.bos.vic.edu.au/csf/csfcd/home.htm

Note in Curriculum and Standards Framework**:**

- The term *phonemic awareness* is absent from the CSF document.
- *Phonics* is mentioned once, and only in relation to teaching writing.
- The terms *explicit, synthetic* and *systematic* do not appear.
- The term *fluency* is absent from the document

"When your child is reading a book, use the 3 P's: Pause, Prompt and Praise. Pause if your child is unsure; wait a moment. Let your child look at the pictures and words to work out the meaning. Give a prompt or cue to encourage them to look more closely and have a go. Ask a question such as: What word might make sense? What would sound right? What does it start with? Praise all efforts. If your child is still unsure after trying, tell them the word so they don't lose the meaning of the story" p.3.
Department of Education, Employment and Training. In The Age, August 29, 2001, Literacy Week Supplement,

Some quotes from a parent home reading information sheet: X Park Primary School.

- "It is inappropriate for your child to be directed to 'sound-out' words, using individual letter sounds, as many words cannot be identified in this manner."
- "When a child gets stuck ask him to have a guess, or look at the picture, add a word that makes sense. Does it 'look right'"?
- "If a mistake makes sense it doesn't necessarily need to be corrected"

X Hill PS 2002 "Teaching your child reading strategies".
If your child has difficulty with a word:

- Ask your child to look for clues in the pictures
- Ask your child to read on or reread the passage and try to fit in a word that makes sense.
- Ask your child to look at the first letter to help guess what the word might be.

Isn't reading really about comprehension? Why the heavy emphasis on decoding words?

In 90% of cases, the source of reading comprehension problems is **poor word recognition skills (Oakhill & Garnham, 1988).**
Stuart,M. (1995). Prediction and qualitative assessment of five and six-year-old children's reading: A longitudinal study. *British Journal of Educational Psychology, 65,* 287-296.

Even among experienced readers individual differences in **comprehension of text reflect efficiency of phonological processing at the word level.**
Shankweiler, D., Lundquist, E., Dreyer, L. G., & Dickinson, C. C. (1996). Reading and spelling difficulties in high school students: Causes and consequences. *Reading and Writing: An Interdisciplinary Journal, 8*, 267-294.

Once **decoding skills are automatized,** growth in text comprehension follows**.**
Foorman, B., Francis, D., Beeler, T., Winikates, D., & Fletcher, J. (1997). Early interventions for children with reading problems: Study designs and preliminary findings. *Learning Disabilities: A Multidisciplinary Journal, 8*, 63-71.

Differences in **reading comprehension** could be explained by differences in **phonological coding on non-words,** but not by differences in semantic word knowledge. p. 220
Elbro, C., Nielsen, I., & Petersen, D. K. (1994). Dyslexia in adults: Evidence for deficits in non-word reading and in the phonological representation of lexical items. *Annals of Dyslexia, 44*, 205-226.

Decoding problems account for the majority of cases of severe reading disability among students of otherwise average intellectual ability (see reviews by Stanovich, 1988; Vellutino & Denckla, 1991). p. 47

Spector, J. (1995). Phonemic awareness training: Application of principles of direct instruction. *Reading and Writing Quarterly, 11,* 37-51.

To examine the relationship between word decoding and reading comprehension, Shankweiler et al. (1999) assembled 361 English-speaking children aged 7.5 to 9.5, of whom 168 had reading disabilities. They found the simple **ability to read aloud a list of English words accounted for 79% of the variance in reading comprehension** ($r = .89$, $p < .0001$). Even the ability to do the same thing with **non-words** (e.g., skirm, bant) correlated very highly with reading comprehension, accounting for **62% of the variance** ($r = .79$, $p < .0001$).
Shankweiler, D., Lundquist, E., Katz, L., Stuebing, K. K., Fletcher, J. M., Brady, S., Fowler, A., Dreyer, L. G., Marchione, K. E., Shaywitz, S. E., & Shaywitz, B. A. (1999). Comprehension and decoding: Patterns of association in children with reading difficulties. *Scientific Studies of Reading, 3,* 69-94.

In each grade, **skill in word recognition was more predictive of reading comprehension** than was listening comprehension.
Juel, C. (1993). The spelling-sound code in reading. In S. Yussen & M. Smith (Eds.), *Reading across the life span* (pp. 95-109). New York: Springer-Verlag.

Facility in decontextualised word identification is a basic prerequisite for extracting meaning from written text. ... performance on the **word identification measure was the best predictor of performance on the reading comprehension test.**
Vellutino, F. R., Scanlon, D. M., & Tanzman, M. S. (1994). Component of reading ability: issues and problems in operationalizing word identification, phonological coding, and orthographic coding. In G. R. Lyon (Ed.), *Frames of reference for the assessment of learning disabilities: New views on measurement issues*. Philadelphia: Brookes Publishing Co., pp. 279-332.

The groups receiving direct instruction in alphabetic code had significantly greater reading comprehension than the literature-emphasis groups. These results are not surprising, given the need for **decoding to be sufficiently automatic that memory and attention can be devoted to grasping the gist of the text.**
Foorman, B., Francis, D., & Fletcher, J. (1997, March 18). *Breaking the alphabetic code, A17.* The Globe and Mail.

“Research suggests that teaching children to read words quickly and accurately can also increase their reading comprehension (Tan & Nicholson, 1997). The theory behind fast and accurate word reading is that good readers are very good at reading words. They have over-learned this skill through much reading practice. As a result, like skilled musicians and athletes, they have developed automaticity, as a result of many hours of word reading practice. What this means is that they have **over-learned word reading skills to the point where they require little or no mental effort. As a result, they are able to put all their mental energies into reading for meaning.”**
G. B. Thompson & T. Nicholson (Eds.) (1998). *Learning to read: Beyond phonics and whole language*. New York: Teachers College Press.

Assessing decoding

Woodcock Reading Mastery Test –Revised (1998) Two forms Ages: 5.6 – 18.6
Subtests: Visual-auditory Learning, Letter Identification, *Word Identification, Word Attack, Word Comprehension, Passage Comprehension*
Word Attack Subtest of Woodcock:
dee ap ift raff bim nan un fay gat roo oss pog poe weat plip dud’s shab whie vunhip nigh bufty sy straced chad than’t tadding twem laip adjex gouch yeng zirdn’t gaked knoink cigbet mancingful wrey bafmotbem translibsodge monglustamer vauge gnouthe quiles cyr pnomocher

What about the Three Cueing system? From:

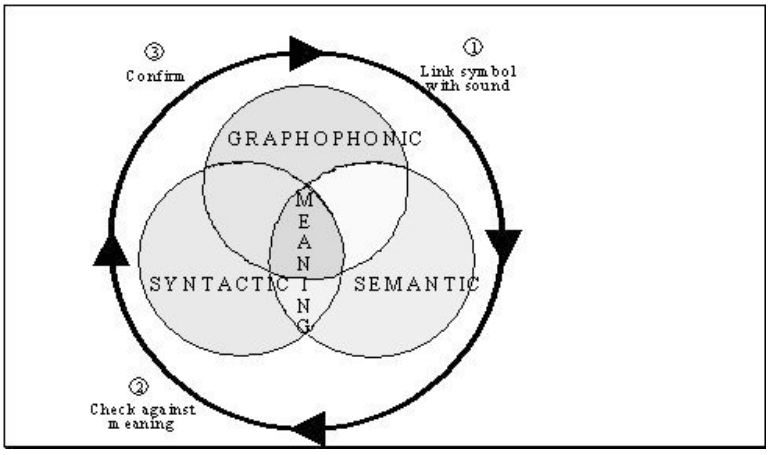
Wren, S. (2001). *Reading and the three cueing systems*. Southwest Educational Development Laboratory. [On-Line]. Available: http://www.sedl.org/reading/topics/cueing.html.
See also Hempenstall, K. (2003). The three-cueing system: Trojan horse? *Australian Journal of Learning Disabilities, 8*(3), 15-23.

Skilled readers do not predict words before they are sighted. Prediction is far too slow and error-filled to be used for word identification. It is useful for helping determine the *meanings* of words that can be decoded but are not in the students vocabulary. Good readers attend to almost every word on the page. Some writers refer to the integrated use of the 3 cueing possibilities; however, the instruction they typically provide does not involve integration. It usually involves asking students to memorise a sequence of questions to be consulted when they cannot immediately recognise and pronounce a word during their reading.

The Three Cueing sequence suggests that children should first try to predict the identity of the word based upon the context (through pictures or understandings derived from previous parts of the passage). Failing that, the children should employ their understanding of syntax (is it likely to be a verb, a noun?), and finally, if the other two cueing systems fail to provide an appropriate word, the child should focus on the letters of the word imagine a word that *looks right*. (It is often suggest that students consult the first letter (and possibly the last letter) of the word to aid their guess.

This process does not represent the integration of cues but a direction to students that they should use prediction as their primary word identification strategy, and more prediction as their secondary strategy. It assigns last position in the hierarchy of strategies to the alphabetic principle, and is therefore contrary to the evidence on the nature of skilled reading and the most helpful methods of ensuring students achieve that state.

A revised form of the 3 Cueing system is presented below: It acknowledges the pre-eminent role of the alphabetic principle, and the subservient roles of the contextual cues. They are sometimes helpful to beginning readers, but only when the structure of the word provides insufficient cues for the limited development of the reader.



"The scientific evidence is simply overwhelming **that letter-sound cues are more important in recognizing words than either semantic or syntactic cues."** (p. 16).
Pressley, M. (1998). Reading instruction that works: The case for balanced teaching. New York: Guilford.

The Panel also refers to phonics. So what do they mean by phonics?

Phonemic Awareness Ain't Phonics

Phonics means:

a) the relationship between sounds and their symbols,
b) the methods of instruction used to teach those relationships
c) the mental activity of using the sound-symbol relationship to “read through” a new word

Phoneme awareness is a necessary but not sufficient condition for learning to read an alphabetic writing system. Complicating the issue is the problem that English is not a transparent orthography:
English and French are more complex than Italian. English has 1,120 ways of representing 40 sounds, whereas there are only 25 sounds in Italian and they are represented in 33 combinations of letters. The disorder is more common in the United States than in Italy.
In Any Language, Dyslexia. (2001, 19 March). The Washington Post. [On-Line]. Available: http://www.washingtonpost.com/ac2/wp-dyn/A23845-2001Mar18?language=printer

Isn’t the English language too irregular for phonics to be of much help?
There are either phonics or spelling rules that govern about 75% of our language. However, if one relies only on the 44 phonics sounds without expanding one's knowledge to cover spelling rules, then 40% might be closer to accurate. After basic sound/symbol phonics teaching occurs, more advanced coding needs to be taught. The sound /ik/ will be spelled "ick" as in trick, thick, flick, sick, Rick, brick as long as it is a one syllable word. If it is at the end of the second syllable or more, it is spelled "ic" as in panic, magic, fantastic, Titanic, etc.

At least 80% of English spellings are regular or predictable.
Hanna, P.R., Hodges, R.E., & Hanna, J.S. (1971). Spelling: Structure and strategies. Boston: Houghton Mifflin.

Rules of limited regularity can be absorbed and utilized if the exceptional cases are presented explicitly and in close proximity to the generalization. Complex and abstract rules like the silent-e rule can be mastered with direct instruction and applied consistently to the decoding task.
Labov, L. (2003). When ordinary children fail to read. *Reading Research Quarterly, 38,* 128-131.

The implication for educators is that it is necessary to know which phonic patterns have high rates of usage, and focus on those phonic patterns. “English must be examined . . . as a complex system that is basically phonetic, but also relies on patterns and meaning to provide an optimal system” (Johnston 142).
Johnston, F.P. (2001). The utility of phonic generalizations: Let’s take another look at Clymer’s conclusions. *The Reading Teacher. 55,* 132-142.

Even the decoding of irregular words is assisted by phonic mediation because no English word is completely phonologically opaque (Tunmer et al., 1998).
Stacey, S., & Wheldall, K. (1999). Essential constituents of effective reading instruction for low progress readers. *Special Education Perspectives, 8*(1), 44-58.

The most effective instructional programs teach children to read successfully with only 40 to 50 sound-spelling relationships. (Writing can require a few more, about 70 sound-spelling relationships.) The chart below is not taken from any particular program but represents the 48 most regular letter-phoneme relationships. (The given sounds for each of the letters and letter groups are either the most frequent sound or occur at least 75% of the time.) www.early-reading.com/home/research/research_04.html

The 48 most regular sound-letter relationships.
a as in fat, **g** as in goat**, v, m, l, e, t, h**, **u-e** as in use, **s, u, p, i** as in sit, **c** as in cat, **w** "woo" as in well, **f, b, j**, **a-e** as in cake, **n**, **I-e** as in pipe, **d, k, y** "yee" as in yuk, **r, o-e** as in pole, **z, ch** as in chip, **ou** as in cloud, **kn** as in know, **ea** as in beat**, oy** as in toy, **oa** as in boat, **ee** as in need, **ph** as in phone, **oi** as in boil, **er** as in fern, **qu** as in quick, **ai** as in maid, **ay** as in hay, **sh** as in shop, **ar** as in car**, igh** as in high, **th** as in thank, **au** as in haul, **ew** as in shrewd, **ir** as in first, **aw** as in lawn.

Phonics Ain’t Phonics Neither

Explicit (synthetic) phonics: Builds up from part to whole; implicit phonics breaks down from whole to part. If whole words are introduced before short vowel sounds, it's not a systematic phonics program.
Implicit (analytic) phonics: "The sound you want occurs in these words: mad, maple, moon" This implies students can compare the sounds in words, that is have already established phonemic awareness.
Synonyms for implicit (analytic) phonics: "systematic contextualized phonics" - "balanced" - "embedded phonics" - "integrated language arts" - “phonics in context” - “eclectic approach” - “onset-rime approach”

Analytic phonics:

- The whole word is seen and children have their attention drawn to certain letters and their sounds
- It is often taught after an initial sight vocabulary has been established, alongside reading-scheme books
- It can take up to three years.

Synthetic phonics:

- All of the letter sounds are taught very rapidly and the emphasis is on how words are built up
- It generally starts before children are introduced either to whole words, or to reading-scheme books
- It can be taught in a few months.

Watson, J.E., & Johnston, R.S. (1998). *Accelerating reading attainment: The effectiveness of synthetic phonics. Interchange, 57*, 1-12 Edinburgh: The Scottish Office. [On-line]. Available: http://www.scotland.gov.uk/library/documents7/interchg.pdf

Phonics Instruction

Phonics instruction is a way of teaching reading that stresses the acquisition of letter-sound correspondences and their use in reading and spelling. The primary focus of phonics instruction is to help beginning readers understand how letters are linked to sounds (phonemes) to form letter-sound correspondences and spelling patterns and to help them learn how to apply this knowledge in their reading. Phonics instruction may be provided *systematically* or *incidentally*. The hallmark of a *systematic* phonics approach or program is that a *sequential* set of phonics elements is delineated and these elements are taught along a dimension of *explicitness* depending on the type of phonics method employed. Conversely, with *incidental* phonics instruction, the teacher does not follow a planned sequence of phonics elements to guide instruction but highlights particular elements opportunistically when they appear in text.
April 2000. Findings and Determinations of the **National Reading Panel**:
http://www.nichd.nih.gov/publications/nrp/findings.htm

What’s the problem with *Implicit* Phonics?
It proves less effective than explicit phonics, and especially so for at-risk students. While more able students can induce the phonic strategies needed, about 30-50% really need to have the relationships carefully explained, and provided with multiple opportunities for practice.

This example highlights the problems for those who never grasp the alphabetic nature of our written language. Betty Price, Director of Professional Reading Services reports that she was hired to tutor a fully licensed pharmacist who was unable to discern the difference between "chlorpromamide" (which lowers blood sugar) and "chlorpromazine" (which is an antipsychotic)! They look similar if the initial letters are your primary cue, and you don’t routinely attend to syllables.

In *Systematic* phonics instruction, the term *Systematic* is about the delivery rather than the content
There will be attention to the detail of the teaching process.

- teacher-directed,
- based on an analysis of the skills required and their sequence.
- massed and spaced practice of those skills (sometimes in isolation),
- corrective feedback of errors, and
- continuous evaluation of progress.

***Incidental* phonics instruction -**

Shifts the responsibility for making use of phonic cues from the teacher to the student. It assumes that students will develop a *self-sustaining, natural, unique reading style* that integrates the use of *contextual and grapho-phonic cues*, without the postulated disabling influence of systematic instruction.

Sadly, for struggling students such well-intentioned clues are neither explicit enough, nor are they likely to occur with sufficient frequency to have any beneficial impact. This approach is sometimes called embedded phonics because teachers are restricted to using only the opportunities for intra-word teaching provided within any given story.

Explicit phonics
In explicit phonics instruction, the sounds associated with the letters are identified in isolation and then "blended" together to form words. During a typical explicit phonics lesson, the children will be asked to produce the sounds of the letters that appear in isolation and in words. A critical step in explicit phonics instruction is blending the isolated sounds of letters to produce words. (1)

***Systematic* phonics**
In systematic code instruction, decodable books are used that are aligned with the sound-symbol associations taught in the lesson. These books, created to make independent reading possible for a beginner, are a device to provide practice reading words that have specific spelling patterns or letter-sound correspondences and to encourage sounding words out. (2)

Decodable Text
Decodable text is composed of words that use the sound-spelling correspondences the children have learned to that point and a limited number of sight words that have been systematically taught. As the children learn more sound-spelling correspondences, the texts become more sophisticated in meaning. (3)

"Research asserts that **most children benefit** from direct instruction in decoding, complemented by practice with simply written **decodable stories**. Further, for some children this sort of systematic approach is critical. Stories should 'fit' the child's reading level. Beginning readers should be able to read easily 90 percent or more of the words in a story".
Federal Academics 2000 (Public Law 103-227), "First Things First"

"Thus phonological training that is **integrated** with phonics training may be as effective as phonological training conducted separately from phonics training."
Hart, T. M., Berninger, V. M., & Abbott, R. D. (1997). Comparison of teaching single or multiple orthographic-phonological connections for word recognition and spelling: Implications for instructional consultation. *School Psychology Review, 26*(2), 279-297.

Major implications for early reading instruction of NICHD research

1. Begin teaching phonemic awareness directly at an early age (kindergarten).
2. Teach each sound-spelling correspondence explicitly.
3. Teach frequent, highly regular sound-spelling relationships systematically.
4. Show children exactly how to sound out words.
5. Use connected, decodable text for children to practise the sound-spelling relationships they learn.
6. Use interesting stories to develop language comprehension.
7. Balance but don't mix comprehension and decoding activities in the beginning.

Grossen, B. (1997). *A synthesis of research on reading from the National Institute of Child Health and Human Development*. Retrieved 12/2/03 from http://www.nrrf.org/synthesis_research.htm

The National Reading Panel refers to fluency. What is reasonable fluency?

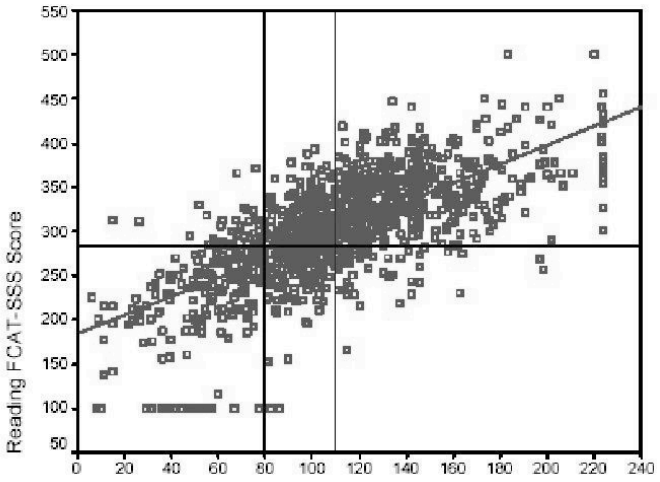
Meyer and Felton defined *fluency* as "'the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading, such as decoding"
http://www.ldonline.org/ld_indepth/reading/reading_fluency.html

The ability to read aloud accurately, rapidly, expressively and with understanding. Very high (> .85) correlations between oral reading rate and reading comprehension. The faster you can produce it. The stronger the association, thus the better you know it. When you know it to automaticity, you don't use your conscious mind to do it. This frees up resources for other tasks like comprehension.

Fuchs, Fuchs, Hosp, and Jenkins (2001) reported evidence that a very brief measure of oral reading fluency was a better predictor of performance on a reading comprehension outcome measure than was a brief measure of reading comprehension itself. In this study, with middle and junior high school students with reading disabilities, the correlation between oral reading fluency and the reading comprehension measure was a nearly perfect .91.

More recently, researchers comparing third graders' performance on the Dynamic Indicators of Basic Early Literacy Skills measure of Oral Reading Fluency to their scores on state assessments of reading comprehension have found correlations of .70 with the Florida Comprehensive Assessment Test (Buck and Torgesen, 2003) and .73 with the North Carolina end-of-grade assessment (Barger, 2003).

Students in 3rd grade at or above 110 wcpm are at low risk of reading below grade level (9%) on the state reading comprehension test (FCAT). Students scoring below 80 wcpm are at high risk



25/8/2005 bmitchell@ec.rr.com **Roger Bacon School Wilmington NC**
Dear Kerry, After doing all three DIBELS (beginning, middle, and end) and dealing with the needed interventions and putting in some Precision Teaching in the second semester (which really made the DIBELS rates jump from mid to end) we made the TOP 25 K-8 schools (out of 1865 in the state) list published by the state Board of Education. Thanks for your part in helping the kids reach this lofty goal (never before achieved by any school in Brunswick, New Hanover, or Pender Counties).
Baker Mitchell

Expected Reading Rates
First half of grade 1 = 45 words per minute
Second half of grade 1 = 60 wpm
First third of grade 2 = 75 words
Second third of grade 2 = 90 wpm
Last third of grade 2 = 110 wpm
First half of grade 3 = 120 wpm
Second half of grade 3 = 135 wpm
Fourth grade and higher = 150 wpm
Carnine, D., & Silbert, J. (1979). *Direct Instruction: Reading*. Columbus, OH: Merrill.

Early 1st = 35 words per minute
Late 1st = 50 wpm

Early 2nd = 70 wpm
Late 2nd = 100 wpm
Early 3rd = 120 wpm
Late 3rd = 140 wpm
From Howell, K.W. & Nolet, V. (2000). *Curriculum-based evaluation: Teaching and decision making*. Belmont, CA: Wadsworth/Thomson Learning.

CBM passages can be obtained from several sources, including:
www.readingprogress.com (18 alternate passages at each grade for grades 1-5);
dlspeece@wam.umd.edu (15 alternate passages at each grade for grades 1-4);
http://www.studentprogress.org/default.asp (30 alternate forms at each grade for grades 1-7);
http://dibels.uoregon.edu/ (DIBELS; 9 passages at each grade for grades 1-6);
www.edformation.com (33 alternate passages at each grade for grades 2 - 8; 23 alternate passages for grade 1).

CRP Decoding Gains: Approximately one grade level in 65 lessons.

Level A - early 1st Year to early 2nd
(Start Rate 45 wpm - End Rate 60 wpm)

Level B1 - early 2nd Year to end of 2nd
(Start Rate 60 wpm - End Rate 90 wpm)

Level B2 - early 3rd Year to end of 3rd
(Start Rate 90 wpm - End Rate 120 wpm)

Level C1 - early 4th Year to end of 4th
(Start Rate 100 wpm - End Rate 120 wpm)

Level C2 - early 5th Year to end of 5th.
(Start Rate 120 wpm - End Rate 130 wpm)

Students in **second grade** whose reading rates were higher than **45 words per minute** appeared more able to practise reading independently.
Dowhower, S. L. (1987). Effects of repeated reading on second-grade transitional readers' fluency and comprehension. *Reading Research Quarterly, 22*, 389-406.

“Research suggests that teaching children to read words quickly and accurately can also increase their reading comprehension (Tan & Nicholson, 1997). The theory behind **fast and accurate word reading** is that good readers are very good at reading words. They have over-learned this skill through much reading practice. As a result, like skilled musicians and athletes, they have developed automaticity, as a result of many hours of word reading practice. What this means is that they have over-learned word reading skills to the point where they require little or no mental effort. As a result, they are able to put all their mental energies into reading for meaning.”
G. B. Thompson & T. Nicholson (Eds.) (1998). *Learning to read: Beyond phonics and whole language.* New York: Teachers College Press.

The average reading rate (when reading grade level material) of **fifth graders** referred for reading assistance is about **60 words per minute** (Rasinski & Padak, 1998) compared to the average rate of above **150 wpm**.
Rasinski, T.V. (2000, Oct). Speed does matter in reading. *The Reading Teacher, 54*, 146-151.

Test of Word Reading Efficiency (TOWRE) Pro-Ed http://www.proedaust.com.au/index.htm
Ages: 6-0 through 24-11 Testing Time: 5-10 minutes Administration: Individual
The Test of Word Reading Efficiency (TOWRE) is a normed measure of word-reading accuracy and fluency. Because it can be administered very quickly the test provides an efficient means of monitoring the growth of two kinds of word reading skills that are critical in the development of overall reading ability: the ability to accurately recognize familiar words as whole units or "sight words" and the ability to "sound out" words quickly.

"The speed of naming pronounceable nonwords is one of the tasks that most clearly differentiates good from poor readers."

Stanovich, K.E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford Press.

What about <u>older</u> students? Phonemic awareness, phonics, and older students

It is not entirely clear what implications the phonemic awareness research has for older children and adults who struggle with reading. It may be that there is a level of phonemic awareness (O'Connor, Notary-Syverson, & Vadasy, 1996) beyond which there is no advantage for reading development in attempting its enhancement. Indeed, it is possible that for older children phonemic awareness is no longer the appropriate focus, as students may be more in need of orthographic (whole word) rather than phonemic strategies. Not so, asserts Share (1995). He argues that without the induction of the alphabetic principle, skilled reading (implying the use of a generative strategy capable of decoding novel words) will not occur. His view is supported by the finding that dyslexic adult readers (even those with strong compensatory orthographic capacities) continue to demonstrate phonemic awareness deficits, and struggle to decode novel words (Bruck, 1992; Hulme & Snowling, 1992; Pratt & Brady, 1988; Siegel, 1993; Solman & Stanovich, 1992).

When considering older students and adults, since the task remains the same, the techniques proved most successful for young students have an a priori advantage over other alternatives in the absence of contrary evidence. There has been some reported work with older children, adolescents and adults. Elbro, Neilsen and Petersen (1994) argued for emphasis upon the alphabetic principle because of the memory constraints imposed by training in whole word recognition:

> In many cases the adults reported that they had completely overcome their reading difficulties, but when asked to read novel words they hesitated and admitted that this was difficult for them. These results underline the validity of a positive definition of dyslexia that is based on poor mastery of the phonemic principle of written language. (Siegel, 1988; Stanovich, 1991; Rack, Snowling, & Olsen, 1992; Stanovich & Siegel, 1992). (p.220).

A number of similar studies involving adults with reading difficulties have revealed marked deficits in decoding (Bear, Truax, & Barone, 1989; Bruck, 1990, 1992, 1993; Byrne & Letz, 1983; Perin, 1983; Pratt & Brady, 1988; Read & Ruyter, 1985; cited in Greenberg, Ehri, & Perin, 1997). In the Greenberg et al. (1997) study the adults' performance on phonologically-based resembled those of children below 3rd grade. The findings were also consistent with those of Bruck (1992), Byrne & Letz (1983), Fawcett & Nicholson (1995), Pennington, Van Orden, Smith, Green, and Haith (1990), and Pratt and Brady (1988). Even very bright well-compensated adult readers acknowledge that they have had to laboriously remember word shapes, have little or no idea how to spell, and are constantly struggling with new words, especially technical terms related to their occupations. These are classic symptoms of the need for a strong phonics emphasis in the instructional process; indeed, some have argued (Greenberg et al., 1997) that it is most likely the failure of the school system to address the phonological nature of the reading problem that precluded satisfactory progress for these individuals.

The critical variable is not age but stage - whether child or adult - the path to facile reading is similar. Certainly adults have a history that cannot be ignored - most relevant is the likelihood of unproductive habits strongly engraved by years of practice. Adults need to unlearn in addition to learning. The implication is that this may entail slower progress, with the requirement of (possibly) vast amounts of practice accompanied by feedback to ensure the new habits are used effectively. On the positive side is that adults are usually vastly more experienced with language in general, and when their decoding difficulties are relieved their comprehension of what they read improves much more rapidly than it does for most young children.

Phonics is the starting motor for an engine subsequently fuelled by confidence and enjoyment. Some starting motors turn sluggishly and demand a significant load from the battery (parents and teacher). If the battery fails, the journey may never begin. However, all phonics are not equal. It is possible to teach phonics carefully and with parsimony; it is possible to do so ineffectively and excessively; and it is possible to do it in name only.

Questions such as “What/When/How much phonics?” continue to be examined, but not the question “Should we teach phonics?”, for it has been answered resoundingly in the affirmative.

From grades 2 to 6 there is no evidence of a developmental window beyond which phonological deficits cannot be effectively remediated with intensive phonological training**.**
Lovett, M.W., & Steinbach, K.A. (1997). The effectiveness of remedial programs for reading disabled children of different ages: Does the benefit decrease for older children? *Learning Disability Quarterly, 20,* 189-209.

Older students: Why are so many struggling students not noticed until about Year Four and beyond?

At about Year Four, there is a marked increase in the number of children referred for reading assistance (Chall, Jacobs, & Baldwin, 1990). This may represents the dawning of teachers’ recognition that the maturational delay hypothesis can no longer be used to explain the lack of reading progress. More salient perhaps is the generally unacknowledged explosion of new words in textbooks at about that time (Carnine, 1982) and of the increased complexity of the words in those texts (Henry, 1991). Many students who have relied upon whole-word memory recognition as their mode for storage and retrieval find the strategy collapses in Year Four. Whereas a word recognition capacity of 400 words is adequate for coping with text up to this time (and many children’s visual memory can manage such a load), the demand increases dramatically to about 4000 words around that year, and up to 7000 words by Year Six (Carnine, 1982), what Share (1995) describes as an “orthographic avalanche”(p.17).

For the student who relies primarily on word shape, the task is similar to that required in visually memorizing 7000 telephone numbers. In those languages that do rely on images rather than an alphabet for their construction, the number of words that are typically employed in print is far less than in English. For example, Chinese adults are said to have a working familiarity with only about 4000-5000 (Adams, 1990). Students who cannot access the phonological route to identify the escalating array of new words obviously struggle, and progress grinds to a halt. In truth, they had difficulties before this time, but perhaps managed to disguise them in classrooms where careful continuous assessment of word attack skills was unavailable. Unfortunately, this under-identification appears to be even more likely for girls, as their rate of referral for assistance (about 1 in every 4 referrals) does not match the prevalence (about equal with males) of reading problems among females in our society (Alexander, Gray, & Lyon, 1993).

A low *Woodcock:* Word Attack score suggests this scenario in students at (or beyond) Year Four. For younger students it is predictive of their reading future. Inability to decode pseudo-words is indicative of the need for an intensive, carefully designed program that provides at least a reasonable opportunity for the accelerated progress needed if a student is to make headway against his peers. If a student is two years behind his peers he must develop in reading at a rate twice as fast as they do, if he is to catch them by the end of primary school (as they will improve by at least two years over that period). While this conception of reading progress is rather crude it does give the flavour of just how immense a task it is. It also helps explain the chilling finding from a Melbourne University study (Hill, 1995), that for most students in this position there is no discernible improvement in reading between Year Four and Year Ten. Most students do not have access to intervention, and their prognosis is grim. For those students who do receive help it is incumbent upon us to provide the best and most efficient intervention available at the time. This implies that the most salient content must be delivered to students in the most effective manner possible.

In a study of 3000 Australian students, 30% of 9 year olds still hadn’t mastered letter sounds, arguably the most basic phonic skill. A similar proportion of children entering high school continue to display confusion between names and sounds. Over 72% of children entering high school were unable to read phonetically regular 3 and 4 syllabic words. Contrast with official figures: In 2001 the Australian public was assured that ‘only’ about 19% of grade 3 (age 9) children failed to meet the national standards.

Harrison, B. (2002, April). Do we have a literacy crisis? *Reading Reform Foundation Newsletter, 48.* [On-Line]. Available: http://www.rrf.org.uk/do%20we%20have%20a%20literacy%20crisis.htm

Students from the 10th and 90th percentiles differ by grade equivalents equal to their grade (i.e., 6 grade range at the end of 6th grade). (Biemiller, personal communication, August 1, 2002) Professor Andrew Biemiller, Institute of Child Study, University of Toronto.

"Learning to read is not just one of the goals of schooling. It is essential if students are to succeed in any grade, in any subject. According to the National Reading Panel, only about 5% of children learn to read effortlessly. About 60% find early reading difficult, and of that number, 20-30% really struggle. By fourth grade, the seriousness of the problem for these children becomes obvious" p.34.
Lewis, L. & Paik, S. (2001). *Add it up: Using research to improve education for low-income and minority students*. Washington: Poverty & Race Research Action Council. [On-Line]. Available: http://www.prrac.org/additup.pdf

What do teacher organisations overseas report about older students?

Among the recommendations of the Learning First Alliance in their report: "Every Child Reading: An Action Plan of the Learning First Alliance" (June 1998, available at WWW.ReadByGrade3.com) are the following:

"D. Older Nonreaders:
We have stressed reading success for children in the early grades because it is easier to prevent reading problems than to remediate them, and unfortunately, there are few proven strategies to help upper-grade nonreaders. As we move to end early reading failure, we must also solve the problem presented by children who did not learn to read in the early grades. A number of children at the upper elementary, middle, and high school levels are reading poorly or not at all. Students at that level are likely to have motivational problems in addition to whatever factors led them not to learn to read in the primary-grades.

There is a critical need for further research to identify effective strategies and programs for remediating reading problems in older children, but we do know some promising approaches that can be applied now. Where older nonreaders demonstrate word recognition difficulties, structured phonics and spelling instruction are warranted. Reading programs built on sound phonetic principles can often make a remarkable difference in student's reading performance in a period of months. In addition, it is essential that opportunities be created to increase the quantity and quality of reading experiences for all such students. This should include careful selection of level-appropriate texts for independent reading as well as supported reading of more challenging material, including classroom assignments.

Children who are adequate decoders but poor comprehenders can be taught comprehension strategies in which they summarize information, generate questions, retell stories or other content, and learn to monitor their own comprehension. There are a number of effective programs to teach study skills, which are closely related to reading comprehension. Many older nonreaders benefit from working with a "study buddy," such as an older student, a volunteer, or a parent, who helps them organize information, look for key ideas in the books they are reading, and practice reading out loud. A smaller percentage of these older nonreaders are likely to have other more serious problems, such as auditory discrimination. These students will require different types of interventions. Comprehension strategies such as finding the main idea, starting with simple paragraphs and moving to more complex material. All of these strategies help build reading comprehension skills that will work with any reading material, not just the particular stories or content children are reading."

The Learning First Alliance comprises the following organizations: American Association of Colleges for Teacher Education; American Association of School Administrators; American Federation of Teachers; Association for Supervision and Curriculum Development; Council of Chief State School Officers; Education Commission of the States; National Association of Elementary School Principals; National Association of Secondary School Principals; National Association of State Boards of Education; National Education Association; National PTA; National School Boards Association.

Other research on <u>older</u> students:

Studies involving adults with reading difficulties have revealed marked **deficits in decoding** (Bear, Truax, & Barone, 1989; Bruck, 1990, 1992, 1993; Byrne & Letz, 1983; Perin, 1983; Pratt & Brady, 1988; Read & Ruyter, 1985; cited in Greenberg, Ehri, & Perin, 1997).

The adults' performance on **phonologically-based tasks** was worse than that reading-level matched young children, resembling those of children **below 3rd grade**. These findings are also consistent with those of Bruck (1992), Byrne & Letz (1983), Fawcett & Nicholson (1995), Penington, Van Orden, Smith, Green, and Haith (1990), and Pratt and Brady (1988). … they may not have received adequate instruction in decoding and spelling to remediate the phonological deficits. p.272

Greenberg, D., Ehri, L. C., & Perin, D. (1997). Are word reading processes the same or different in adult literacy students and third-fifth graders matched for reading level? *Journal of Educational Psychology, 89*, 262-275.

When we gave this (Auditory Analysis Test) and other tests of phonemic awareness to a group of 15-year-olds in our Connecticut Longitudinal Study, the results were the same: **even in high school students, phonological awareness was the best predictor of reading ability.**

Shaywitz, S (No date). *Dyslexia.* [On-Line]. Available: <u>http://www.sciam.com/1196issue/1196shaywitz.html</u>

What about the very early preschool years? Aren't they important too?

Educational experiences in preschool cannot completely compensate for the educational deprivation that can occur during the first 3 years. **Early vocabulary development** is particularly critical. Parents with *professional* jobs spoke about 2,000 words an hour to toddlers. For *working-class* parents it was 1,200 words an hour, and for those *on welfare* only 600 words an hour.

Compared to children from the families in the highest fifth of socioeconomic status, the kindergartner whose family falls in the lowest fifth:

- Owned just 38 books, compared to the 108 owned by the top fifth, and was read to much less often
- Was far less likely to have a computer in the home (20% versus 85%)
- Was much less likely to have been taken to a museum, a public library, a play, or to have participated in dance, art, music, or crafts classes.
- Spent the most hours per week watching television (18 versus 11 hours)
- Was far more likely to have only one parent (48% versus 10%) and to have moved around more.

Lee, V.E. & Burkam, D.T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school.* USA: The Economic Policy Institute.

> Children who do not receive a strong language and emergent literacy foundation during the preschool years frequently have difficulties comprehending and using language and developing strong reading and writing abilities throughout their school tenure.
>
> Children from poor families are still much more likely to enter school with limited vocabularies, meagre early literacy and other pre-academic concepts, and a motivation to learn that is already on the wane.
>
> The major perpetuating factor is school failure, which, in turn, is typically the result of reading failure in school. The cycle goes on! But it doesn't have to.
>
> It is likely that these mothers cannot read well enough to read to their new babies or to their other children.
>
> Unless we do something of substance for those babies, they will most likely be repeating this cycle with their own newborns over the next two decades.

Lyon, G.R, (2001, July 30). Summary comments White House Early Childhood Cognitive Development Summit. *Education News Org*. [On-Line]. Available: <u>http://www.educationnews.org/white_house_early_childhood_cogn.htm</u>

It is very important for us to reflect honestly and objectively on why the development of a science of early childhood has been so long in developing and why so many of our children continue to flounder once they reach kindergarten and elementary school. To be blunt, one reason is that many people working with our young

children DO NOT KNOW WHAT THEY DO NOT KNOW. Let me be even more blunt. Much of the thinking in the early childhood education community over the past three decades has been predicated upon faulty assumptions and beliefs about development, appeals to scientific authorities that actually did not explicitly or carefully address the issues we are discussing here, and less than rigorous or informed scientific study.
Lyon, G.R, (2001, July 30). Summary comments White House Early Childhood Cognitive Development Summit. *Education News Org*. [On-Line]. Available: http://www.educationnews.org/white_house_early_childhood_cogn.htm

President Bush's "Good Start, Grow Smart" initiative includes the following elements:
http://www.nsba.org/sbn/02-apr/042302-1.htm. April 24 2002

- Federal support for high-quality early childhood education programs is critical "if this nation is to make significant gains in the academic performance of our public school students."
- Provide large funding increases for early childhood education.
- States to develop guidelines on building pre-reading and language skills aligned with state K-12 standards.
- Implement a national training program for 50,000 Head Start teachers in early literacy teaching techniques.
- $45 million research collaboration between the National Institute of Child Health and Human Development and the Education Department to identify effective pre-reading and language curricula and teaching strategies.

What about the National Reading Panel's interest in vocabulary?

The average number of new words taught directly in a year - about 300 to 500. The average number of new words learned in a year - about 3,000 to 4,000.
Osborn, J.H. & Armbruster, B.B. (2001). Vocabulary acquisition: Direct teaching and indirect learning. *Basic Education Online Edition, 46*(3). [On-Line]. Available: http://www.c-b-e.org/be/iss0111/a2osborn.htm

Beginning in about the third grade, the major determinant of vocabulary growth is the amount of free reading.
Nagy, W., & Anderson, R. (1984). How many words are there in printed school English? *Reading Research Quarterly, 19*, 304-330.

Extensive independent reading is the primary means for increasing vocabulary knowledge (Nagy, 1998). Students who read more learn more about words and their meanings. Although direct, explicit teaching of word meanings is effective and important, it cannot produce the needed growth in students' vocabulary knowledge that should occur in the fourth grade.
Nagy, W. (1998). Increasing students' reading vocabularies. Presentation at the Commissioner's Reading Day Conference, Austin, Texas.

According to the National Reading Panel (2000), estimates of students' vocabulary size indicate that most of a student's vocabulary is learned in contexts other than formal learning, especially through independent reading.
Osborn, J.H. & Armbruster, B.B. (2001). Vocabulary acquisition: Direct teaching and indirect learning. *Basic Education Online Edition, 46*(3). [On-Line]. Available: http://www.c-b-e.org/be/iss0111/a2osborn.htm

(In this study) children at the 10th percentile of reading ability in the fifth grade sample read about 50,000 words per year out of school. The comparable figure at the 90th percentile was 4,500,000 words.
Fielding, L., Wilson, P., and Anderson, R. (1986). A new focus on free reading: The role of trade books in reading instruction. In T. Raphael & R. Reynolds (Eds.), *Contexts of literacy* (pp.149-160). NY: Longman

Children had on average acquired about 5,200 root words in their vocabulary by the end of grade 2 and an average 3,200 additional root words in grades 3-5 and that advantaged children had acquired 6,200 root words by the end of grade 2 and an additional 2,500 thereafter. Thus, large differences in root word vocabulary had occurred by grade 2.

Biemiller, A., & Slonim, N. (2001).Estimating root word vocabulary growth in normative and advantaged populations: evidence for a common sequence of vocabulary acquisition. Journal of Educational Psychology, 93, 498-520.

Print exposure appears to compensate for modest levels of general cognitive abilities .... low ability need not necessarily hamper the development of vocabulary and verbal knowledge as long as the individual is exposed to a lot of print. p.162
Stanovich, K.E. (1993). Does reading make you smarter? Literacy and the development of verbal intelligence. *Advances in Child Development and Behaviour, 24*, 133-180.

By the end of first grade, the good readers in our study had seen approximately 18681 words in running text in their basal readers. The poor readers, however, had seen only about half as many – 9975. … by at least the end of second grade (it) is further compounded by differences in the amount of time spent reading outside of school (Juel, 1988).
Juel, C. (1993). The spelling-sound code in reading. In S. Yussen & M. Smith (Eds.), *Reading across the life span* (pp. 95-109). New York: Springer-Verlag.

Vocabulary
New words are learned mainly through reading. Children's books contain 50% more "rare" words (outside the vocabulary of 9-12 yr olds) than do adult prime time television, or the conversation of college graduates. Popular magazines have roughly three times as many opportunities for new word learning as prime-time television and adult conversation.
Stanovich, K.E. (1993). Does reading make you smarter? Literacy and the development of verbal intelligence. *Advances in Child Development and Behaviour, 24*, 133-180.

Only above average readers gained significantly in incidental (vocabulary) learning. Reading stories to children will only increase the vocabulary of above average readers.

Nicholson, T., & Whyte, B. (19XX). Matthew effect in learning new words while listening to stories. In *Literacy research: Theory and practice.*

And Comprehension? What does the National Reading Panel have to say?

Direct teaching of meta-cognitive skills

Metacognition: One's knowledge concerning one's own cognitive processes and products of anything related to them. Involves:
(a) *Specific strategy knowledge*. What strategies might I use here?
(b) *Executive processes*. What strategy will I use here? How is it going?
(c) *General strategy knowledge*. I will seek the best strategy because it helps.

Some strategies
Skimming, Imagining, Drawing, Elaborating, Paraphrasing, Mnemonics, Accessing prior knowledge, Reviewing, Orienting to critical features.
Swanson, H.L., & Hoskyn, M. (1998). Experimental intervention research on students with learning disabilities: A meta-analysis of treatment outcomes. *Review of Educational Research, 68,* 277-321.

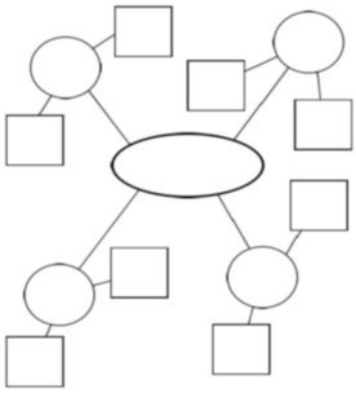
Imaging example:
"The girls scurried down the street." Possible questions include:

- What does the street look like?
- How do you think the girl is going down the street?
- How big is the girl?
- What is she wearing?
- What colours are in her clothes?
- What you think the girl is thinking or feeling as she is running?

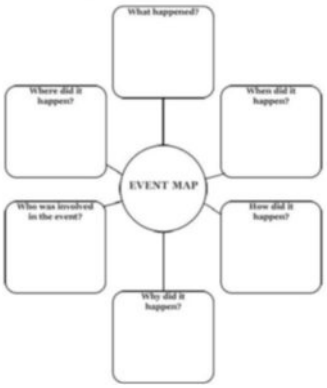
- Is it daytime or night? What in your picture in your head led you to that conclusion?

See *Tips For Understanding What You Read* http://www.ldonline.org/article.php?id=1111&loc=89

Story Map



Event Map



Dyslexia

A relatively common disorder that, when severe, persists into adulthood.
Females are affected nearly as frequently as males.
Neuropsychological studies characterize dyslexia as a language disorder that involves phonological deficits in particular.
Educational therapies aimed at direct improvement of reading skill constitute the best available treatment.
Variable genetic transmission leading to a final common pathway appears to involve deficits in phonological coding. Chromosomes 1, 2, 6, 15, 18 implicated.
Postmortem studies and in vivo anatomical imaging suggest altered asymmetry of structures in the temporal lobes, and PET studies indicate left temporo-parietal dysfunction in particular.

Rumsey, J.M. (1992). The biology of developmental dyslexia. *JAMA, 268*, 912-915.

The basis for dyslexia?

Although their handicapping condition may be invisible to educators, nonetheless there is a physical basis for dyslexia--in genes (e.g., Cardon et al., 1994; De Fries, Fulker, & LaBuda, 1987; Grigorenko et al., 1997; Olson, Forsberg, & Wise, 1994; Pennington et al., 1991; Smith, Kimberling, Pennington, & Lubs, 1983) and in the metabolic activity of the brain (e.g., Shaywitz, Shaywitz et al., 1998; Richards et al., 1999).

Markers for dyslexia?

There are also behavioral signs very early in the process of learning to read that educators should take seriously and not dismiss, that is, assume that the problems will go away with maturation.
These are:

- inordinate difficulty in learning to name and write alphabet letters
- learning to associate sounds with letters.

Berninger, V.W. (2000). Dyslexia, the invisible, treatable disorder: The story of Einstein's NINJA turtles. *Learning Disability Quarterly, 23,* 175- 198.

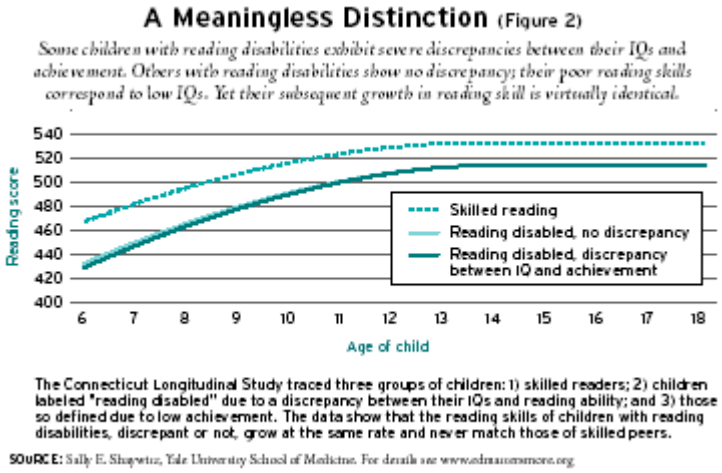
Its prognosis?

- Initially poor readers in the early school years remain poor readers.
- Shortly after school entry, the reading achievement of children changes very little relative to their peers.
- These special services, however, consisted of eclectic approaches to teaching reading that were provided in an inconsistent fashion and for relatively brief periods.

Shaywitz, S.E., Fletcher, J.M., Holahan, J.M., Shneider, A.E., Marchione, K.E., Stuebing, K.K., Francis, D.J., Pugh, K.R., & Shaywitz, B.A. (1999). *Persistence of dyslexia: The Connecticut longitudinal study at adolescence*. *Pediatrics, 104*, 1351-1339.

Diagnosis?

Verbal IQ – word reading discrepancy did not predict the response to early intervention in reading. Overall results supported the use of reading-related language and attention measures rather than IQ–achievement discrepancy in identifying candidates for early reading intervention.
Stage, S.A., Abbott, R.D., Jenkins, J.R., Berninger, V.W. (2003). Predicting response to early reading intervention from verbal IQ, reading-related language abilities, attention ratings, and verbal IQ–word reading discrepancy: Failure to validate discrepancy method. *Journal of Learning Disabilities, 36*, 24-33.



Controversial treatments
Nutritional:

- Megavitamins
- Allergy treatment,
- Combination of fish oil, evening primrose oil and vitamin A
- Lead levels (10 micrograms per decilitre)
- Hypoglycaemia
- Chiropractic

Medication

- stimulants,
- tranquillizers,
- anti-histamine,
- anti-convulsants.

Physical:

- Active breathing,
- Eye exercises "vision therapy"
- Special tinted (Irlen) lenses

Any reduction in print distortion may not be sufficient to generate improved word-identification skills without additional remedial support.
Robinson, G.L., & Foreman, P.J. (1999). Scotopic sensitivity/Irlen syndrome and the use of coloured filters: A long-term placebo controlled and masked study of reading achievement and perception of ability. *Perceptual and Motor Skills, 89*, 83-113.

The failure to find significantly greater improvement for the experimental groups over the control group for the total period, despite subjects' reports of improved print clarity, may be partly related to the lack of effective letter-sound analysis and synthesis skills and to the use of a word-identification strategy of guessing based on partial visual analysis.
Robinson, G.L., & Foreman, P.J. (1999). Scotopic sensitivity/Irlen syndrome and the use of coloured filters: A long-term placebo controlled study of reading strategies using analysis of miscue. *Perceptual and Motor Skills, 89*, 35-52.

Color overlays did not differentially affect the reading performance of individuals with and without reading disabilities.

Iovino, I., Fletcher, J.M., Breitmeyer, B.G., Foorman, B.R. (1998). Colored overlays for visual perceptual deficits in children with reading disability and attention deficit hyperactivity disorder: Are they differentially effective? *Journal of Clinical and Experimental Neuropsychology, 20,* 791-806

National Health and Medical Research Council 2001
http://www.health.gov.au/nhmrc/publications/adhd/part23.htm
Reported improvements may be motivational or due to placebo effect. There is still a paucity of conventional, methodologically rigorous research that clearly demonstrates the benefit of these lenses, and at this time no strong evidence exists.

American Optometric Association 2003
www.aoanet.org/clincare/pediatrics-tinted.asp
Current research does not support the validity or presence of an actual visual perceptual dysfunction termed "scotopic sensitivity syndrome." Therefore the use of this term is meaningless.

- Snoring caused by sleep apnea
- Sensory integration: deep brushing; swings; textures; bounce pads; scooter boards; weighted vests; ramps
- Diet

Brain based
- Brain exercises for the 19 brain areas that under-perform. Individuals can have the 19 key brain areas tested at Arrowsmith School http://www.oqe.org/oqe1114.htm
- Infinity: It involves walking in the pattern of the symbol for infinity. This aids in communication between the hemispheres of the brain and "prepares our sensory and motor nervous system for successful action". http://www.sunbeck.com/InfinityWalkBook.htm
- Brain Gym
- Left–right brain dominance
- Doman Delacato patterning

This statement reviews patterning as a treatment for children with neurologic impairments. This treatment is based on an outmoded and oversimplified theory of brain development. Current information does not support the claims of proponents that this treatment is efficacious, and its use continues to be unwarranted.
American Academy of Pediatrics. (1999). The treatment of neurologically impaired children using patterning. *Pediatrics, 104,* 1149-1151. Retrieved 11/8/2003 from http://www.aap.org/policy/re9919.html
- Educational kinesiology
- Cerebellum exercises
- Cranial massage

A wealth of research conducted over the years has consistently shown that perceptual and motor processing skills are poor predictors of reading and that training in these skills is not useful for remediating reading problems (e.g., Kavale, 1982; Larsen & Hammill, 1975; Mann, 1979). Therefore, one is not surprised to learn that such abilities proved to be poor predictors of reading in the meta-analyses reviewed.
Hammill, D.D. (2004). What we know about correlates of reading. *Exceptional Children, 70*, 453-469.

Other hypotheses
Magnocellular theory (Stein) - magno-cells in all sensory pathways are deficient
Auditory processing speed (Tallal - FastForword)
Cerebellar processes (Nicolson & Fawcett)
Evidence for each is contradictory & only a fraction of dyslexics are so impaired.

In seven experiments, we investigated whether compensated and uncompensated adults with dyslexia show different patterns of deficits in magnocellular visual processing and in language processing tasks. In four visual tasks, we failed to find evidence of magnocellular deficits in either group. However, both groups of adults with dyslexia showed deficits in component language skills, and the degree of reading impairment predicted the nature and extent of these deficits. Uncompensated readers showed deficits in orthographic and especially

phonological coding and awareness and were slower on rapid naming. Compensated readers showed word and nonword performance below controls but better than the uncompensated readers. The compensated group was not significantly less accurate than controls on phonological awareness, nor significantly worse overall on rapid naming.
Birch, S & Chase, C.H. (2004). Visual and language processing deficits in compensated and impaired dyslexic college students. *Journal of Learning Disabilities, 37*, 389 412.

Overwhelming evidence that for the vast majority of children with dyslexia, a specific deficit of the phonological system is the main culprit (Ramus, 2004)

Regarding FastForword (see also Cellfield)
Gains in the ability to perceive auditory durations did not generalize to changes in skills related to reading.
Agnew, J., Dorn, D., Eden, G.F. (2004). Effect of intensive training on rapid temporal processing. *Brain and Language, 88*(1), 21-25.

Regarding visual, hearing and cerebellar problems
The results revealed that all of the dyslexics had phonological deficits, and five showed none of the symptoms implicated in the rival visual, hearing and cerebellar theories. “While only some dyslexics have abnormal vision and hearing, all have problems with tasks that specifically require them to manipulate phonemes,” says Frith. This, she argues, indicates that dyslexia is essentially a disorder of phoneme processing. **Visual, hearing and cerebellar problems may often be associated with the condition, but they are not its direct cause.**
Ramus, F., Rosen, S., Dakin, S. C., Day, B. L., Castellote, J. M., White, S., & Frith, U. (2003). Theories of developmental dyslexia: Insights from a multiple case study of dyslexic adults. *Brain, 126*, 841-865.

What is clear about dyslexia is:
Together, these findings provide evidence that dyslexic adults are not, as may have been assumed, unable to profit from remedial practice," wrote the researchers. "In fact, the same strategies that are effective in teaching children phonological awareness skills are helpful in adults. Further, they are accompanied by neural changes known to underlie reading remediation of developmental dyslexia in childhood combined with those previously observed during the rehabilitation of adults with acquired dyslexia [due to brain damage].
Eden, G. F., Jones, K.M., Cappell, K., Gareau, L., Wood, F.B., Zeffiro, T.A., Dietz, N.A.E., Agnew, J.A. and Flowers, D.L. (2004). Neurophysiological recovery and compensation after remediation in adult developmental dyslexia, *Neuron, 44*, 411–422.

In this group of high school students who have been continuously and prospectively monitored since kindergarten, our findings indicate that difficulty with phonologic awareness represents the most robust characteristic of reading disability.
Shaywitz, S. E., Fletcher, J. M., Holahan, J. M., Shneider, A.E., Marchione, K., Stuebing, K. K., Francis, D. J., Pugh K.R., Shaywitz, B. (1999). Persistence of dyslexia: The Connecticut longitudinal study at adolescence. *Pediatrics, 104*, 1351-1359.

For an excellent review: http://www.medscape.com/viewarticle/495637
Ann W. Alexander; Anne-Marie Slinger-Constant (2004). Current Status of Treatments for Dyslexia: Critical Review. *J Child Neurol. 19* (10): 744-758The acquisition of reading is a complex neurobiologic process. Identifying the most effective instruction and remedial intervention methods for children at risk of developing reading problems and for those who are already struggling is equally complex. This article aims to provide the clinician with a review of more current findings on the prevention and remediation of reading problems in children, along with an approach to considering the diagnosis and treatment of a child with dyslexia.
(**User name** *aksdaowelfk* ***Password*** *12345)*

Last word?
Typically, instruction for children who are at risk of reading failure must be more explicit, more comprehensive, more supportive, and more intensive than reading instruction required by average readers (Foorman & Torgesen, 2001; Snow, Burns, & Griffin, 1998).
Foorman, B. R., & Torgesen, J. (2001). Critical elements of classroom and small-group instruction promote reading success in all children. *Learning Disabilities Research & Practice*, *16*(4), 203-212.

Establishing effective school-based literacy interventions for students at-risk

A noticeable shift from fads to evidence

Reviews supporting Direct Instruction programs?

How does one make judgements about which literacy programs/approaches deserve respect and implementation? One can go to the primary sources (original research), though this may be very time-consuming, or one may feel unable to critically evaluate research merit. An alternative is to examine reviews and the findings by respected sources.

One focus involves whether particular programs incorporate the components considered crucial by relevant authorities. That is, is the approach in question theoretically plausible? Does it have the recommended elements to enable it to succeed?

How does Direct Instruction stack up theoretically?
The National Reading Panel (2000) issued a now famous report consequent upon a Congressional mandate to identify skills and methods crucial in reading development. The Panel reviewed more than 100,000 studies focusing on the K-3 research in reading instruction to identify which elements lead to reading success.

From a theoretical perspective, each of the **National Reading Panel** (2000) recommended foci for reading instruction (phonemic awareness, phonics, fluency, vocabulary, comprehension) is clearly set out and taught in Direct Instruction literacy programs. An examination of the program teaching sequences in, for example, the Reading Mastery and Corrective Reading texts attests to their comprehensive nature.

However, these necessary elements are only the ingredients for success. Having all the right culinary ingredients doesn't guarantee a perfect soufflé. There are other issues, such as what proportion of each ingredient is optimal, when should they be added, how much stirring, heating, cooling is necessary? Getting any of these requirements wrong leads to sub-optimal outcomes.

So, it is with literacy programs. "Yet there is a big difference between a program *based* on such elements and a program that has itself been compared with matched or randomly assigned control groups" (Slavin, 2003). Just because a program has all the elements doesn't mean that it will be effective necessarily. Engelmann (2003) points to the logical error of inferring a whole based upon the presence of some or all of its elements. *If a dog is a Dalmatian, it has spots. Therefore, if a dog has spots, it is a Dalmatian* (Engelmann, 2003). In this simile, the Dalmatian represents programs known to be effective with students. It is possible to analyse these programs, determine their characteristics, and then assume incorrectly that the mere presence of those characteristics is sufficient to ensure effectiveness. Engelmann is thus critical of merely "research-based" programs, that is, programs constructed only to ensure each respected component is somewhere represented. He points out that this does not guarantee effectiveness.

So for a true measure, we must look also for empirical studies to show that a particular combination of theoretically important elements is indeed effective.

The questions become: Has a particular program demonstrated replicated effectiveness? For what populations?

There is ample empirical evidence that the Direct Instruction programs have succeeded with a wide range of learners. This has been recognised by diverse groups, for example, the US Government's acceptance of the Direct Instruction model as one eligible for funding. The US Department of Education allocates enormous amounts for the implementation of replicable, research based school reform models. Its approved list includes *Direct Instruction* programs. Direct Instruction programs have also been acknowledged as having the exemplary research base required under the recent USA *Reading First Act*, 2001 (Manzo & Robelen, 2002).

The two best known examples of sound research-based practices coming to scale are Direct Instruction (Carnine, Silbert, & Kameenui, 1997) and Success for All (Slavin, Madden, Dolan, & Wasik, 1996).
Foorman, B.R., & Moats, L.C. (2004). Conditions for sustaining research-based practices in early reading instruction. *Remedial and Special Education, 25,* 51-60.

Major reviews of the primary research can provide additional surety of program value. In a Department of US Education meta-analysis, **Comprehensive School Reform and Student Achievement** (2002, Nov), Direct Instruction was assigned the highest classification: *Strongest Evidence of Effectiveness*, as ascertained by *Quality* of the evidence *Quantity* of the evidence, and *Statistically significant and positive* results. "Its effects are relatively robust and the model can be expected to improve students' test scores. The model certainly deserves continued dissemination and federal support"
Borman, G.D., Hewes, G.M., Overman, L.T., & Brown, S. (2002)
http://www.csos.jhu.edu./crespar/techReports/report59.pdf

One relevant meta-analysis of Direct Instruction programs (including versions of *Corrective Reading)* did find support for this instructional method (Borman, Hewes, Overman, & Brown, 2002).
Borman, G.D., Hewes, G.M., Overman, L.T., & Brown, S. (2002). *Comprehensive school reform and student achievement: A meta-analysis.* Report No. 59. Washington, DC: Center for Research on the Education of Students Placed At Risk (CRESPAR), U.S. Department of Education. Retrieved 12/2/03 from http://www.csos.jhu.edu./crespar/techReports/report59.pdf

A report from **American Institutes for Research** found that Direct Instruction was one of only three programs with adequate evidence for effectiveness in reading instruction.
http://www.aasa.org/issues_and_insights/district_organization/Reform/Approach/direct.htm T

The **Council for Exceptional Children** provides informed judgements regarding professional practices in the field. The Direct Instruction model was judged by the Editorial Committee to be well validated and reliably used.
http://dldcec.org/ld_resources/alerts/#direct

Direct Instruction is the only model to be recommended by **American Federation of Teachers** in each of their reviews. Seven Promising Reading and English Language Arts Programs "When this program is faithfully implemented, the results are stunning..." (Seven Promising Reading and English Language Arts Programs, pg. 9). Direct Instruction is also lauded in Three Promising High School Remedial Reading Programs, and Five Promising Remedial Reading Intervention Programs (http://www.aft.org/pubs-reports/downloads/teachers/remedial.pdf
). http://www.aft.org/edissues/Reading/Resources.htm
American Federation of Teachers (1999). *Five promising remedial reading intervention programs*. Building on the best: Learning from what works. Retrieved 12/2/03 from http://www.aft.org/pubs-reports/downloads/teachers/remedial.pdf

The report **Bringing Evidence Driven Progress to Education: A Recommended Strategy for the U.S. Department of Education** (2002) nominates Direct Instruction as having strong evidence for effectiveness.
http://www.excelgov.org/displayContent.asp?Keyword=prppcEvidence

The **Center for Education Reform** (2003) nominated DI among its "*Best Bets*".

“Strong, proven education programs for kids - programs that demonstrate success for more than just a handful of students”
McCluskey, N. (2003). *Best bets: Education curricula that work.* Center for Education Reform. Retrieved 11/5/2004 from http://www.edreform.com/pubs/bestbets.pdf

Better by design: A consumers' guide to schoolwide reform: A report from the Thomas B. Fordham Foundation supports the Direct Instruction model as a viable approach to schoolwide reform
http://www.edexcellence.net/library/bbd/better_by_design.html

Reading Programs that Work: A Review of Programs for Pre-Kindergarten to 4th Grade
This independent review included Direct Instruction among six school-wide effective reading models (Schacter, 1999)http://www.mff.org/edtech/publication.taf?_function=detail&Content_uid1=279

Corrective Reading: Decoding and Corrective Reading: Comprehension are among the programs adopted by the California State Board of Education in 1999, after it abandoned the Whole Language model.
http://www.cde.ca.gov/cdepress/lang_arts.pdf

Task Force on Improving Low-Performing Schools (American Federations of Teachers, 1999) named Corrective Reading as one of five effective remedial reading interventions

Marilyn Jager Adams, author of a major text on reading: “Beginning to read: Thinking and learning about print” commented on Direct Instruction thus "The research is irrefutable."

From renowned researcher on effective teaching, **Barak Rosenshine,** “Reading Mastery is an extremely effective program for teaching decoding to all children. The mean score for 171 students across six DI schools, who began the program in kindergarten and who remained in the program for four years was at the 49th percentile. I think this is a wonderful finding” (Rosenshine, 2002).

Adams & Englemann' (1996) meta-analysis resulted in an effect size of 0.69 for the 44 acceptable comparisons involving the Direct Instruction program Reading Mastery. Across DI programs, the average effect size for 173 comparisons was 0.87. In White’s 1988 DI meta-analysis involved learning disabled, intellectually disabled, and reading disabled students, the average effect size for Direct Instruction programs was .84. A similar meta-analysis of the effectiveness of the whole language approach to reading found an effect size of only 0.09 (Stahl & Miller, 1989). An effect size of 1 means a gain of 1 standard deviation - equivalent of a year’s progress (0.8 is a large effect size, 0.5-0.8 is a medium effect size, and less than .5 is a small effect size).

2004 Florida Center for Reading Research aims to disseminate information about research-based practices related to literacy instruction and assessment for children in pre-school through 12th grade. Its Director is well known researcher, Joe Torgesen.
“The instructional content and design of *Corrective Reading* is consistent with scientifically based reading research” (p.4).
Torgesen, J. (2004). *SRA Corrective Reading*. Florida Center for Reading Research. Retrieved 16/1/2005 from http://www.fcrr.org/FCRRReports/PDF/corrective_reading_final.pdf

In the *Oregon Reading First Center* Review of 9 Comprehensive Programs 2004 Reading Mastery was ranked number 1.
http://reading.uoregon.edu/curricula/core_report_amended_3-04.pdf
To be considered comprehensive, a program had to (a) include materials for all grades from K through 3; and (b) comprehensively address the five essential components of the Reading First legislation.
Program Title
1 Reading Mastery Plus 2002
2 Houghton Mifflin The Nation’s Choice 2003
3 Open Court 2002
Others:

Harcourt School Publishers Trophies 2003
Macmillan/McGraw-Hill Reading 2003
Scott Foresman Reading 2004
Success For All Foundation Success for All
Wright Group Literacy 2002
Rigby Literacy 2000
Curriculum Review Panel. (2004). *Review of Comprehensive Programs*. Oregon Reading First Center. Retrieved 16/1/2005 from http://reading.uoregon.edu/curricula/core_report_amended_3-04.pdf

DI for English language learners
The beginning reading programs with the strongest evidence of effectiveness in this review made use of systematic phonics - such as Success for All, Direct Instruction, and Jolly Phonics (Slavin & Cheung, 2003)

Slavin, R.E., & Cheung, A. (2003). *Effective reading programs for English language learners: A best-evidence synthesis*. Center for Research on the Education of Students Placed at Risk.www.csos.jhu.edu/crespar/techReports/Report66.pdf

The two best known examples of sound research-based practices coming to scale are direct instruction (Carnine, Silbert, & Kameenui, 1997) and Success for all (Slavin, Madden, Dolan, & Wasik, 1996).
Foorman, B.R., & Moats, L.C. (2004). Conditions for sustaining research-based practices in early reading instruction. *Remedial and Special Education, 25,* 51-60.

Recently revived interest:
Torgesen (2003) suggests there is now a consensus on the most important instructional features for interventions:

- Provide ample opportunities for guided practice of new skills
- Provide a significant increase in intensity of instruction
- Provide systematic cueing of appropriate strategies in context
- Interventions are more effective when they provide appropriate levels of scaffolding as children learn to apply new skills
- Provide systematic and explicit instruction on whatever component skills are deficient: e.g., in reading - phonemic awareness, phonics, fluency, vocabulary, reading comprehension strategies (Torgesen, 2003)

The 2000 report to the Department for Education and Employment in Great Britain (McBer: A model of teacher effectiveness) reached similar conclusions about the value of this approach.

DI was originally designed to assist disadvantaged students
But, its emphasis on analysing task characteristics and effective teaching principles transcends learner characteristics

DI programs have been shown to be effective for:
Slow learners Disadvantaged Intellectual disability Gifted Learning disability Indigenous Acquired brain injury Language disability Deaf Behavioural disorder Autism spectrum ADHD English language learners

Many DI programs have been shown effective in:
Basic skills: reading, spelling, maths, language, writing
Higher order skills: literary analysis, logic, chemistry, critical reading, geometry, history and social studies
Computer-assisted instruction: Funnix beginning reading program, videodisc courseware in science and maths.

The combination of effectiveness across learner types and across curriculum areas provides credibility that the model itself is very well founded. Further it demonstrates that effective instruction transcends learner characteristics.

So, tell me about DI programs

How are the DI programs different from other instructional programs?

The Direct Instruction model is highly structured and teacher directed. In terms of responsibility for learning outcomes, it emphasises the role of the teacher. The model is in direct contrast to child-centred, discovery approaches in which student responsibility for learning is paramount. There is a priority on the efficient use of time - maximizing the time students spend engaged in the learning activities. The most obvious difference is that DI lessons are scripted. In a traditional reading program, the teacher is given few guidelines on how to present the material. For example, when teaching reading comprehension the teacher might be told, "Discuss the concept of main idea". Loose guidelines such as this leave tremendous latitude concerning what the teacher actually says and does. It is very easy for teachers to unknowingly change the wording used to teach essential skills or concepts leading to ambiguity, thus making it especially difficult for some students to learn. Teachers may use vocabulary that is too sophisticated for some students, leaving success only to those who can understand the language. In a DI lesson, what the teacher says is actually printed out on the page. The students' responses are also printed out on the page. Teacher wording is thereby controlled, making it easier for students to learn.

DI programs are also different from other programs because they have been researched and tested to prove that they work. There are very big differences between DI and most curriculum materials. They are scripted so that the presenter does not need to be knowledgeable about teaching reading. They cover a lot of curriculum material in a short time because lessons are rapid-paced and because errors are kept to a minimum through careful sequencing of the steps.

In addition to scripted lessons and rapid pacing, are there other ways the DI programs are different?

Yes. Students make many responses during DI lessons, many more, in fact, than they would normally make in standard classroom lessons. In a typical DI lesson, students will make between eight and twelve responses each minute. That means that students will make between 240 and 360 responses in a half-hour lesson. This is particularly important because students get a lot of opportunities to practise correct responses, teachers get many opportunities to praise students for performing correctly, and teachers also get many opportunities to correct student errors. In fact, teachers have the opportunity to correct errors immediately, long before persistent errors develop. A child is likely to reach mastery in a shorter amount of time.

OK, but the students can't always answer correctly or they wouldn't be learning anything, would they?

That's right. Research shows that academic skills are best improved when materials are designed so that students are correct 75-85 percent of the time. This gives students lots of opportunities for success and the praise that comes with it, and it still gives them something to conquer. The DI programs are specifically designed to accomplish a level of correct responding that is about 80% for students who are correctly placed by the placement tests. This means that on about 20% of the questions that students are given the first time, they will make an error. This is intentional planning. Without errors, it is doubtful that the students would be learning much of anything. However, it is a DI principle that all errors are corrected immediately. How to correct errors can be a fairly sophisticated process, but there is a general rule that applies very often: Give the answer, repeat the question, repeat the part of the lesson in which that question appeared, and go on to the next part of the lesson. This procedure always has the effect of having the student practise the correct response when the question is embedded in the lesson.

If the students are just saying the things printed in the book, aren't they just learning by rote?

This is an all too common misunderstanding of DI. Some people feel that it derives from a failure to understand how the programs are put together. After all, if one merely saw one or two lessons, and saw the kind of interaction we've been talking about, it is likely that s/he would get this impression. The students appear to be parroting, especially when the teacher must perform several error corrections. However, a closer look at the way the material evolves from lesson to lesson reveals a very different picture. For instance, in the Reading Mastery program, the student first learns to say when the teacher points to the letter "m". This is appropriately called rote learning. Later, however, the student learns to use this skill in a sophisticated strategy for sounding out words "mmmaaannn." Still later, the student is capable of sounding many regular words that she or he has never before practised. This is not rote learning; it’s solving new problems based on well-learned, generalizable skills. (Some of this section was adapted from: Advantage Schools Inc. http://www.advantage-schools.com/home/di.htm)

O.K., but I'm still not convinced. What is the research showing that Direct Instruction programs are effective, and for whom?

Yes, there is quite a lot. The most important research study is called Project Follow-Through. It was a federally funded project that began in the early 1970's. About a dozen different programs were tested at school sites located all over the U.S. to see whether any of them could help maintain the gains that poverty-level students made in Project Headstart, but lost almost as soon as they started public school. The programs represented all important educational philosophies, including open-classrooms, Piagetian-based learning, behaviour modification, and DI. The DI program consisted of reading, math and language programs. The results overwhelmingly supported the superiority of the DI method over all other programs. All tests of academic skills not only showed the DI programs to be superior, but DI was the only program to bring these low-performing students within the national norm. In addition, the DI programs proved superior in social measures, such as measures of "self-esteem," even when compared to programs that directed their energy specifically at improving self-esteem.

"Research on best practices indicates that instruction directed by teachers, targeting specific skills, and delivered to small groups is particularly efficacious."
Stevens, R.J., Slavin, R.E., Farnish, A.M. (1991). The effects of co-operative learning and direct instruction in reading comprehension strategies on main idea identification. *Journal of Educational Psychology, 83,* 8-16.

"The decade of the 1990s will witness, in classrooms serving students with mild mental retardation, the implementation of a group of instructional methods often referred to as effective teaching practices or *direct instruction,* if we heed the literature published in this area over the past 15 years."
Hendrickson, J., & Frank, A. (1993). Engagement and performance feedback: Enhancing the classroom achievement of students with mild mental disabilities. In R. Gable and S. Warren (Eds), *Advances in mental retardation and developmental disabilities: Strategies for teaching students with mild to severe mental retardation.* Vol.5. Philadelphia: Jessica Kingsley.

Can people with an intellectual disability learn to read?

People can acquire transmitted skills like reading at any age, and can benefit from instruction at any age
The bottom line is that the role of mental age is not one of limiting what a child can learn but of limiting the ways in which they can be effectively taught (Adams, 1990).

"Initially established with learners of more average abilities (for) learning basic skills, these (effective) teaching practices have also been shown to be strongly related to achievement of students with mild mental retardation.....A substantial amount of research evidence now supports the effectiveness of this approach for special education."
Scruggs, T. & Mastropieri, K. (1993). Teaching students with mild mental retardation. In R. Gable and & S. Warren (Eds.), *Advances in mental retardation and developmental disabilities: Strategies for teaching students with mild to severe mental retardation.* Vol.5. Philadelphia: Jessica Kingsley.

"... the areas discussed may be viewed as illustrations of the general applicability of effective instructional methods to training autistic children..... The similarity of teaching methods suggests that principles underlying effective instruction may be more influential in the process of learning than the special characteristics of any particular student population."
O'Neill, R. & Dunlap, G. D.I. principles in teaching autistic children. *Direct Instruction News*, Spring. 1984.

"Thus techniques based on *direct and effective instructional* practices are anywhere from 5 to 10 times more effective than the "special" practices attempting to cure LD (learning disabled) students by influencing unobservable constructs (e.g. perception)....thus the effective schooling research needs to be better integrated into LD practice."
Kavale, K. (1990). Variances & verities in learning disability interventions. In T. Scruggs and B. Wong (Eds), *Intervention research in learning disabilities*. New York: Springer Verlag.

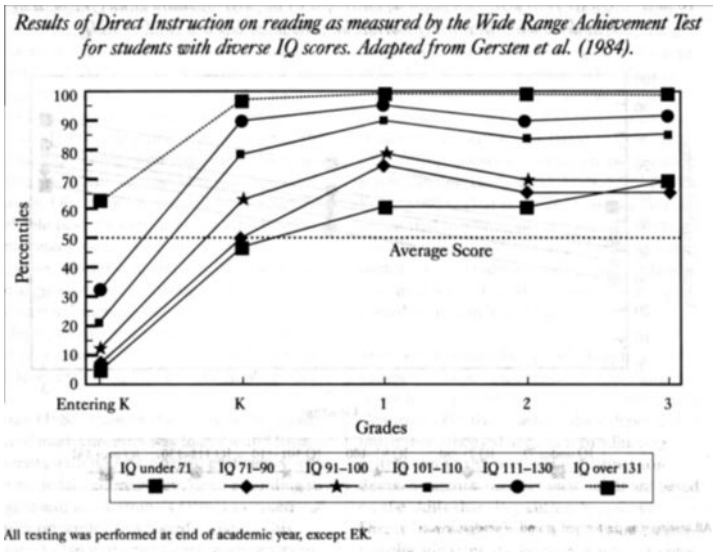
"The documented success .... of *direct instruction* reading programs with thousands of hard-to-teach and high-risk children is unsurpassed in the annals of reading history."

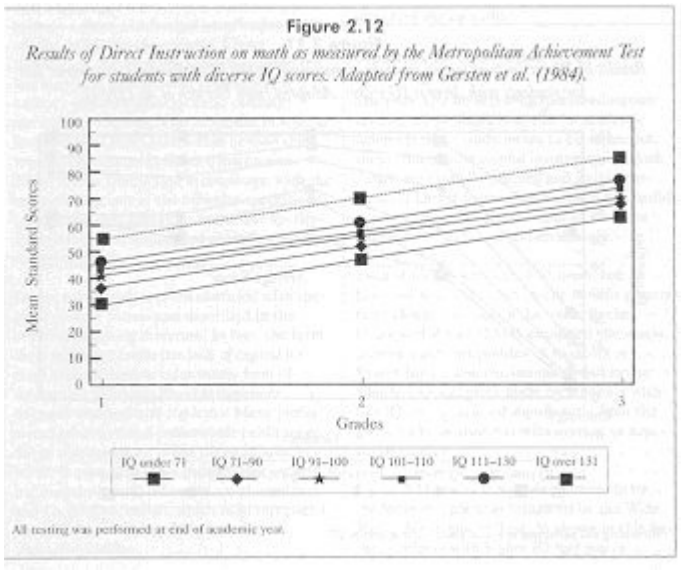
Bateman, B. (1991). Teaching word recognition to slow learning children. *Reading, Writing & Learning Disabilities, 7,* 1-16.

"Children with deficits or weaknesses in these skills should be identified early (kindergarten or first grade), and educators and speech pathologists should work together to provide *direct instruction* in these areas." (Also see Catts, 1991; Felton, 1993).
Wood, F. B., & Felton, R. H. (1994). Separate linguistic and attentional factors in the development of reading. *Topics in Language Disorders, 14,* 42-57.

"Effective reading programmes are not differentially effective - they are equally effective for all groups of children". p. 234.
Goyen, J. (1992). Diagnosis of reading problems: Is there a case? *Educational Psychology. 12,* 225-237.

DI – only for the low performers? Effects across different ability levels





Summary of research findings on various interventions
Effect size: Strong > 0.5 Moderate 0.35 - 0.5 Weak < 0.35

Intervention	No. of studies	Av. effect size
Perceptual-motor training	180	0.08
Modality instruction (Learning Styles)	39	0.14

Establishing DI programs

For secondary level programs, students are often assessed in their final year of primary school and those considered at risk (i.e., are expected to have difficulty with secondary text books) are offered assistance through the Reading Program in place of their English Program or their LOTE program, or simply every day for period X regardless of what the timetable indicates. For other subjects they are part of the regular program. There are costs and benefits to each approach. However careful evaluations of the Corrective Reading program over the years have consistently demonstrated the success of the approach. The evaluations often includes formal pre and post testing, parent questionnaires and teacher comments. It has been generally accepted by school communities that the benefits have outweighed the costs.

After the initial whole class screen (often with a group test like the Progressive Achievement Test, ACER), those seen as at risk are provided with the Corrective Reading program Placement Test (http://www.sra-4kids.com/product_info/direct/placementtest.phtml?pg=4).
For any given student, the possible outcomes of such assessments are:

1. the student's current decoding skill levels are below those of the lowest level of the program (Level A), and would be best addressed with a beginning reading program, such as "100 Lessons".
2. the student is appropriate for placement in one of the four program levels, or
3. the student has already mastered the decoding skills taught at each level, and any reading deficits are probably not in the area of decoding.

Their average reading retardation of students coming arriving at secondary school with reading problems is about 3 years and it is unlikely that will they have independence after completing Level B – though it does allow them to (a) more readily decode unfamiliar words than previously and (b) develop good automatic recognition of irregular words. One of the desired outcomes of Level C is improved ability to manage texts from other subjects, and to cope with the large number of irregular and technical words they are increasingly required to address.

It should be remembered that the Decoding B & C programs focus primarily on students who have lacked word attack skills - who have read so haltingly and so inaccurately that they were prevented from comprehending what they read. While their word attack skills after Level C would then be adequate for comprehension, many of the students still lack basic word knowledge and so may not show good comprehension of orally presented or written material. They are then in a position to improve in those areas through the regular English program, through encouragement for them to read a wide range of literature (from trucking magazines to classics) and through an awareness by subject teachers that these students continue to have needs in the area of comprehension, spelling, syntax, and expressive writing skills.

Where to for these students?

An issue for schools is whether to continue upon completion of one program level for any given group. Some schools consider that all needy children should have an opportunity to participate; whereas, others prefer to follow the same cohort through several levels. The issue is a vexed one when resources are insufficient to meet the longer term needs of all the students. Felton (1993) made the point that, for disabled learners, several years of Direct Instruction may be necessary before they are able to make adequate progress in reading without requiring additional educational assistance. This is particularly so for secondary students who have a long history of failure, and whose reading problems have impaired their vocabulary development compared to that of their peers.

One measure which may assist schools in determining which students should be in the *continuers* group involves consideration of reading volume. The students who participate in the program are likely to have done much less reading than their more facile peers, and evidence as to any increase in the volume of reading undertaken by the students may be valuable. Stanovich (1986) pointed to the effect of volume of reading on reading progress, and it may be that a mediating variable between program conclusion and the need for further intervention resides in the amount of reading subsequently performed. The likelihood of students reverting to poor reading strategies is unknown, but is a hazard when an intervention does not include a longitudinal component. It is possible for students to develop strong word attack strategies and to make progress in reading

generally, but for such skills to have little or no impact on day to day reading, or to lose its impact after program completion.

It is for this reason that the continuous within-program tests of rate and accuracy should be important elements in the overall evaluation of program success. There are clear behavioural objectives to be achieved by the end of the program. For example, by the end of Level A students are expected to be reading the daily stories and regular mastery tests at a rate of 60 words per minute at a specified error rate, and for Level B1, 90 words per minute. It is not possible to meet those speed and accuracy criteria if the reader adopts contextual cues, partial word cues, or word shape analysis strategies. Thus, the program does prompt the practice of effective reading strategies. These may be strengthened by within-school and home-based programs designed to promote and monitor increased reading volume in the post-program period. Regular subsequent assessment could be used to ascertain the degree to which student progress in reading can be achieved independently for any given student. Some students may have reached the independence level (self-teaching) described by Share (1995); whereas the progress of other students may stall, indicating the need for a further program level.

At last count there were more than 350 schools in Victoria having one or more Direct Instruction programs in reading, spelling, language, maths, and writing. Of these, about 60 are secondary schools, and about 100 Catholic. Whilst most schools continue the programs' usage because of their excellent results it is also pleasing to note that there is a wider body of research evidence to support their usage.

Isn't reading really about comprehension?

In 90% of cases, the source of reading comprehension problems is poor word recognition skills (Oakhill & Garnham, 1988).
Stuart,M. (1995). Prediction and qualitative assessment of five and six-year-old children's reading: A longitudinal study. *British Journal of Educational Psychology, 65*, 287-296.

Even among experienced readers individual differences in comprehension of text reflect efficiency of phonological processing at the word level.
Shankweiler, D., Lundquist, E., Dreyer, L. G., & Dickinson, C. C. (1996). Reading and spelling difficulties in high school students: Causes and consequences. *Reading and Writing: An Interdisciplinary Journal, 8*, 267-294.

Once decoding skills are automatized, growth in text comprehension follows.
Foorman, B., Francis, D., Beeler, T., Winikates, D., & Fletcher, J. (1997). Early interventions for children with reading problems: Study designs and preliminary findings. *Learning Disabilities: A Multidisciplinary Journal, 8*, 63-71.

Differences in reading comprehension could be explained by differences in phonological coding on non-words, but not by differences in semantic word knowledge. p. 220
Elbro, C., Nielsen, I., & Petersen, D. K. (1994). Dyslexia in adults: Evidence for deficits in non-word reading and in the phonological representation of lexical items. *Annals of Dyslexia, 44*, 205-226.

Decoding problems account for the majority of cases of severe reading disability among students of otherwise average intellectual ability (see reviews by Stanovich, 1988; Vellutino & Denckla, 1991). p. 47
Spector, J. (1995). Phonemic awareness training: Application of principles of direct instruction. *Reading and Writing Quarterly, 11*, 37-51

To examine the relationship between word decoding and reading comprehension, Shankweiler et al. (1999) assembled 361 English-speaking children aged 7.5 to 9.5, of whom 168 had reading disabilities. They found the simple ability to read aloud a list of English words accounted for 79% of the variance in reading comprehension ($r = .89$, $p < .0001$). Even the ability to do the same thing with non-words (e.g., skirm, bant) correlated very highly with reading comprehension, accounting for 62% of the variance ($r = .79$, $p < .0001$).

Shankweiler, D., Lundquist, E., Katz, L., Stuebing, K. K., Fletcher, J. M., Brady, S., Fowler, A., Dreyer, L. G., Marchione, K. E., Shaywitz, S. E., & Shaywitz, B. A. (1999). Comprehension and decoding: Patterns of association in children with reading difficulties. *Scientific Studies of Reading, 3*, 69-94.

In each grade, skill in word recognition was more predictive of reading comprehension than was listening comprehension.
Juel, C. (1993). The spelling-sound code in reading. In S. Yussen & M. Smith (Eds.), *Reading across the life span* (pp. 95-109). New York: Springer-Verlag.

Facility in decontextualised word identification is a basic prerequisite for extracting meaning from written text. ... performance on the word identification measure was the best predictor of performance on the reading comprehension test.
Vellutino, F. R., Scanlon, D. M., & Tanzman, M. S. (1994). Component of reading ability: issues and problems in operationalizing word identification, phonological coding, and orthographic coding. In G. R. Lyon (Ed.), *Frames of reference for the assessment of learning disabilities: New views on measurement issues*. Philadelphia: Brookes Publishing Co., pp. 279-332.

The groups receiving direct instruction in alphabetic code had significantly greater reading comprehension than the literature-emphasis groups. These results are not surprising, given the need for decoding to be sufficiently automatic that memory and attention can be devoted to grasping the gist of the text.
Foorman, B., Francis, D., & Fletcher, J. (1997, March 18). *Breaking the alphabetic code, A17*. The Globe and Mail.

"Research suggests that teaching children to read words quickly and accurately can also increase their reading comprehension (Tan & Nicholson, 1997). The theory behind fast and accurate word reading is that good readers are very good at reading words. They have over-learned this skill through much reading practice. As a result, like skilled musicians and athletes, they have developed automaticity, as a result of many hours of word reading practice. What this means is that they have over-learned word reading skills to the point where they require little or no mental effort. As a result, they are able to put all their mental energies into reading for meaning."
G. B. Thompson & T. Nicholson (Eds.) (1998). *Learning to read: Beyond phonics and whole language*. New York: Teachers College Press.

So what are the issues in reading comprehension.

Evidence indicates that, in order to be able to read, children must be able to decode text, translating it into a speech form, but children must also be able to understand spoken language if they are to understand what they decode.
From the results of the National Reading Panel, at: http://www.nichd.nih.gov/publications/nrp/report.htm

Comprehension has come to be viewed as "the essence of reading "(Durkin, 1993). This knowledge a reader brings with him enables the reader to make meaning of the text, to form memory representations of these meanings, and to use them to communicate with others information about what was read.

Readers normally acquire strategies for active comprehension informally. Comprehension strategies are specific procedures that guide students to become aware of how well they are comprehending as they attempt to read and write. Explicit or formal instruction on these strategies is believed to lead to improvement in text understanding and information use. Instruction in comprehension strategies is carried out by a classroom teacher who demonstrates, models, or guides the reader on their acquisition and use. When these procedures have been acquired, the reader becomes independent of the teacher. Using them, the reader can effectively interact with the text without assistance. Readers who are not explicitly taught these procedures are unlikely to learn, develop, or use them spontaneously.

Cognitive strategies for improving reading comprehension

Comprehension strategies are procedures that guide students as they attempt to read and write. For example, a reader may be taught to generate questions about the text as it is read. These questions are of the why, what, how, when, or where-variety; and by generating and trying to answer them, the reader processes the text more actively. The value of cognitive strategies in comprehension instruction is, first, their usefulness in the development of instructional procedures, and second, the learning of these procedures by students as an aid in their reading and learning, independent of the teacher.

Typically, instruction of cognitive strategies employed during reading consists of:

1. The development of an awareness and understanding of the reader ' own cognitive processes that are amenable to instruction and learning
2. A teacher guiding the reader or modeling for the reader the actions that the reader can take to enhance the comprehension processes used during reading
3. The reader practising those strategies with the teacher assisting until the reader achieves a gradual internalization and independent mastery of those processes (Palinscar & Brown, 1984; Paris & Oka, 1986; Pressley et al., 1994).

Durkin 's (1979) highly cited observational studies of reading instruction in grade 4 showed that most teachers, in fact, spent little time on comprehension instruction. Only 20 minutes of comprehension instruction was observed in 4,469 minutes of reading instruction. This lack was echoed by Duffy, Lanier, and Roehler (1980). They described teachers as spending time in assigning activities, supervising and monitoring students as to being on task, directing recitation sessions as a way of assessing what the students were doing, and providing corrective feedback when the students erred. The teachers did not teach or show the students' skills, strategies, or processes that they could use in reading to comprehend what they read and to be successful in learning information in the text.

The Panel identified 453 studies on comprehension, of which 203 were methodologically acceptable. The seven individual strategies that appear to be effective and most promising for classroom instruction are (in alphabetical order) **comprehension monitoring, cooperative learning, graphic and semantic organizers including story maps, question answering, question generation, and summarization**. In addition, many of these strategies have also been effectively used in the category "multiple strategy, "where readers and teachers interact over texts.

"Becoming an effective transactional strategies instruction teacher takes several years "(Brown et al., 1996, p. 20). "The data suggests that students at all skill levels would benefit from being taught these strategies" (Rosenshine, Meister, & Chapman, 1996, p. 201). The past 2 decades of research appear to support the enthusiastic advocacy of instruction of reading strategies expressed in the above quotations. The Panel ' review of the literature indicates that there has been an extensive effort to identify reading comprehension strategies that can be taught to students to increase their comprehension and memory for text.

The instruction of cognitive strategies improves reading comprehension in readers with a range of abilities.

This improvement occurs when teachers demonstrate, explain, model, and implement interaction with students in teaching them how to comprehend a text. In studies involving even a few hours of preparation, instructors taught students who were poor readers but adequate decoders to apply various strategies to expository texts in reading groups, with a teacher demonstrating, guiding, or modeling the strategies, and with teacher scaffolding (e. g., Palinscar & Brown, 1984; see Rosenshine, Meister, & Chapman, 1996 for a review). Such instruction is consistent with socially mediated learning theory (Pressley & McCormick, 1995; Vygotsky, 1978).

Students using these strategies, even in limited ways, produced noticeable improvement in the use of the instructed strategies, albeit with only modest improvement on standardized reading tests (Rosenshine & Meister, 1994). More intensive instruction and modeling have been more successful in improving reading and standardized test scores (Bereiter & Bird, 1985; Block, 1993; Brown et al., 1996).

Many of the studies involve teaching one group of students a particular cognitive strategy to use while reading. These studies show that readers can learn a strategy and use it effectively in improving their comprehension. Reading, however, requires the coordinated and flexible use of several different kinds of strategies. Considerable success has been found in improving comprehension by instructing students on the use of more than one strategy during the course of reading. Skilled reading involves an ongoing adaptation of multiple cognitive processes. Becoming an independent, self-regulated, thinking reader is a goal that can be achieved through instruction of text comprehension (Brown et al., 1996).

How well has the knowledge gleaned from research filtered into the classroom to impact teachers actual practice? In spite of apparent effectiveness, teachers may not be using effective comprehension instruction strategies without having themselves had preparation in instruction (Anderson, 1992; Bramlett, 1994; Brown, 1996; Duffy, 1993; Durkin, 1979; Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989; Pressley, 1998; Reutzel and Cooter, 1988)

Durkin (1981) observed that when comprehension skill instruction is present, in many classrooms teachers appear to be “mentioning ”a skill to students and “assigning ”it to them rather than employing the effective instruction modeling and transactional practices that research supports (Durkin, 1981; Reutzel & Cotter, 1988) . In the United States, reading from basal reading series accounts for 75%to 90%of classroom reading instruction time (Franklin et al. ,1992) . Although some basal teachers ’manuals do provide more evaluative comprehension skill lessons, these lessons are usually not instructional and offer little structure and rationale for helping teachers give effective skill instruction (Reutzel & Cotter, 1988). In general, students were provided with opportunities to practice comprehension strategies, but were not actually taught the strategies themselves nor the utility value of applying them. . (Pressley, 1998, p. 198) .

Who are the students who have serious problems in comprehension strategies?
They are the students who struggle with most aspects of their schooling. Their problems are usually not confined to reading. They do not follow instructions. They have a poor memory for information. They struggle to repeat sentences. They don’t understand or employ logic in arguments. Their vocabulary is limited. Motivation is not their strength.

Does a given child have only a decoding problem, or is his decoding ability actually commensurate with his other language skills?
Stanovich (1988b) describes the dyslexic child as one with a severe phonological problem, but (initially at least) no other language difficulties. He contrasts this child with the garden variety reading-problem student, who shares the phonological problem (though perhaps to a lesser extent) with his dyslexic colleague, but who also has other language difficulties, such as language comprehension, vocabulary, short-term memory, or attentional problems. The rationale for making such a discrimination revolves around the instructional decisions that need to be made consequent upon the assessment. For the dyslexic child, there is considerable consensus in the research community that the deficit lies in the area of phonological processing (Elbro, Nielsen, & Petersen, 1994; Yap & Van Der Leij, 1993), and that the intervention focus needs to be at the level of word decoding. Consistent with research findings (Adams, 1990), our best RMIT Clinic results have come from reading programs that have a strong phonic emphasis and involve explicit instruction (Foorman, 1995; Perfetti, 1992) - such as the Corrective Reading Program - Decoding strand. The garden variety reading problem is also addressable by the same program, at least at the decoding level. This is a valuable intervention to introduce, as the increased facility for decoding reduces the attentional requirements needed at the level of print-decoding, thus freeing up valuable attentional capacity for the task of comprehension. However, this group of students may also need assistance with the comprehension of what they decoded, and additional intervention should be considered simultaneously with, or perhaps after, the decoding program. The Corrective Reading Program - Comprehension strand is a program that has been successfully used in primary and secondary settings and by parents (Clunies-Ross, 1990; Noon & Maggs, 1980) for this purpose.

The deceptively simple way to discriminate between these two (dyslexic and garden variety) groups of students is to compare their attainment on a reading comprehension task to that on a listening comprehension task. The Brigance Comprehensive Inventory Of Basic Skills has the capacity to provide such a comparison, with its

reading comprehension and listening comprehension subtests (up to Year 9). This technique is now considered by many researchers as the most appropriate method of discriminating these two groups since the discrepancy-defined dyslexia model has fallen from favour in recent times. In this previous approach, dyslexia was assessed by the presence of a discrepancy between a child's intelligence and his reading attainment. However, it is now increasingly recognized that intelligence is far from perfectly correlated with reading. Stanovich (1992) calculated a median correlation of 0.34 across 14 studies involving 26 measures whose correlations ranged from 0.10 to 0.66. The range of correlations relate to the choice of intellectual and reading tests. The lower figures are more likely when the reading measure has a strong word-decoding emphasis, and the higher figures when comprehension is the major focus. Given this only moderate correlation, any discrepancy may be more reasonably considered a normal statistical variation than a specific neurological deficit. More recently, the Spadafore Diagnostic Reading Test (1983) has been employed in the RMIT Clinic, as it is normed to Year 12.

Further, it is noted that the development of literacy is closely intertwined with the development of intelligence (Stanovich, 1993). That is, the continued normal development of intelligence may rely on an adequate volume of reading. This assertion may be difficult to accept, but vocabulary development and higher-order comprehension skills are best advanced through reading (Nagy & Anderson, 1984) once the beginning stages are passed. Thus, as children with reading difficulties grow older, their lack of reading could be expected to reduce the initial gap between intelligence and attainment. That is, over time, dyslexic students measured intelligence may come to more closely resemble that of their garden-variety colleagues, as problems additional to the phonological core develop (Stanovich, 1988a). Sadly, the intelligent under-achiever may appear to become less intelligent because of our educational system's failure to adequately address his needs at the critical early stage.

The other major problem with discrepancy-defined dyslexia is that a different group (between 2%-35% of the population) is described by different intelligence tests, and through different subtest-analysis. For example, there has been debate over whether verbal or performance (or both) scales should be used - the use of one over the other certainly defines a different group as dyslexic. There is also disagreement over how large a discrepancy (eg 1, 1.66, or 2 SD) is needed for a diagnosis of dyslexia; over the minimum intelligence level needed for a dyslexia classification; and, over the type of reading test chosen to define the reading deficit. Given the slippery nature of such assessment choices, it is unsurprising that such a model is falling from favour, although it still has currency in some educational circles.

Comparing the results of listening comprehension to reading comprehension also makes intuitive sense, because listening comprehension tasks are much more closely related to reading than are the more global tasks involved in intellectual assessment. It offers the capacity to define those children who have a major problem only at the level of print. They will perform well on the listening comprehension tasks, using their impressive general language skills to answer questions about a story read to them. On the reading comprehension task however, they will do relatively poorly as their under-developed decoding skills prevent them bringing into play their well-developed general language skills. When required to decode a passage unassisted, they struggle, as did their garden-variety peers. On the other hand, the garden-variety students would be expected to perform similarly on both tasks. Their reading problems are general rather than specific, and they may not have any particular reading subskill restricting their development. Their decoding skill is commensurate with their other language skills, such that if they know the meaning of a word (or phrase, or sentence), they can comprehend it whether it is presented orally or in print. The consequence for the high LC (listening comprehension)-low RC (reading comprehension) child should be intensive assistance at the decoding level. For the low LC-Low RC child, intensive assistance at both the decoding and comprehension levels is indicated.

Other possible outcomes are high LC-high RC, a result predictable from an all-round good reader; and low LC-high RC, a rare result, possibly from a student with acute attentional, hearing, or short-term memory problems. In this case, the permanence of text would allow the student to use his intact language comprehension skills, whereas the ephemeral nature of the spoken story precludes such access. Hyperlexic students (a rare sub-group with excellent word recognition, but poor reading comprehension) would not be detected by this discrepancy analysis, because their listening comprehension parallels their reading comprehension (Sparks, 1995).

This LC-RC discrepancy represents an alternative definition of the group known as dyslexic; however, as with the IQ discrepancy-defined dyslexic, an issue is how great a discrepancy should be considered significant. Some (including the RMIT Clinic) have considered two years to be very significant (Anderson, 1991) given the extent of commonality of the tasks; although this is clearly an arbitrary figure, its significance being higher the younger the age of the child. As the term dyslexia is unlikely to disappear (at least in the short term), and parents almost always ask questions about it, the Clinic policy is to make use of the listening comprehension-reading comprehension discrepancy in discussions with parents. This is its major value since the techniques employed include systematic phonics whether the difficulty is described as dyslexic or garden-variety. The dyslexic classification does, however sensitize clinicians to the possibility that dyslexic students may be more treatment-resistant (Berninger & Abbott, 1994) than garden-variety students, and some may also require additional direct phonemic awareness instruction if they do not make early and sustained progress with a systematic phonics program.

What about teaching comprehension?

Is it right to separate comprehension from decoding?

In Gough's view states reading has two components: decoding and linguistic comprehension. Poor readers are either poor in decoding, poor in linguistic ability, or poor in both. It is called the Simple View of reading and reading disability (Gough & Tunmer, 1986) and has received much support in both reading development theory and in research into instruction.

The following principle was distilled from the findings of more than 30 years of research studies under two very expensive federally funded programs: the $1 billion Project Follow Through Study, and the $200 million in studies conducted under the direction of the National Institute of Child Health and Human Development (NICHD).

"Seventh: Teach decoding and comprehension skills separately until reading becomes fluent.

Both instructional activities should occur, but decoding and comprehension instruction should be taught separately while students are still learning to decode. Comprehension skills learned through teacher-read literature can be applied to students' own reading once they become fluent decoders."

Deficits in acquiring reading comprehension strategies

Some children encounter obstacles in learning to read because they do not derive meaning from the material that they read. In the later grades, higher order comprehension skills become paramount for learning. Reading comprehension places significant demands on language comprehension and general verbal abilities. Constraints in these areas will typically limit comprehension. In a more specific vein, deficits in reading comprehension are related to: (1) inadequate understanding of the words used in the text; (2) inadequate background knowledge about the domains represented in the text; (3) a lack of familiarity with the semantic and syntactic structures that can help to predict the relationships between words; (4) a lack of knowledge about different writing conventions that are used to achieve different purposes via text (humor, explanation, dialogue, etc.); (5) verbal reasoning ability which enables the reader to "read between the lines", and (6) the ability to remember verbal information.

If children are not provided early and consistent experiences that are explicitly designed to foster vocabulary development, background knowledge, the ability to detect and comprehend relationships among verbal concepts, and the ability to actively employ strategies to ensure understanding and retention of material, reading failure will occur no matter how robust word recognition skills are.

Our current understanding of how to develop many of these critical language and reasoning capabilities related to reading comprehension is not as well developed as the information related to phoneme awareness, phonics, and reading fluency. We have not yet obtained clear answers with respect to why some children have a difficult time learning vocabulary and how to improve vocabulary skills. Our knowledge about the causes and consequences of deficits in syntactical development is sparse. A good deal of excellent research has been conducted on the application of reading comprehension strategies, but our knowledge of how to teach children to apply these strategies in an independent manner and across contexts is just emerging.
(Reid Lyon, NICHD chief from his submission to US Congress).

Beyond decoding, the reader must: **Activate relevant background knowledge; Employ comprehension strategies (summarizing, predicting, clarifying, questioning); Apply critical thinking; Know what words mean.**

Corrective Reading Comprehension strand

For students who read without understanding, the Corrective Reading Comprehension programs develop vocabulary, information, and comprehension strategies needed for academic success.

This program helps underachieving readers develop higher-order thinking and reasoning tactics used by successful readers—applying prior knowledge, making inferences, and analyzing evidence.

Lessons incorporate information from science, social studies, and other content areas to build general knowledge and develop study skills.

Level A: Thinking Basics (65 lessons) teaches basic reasoning skills that form the framework for learning information. It also fills crucial gaps in students' background knowledge.
Students who place in **Comprehension A**

- do not understand the concepts underlying much of the material being taught in classrooms.
- do not have well-developed recitation skills.
- cannot repeat sentences they hear, so they have trouble retaining and answering questions about information that is presented.
- don't even understand the material when it is presented orally.

Level B: Comprehension Skills (B1, 60 lessons; B2, 65 lessons) teaches literal and inferential comprehension strategies.
Students who place in **Comprehension B**

- lack some common basic information, such as how many months are in a year.
- deficient in thinking operations, though more advanced than Level A
- make about fifteen errors on the Placement Test.
- miss the difficult statement-repetition items and some of the information items.
- trouble identifying how things are the same,
- have trouble with the deductions that involve "maybe."

Level C: Concept Applications (140 lessons) teaches students to use thinking skills independently.
Students who place in **Comprehension C**

- can draw deductions, make inferences, and respond to specific instructions.
- do not yet have a facility for working independently

The RMIT Psychology Clinic

The RMIT Psychology Clinic provides assessment and training to parents wishing to supplement the reading instruction supplied by their child’s school. Telephone 99257722 or 9252376 or write to The Co-ordinator, RMIT Psychology Clinic, Plenty Road Bundoora 3083

Typical Clinic Sequence (Cost currently $60/ 1 hr session)
Session 1: Initial Interview
(a) Relevant information
(b) Clinic’s role
(c) Agreement about what’s possible
(d) Intervention responsibility
Session 2: Intellectual assessment
Session 3: Assessment of reading/other educational skills
Session 4: Discussion of the written report
Sessions 5+: Reading intervention training; monitoring of progress weekly by phone

Later sessions: Mid and post-program testing; new programs selected

The Direct Instruction programs employed in the *RMIT Psychology Clinic* combine phonics and phonemic awareness instruction. Referrals may be made by clients or professionals by ringing Vanessa Leung at 9925 7722 on Tuesday mornings or Friday mornings. Training for the parents to use these programs with their children is provided as appropriate. The programs are loaned to the parents.

The *Teach Your Child to Read in 100 Easy Lessons* program can be purchased from the RMIT, Bundoora bookshop. Phone (03) 9925 7237. More information is available from one of the author's webpage at http://www.startreading.com

Programs regularly used in the RMIT Psychology Clinic

Dixon, R. (1976). *Morphographic Spelling*. Chicago: Science Research Associates.
Dixon, R. (1997). *Corrective Spelling Through Morphographs*. NSW, Australia: McGraw-Hill.
Dixon, R., Engelmann, S., Meier M., Steely, D., & Wells, T. (1990). *Spelling Mastery*. Chicago: Science Research Associates.
Dixon, R., Engelmann, S. Bauer, M.M., Steely, D., & Wells, T. (1998). *Spelling Mastery*. Chicago: Science Research Associates.
Engelmann, S. & Bruner, E. C. (1988). *Reading Mastery*. Chicago: Science Research Associates.
Engelmann, S. Haddox, P., & Bruner, E. (1983). *Teach Your Child To Read In 100 Easy Lessons*. New York: Simon & Schuster.
Engelmann, S., Hanner, S., & Johnson, G. (1988). *Corrective Reading: Decoding A*. Chicago: Science Research Associates.
Engelmann, S., Johnson, G., Carnine, L., Meyer, L., Becker, W., & Eisele, J. (1988). *Corrective Reading: Decoding B1, B2*. Chicago: Science Research Associates.
Engelmann, S., Carnine, L., Johnson, & G., Meyer, L. (1988). *Corrective Reading: Decoding C*. Chicago: Science Research Associates.
Engelmann, S., Haddox, P., Hanner, S., & Osborne, J. (1989). *Corrective Reading: Comprehension*. Chicago: Science Research Associates.

The *Corrective Reading* programs are available from McGraw Hill. In Vic, ph. 9836 7061. The contacts in NSW are Betty Ratcliffe 0411 599 820 and Cally Moores 0411 599 934; in QLD Leona Greer, 0411 599 927

The Direct Instruction programs employed in the *RMIT Psychology Clinic* combine phonics and phonemic awareness instruction. Referrals may be made by clients or professionals by ringing the intake person at 9925 7722 on Tuesday mornings or Friday mornings. Training for the parents to use these programs with their children is provided when appropriate. The programs are loaned to the parents.

Some Issues for Schools in the Implementation of Corrective Reading

What are the limits of instructional influence on progress?

The instructional emphasis expressed in the Corrective Reading program does not preclude the acknowledgement that causes of failure can reside within the individual, but allows for the possibility of resolving problems by manipulating instruction regardless of the source of the difficulty. There are a number of elements within the Direct Instruction programs that may have the effect of enhancing student progress. For example, the within-program attention to student responses allows for the identification of difficulties at the time they occur, rather than at the program's conclusion.

In particular, the program requirements for repeating tasks until mastery is achieved, of monitoring each student's responses and their daily rate and accuracy checks - should be examined when considering any student's failure to progress. The mastery tests provided for the program (usually at mid-point and conclusion) also provide a safeguard against a student's failure remaining unobserved throughout the program. Even motivational/attentional variations are addressable through the incentive program integral to the *Corrective Reading* program.

There are several safeguards against failure addressed by the program. One involves information provided to teachers on how best to react to any incorrect student responses detected during the lesson. There are clear scripted correction procedures specific to different tasks, designed to redirect students to the appropriate

response. It typically involves an instantaneous correction sequence in which the teacher models the correct response, leads the student through the correct response, and finally tests the student for the correct response.

Teachers are exhorted at the conclusion of most teaching routines to *repeat until firm.* This is designed to provide additional practice when errors are noted, the practice intended to reduce error incidence in the future. If errors are continually made by the same one or two students, the teacher is faced with a dilemma - to slow the pace of the lesson, provide more practice of each task for the entire class, or, to continue at the pace comfortable to most of the class, and hope that the stragglers at least derive some benefit.
A more humane, though resource expensive option is to coopt an aide or parent volunteer to pre-teach each lesson prior to the regular group lesson. This allows for individually appropriate pacing, tailored to the student's need, and allows the student to continue a rate of progress in concert with his peers during the group session. Usually this double-teaming has the effect of supporting the student in the critical early stages of foundation skill development, improving the student's adaptation to the program structure, and increasing the student's confidence to respond with the group. In the author's experience a short burst of this added assistance allows for successful return to reliance on the group instruction alone.

Another instructional decision point occurs when most of the group makes an incorrect response. In this case, the teacher should examine instructional variables. Some of the candidates could be faulty (perhaps ambiguous) presentation, overly rapid lesson pacing, and, the presence or absence of pre-skills necessary for correct responding during the current task.

What is program fidelity?
The major issue arising from the above discussion is the emphasis on instructional considerations in any attempts to increase the breadth of a program's success. Both the early detection of problems (monitoring) and the planned response to detected problems should be critical foci in such attempts. As the *Corrective Reading* program was carefully designed to allow continuous monitoring of student progress, a failure to present the curriculum in the prescribed manner (if the deviations are deleterious) should become readily apparent. Some of the deviations noted by the author in schools merely comprise unnecessarily verbose explanations, or interesting but largely irrelevant excursions into other topics. These minor deviations may detract from the elegance of the design, thus reducing efficiency, but they are unlikely to jeopardise outcomes for students.

Other departures from the prescribed program such as omitting some elements, for example, individual turn-taking, or specific exercises or tasks, may have a significant effect on the average group progress (if the departures are severe). Alternatively, the modifications may interfere with the progress of some (probably the most vulnerable) students, for it is the most vulnerable students who adapt least easily to ambiguous or incomplete instructional sequences. The early detection of difficulties in any given student is critical to the achievement of broadband success.

The program designers argue that the *Corrective Reading* program is an individual program, but presented in a group format. For this efficiency to succeed, the teacher must observe each student's responses by first ensuring that choral responding is precise, thus enabling the detection and teacher correction of incorrect responses. The teacher also requires well-developed powers of observation to systematically attend to each response of each student. The extent to which teachers can do this successfully depends upon several factors, such as hearing acuity, ability and determination to ensure their students achieve truly choral responding, and the group size. The teachers' manuals recommend group sizes of 15 or less. In the author's experience, inexperienced Direct Instruction teachers should reduce the number to below 10 until they become more skilled. The vigilance provided by teachers in attending to student responses is a major defence against any student's failure in the program. Given that there can be students who do not progress as hoped, this may be an area in which additional training and monitoring of teachers should be a priority.

Several elements of program fidelity appear critical. In a cumulative curriculum, it is essential that all tasks are mastered if students (especially the vulnerable) are to make progress. The in-built continuous progress evaluation is valuable in detecting quickly individual or group difficulty at any point. It is through these

program features that problems of progress resistance can be addressed, and hence students spared the fate of participating in an ineffectual educational process.

In the long term, it may be that individual programming, enabling appropriate and immediate response to student difficulty, can more precisely be delivered through the use of computer-based interactive videodisc in conjunction with voice recognition software. In such a scheme, variations in student learning rates could be effectively and efficiently compensated for through differential presentation rates, error correction, and massed and spaced practice. Student responses could then determine the lesson structure that would, in turn, be capable of adjustment as the needs of the student alter.

Other program characteristics and effectiveness

There is a consensus that the earlier the intervention for at-risk learners the more rapid and widespread is the success; however, in secondary schools, the students have already experienced some years of reading failure, and the habit of employing ineffective strategies for reading is firmly ingrained. The effects of resistance born of failure can form obstacles to progress at least as difficult to overcome as the original source of the reading difficulty. For this reason, the *Corrective Reading* program includes a motivational system based on assigning points for maintaining speed and error limits. Teachers' comments suggest that this element of the program should not be underestimated in making judgements about which are the program's most effective elements. Numerous positive comments have been made about the student enjoyment and increased on-task behaviour attributable to the points system. Additionally, the system has helped to *capture* the cooperation of many students initially negative about being involved in the program.

One difficulty evident in much of the reading research involves ensuring students transfer their newly developed knowledge and skills to the task of everyday reading. For this to occur, the students need to notice that the new strategies are superior to the old

An element contributing to the impressive gains no doubt involves the time and intensity of the intervention. Longer interventions allow for greater content coverage and adequate practice, though of course there is no guarantee that all intervention designs specifically incorporate such effective teaching characteristics. Program intensity involves a combination of lesson length, lesson density, and lesson frequency. Lesson length for the *Corrective Reading* program is about 40 minutes. This period allows for a reasonable content coverage in each session and for the integration of new knowledge into the existing structure. As the programs involve a cumulative sub-skills approach to reading comprehension - the introduction of new skills, the practice of recently acquired skills and the amalgamation of these with the already-established core - requires careful lesson planning and sufficient time for this amalgamation to occur.

Program density involves the extent to which students are actively engaged in learning during the lesson time. Various concepts such as time on task, academic engaged time, and academic learning time have been employed to address the issue of student engagement. An observational study by Allington, Stuetzel, Shake, and Lamarche (1986) noted that typically only about one third of the time allocated to remedial reading instruction was actually spent in direct reading activities, the rest consumed by management issues, waiting, transition, and absence from the room. One way of promoting student engagement is to plan for overt responses. When students are producing overt responses it is apparent that students are participating, and their learning can be monitored. The additional advantage of overt responses involves the opportunity to provide corrective feedback.

Another element of lesson density involves the proportion of correct to incorrect responses. Students who struggle with reading require high rates of success if they are to adopt new strategies, transfer new skills across tasks, and persevere with the new strategies. Teachers in this study have commented on the high success rates achieved daily through careful lesson design, and student placement at the appropriate program level. The author has counted 300 responses from a student in a 10 minute word attack segment of a *Corrective Reading* program lesson. This represents a very high intensity of participation; additionally, the success rate was very high, above 90%.

Lesson frequency appears to be important, perhaps because of the need for spaced practice of newly mastered skills. It has been noted that students, particularly those at-risk, readily forget what they have learned when lesson frequency is too low. If this occurs, additional time is spent in relearning rather than in incorporation activities. Frustration and disengagement are the possible negative outcome of under-scheduling. The program guidelines recommend five lessons per week, although this may not achieved by all schools. Most schools allow for five sessions per week, but almost inevitably other priorities intrude. These usually involve activities such as school swimming programs and other sports, visiting guests and excursions. Often a period of school holidays (either 2 or 6 weeks) interrupts the lesson sequence. The effect of variable frequency impacts most notably on the students most at-risk. They are the students most likely to lose hard-won gains through forgetting.

The total contact hours are also relevant. Each level of the *Corrective Reading* program entails about 50 hours of instruction.

Program fidelity: Teacher training

The Direct Instruction model as explicated in the massive Follow Through experiment paid significant attention to the issue of fidelity of implementation. The designers' examination of implementation research had found moderate to high correlations between student outcome and degree of adherence to prescribed procedures (Engelmann, Becker, Carnine, & Gersten, 1988). The training program for their teachers involved several elements: presenting the rationale, demonstrating technique, providing practice and feedback in response to teacher performance, and, observing real classes - weekly for the first four months, then fortnightly. That process may take a year overall, with the level of complexity of the skills to be introduced increasing over that period. In examining the training modules it is evident that the model of teacher training adopted by the designers involves the same direct instruction principles as underlie the student skill development programs.

In the design of the delivery system, the focus was on those teacher behaviours that resulted in optimum student achievement. This concern for detail mirrored the designers' approach to field testing instructional routines also. In that process, theoretical principles of instructional design drove the initial development of content, but it was multiple-setting field testing that determined the final design. For example, the *Corrective Reading* program (*Level B Decoding*) underwent nine revisions before publication (Hanner & Engelmann, 1984).

Engelmann (1988) argues that the average teacher would need to practise an exercise in a reading program at least a dozen times before the fluent orchestration of component presentation and correction skills is attained. These skills involve comfortable and facile use of the specified teacher wording, using lesson pacing appropriate to the example and to the student group, using signals in an unambiguous and natural manner, and providing adequate (but not excessive) reinforcement. In his view, this practice and associated feedback should not take place in the classroom but in less complex settings such as "dummy" runs with colleagues, etc. Such practice is considered important as a beneficial precursor (though not sufficient) to the transfer of training to the real world of the classroom.

Engelmann's experience has been that, without safeguards, less than 30% of the skills practised (outside the classroom) will be evident subsequently in classrooms. Thus, the provision of in vivo coaching was found to be especially important for the acquisition of skill. This is unsurprising given the increased salience of observing a model performance in one's own classroom. Glang and Gersten (1987) commented on the value for teachers in seeing how their own students responded to the expert instructional techniques presented by the visiting supervisor. Unfortunately, this level of support is rarely available in our educational settings.

As for school-based training in Victoria, contact Claire Scott at cgscott@netspace.net.au She has studied as DI trainer in Oregon and is very adept at teaching and training. She provides service by contracting with a school.

Within program controls

In most schools, it has not been possible to provide the intensity and duration of teacher-training recommended by the authors. It has been noted in other studies that program fidelity can be a major contributor to the success or otherwise of an intervention. Schneider, Kuspert, Ruth, Vise, and Marx (1997) found that whilst differences in focus and duration (time allotted daily and overall program length) had a significant effect on outcome; so did the degree of pre-program and within-program teacher training have a significant influence on the degree of success experienced by students.

A major difference in implementing the Corrective Reading program compared to most experimenter-developed curricula involves the extent of within-program control of curriculum and delivery. The programs used in this study are very prescriptive - the teacher making few judgements about curriculum issues. The content and delivery are scripted, and the teachers' role is relatively transparent. The teachers' skill revolves around classroom management, task presentation, and response monitoring (making decisions about the degree of repetition needed, or the need for error correction).

Thus, one source of variation in "loose" programs may involve limitations due to the under-developed teaching abilities of some teachers. Another source in programs that provide only general lesson plans (or even less structured, topic areas) is the variation in the manner in which different teachers may choose to present the curriculum - the degree of teacher directed vs. self directed learning, the amount of massed and spaced practice, and the error correction opportunities, for example. Such variables are known to impact on student outcomes, and variation at this level can be confounded with the effects of program content.

The level of prescription in the Direct Instruction programs is valuable in reducing, though not eliminating, teacher differences. It has been noted that there is usually reasonable consistency of results across different schools in the sense that the effects tend to be described as large by most schools. This suggests that the designers' intent of reducing the impact of teacher differences has been achieved to some extent. This is a non-trivial finding as the requirement of training in some programs has been a significant added cost to be considered in conjunction with program effectiveness. For example, in the Foorman et al. (1997) studies, teacher training involved between 30 and 90 hours initially, and subsequent twice monthly lesson observation.

It is possible that an increased level of initial training and subsequent monitoring of teacher presentation skills can increase student achievement levels. It is also possible that as teachers become more experienced their effectiveness increases. However, the reported improvements evoked by teachers who are inexperienced in the program are educationally and educationally significant at the current low levels of support, an important finding in the real world of inadequate funding. Pressley and Beard El-Dinary (1997) make the point that designers cannot afford to be too precious when their excellent results are not replicated because schools fail to exactly duplicate the procedures used in the evaluation studies. An important question for any program being considered by a school is the degree to which it is robust to changes in its content or delivery across a range of settings.

Where to for these students?

An issue for schools is whether to continue upon completion of one program level for any given group. Some schools consider that all needy children should have an opportunity to participate; whereas, others prefer to follow the same cohort through several levels. The issue is a vexed one when resources are insufficient to meet the longer-term needs of all the students. Felton (1993) made the point that, for disabled learners, several years of Direct Instruction may be necessary before they are able to make adequate progress in reading without requiring additional educational assistance. This is particularly so for upper-primary and secondary students who have a long history of failure, and whose reading problems have impaired their vocabulary development compared to that of their peers.

One measure which may assist schools in determining which students should be in the *continuers* group involves consideration of reading volume. The students who participate in the program are likely to have done much less reading than their more facile peers, and gathering evidence as to any increase in the volume of reading undertaken by the students may be a valuable process. Stanovich (1986) pointed to the positive effect of increased volume of reading on students' reading progress, and it may be that an aid in deciding for any

student between program conclusion and the need for further intervention could reside in the amount of reading subsequently performed.

The likelihood of students reverting to poor reading strategies is difficult to establish, but is a hazard when an intervention does not include a follow-up. For example, it is possible for students to develop strong word attack strategies and to demonstrate progress in the reading class, but for such skills to have little or no impact on day-to-day reading, or to lose its impact upon program completion.

It is for this reason that the continuous within-program tests should be important elements in the overall evaluation of program success and the discontinuation decision. The benefits of this routine may be strengthened by within-school and home-based programs designed to promote and monitor increased reading volume in the post-program period. Regular subsequent assessment could be used to ascertain the degree to which any given student's progress in reading is being independently maintained. Some students may have reached the independence level (after which self-teaching replaces instruction) described by Share (1995), whereas the progress of other students may stall, indicating the need for the implementation of the next program level.

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The use of direct instruction reading programs for beginning readers and for remedial non-readers

There are Direct Instruction reading programs for younger at-risk beginners, and for the older complete non-reader, whether intellectually disabled or not.

(1) Reading Mastery (Engelmann & Bruner, 1988. Available from McGraw Hill). This is a series designed as a basal beginning reading program for schools. It is a teacher-directed, phonics-emphasis program, which meets the criteria for an effective reading program as outlined in the accompanying articles - *30 Years of Research: What We Now Know About How Children Learn to Read*. And *Building a Powerful Reading Program from Research to Practice.* The research supporting this program is described in the accompanying article- *The Research Base for Reading Mastery.*

(2) Teach Your Child to Read in 100 Easy Lessons (Engelmann, Haddox, & Bruner, 1983. Available from RMIT Bookshop 9925 2237, about $30). This program is derived from *Reading Mastery* but is written for parents to use in a one-to-one tutoring situation. Our experience in the RMIT Psychology Clinic is that parents can be readily trained in the use of this program, and the results have been very pleasing. It is fully scripted so no lesson preparation is needed. Many parents have found this program has given them the capacity to enhance their child's progress to a degree not experienced when their contribution was restricted to listening to their child read.

Both programs are designed to be presented daily for between 30 and 45 minutes, either individually or (for *Reading Mastery*) in groups of up to six students.

Matthew Effect

Many of the children seen in the Clinic (and in schools) have experienced the debilitating sequence of interacting skill deficits described by Stanovich (1986) as the Matthew effect. For example, the early lack of phonemic awareness leads to a failure to master the alphabetic principle. This further entails slow, error-prone decoding, the overuse of contextual cues, and poor comprehension. This resultant laborious, unsatisfying reading style leads students to avoid text, with a consequential reduction in vocabulary growth, and a broadening of the skill deficit.

The lack of practice means fewer words are able to be read by sight, thus restricting automaticity. The continued expenditure of cognitive attention on decoding leaves few resources available for comprehension, and so the student's difficulties are compounded. The longer this set of circumstances prevails, the further delayed the student becomes, the more pervasive becomes the problem, and the more difficult the rescue operation.

The *Corrective Reading* Program is an excellent program for addressing their literacy needs, however progress is often slow, and in the case of seriously disaffected students, hard won. Hence the concern for intervening earlier in this otherwise escalating chain of events.

Early intervention and phonemic awareness

If the rescue operation is commenced earlier, when the primary deficit is restricted to phonemic awareness, and it is this deficit that is targeted, it is reasonable to anticipate a more efficacious process. If increased phonemic awareness and an early understanding of the alphabetic principle are the outcomes (thereby precluding the by-products of early reading failure), the intervention at this stage should be more effective, efficient and socially

just. For a full discussion of phonemic awareness, and its critical importance to reading success, see the accompanying articles.

Although the content of the *Teach Your Child to Read in 100 Easy Lessons* (Engelmann, Haddox, & Bruner, 1983) was developed earlier than most of the research into phonemic awareness, it is now becoming more evident that the combination of letter-sound instruction with phonemic awareness training (as evidenced in the *100 Lessons* program) is a potent one in stimulating early reading development (Byrne & Fielding-Barnsley, 1991, 1993, 1995; Ehri, 1987; Perfetti, Beck, Bell, & Hughes, 1987, Torgesen, Wagner, & Rashotte, 1994; Hatcher, Hulme, & Ellis, 1994).

However a wide range of phonemic awareness tasks have been incorporated into phonemic awareness programs, and a vital question (especially for at-risk students) is what combination of tasks is optimally related to accelerated reading development? O'Connor, Slocum, and Jenkins (1995) reported a study in which the combination of letter-sounds, blending and segmenting instruction led to educationally significant gains for at-risk beginning readers. The program intervention lasted a total of five hours (15 minutes twice weekly for 10 weeks). A second experimental group had a much greater range of phonemic awareness activities (in addition to segmentation and blending) but showed no increase in reading development over the first experimental group. The authors argue that both experimental groups were able to generalise the phonemic awareness skills they were taught, that is, they attained phonological insight, and were able to relate it to the reading process. Importantly, their findings suggest that the combination of blending and segmenting is sufficient to create this condition.

Torgesen, Morgan, and Davis (1992) tested two types of phonemic awareness training approaches - blending only, and a combination of blending and segmenting - and compared them to a language experience control group. The small groups trained three times per week for 20 minutes for a total of 7-8 weeks. The blending only group improved only on blending, their segmentation skills remaining similar to that of the controls. Similarly, their ability to learn in a reading analogue task did not significantly exceed that of the control group, indicating a lack of generalisation of this skill to this reading task. In contrast, the combination of blending and segmenting led to significant improvements in both skills, and evidence of transfer to the reading task. The authors acknowledge that the introduction of letter-sound training may have even further enhanced the transfer to reading tasks had they incorporated such strategy.
Davidson and Jenkins (1994) in a similar study included a segmentation-only training group, and while they noted some transfer to a reading analogue task for that group, they too argued against teaching only one type of phonemic awareness strategy, as generalisation of awareness is likely to be compromised.

Lovett, Borden, DeLuca, Lacerenza, Benson, and Brackstone (1994) used a 35 lesson training program developed from Reading Mastery and Corrective Reading to teach word identification to dyslexic students for one hour four times per week. They compared results to a control group taught a study skills program, and achieved highly significant posttest gains for the experimental group - effect sizes of .76, 1.11, and .90 on the three training measures. The transfer to real words was impressive , and "was based on the successful training of what is considered the core deficit of developmental dyslexia: phonological processing and nonword reading skill" (p. 818). Further, they argue, "this training success rests on embedding letter-sound training in an intensive phonological training program" (p. 819).

Thus there is evidence to support the use of a program which explicitly teaches letter-sound correspondence, and which simultaneously links this knowledge to two critical phonemic awareness skills, blending and segmenting. This should not surprise since segmenting and blending are the phonemic awareness processes most closely involved in reading, and letter-sound knowledge is both a prompt, and a necessary condition for this phonemic awareness knowledge to be useful in reading. The *100 Lessons* program meets these dual requirements of theoretically and empirically validated practice.

The Program

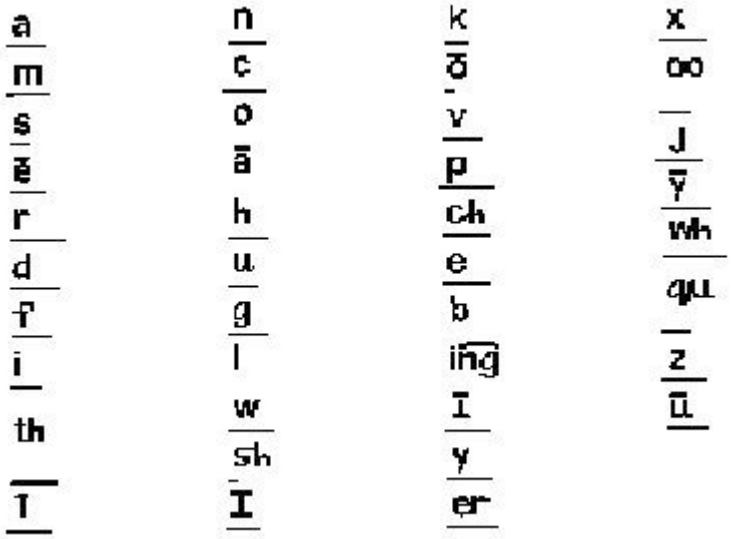
Teach Your Child to Read in 100 Easy Lessons (Engelmann, Haddox, & Bruner, 1983) follows the Direct Instruction principles of design, and the content emphasises the explicit teaching of phonemic awareness (rhyming, blending, segmenting) along with 44 letter sound correspondences. These selected correspondences

allow for the decoding of 95% of the sounds in the students' typically available books, and close approximations for 98% (Grossen, 1995).

A specially developed orthography reduces the number of such correspondences to an attainable number (some programs had taught up to 200 such correspondences) and allows for the introduction (Lesson 13) of interesting sentences while still controlling the text for regularity (albeit artificially). This Distar orthography enables a range of interesting irregular words to be decoded using the segment/blend strategy, thus providing for students both practice and a developing assurance that the strategy is a successful one, worth persevering with until familiarity produces whole word recognition. This feature is very important as students can be overwhelmed by the number of irregular words in uncontrolled text - the result being an inability to appreciate the value of the recoding strategy, and a consequent failure to focus on developing the skill.

The orthography has several useful features that enable a variety of text, avoiding the "Dan can fan Nan" limitation of devising regular text when few sounds are known by students.

Visual cues are provided to promote the distinction between long and short vowels, through the use of a macron over the relevant long vowel (*e*). Words with CVCe sequences are regularised through the use of small letters which are not pronounced. Hence *lake* is written as *lake*, and can be decoded by blending the three sounds. The teaching of separate sounds for two letter blends, such as *er, wh, sh, th, ch* and *qu*, similarly allows for the regularisation of troublesome words such as *she* and *where*. Not all words are made regular as that would teach a misrule - that all words are regular in natural text - thus a few words are allowed to continue as irregulars (e.g., *to, was, said*). This misrule would make the subsequent transition to normal orthography difficult for students. There are enough words taught in this manner to ensure students are aware of the exceptions, but not so many that the utility of mastering phonological recoding is jeopardised.



The correspondences are introduced in a sequence different to that in the alphabet, to reduce the ambiguity associated with similar shapes or sounds being introduced at nearly the same time. For example, /d/ is introduced in Lesson 12, whereas /b/ is taught in Lesson 54. An additional distinguishing prompt sees the "ball" on the /d/ assigned a stretched (almost elliptical) shape (until Lesson 74) to separate it further from its mirror image /b/. This pair of letters often presents problems of interference (reversals) to young readers, who are sometimes accused of neurological deficits to account for a largely instructional problem. Another rationale for the atypical sequence of letter introduction is to enlarge the range of words which can be created from the earliest stages of the program.

Words are first introduced in Lesson 3, and considerable attention is paid towards oral reading practice with immediate corrective feedback.

Research support for the *Reading Mastery* series has been strong; see accompanying article for the results of a huge study of 70,000 students in the USA (Operation Follow Through), and recently a meta-analysis by Adams

(in press) has reported on effect-size of .68 for 44 acceptable comparisons involving *Reading Mastery* and other beginning reading programs. This is considered a very powerful effect, especially in comparison to the whole language reported effect-size of.06 (Stahl & Miller, 1989).

The *100 Lessons* is very carefully constructed. Apart from the controlled vocabulary, the program prescribes the tasks to be presented, the examples chosen, and how often they occur. Even the teacher's wording is specified through the use of a script. This high level of control allows for consistent implementation across different teachers, and the facility for teaching by non-teachers. The program's effectiveness, however, does rely on faithful adherence to the format provided.

The program emphasises letter sounds rather than letter names because of the functionality of the former in beginning reading, and to avoid the opportunity for unnecessary confusion entailed by teaching both sounds and names simultaneously. Names are introduced in Lesson 73, and capital letters in Lesson 81. The phonemic awareness skills of blending and segmenting are taught orally initially, because there are fewer elements in the oral than the written task, and hence less likelihood of error. Blending is taught as a simultaneous rather than discrete-sound format - "mmmaaat" rather than "mmm-aaa-t" because the stimulus sequence of sounds is really a stretched form of the word "mat", rather than a broken form in which the elements are completely separated. The authors argue that the mastery of continuous blending is a worthwhile objective because it provides more salient clues to the pronunciation of words. The oral blending activities proceed from large intra-word clusters to single phoneme blends.

"Let's play say-it-fast.
My turn: **motor** (pause) **boat**.
(Pause) Say it fast. "motorboat".

To assist the mastery of simple two phoneme blends an additional step is included in the model-test sequence. The sequence becomes model-lead-test, thus providing an additional prompt.

"First I'll say **am** slowly. Listen: aaammm.
Now it's your turn to say the word slowly with me. Take a deep breath and we'll say aaammm. Get ready. aaammm
Your turn to say the word slowly by yourself. Say aaammm. Get ready. aaammm."

Blending activities begin in the first lesson, and segmenting written words into constituent phonemes in Lesson 9. This latter process is assisted by the use of marks under the word which prompt the sounds one by one at the required pace.

Task 9 WORD READING

1. (Point to **sat**.) *You're going to touch under the sounds as you sound out this word and say it fast.* (Touch under **s**.) *What's the first sound you're going to say?* "sss." (Touch under **a**.) *What's the next sound you're going to say?* "aaa." (Touch under **t**.) *What's the next sound you're going to say?* "t."
2. *Touch the first ball of the arrow. Take a deep breath and say the sounds as you touch under them. Get ready. Go.* (Child touches under **s**, **a**, and **t** and says "sssaaat." (Repeat until firm.)
3. *Say it fast.* "sat." *Yes, what word?* "sat." *You read the word* ***sat****. Good reading.*

Teach Your Child to Read in 100 Easy Lessons (Engelmann, Haddox & Bruner, 1983, p. 53)

Other activities include: rhyming to promote a sensitivity to word families based on common endings (or rimes); sounds-writing because it prompts attention to the letter shape, and helps forge the association between shape and sound; story reading (from Lesson 13) involving successive segmenting and blending; and, picture comprehension (from Lesson 13). Pictures are provided after the story is finished to assist comprehension, but to avoid the picture cues being used in place of print cues in the decoding task. Sight words (from Lesson 13). Words which have been practised sufficiently often (using the segment-blend procedure) for them to begin to become familiar are "read the fast way", that is, the child slides his finger under the letters to prompt a thorough viewing, but does not sound out the word, rather he reads it orthographically.

Supporting this cumulative skill acquisition and skill synthesis model are clear scripted correction procedures. There are two basic principles - the first is that correction be applied immediately following the error, rather than delayed until the end of a sentence, or waiting for self-correction. The purpose of the program is to teach accurate decoding of words based on information provided by the print, rather than relying on contextual cues to prompt a word's pronunciation. Hence the correction redirects the child's attention to the source of the information - the word. The second principle specifies the basic correction structure - the child is notified of the error, given the correct response, allowed to practise this response, and finally tested on the original task before moving on. Additionally, a delayed test presented later in the lesson is often recommended.

The change from the alternative orthography to normal print occurs over a three lesson period (Lessons 74-76), and after that time all print is conventional. By this stage the child is reading stories of about 200 words orthographically, and answering comprehension questions. According to the program designers the child should be reading at about a Year Two level at the completion of the program.

The shift from letter by letter decoding to orthographic whole word recognition occurs in students who are able to fully analyse word structure (Stanovich, 1991), and have had many opportunities for practice of such words in isolation, and in connected text - particularly with words containing high frequency spelling patterns (Ehri, 1992).

According to Ehri's (1992) work, the most effective way for beginning readers to store sight words in memory is to fully analyse the sounds in the spoken word and to match those sounds to the letters in the printed form of words. To do this, readers must know how to segment pronunciations of words into their smallest sounds, and they must know which letters typically symbolise those sounds. (p. 315). (Gaskins, Ehri, Cress, O'Hara, Donnelly, 1996).

Given that the content of the *100 Lessons* program focuses on the skill areas currently accepted as critical, that the style of teaching employs empirically supported effective-teaching principles, and that the instructional design principles ensure ample massed and spaced practice - the authors' claims that their decoding instruction leads to eventual skilled whole-word recognition appear reasonable.

Schools' selection of the parent-based program over the *Reading Mastery* series is often based on cost. Few schools are prepared to invest the relatively large sum of money in a program for a few at-risk beginning readers. The *Reading Mastery* series was written as a basal series designed for general classroom beginning reading instruction, but is not generally attractive to schools for that purpose. It is unfortunate that this program has not found favour as a whole class approach; perhaps it is due to the strong influence on schools exerted through the dominant Whole Language philosophy. I am aware of at least one school that ran the Reading Mastery series throughout the whole school for a number of years, and obtained outstanding results, noted in the accompanying chart. There were no students below the State average in this disadvantaged primary school. In fact, the majority of students were at stanines 7,8,9, that is, above average in both decoding and comprehension.

Despite its impressive results, it likely that Reading Mastery will remain under-used in schools. The initial cost is high at about $1400 for a class of 20 students, and $27 per student in consumables. This initial cost is, of course, a one-off expense, and overall, it is not as expensive as 1:1 programs such as *Reading Recovery*. A major advantage over *Reading Recovery* lies in its capacity to effectively teach groups of up to six.

By contrast, the less comprehensive *100 Lessons* program is cheap ($40) and in the author's experience, effective if presented faithfully, either by parent or teacher. As the program is designed for one-to-one teaching, there are some modifications required for group instruction. If the teacher involved is skilled in presenting the *Corrective Reading* Program, it is not difficult to adapt the group-signalling, correction, and choral/individual turn-taking strategies from one program to the other.

The most evident changes involve: the use of the blackboard to reproduce the graphics presented in the book; using the finger-slide signal at the board rather than on the page; providing roneo sheets containing the words and sounds for that lesson to allow the students to use the finger-slide prompt; and, using a hand-drop signal for the orally-presented tasks to ensure simultaneous choral responding.

The techniques described above are not typically part of a teacher's repertoire, and some teachers find it more difficult than others to accommodate to the program, and avoid adapting the program. Most teachers need some assistance to develop the presentation and correction skills, and comment that it takes about 20 lessons before they begin to feel comfortable with the approach. Students usually have less trouble in adapting, and if the lessons are presented in a brisk and focussed manner, most students enjoy the structure, success and routine of the program. Teachers who prefer an orderly classroom, and whose teaching accentuates planning rather than an opportunistic model tend to have greater success in engaging the students.

In the RMIT Clinic, and at schools, training in *Teach Your Child To Read In 100 Easy Lessons* has been provided to parents, volunteers, and teachers to successfully implement this program in an individual or group format. Apart from initial training, the Clinic model involves monitoring of the presenters' skills, on-going support, and a variety of pre- and post-test evaluation strategies. The success of the program is heavily dependent upon treatment fidelity, thus the necessity of continued support. This overseeing role has an important secondary effect of enhancing the willpower necessary to achieve success. Our experience has been that without this continued Clinic role, programs are often discontinued prematurely, or are altered to the extent that success is jeopardized. In addition, parents are sometimes pressured by schools not to implement this program because it does not fit with the school's language policy. While there is no reason why the approaches need be seen as antagonistic, there are occasions when assistance, through clinician contact with the school, is necessary.

The approach to training involves the following sequence: the clinician provides information about the program; the clinician demonstrates the program - with the parent initially acting as the student; role-reversal, in which the parent teaches the clinician (who provides feedback); the clinician teaches the student; finally the parent teaches

the student (with clinician feedback). This process of *demonstration-practice-feedback* continues until the clinician is satisfied that the parent is able to correctly present the program. At least one complete session is devoted to this sequence; usually another session (one week later) is scheduled before the parent is asked to commence the 5 times per week program implementation at home. During this week the parent (or preferably parents) practise the various tasks in the first couple of lessons. The training of two parents is advantageous because it reduces the load on one parent, reduces the problems of student reluctance, and allows for supportive collaboration - all of which enhance program endurance.

Follow-up sessions are (typically) weekly for the first two weeks, fading to fortnightly for two subsequent visits, then monthly until the program is completed. The amount of support parents require varies from case to case. Parents are asked to tape-record the first, 50th and 100th lesson, as such recordings can provide a more dramatic indication of progress than the standardized pre- and post-test results. One major difference between the above-mentioned programs is the increased opportunity in *Reading Mastery* for practice with stories. This practice can be added to the*100 Lessons* program by use of the Distar Library series (a series of graded readers available from McGraw Hill). Similarly, the regular mastery tests provided in *Reading Mastery* can be incorporated into the *100 Lessons* program to provide regular indicators that the program is being correctly implemented.

Notes for presenters of the "Teach Your Child to Read in 100 Easy Lessons" program.
Read the manual's introduction carefully - many questions are answered in this section of the manual.

Use the Reading Mastery Placement Test to ensure this program is appropriate for the student.
Students obtaining 0-18 points begin at Lesson 1 of the "100 Lessons" program
Students obtaining 19-20 points proceed to Part 2 of the Placement Test
Students obtaining 0-7 points begin at Lesson 1 of the "100 Lessons" program
Students obtaining above 8 points should complete the Placement Test for the Corrective Reading program

This procedure ensures that the student has sufficient skill to cope with the program from the beginning, but does not already have the reading skills taught in the program. In general, it is appropriate for beginning readers, and for those whose progress in another beginning reading program has been negligible. The approach has been used successfully in the RMIT Clinic and in many other places, including homes and schools. The approach is appropriate for children with dyslexia, ADD, ADHD, reading delay, speech and language disorders, and for children with mild intellectual disability. The program meets the requirements of effective reading models, incorporating phonemic awareness activities, direct teaching of letter-sound relationships, explicit phonics, and incorporates sufficient practice opportunities to stimulate automaticity of decoding - a critical requirement for subsequent whole-word recognition.

Be aware of the need for the teacher, parent, or volunteer to complete 5 lessons of the program each week. Students who struggle with reading typically forget what they have mastered, unless carefully designed and regularly presented follow-up occurs. If the lesson frequency falls below 4 lessons per week it is likely that previous lessons will need to be revised, as evidenced by an increase in the error rate during lessons. Scheduled follow-up of the progress of the program is vital - as initial enthusiasm may wane if regular supportive contact is not maintained. The consequence of such a drop in lesson frequency is an unsatisfying experience for both presenter and student leading to a further lowering of lesson frequency. The use of the mastery tests of the Reading Mastery program can help to indicate any stalling of student progress before it becomes too difficult to retrieve. The tests also provide the presenter (and clinician) with some confidence that the program is being presented competently.

Presenting the program exactly as written is crucial. Whilst it may be tempting to alter the program, the excellent results obtained in the Clinic and elsewhere usually only occur when the program is carefully adhered to. Develop a contract if it is considered necessary, in order to diminish the reluctance sometimes displayed by students who do not yet believe that they are capable of mastering reading.

<u>Some important points about this program</u>:

- The beginning lessons appear very simple; however, they address precisely the basic skills that have not been

mastered thus far, and that have held back the student's progress in the past. These early lessons are necessary if the student is to cope with the more obviously reading-related content appearing in later exercises.

- Teaching is provided for every skill required by the child when performing even the simplest reading exercises.
- Exercises progress slowly, and changes are relatively small; as a result the exercises maintain a level of ease for the students.
- At every step, clear and unambiguous communications are provided through the meticulously designed and tested scripts.

Why are the lessons scripted?

There are many things to which you, as the teacher, must attend. As the instructions are provided, the teacher's workload is correspondingly reduced, and you can focus solely on the student's responses and behaviour. Detailed instructions have been carefully designed and trialled to allow for effective communication between teacher and child. The use of identical instructions for similar tasks assists students to attend to the content, because they are less likely to misunderstand instructions with which they have become familiar. Paying attention to such seemingly minor (but actually quite important) instructional details is part of the reason why the program is successful. It attempts to provide instruction that is unambiguous.

Orthography -'Funny print'

Orthography involves the manner in which the letters in words are represented. In English there are a lot of words that are not spelled as they are spoken, for example, 'said' is read as 'sed'. This can be very confusing for a beginning reader, so in this program, use is made of a novel orthography. Its purpose is to regularise many words that could not otherwise be used in a controlled-vocabulary story. The unusual orthography allows extra cues about the words to be made available to the beginning reader. For example, letters that are necessary for spelling, but which are not sounded, are written as small letters (e.g., little). Another potential source of confusion involves the different sounds made by a given vowel. To enable the sounding-out procedure to be effective and rewarded, the long sound and short sound are taught for the vowels. They are distinguished in the printed word by the use of a bar (called a macron) over the top of the vowel when the long sound is expected (e.g., the *ay* sound as in *lake*).

The altered orthography could make all words regular, that is, one symbol makes one and only one sound when used in words. Exceptions in the program are 'to', 'the', 'said' and 'was'. These few irregular words are taught to children to make it clear that not all words are regular. This distinction allows for the introduction of other irregular words later, but without swamping them with so many irregular words initially that there would be a risk of their failing to see the benefits of decoding.

First things first

Letter names are not taught at first because they are not critical for reading words. What is initially important for reading is knowledge of the sound each letter makes. *Sounds* are functional in reading, so they are taught before being presented in words. If letter names are taught simultaneously with sounds some children become confused, and their progress is threatened.

There are two types of letter sounds - continuous and discontinuous. A letter such as **m** has a continuous sound: 'mmm'. The repeated letters mean that you are require to hold the sound. Other continuous sounds include **f, s, n, 1, z,** and all the vowels: **a, e, i, o,** and **u**. The sounds that cannot be held for a long time are called discontinuous sounds. They include **b, d, ch, g, h, p, j,** and **t.** To say these sounds, you pronounce them very fast, adding no 'uh' sound to the end of them. This is not easy to do, but if you practise saying words in which the relevant sound occurs at the end of a word, you'll get the idea. For example, say 'rob', and listen to the 'b' sound you made - you did not say 'robuh'. Now try to reproduce that same sound 'b' alone - it requires the effort of stopping just as you pronounce it. It is hard to describe in text, but important for students because the 'buh' sound may confuse them when they are trying to listen for a clean 'b' sound.

The letters are not taught in alphabetic order because it has been shown that the proximity of some letters (e.g, *b* and *d*) in the alphabet can cause unnecessary confusion - to the extent that sometimes students are thought to be

prone to reversals. Letters are taught in a sequence that maximises the number of words that can be created (thus making more interesting stories), but without producing letter-shape confusions.

Blending

These are verbal, not visual skills. To teach blending, first the student says the word very slowly, holding each sound but not stopping between the sounds,

eg: mat - **"**mmmaaat", not "mmm--aaa--t"

Next the student says the word fast - "mat".

This task might be presented in the book as:

"Say "**mmmaaat**" Student: "mmmaaat"
"Say it fast." Student: "mat".

In the blending tasks, the teacher does not stop between the sounds. This can sometimes be more difficult for the teacher than the child. When the student says the sounds without pausing between them, he is actually saying the word slowly. The advantage of insisting on continuous blending has been confirmed by research. It is more difficult for students to mentally squash together the sounds when they are pronounced with pauses between them.

The next step involves the written word being added to the blending exercise. First there is a word-reading exercise.

The teacher points to the word **"mat"** and touches under the letters 'm', 'a' and it' as the teacher says: "mmmaaat".

Rhyming

Already two important skills have been taught - sounds and blending. A third skill is rhyming, the ability to understand the relationship of one word to words that are similar in their ending sound. If we start with the word segment 'op', and add different beginnings, we create a series of related words. If the student has basic rhyming skills, the relationship between the words will become clear. That is, words with quite different meanings but similar construction will be viewed by students (often for the first time) as being related to each other. This relationship between words that have similar end sounds becomes very useful later when students discover that they are probably spelled similarly also.

Not all the sounds will be taught to the student at once, and plenty of practice will be given with each new letter. The sounds are not taught in the usual sequence, but rather based on their ability to provide the maximum number of simple words, and in an order that reduces the potential confusion of similar looking letters, such as, 'b' and 'd', 'u' and 'n'.

Irregulars and Comprehension

After initial decoding has been introduced to students, there are other skills that need to be taught. Different groups of irregularly spelled words are included in the next teaching phase. Emphasis is switched from reading isolated words to reading sentences, and comprehending those sentences.

All the tasks and questions you as the teacher need to present will be written into the program for you. Additionally, all the correct responses that students should make for the various tasks are indicated. The most important thing is to follow the program to the letter, without changing anything. The program was redesigned numerous times based on the findings of trials in homes and schools, so you may be assured that the wording supplied is both sufficiently instructive to meet the needs of most students in understanding the task, but not overly wordy to distract them or waste time.

Before you start teaching...

You should:

1 Learn the sounds that are introduced in the program, particularly the first ten. Ensure that you are precise about the difference between a letter sound and a letter name.

2. Devise a teaching schedule - lessons usually once a day, preferably the same time each day. No fewer than 4 lessons per week should be considered, as the students we are concerned about typically struggle to remember new information over the untaught days. The end result is reteaching lessons, to the annoyance of all concerned.

3. Practise your correction strategies.

4. Practise presenting the first couple of lessons in the program. Before teaching a lesson to students, you will need a couple of hours to prepare for the sessions, so that you are really familiar with the program. It is difficult to monitor student's responses if you need to concentrate heavily on the script. Most teachers indicate that it takes about 20 lessons before they feel comfortable with the formats, so do not let initial discomfort dissuade you from continuing. Practise!

The first lesson will probably take the longest of all sessions. You will require an hour preparation time for this lesson, but this time will decrease with each lesson. Soon you will have assimilated the format, knowing what you need to say, and only needing to look at the words that comprise the day's task content.

Reinforcement

When working with students, you should be responsive to their efforts, and in responding them you should both reinforce - or praise - appropriate behaviours, and correct mistakes.

Lessons should be overwhelmingly reinforcing, but do not confuse reinforcement with overlooking mistakes, or letting students perform sloppily. All the skills being taught in the earliest lessons are required for later lessons, and comprise the basis of student's beginning reading. If some skills are overlooked or presented without careful monitoring (and feedback) in these early lessons, the students will certainly struggle when they are presented with more complex forms. The consequence of such mistaken kindness is that students will not understand that accuracy is important, and they may fail to make adequate progress. Such an outcome reduces both teacher and student motivation, making additional later remedial attempts even more difficult. The teacher's failure to follow the program precisely is the most likely reason for a student's inability to make continued progress. The regular use of the Reading Mastery program's mastery tests ensures that each skill is attained before the next step in the cumulative sequence is attempted. At least with such careful progressive monitoring, one can preclude the necessity for student needing to revert to the beginning of the program, and recommencing.

Some reinforcing statements are scripted for you; however, you may (for some students) need to provide your own reinforcement for other good things that a student does. To be reinforcing, you need to do the following:

1. Praise students for working hard, even if their performance is not perfect- 'I like the way you are really working hard!'; 'You try so hard, I can see that you really want to learn to read well!'

2. When a student performs well, praise him: "Billy, that's fantastic. You're so a clever to remember the sounds for 'b' and 'd'!"

3. If student does well on a task that he found difficult on earlier occasions, show surprise-. "Johnny, I thought you'd have a lot more trouble with that! There's no tricking you**,** is there? Fantastic!"

4. Give the student the chance to show off the skills he has mastered: "Wait until your dad/mum sees what you've learnt! They'll never believe it!" (Do not use this strategy unless you have contacted the parent, and can anticipate home support.)

Surprise is a very effective reinforcer because it shows that a student has done more than you expected him to be able to do. You can challenge a student by saying things such as, 'Let's do the say-it-fast exercises today - I bet you can't do them all without making two mistakes. These are really hard'. Choose a task that you know student can perform. If student makes fewer than two mistakes - which will probably be the case - challenge him further:

"Fantastic! You didn't make one mistake!" And if the student does make more than two mistakes, you can help him save face by saying, "Well, they were hard words, weren't they? You did try really hard, though. Lets go over them once again, just to make sure you can do them."

Remember, the point of challenging is not to tease or make fun of student - it's to show him that he is capable of more than you expect. Some children are wary of making attempts unless they are sure of the correctness of their answers. They need encouragement to take the risk of making attempts that are possibly incorrect. For most students, the necessarily frequent corrections are not seen as criticisms; but be sensitive to this possibility, and make your corrections matter-of-fact. Beware of the tendency to sound punitive when correcting errors; just because in your view a student should know an answer does not mean that they are being slack. There is a difference between a student mastering a skill on any given day, and their capacity to incorporate that skill within their readily accessible store of techniques for solving problems like decoding. Different children require different amounts of teaching presentations to achieve mastery, and also require different levels of practice to achieve permanence. Some children can learn general knowledge, for example, with minimal teaching, but require enormous amounts of practice to learn other skills (especially, sounds-based skills) in reading. Control your impatience, and deliver your corrections in a calm manner.

Two things to remember about reinforcing:
1. Don't reinforce student after every task. If you do so, students may come to expect the reinforcement, and it will diminish its effect. Additionally, a student may be less likely to remain on task because of a belief that the reinforcement will occur anyway.
2. A similar outcome may eventuate if reinforcement statements are too long.

As you present the task, make brief one-second comments - ‘That's it’, ‘Good stuff’, ’Well done’ - and try to keep a fast pace from one task to the next. If examples are presented in a brisk, uninterrupted manner then the student will be able to see more readily how the examples are the same, and how they are different. This element of the design of the program is critically important; additionally, rapid presentation encourages the student to remain on task - sometimes an area in which students with reading difficulties require additional support. Initially, it may be necessary to ignore interruptions from the student, who may have found interesting tangents reduce the requirement for working consistently on a task that is not easy for them. In other words attempts to make conversation may be a form of task avoidance. The best response is to indicate that reading time is only for the program; however you will make time after the lesson’s conclusion to allow conversation. If you promise this, do not fail to provide the opportunity.

A very important point
If a student interrupts you while you are presenting, do *not reinforce him.* This means, don't listen to him or answer him, because such a response reinforces the behaviour, and the interruptions are likely to occur more often. Simply tell student, “Not now, John”, and continue with the task. After you have finished a sequence of tasks, praise the student if he performed well, and then say, "Now, what did you want to say before?"

To further discourage student from interrupting, praise him for not interrupting. Don't go overboard on this, just say after a group of tasks: "You really are a grown up boy, aren't you? You didn't interrupt once! I didn't know you could stick to the job so well!"

As a means of reducing the likelihood of irrelevant comments and questions (a very common tactic for struggling readers, designed to distract from their area of weakness), it is wise to establish ground rules expressly ruling out any extraneous conversations during the reading lessons. If this rule is taught from day one, and regularly reinforced with students, and similarly observed by teachers, then concentration-breaking interruptions are less of a problem.

Corrections
When a student makes a mistake, correct him immediately. If a student makes a mistake on the second letter of a word he is sounding out, do not wait for him to finish sounding out the word - correct him immediately. Similarly, if an error occurs in a sentence, do not wait until the end of the sentence to make a correction, or hope

that a self-correction will ensue because the sentence's meaning has been compromised. This program is based on the need for students to be able to read words correctly, based on the letters contained in those words, not on other cues (such as pictures, or sentence sense). If a student self-corrects on the basis of sentence comprehension, rather than on the basis of the word's construction, he will learn nothing of the critical importance of every letter in a word and also the position in the word of each letter. He will also be inclined to substitute words, that may now make some sense in the context of the sentence, but which may dramatically alter the meaning of the sentence. If it seems churlish to correct a student for substituting 'ship' when the word was 'boat' (because the meaning is preserved), what are the wider implication of allowing students to read words that are not actually on the page? How would you feel about their substituting words in sentences of a machine safety manual at work, or in reading a contract for a car or home. Precision is important!

Three important things a correction should do:
1. Alert student to the mistake and where it occurred.
2. Lead to practice with the skill the student needs to preclude similar mistakes in future.
3. Provide the opportunity to test students within the context in which the mistake occurred.

An example: If a student makes a mistake during a *sound* exercise:

1. Signal the mistake: "Stop."
2. Provide practice with the skill: "This sound is **aaa.** What sound?"
3. Test student again. "Remember that sound, Jimmy. Lets go back and do these sounds again." Repeat the sounds in order starting from the first one. Each of these three steps is important, and should not be omitted. You should to learn this correction procedure by heart, as you will need to use it many times during the program. It is commonly called MODEL-LEAD-TEST, and is a powerful, yet deceptively simple, procedure.

Additional Notes for Clinicians

- Consider using the Victorian Infant Cursive chart for the sounds writing exercises. It is more supportive of the writing style expected of students in the school setting. The parent/teacher/volunteer should maintain a progress folder - a comparison of the initial attempts to write the alphabet compared with those at the end-of-program adds to the evaluation data.

- Provide information sheets (enclosed) for lesson completion data. This provides discussion detail for the regular monitoring sessions with the presenter, and encourages the program's continuation.

- Suggest that the child holds the textbook (when feasible) - it increases the child's feeling of commitment and control.

- Tape record an early and a late lesson to provide pre- and post-program comparisons. Also record the child's attempts at the Lesson 100 story during the initial assessment. Compare it with the reading of the Lesson 100 story at the end of the program.

- Encourage both parents (if it is a parent-delivered program) to learn and present the lessons when possible. The shared responsibility enhances the likelihood of the program being completed.

- Discuss the near-inevitability of presenter discomfort during the early stages. The clinician's own modelled attempts (if less than impeccable) can relieve parental anxiety. Even trained teachers comment that the program feels most unfamiliar for about 20 lessons.

- If parents are implementing the program, it may be useful and good etiquette to discuss the program with the child's school. Make clear that the program is complementary to the school's program - not supplantive. In engaging parents, promote confidence in the program (research support, successful use in clinic, etc.) but do not become embroiled in criticisms of any school's program.

- Use demonstration-practice-feedback as a coaching techniques, that is, model a lesson with the child - ask the parent to copy your presentation with you as the child - provide feedback on accurate and inaccurate delivery.

Ensure your own modelling is bright, assured and with good pace (i.e., practise until you are confident and fluent).

- Frequency of contact: Weekly for first 3 weeks - two-week intervals as fidelity of implementation improves - up to 4 week maximum intervals. Any tendency for enthusiasm to slacken is reduced when the sheets are completed lesson by lesson; and, they are regularly overseen by the clinician, and parents are praised for their commitment.

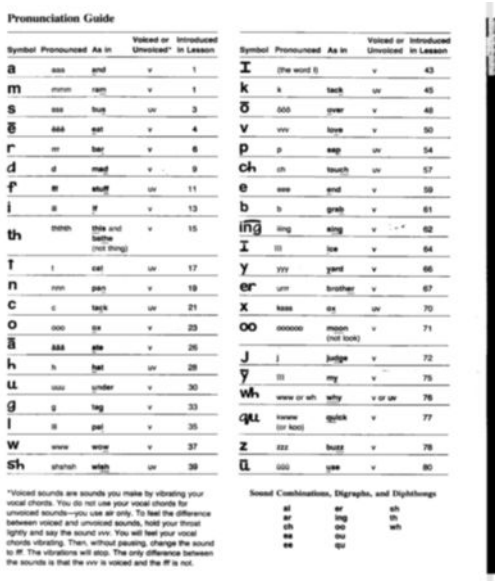
- If additional reading practice for the child is advisable, I have constructed a sheet (see previous) indicating those books and pages from the Distar Library series relevant to a given “100 Lessons” story. The story books from Reading Mastery can also be used to augment the “100 Lessons” program - see previous pages for the sequence.

- Consider additional reinforcers - visual progress charts, stars, contracts, points, etc. if the child is resistant to participating wholeheartedly.

Pre- and post-test on the CTOPP, and either Neale or Woodcock reading tests - Video-record the assessments. Even if the child is below the floor of the test at Pretest stage, comparison with post-test attempts can be dramatic. One way to ensure that progress is occurring is to make regular use of the Mastery tests from Reading Mastery. I have produced a chart to indicate which Mastery test is appropriate for which 100 Lessons lesson.

Some potential problem spots:

- Ensure instructions regarding sounding-out the story are followed. "Period" is US for 'full stop'
- Some parents will struggle with correct sound pronunciation. Sounds pronunciation needs to be carefully taught and monitored. See chart below.
- Note the errors for *i* and *I* on p.17.
- Be able to explain why the strange orthography is helpful in regularizing words.
- Ensure correction procedures are practised.
- Teach the meaning of "Repeat until firm", and give examples of when a segment needs to be repeated.



Pronunciation Guide

Symbol	Pronounced	As in	Voiced or Unvoiced*	Introduced in Lesson
a	aaa	and	v	1
m	mmm	ram	v	1
s	sss	hug	uv	3
ă	ăăă	eat	v	4
r	rr	bar	v	6
d	d	mad	v	9
f	ff	stuff	uv	11
i	ĭ	if	v	13
th	thhh	this and bathe (not thing)	v	15
t	t	cat	uv	17
n	nnn	pan	v	19
c	c	tack	uv	21
o	ooo	ox	v	23
ā	āāā	ate	v	26
h	h	hat	uv	28
u	uuu	under	v	30
g	g	tag	v	33
l	ll	pal	v	35
w	www	wow	v	37
sh	shshsh	wish	uv	39

*Voiced sounds are sounds you make by vibrating your vocal chords. You do not use your vocal chords for unvoiced sounds—you use air only. To feel the difference between voiced and unvoiced sounds, hold your throat lightly and say the sound vvv. You will feel your vocal chords vibrating. Then, without pausing, change the sound to fff. The vibrations will stop. The only difference between the sounds is that the vvv is voiced and the fff is not.

Symbol	Pronounced	As in	Voiced or Unvoiced	Introduced in Lesson
I	(the word I)		v	43
k	k	tack	uv	45
ō	ōōō	over	v	48
v	vvv	love	v	50
p	p	sap	uv	54
ch	ch	touch	uv	57
e	eee	end	v	59
b	b	grab	v	61
ing	ing	sing	v	62
ī	ĭĭĭ	ice	v	64
y	yyy	yard	v	66
er	urr	brother	v	67
x	ksss	ox	uv	70
oo	oooooo	moon (not look)	v	71
J	j	judge	v	72
ȳ	ĭĭĭ	my	v	75
wh	www or wh	why	v or uv	76
qu	kwww (or kss)	quick	v	77
z	zzz	buzz	v	78
ū	ūūū	use	v	80

Sound Combinations, Digraphs, and Diphthongs

ai	er	sh
ar	ing	th
ch	oo	wh
ee	ou	
ea	qu	

The Reading Mastery program is a beginning reading program designed for school groups. It is the program from which the parent-based "Teach Your Child to Read in 100 Easy Lessons" is derived. Because the lesson sequence is similar it is possible to use the Mastery Tests (from the Reading Mastery program) to check that the student is progressing appropriately. By following the above guide it is less likely that any student’s failure to make continuous progress can go undetected. This is most important, as the design of the program requires the mastery of earlier lessons as a pre-requisite for success in subsequent lessons. Success on the Mastery Tests enables confidence in one's presentation skills, correction skills, lesson pacing, and adequacy of the use of the "Repeat until firm" direction. Failure of a Mastery Test implies the need to reteach segments of the program before moving on. This careful progressive evaluation is especially helpful in ensuring success for at-risk students.

Informal DI program evaluation: Parents

Your child has been participating in a special reading assistance program at the school, and we would like to find out how useful it has been for your child. We are particularly interested to learn whether you have noticed any changes in your child's reading. We would appreciate your help in filling out this form, and returning it to us as soon as is convenient.

Please *underline* the words that best describe your child's current reading.

In terms of the amount of reading done at home, my child is now reading *much more than* *a little more than* *the same as* *less than* before the program's introduction.

If you have noticed an increase, what type(s) of reading materials does your child favour?

In terms of the skill of reading done at home, my child is now *reading much better than* *better than* *the same as* *worse than* before the program's introduction.

If you have noticed a skill improvement, is it in *speed, accuracy, smoothness, preparedness to read out loud understanding of what is read*?
(You may underline any number of these words.)

In terms of the enjoyment of reading done at home, my child now seems to find reading *much more enjoyable than* *more enjoyable than* *the same as* *less enjoyable than* before the program's introduction.

Do you have any other comments which you think might be helpful to future planning? Please write them below.

DI Program Evaluation: Teachers

One or more of your students has been participating in a special reading assistance program at the school, and we would like to find out how useful it has been for him/her. We are particularly interested to learn whether you have noticed any changes in your student's reading, and general performance.

Please underline the words that best describe your student's current reading.

In terms of the amount of reading done at school, my student is now reading *much more than* *a little more than* *the same as* *less than* before the program's introduction.

If you have noticed an increase, what type(s) of reading materials does your student favour?

In terms of the skill of reading done at school, my student is now reading *much better than* *better than* *the same as* *worse than* before the program's introduction.

If you have noticed a skill improvement, is it in *speed* *accuracy* *smoothness* *preparedness to read out loud* *understanding* of what is read? (You may underline any number of these words).

In terms of the enjoyment of reading done at school, my student now seems to find *reading much more enjoyable than* *more enjoyable than* *the same as* *less enjoyable than* before the program's introduction.

Is there evidence of change in reading skills in other curriculum areas, that is, have the skills transferred? The student is *much better than* *better than* *the same as* *worse than* before the program's introduction.

Has there been any change in the student's attitude, or behaviour generally? The student *is much better than* *better than* *the same as* *worse than* before the program's introduction.

Do you have any other comments that you think might be helpful to future planning? Please write them below.

A Blueprint For A Multi-Level Approach To Literacy

Become involved in language activities with the families of children prior to school
Provide a cascading level of support to parents of young children – from informal tip sheets to one-on-one interventions.
Schools liaise with feeder kindergartens to enable dovetailing of objectives and programs
Include phonemic awareness activities in kindergarten programs
Make contact with the parents of struggling readers before the younger siblings arrive
Screen all students prior to school entry on phonemic awareness and letter sounds/names.
Make literacy the school's highest priority
Involve all available resources – teachers, parents, volunteers, retirees, grandparents
Include research-supported instruction in beginning reading in Prep grade – emphasise phonemic awareness and phonics outside of the literature segments of the literacy program.
Separate comprehension skills and decoding in the early stages of reading development
Teach students the metacognitive comprehension skills of reading.
Teach students organisational skills explicitly
Assess student progress continuously, and respond rapidly and intensively to early signs of failure
Develop a Frameworks document that reflects all these features
Principals provide leadership on professional development of teachers
Teacher training institutions to alter their approach to literacy to better reflect current knowledge of reading development and instruction.

Armbruster, B.B., & Osborn, J. (2001). *Put reading first: The research building blocks for teaching children to read*. Center for the Improvement of Early Reading Achievement. [On-Line]. Available: http://www.nifl.gov/nifl/research/reading_first1.html

Some additional references:

An Educators' Guide to Schoolwide Reform. This guide provides a review of the research on 24 schoolwide reform models. For each approach reviewed, the guide provides ratings accompanied by profiles and research references. This work was conducted by the American Institutes for Research (www.air.org) and was contracted by the American Association of School Administrators (www.aasa.org), American Federation of Teachers (www.aft.org), National Association of Elementary School Principals (www.naesp.org), National Association of Secondary School Principals (www.nassp.org), and National Education Association (www.nea.org). Available at www.aasa.org/Reform/index.htm.

Lewis, L. & Paik, S. (2001). *Add it up: Using research to improve education for low-income and minority students*. Washington: Poverty & Race Research Action Council. [On-Line]. Available: http://www.prrac.org/additup.pdf

National Reading Panel. (2000*). National Reading Panel: Teaching children to read*. [On-Line]. Available: http://www.nationalreadingpanel.org.

Teaching reading is rocket science: What expert teachers of reading should know and be able to do. This report from the American Federation of Teachers describes the essential knowledge teachers should have in order to be successful at teaching all children to master reading. Recommendations for improving the teaching of reading are made regarding teacher education and professional development. Available at www.aft.org/edissues/rocketscience.htm.

Torgesen, J.K. (1998, Spring/Summer). Catch them before they fall: Identification and assessment to prevent reading failure in young children**.** *American Educator*. [On-Line]. Available: http://www.ldonline.org/ld_indepth/reading/torgeson_catchthem.html

Some websites of interest

Children of the Code. Great interviews with eminent researchers about the scientific approach to reading at http://www.childrenofthecode.org/interviews/index.htm

A large and well constructed site with a collection of resources and articles related to **educational reform** in literacy and related topics. www.illinoisloop.org

The CEC Alerts series (http://teacheffectively.com/) is an initiative of the **Council for Exceptional Children**. The site offers evaluations of various approaches. They recommend some activities as well supported - GO FOR IT: Phonological Awareness instruction, Class-wide Peer Tutoring, Mnemonic Instruction, Formative Evaluation, Direct Instruction. They are less enamoured by the research behind other activities - USE CAUTION: Social Skills Instruction, Reading Recovery, Co-Teaching, High-Stakes Assessment

Various links regarding **reading writing, spelling**: http://ettc.colstate.edu/ram/webliography.htm

Martin Kozloff's brilliant or crazy musings http://educationation.org/

For **psychological assessment** issues: http://www.hoagiesgifted.org/tests.htm

Sharon Sewell's **Direct Instruction** site http://www.mps.k12.al.us/board/cai/is/di/index.php

The **Centre for Development and Learning (CDL)** specializes in the development and dissemination of leading edge research, knowledge, training and best practices from diverse yet related fields that impact educational success. "To my knowledge, CDL is the only organization worldwide that is working to connect knowledge from the medical, psychological, educational and judicial fields to multiply the benefits to children." --Michael Fullan, Dean, Ontario Institute for Studies in Education, University of Toronto
http://www.cdl.org/resources/reading_room.html

Bruce Murray, distinguished researcher, has how to teach reading articles at http://www.auburn.edu/~murraba/

55th International **Dyslexia Association Conference** (2004 Philadelphia) notes at:
http://www.interdys.org/servlet/compose?section_id=5&page_id=214

The **Division for Early Childhood** (DEC) is one of seventeen divisions of the Council for Exceptional Children (CEC), an organisation dedicated to improving educational outcomes for individuals with exceptionalities, students with disabilities, and/or the gifted. The Division for Early Childhood promotes polices and advances evidence-based practices that support families and enhance the optimal development of young children who have or are at risk for developmental delays and disabilities. Numerous resources, best practices and bibliographies at http://www.dec-sped.org/aboutdec.html

A Model of Teacher Effectiveness.
A report by Hay McBer to the Department for Education and Employment - June 2000
http://www.teachernet.gov.uk/docbank/index.cfm?id=1487

Centre for Evidence-Informed Policy and Practice in Education.
The EPPI-Centre was established in 1993 to address the need for a systematic approach to the organisation and review of evidence-based work on social interventions. See articles at http://eppi.ioe.ac.uk

National Research and Development Centre for Adult Literacy and Numeracy.
NRDC is the national centre dedicated to research and development on adult literacy, language and numeracy. It was established as part of Skills for Life, the national strategy for improving adult literacy and numeracy skills. Articles at
http://www.nrdc.org.uk/content.asp?CategoryID=424

Institute for Human and Machine Cognition
Bibliography on concept maps and concept mapping at http://www.ihmc.us

Three randomization plan generators at http://www.randomization.com/

Jim Wright's page
There are numerous resources at Jim Wright's page:
Kids as Reading Helpers: A Peer Tutor Training Manual at
www.jimwrightonline.com/pdfdocs/prtutor/peerTutorManual.pdf

Launching & Monitoring the Peer Tutoring Program
www.jimwrightonline.com/pdfdocs/prtutor/prtutor_chap3.pdf

Curriculum-Based Measurement: A Manual for Teachers at
www.jimwrightonline.com/pdfdocs/cbaManual.pdf

Curriculum-Based Measurement Workshop Participant Packet
www.jimwrightonline.com/pdfdocs/brouge/cbaWkshpPacket.PDF

The Savvy Teacher's Guide: Reading Interventions That Work
http://www.jimwrightonline.com/pdfdocs/brouge/rdngManual.PDF

Intervention Central
This site offers free tools and resources to help school staff and parents to promote positive classroom behaviours and foster effective learning for children and youth.
http://www.interventioncentral.org/

Research and Training Center (RTC) on Early Childhood Development
The major aim of the Research and Training Center (RTC) on Early Childhood Development is to implement a coordinated and advanced program of applied research on knowledge and practice that improves interventions associated with the healthy mental, behavioral, communication, preliteracy, social-emotional, and interpersonal development of infants, toddlers, and preschoolers with or at risk for developmental disabilities. Carl Dunst provides easy to read summaries of the evidence behind different nontraditional approaches such as, dolphin therapy, hippotherapy, melonic intonation therapy, and so forth. There are also several very useful documents that define "evidence-based practices." See at
http://www.researchtopractice.info/products.php#bridges

For mid primary and secondary students, the RMIT Clinic uses the Corrective Reading program Decoding Placement Test
PART 1
Tell the student *"Read this story out loud. Follow along with your finger so you don't lose your place. Read carefully"*. Begin timing as soon as the student begins reading the first sentence.

Record **each** decoding mistake the student makes in oral reading.

Mark an X on the filled-out form to show where the student made each mistake.

If the student **omits** a word, mark an X above the omitted word.

If the student **adds** a word that does not appear in the story, mark an X between two words to show where the word had been added.

If the student **misidentifies** a word, mark an X above the misidentified word. **Do not count the same misidentified word more than once.** (For example, if the student misidentified the name "Hurn" four times, count only 1 error.)

If the student cannot identify a word within **3 seconds**, say the word and mark an X above it.

If the student makes a mistake and then **self-corrects** by saying the correct word, mark an X above the word.

If the student sounds-out a word but does not pronounce it at a normal speaking rate, ask What word? If the student does not identify it, mark an X above the word.

Do not count the re-reading of a word or phrase as an error if the word is read correctly both times.

After each of the word-identification errors, **immediately tell the student the correct word**.

Part II
Part II is a series of sentences that are to be read aloud by the student. You **do not need to time** this part of the test. To administer, present the section labeled Part II and tell the student *"Read these sentences out loud. Follow along with your finger so you don't lose your place. Read carefully"*.

Part III & IV
Each of these Part III and Part IV test sections is a passage that is to be read aloud by the student and timed.

Decoding Placement Schedule

Errors	**Time**	**Outcome**
PART I		
22 or more		Do Part II
12 to 21	> 2:00	Level A, Les'n 1
12 to 21	≤ 2:00	Do Part II
0 to 11	> 2:00	Level B1, Les'n 1
0 to 11	≤ 2:00	Do Part III

PART II 41 or more - no Corrective *Reading* placement; use a beginning reading program, Reading Mastery or 100 Lessons

8 to 40		Level A, Les'n 1
0 to 7		Level B1, Les'n 1

PART III		
15 or more		Level B1 Les'n 1
6 to 15	>2:30	Level B1 Les'n 1
6 to 15	≤ 2:30	Level B2, Les'n 1
0 to 5	>2:30	Level B1 Les'n 1
0 to 5	≤ 2:30	Do Part IV Test
PART IV		
9 or more		Level B2, Les'n 1
4 to 8	> 1:30	Level B2, Les'n 1
4 to 8	≤ 1:30	Level C, Les'n 1
0 to 3	>1:20	Level C, Les'n 1
0 to 3	≤ 1:20	Doesn't need CRP

Part 1
Kit made a boat. She made the boat of tin. The nose of the boat was very thin. Kit said, "I think that this boat is ready for me to take on the lake." So Kit went to the lake with her boat.
Her boat was a lot of fun. It went fast. But when she went to dock it at the boat ramp, she did not slow it down. And the thin nose of the boat cut a hole in the boat ramp.
The man who sold gas at the boat ramp got mad. He said, "That boat cuts like a blade. Do not take the boat on this lake any more."

Part II
Can she see if it is dim?
And it can fit in a hand.
Now the hat is on her pet pig.
I sent her a clock last week.
How will we get dinner on this ship?
The swimming class went well.
When they met, he felt happy.
Then she told me how happy she was.
The tracks led to a shack next to the hill.
They said, "We will plant the last of the seeds."
What will you get when you go to the store?

You left lots of things on her desk.

Part III

Hurn was sleeping when it happened. Hurn didn't hear the big cat sneak into the cave that Hurn called his home. Suddenly Hurn was awake. Something told him, "Beware!" His eyes turned to the darkness near the mouth of the cave. Hurn felt the fur on the back of his neck stand up. His nose, like noses of all wolves, was very keen. It made him very happy when it smelled something good. But now it smelled something that made him afraid. Hurn was five months old. He had never seen a big cat. He had seen clover and ferns and grass. He had even eaten rabbits. Hurn"s mother had come back with them after she had been out hunting. She had always come back. And Hurn had always been glad to see her. But now she was not in the cave. Hurn's sister, Surt, was the only happy smell that reached Hurn's nose.

Part IV

During a good year, a large redwood will produce over six kilograms of seed, which is nearly a million and a half seeds. And the year that our redwood seed fluttered from the cone was an exceptionally good year. The parent tree produced over eight kilograms of seed that year, enough seed to start a forest that would be ten square kilometers in size. However, only a few redwood seeds survived. In fact, only three of the seeds from the parent tree survived their first year, and only one of them lived beyond the first year.

Obviously, our seed was lucky. It was a fortunate seed because it was fertile. If a seed is not fertile, it cannot grow, and about nine out of every ten redwood seeds are not fertile. Our seed also had the advantage of landing in a place where it could survive. If it had fallen on a part of the forest floor covered with thick, heavy litter, it probably would not have grown. If it had fluttered to a spot that became too dry during the summer, it would have died during the first year. Our seed landed in a spot where moles had been digging.

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