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Reading and Spelling are Language-based Skills

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Literacy Teaching Based on Evidence:
What Roles Can Speech Pathologists Play?

Submission to the

National Inquiry into the Teaching of Literacy

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Literacy teaching based on evidence: What roles can speech pathologists play?

Purpose

This document has been prepared by the Speech Pathology Australia Reference Group for the National Inquiry into the Teaching of Literacy. In keeping with the brief for the inquiry, this paper reviews the strong research base that supports the teaching of reading and informs teacher education and practice. This submission emphasises the fact that a range of professionals are needed to apply this research and support classroom teaching. It highlights the collaborative roles speech pathologists play in children's literacy acquisition and education, including:

- early identification of students at risk for literacy failure;
- direct work with students to improve language and literacy outcomes;
- collaboration with parents, teachers, psychologists and other professionals;
- undergraduate and postgraduate teacher education;
- professional development for classroom teachers;
- curriculum development;
- ongoing literacy research, contributing to the evidence for successful literacy approaches.

Summary

The connections between spoken and written language are well documented (see Appendix A). An understanding of this relationship is essential for effective literacy teaching.

- Spoken language provides a critical foundation for the development of reading, spelling and written expression and this relationship is reciprocal;
- Children experiencing difficulties learning written language frequently demonstrate difficulties using oral language to communicate;
- Children with spoken language difficulties have an increased risk of difficulty learning to read and write.

Speech pathologists are university trained in identifying, assessing and managing children with speech and language problems. Speech pathologists:

- offer early identification of students at risk for literacy failure;
- offer targeted intervention from a strong base of empirical research either aimed at preventing difficulties from arising, or providing support and intervention;
- come from a training and practice background which emphasises collaboration with educators, psychologists, children themselves and their parents;
- generate and apply research that develops the key oral language and sound awareness abilities which are the foundation from which literacy skills develop.

Background

Approximately 16% of Australian children have difficulties learning to read (Westwood, 2001). The recent investigation by OFSTED in the UK demonstrated that schools in which children at risk of literacy failure were identified *early* achieved higher literacy outcomes (Ofsted, 2004). Speech and language impairment in preschool children is frequently a precursor of language and literacy difficulties that persist throughout childhood into adolescence and beyond (Catts, Fey, Tomblin, & Zhang, 2002; Leitão & Fletcher, 2004; Lewis & Freebairn, 1992; Roth, Speece, & Cooper, 2002; Snowling, Bishop, & Stothard, 2000).

The term **‘speech’** refers to the physical production of sounds. That is, the physical process of turning air into the consonants and vowels which form the sounds of language. Children with speech disorders say these sounds incorrectly and can be difficult to understand in comparison to children their own age.

Three major types of speech difficulties involve:

Articulation: sound distortions, isolated sound difficulties and structural problems

Phonology: rule based sound errors that affect related groups of sounds

Dyspraxia: co-ordination and motor planning problems

‘Language’ is the general term used to refer to the communication system that enables an individual to function in society. It is a learned system of rules that enables a person to communicate ideas and express wants and needs. Language encompasses both expression and understanding in a number of forms: speaking, reading, writing, and gesturing. Children with language disorder may have difficulty understanding and/or expressing their ideas in words and sentences (SPEECH (WA), 2001).

Language can be considered from a number of perspectives:

Phonology: the sounds that make up words. Awareness of these sounds (phonological awareness) has repeatedly been shown to play a critical role in early literacy development

Syntax or grammar: words combine to form phrases and sentences, words have different endings and forms (**morphology**)

Semantics: the meaning of words and phrases, vocabulary knowledge, the relationship between words

Pragmatics: the process of using language socially and to convey our feelings

Discourse: the ability to deal with language at the text level

Intonation and stress (prosody): the rhythm of our speech

Speech pathologists are trained to formally assess and mass screen young children’s speech and oral language skills as well as phonological awareness and processing capacity. Where deficits of vision, hearing, auditory processing, attention or intellect are apparent, speech pathologists are trained to make the appropriate referrals. This places speech pathologists in a position to identify and begin remediation of difficulties that may not yet be apparent to parents, which may not be yet visible to teachers in children’s earliest school experiences, but which nonetheless are known to undermine literacy achievement.

The Adelaide declaration (Ministerial Council on Education, 1999) states that upon leaving school ‘*..every student should be numerate, able to read, write, spell and communicate at an appropriate level.....*’

Without the early identification and intervention described above, many students with speech, language or phonological processing and awareness deficits will be denied access to literacy skills ‘at an appropriate level’ commensurate with their learning potential.

Long term outcomes

'Learning to read is the foundation for future educational success.' (Ofsted, 2004, p.5).

A review of the literature has shown between 41% and 75% of children with early expressive language delays continue to exhibit reading problems at age 8 years (Law, Boyle, Harris, Harkness, & Nye, 1998). The ongoing incidence of literacy difficulties in adolescent children with a history of speech and language impairment (SLI) is also high: difficulties were apparent in 52% of adolescent students with resolved SLI and 93% of a group of 15 year olds with persistent SLI (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998).

Young people with a history of speech and language impairment are seriously disadvantaged by poor literacy skills even after cognitive ability has been taken into account (Snowling, Adams, Bishop, & Stothard, 2001). Poor outcomes occur because limitations in speech / language as well as reading and writing are associated not only with poor classroom performance, but also difficulties in social language use, peer interactions, social -emotional and behavioural difficulties and mental health morbidity (Law et al., 1998; Taylor, 2002). This has a subsequent impact on vocational and life choices.

Reading failure is considered by the National Institute of Child Health and Human development in America to be a national public health problem. The 2001 US Congress Hearing on Measuring Success states that surveys of adolescents and young adults with criminal records indicate that at least half have reading difficulties. Recent Australian research has highlighted both the poorer language processing and production skills of a group of male juvenile offenders (Snow & Powell, 2004) as well as higher rates of poor literacy skills in young offenders (Putnins, 1999).

Acknowledging such costs and investing in the future, the South Australian State Government has invested \$35 million dollars in its 2004-2005 State Budget to be spent over the next four years to improve literacy outcomes for junior primary school students (South Australian State Government, 2005).

Literacy builds on oral foundations

Research demonstrates that children require a solid foundation in oral language before they can learn to read and write.

'The child's competence in language provides the basic foundation for reading' (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001 p.34).

Oral language abilities are critical in guiding children's thinking and learning. These abilities include being able to put ideas into sentences, tell stories that make sense and understand what they hear and read.

The literature points to the importance of an intact and robust speech processing system and good phonological processing skills (especially phonological awareness) in supporting the early stages of reading and spelling development. In addition, the role of semantic (vocabulary, meaning and conceptual) knowledge is critical in supporting literacy development throughout the school years (Snowling, 2000b).

Speech pathologists are able, even with young children, to assess oral language skills, identify areas of difficulty, plan and implement targeted language and phonological intervention. They can help build the oral foundations for literacy. They can collaborate with teachers and educational institutions to achieve higher literacy outcomes (Silliman & Wilkinson, 2004).

Phonological awareness defined

Processing phonological information involves storing, retrieving and using phonological (sound based) codes in memory. Phonological (or sound) awareness skills include recognising and producing syllables, rhyming words and identifying, blending, segmenting and manipulating sounds in spoken words (Dodd & Gillon, 2001; Gillon, 2004; Roth et al., 2002). Phonemic awareness involves the ability to identify and work with individual sounds or 'phonemes' and is identified as the critical level in supporting early literacy development.

Speech pathologists have particular expertise in analysing the sound stream of language and teaching sounds to children. Speech pathologists are therefore well placed to locate and remedy the specific difficulties of children with poor phonological processing skills, in particular difficulties with phonological awareness. Research has shown that phonological awareness skills are responsive to teaching (Mallen, 1996).

Phonological awareness, phonics and early reading

Phonological awareness ability at preschool level has a powerful influence on early reading and spelling acquisition (Gillon, 2004). The ability to use auditory skills to process and analyse sounds in words provides a solid foundation for a child to 'crack' the alphabetic code. In other words, phonological awareness helps the student to develop skills in mapping sounds to letters and letter groups (and vice versa), which constitutes phonics.

Phonological awareness should not be confused with phonics. Phonics refers to learning the relationships between letters and letter groups in written language and the sounds associated with them. It does not develop the conceptual understanding that spoken language is comprised of a sequence of spoken sounds that can be acoustically separated and manipulated. An understanding and awareness of the sound structure of words in the pre-school years enables a child to better understand that letters are a symbolic code to represent those sounds.

Early Identification

One of the most important predictors of literacy development among children with speech and language impairment is the status of their oral language skills at the age at which they learn to read (Bird, Bishop, & Freeman, 1995).

Given that difficulties with oral language are typically observable before children experience any formal literacy instruction, speech pathologists play an important role in early identification of children at risk. Assessment of competence in oral language and phonological awareness is a highly reliable indicator of future reading outcomes (Catts, 1991).

Current research has identified a number of *key indicators* that are predictive of an increased risk of literacy difficulties in children with speech and language impairment.

These indicators include speech disorders that are not typically developmental and are associated with phonological processing difficulties (Leitão & Fletcher, 2004). In addition, difficulties with vocabulary, both receptive and expressive, listening comprehension, using correct morphological markers (eg verb tense) and telling stories, are considered markers of concern (Scarborough, 1990; Snowling, 2000b).

Both spoken and written language difficulties can stem from a weak underlying phonological processing system, with surface indicators changing as children get older, making a single 'identifying test' unlikely.

Measures of phonological processing include assessment of expressive phonology, phonological awareness, phonological short term memory (such as nonword repetition tasks), phonological retrieval (rapid naming tasks) and letter knowledge. All of these measures have been shown to be predictive of poorer literacy outcomes (Bird & Bishop, 1992; Catts, Fey, Zhang, & Tomblin, 2001; Heath & Hogben, 2000; Leitão & Fletcher, 2004; Leitão, Hogben, & Fletcher, 1998). Measures of vocabulary, syntax, narrative and text comprehension exist in a number of standardized and research based assessment protocols.

Speech pathologists are trained in assessing all of these components of speech and language and are familiar with test administration procedures.

Recent West Australian research has provided evidence of cost effective screening batteries, critical in early identification (Heath & Hogben, 2004). Theoretically driven assessment protocols for assessing the literacy related oral language skills of older children can be found in many research and speech pathology clinics.

Later identification

Students may not be identified until they start school and struggle acquiring literacy skills. Many such students who are identified with literacy difficulties have pre-existing difficulties with oral language which impact on vocabulary, comprehension, expressive language and phonological awareness. Their speech is often characterised by difficulty pronouncing longer words and imprecision in speech patterns and vocabulary. These oral language difficulties can be subtle and often remain unrecognised until a child begins to struggle at school.

Teachers are generally sensitive to the varying language skills of their pupils. In the whole class setting, however, children often work hard to disguise their problems as a way of surviving socially. Language difficulties can consequently be overlooked or, at times, misunderstood as behavioural and/or social-emotional issues.

It is critical that a full speech and language assessment occurs with later identified students in order to pinpoint areas of strength and weakness, and ensure intervention and support is targeted appropriately.

Identification – what about subtypes of reading difficulties?

Any discussion of students who experience difficulties reading will at some point come to the term ‘dyslexia’. Dyslexia is typically defined as a reading and spelling problem that cannot be accounted for by sensory or neurological damage, lack of educational opportunity or low intelligence. The term has been surrounded by controversy since its first use.

Both practitioners and researchers have long recognised that children with reading difficulties form a heterogeneous group. There have been many attempts at sub-groupings and classification systems but these have proved variable in their usefulness.

Classification systems that focus directly on reading and individual differences in the behaviours displayed by children learning to read are now more commonly used. Research has demonstrated that word recognition and listening comprehension account for independent variance in reading comprehension. One classification system profiles patterns of reading disability according to these two dimensions, and three clear subtypes emerge (Catts & Kamhi, 1999).

The first group of students, who might be termed ‘dyslexic’ have difficulties learning to phonetically decode words and in developing a sight vocabulary. Word recognition and associated phonological processing deficits (such as weak phonological awareness) provide the key defining features though spoken language comprehension is generally intact.

A second group could be termed 'reading disabled'. These children have difficulties with both word recognition and phonetic decoding but beyond that, they also struggle with listening comprehension. This group has also been called 'language-learning disabled' to focus attention on the central role played by language learning difficulties in these children's problems (Catts & Kamhi, 1999).

A third, much smaller, group of students present with specific comprehension difficulties alone. These children usually demonstrate good word recognition skills but poor listening comprehension. They are often identified at a later age as the curriculum demands place more emphasis on reading comprehension and the students begin to struggle.

Speech pathologists can play a critical role in carrying out detailed assessment of speech and language skills of any child struggling with literacy. This allows identification of factors which may be contributing to and maintaining literacy difficulties, rather than treating all children experiencing difficulties as one homogeneous group. This ensures more accurate goal setting and targeted teaching rather than the application of a generic remedial programme.

Current teaching practice

A large number of reading approaches and programs currently exist for children experiencing difficulties learning to read and write. Many of these literacy approaches do not specifically target the underlying causes and factors maintaining the literacy difficulty and many make the assumption that one approach will address the needs of all students regardless of individual profiles. Teaching needs to take account of all the ways we learn to read, write and spell, building on the existing and growing evidence base coming out of classrooms and research clinics.

Successful readers draw upon a range of strategies during the reading task. Some words are instantly recognized and converted to meaning, other words are predicted from meaning, and unfamiliar words must be decoded (sounded out and blended). Students need to access the written code with fluency, understand the vocabulary and language of the content and integrate the meaning of the text into a coherent whole.

The OFSTED (2004) report also found that schools in which teachers were willing to examine their own practices were achieving better literacy outcomes for their students. Teaching strategies must at the very least incorporate phonological (sound) training, language training and word recognition skills to allow this range of strategies to fully develop. Polarized teaching practices do not meet the needs of all students. An effective reading programme will address phonological awareness and phonics, decoding and word recognition skills from the earliest stages while also working on vocabulary and comprehension to support the main goal of reading – the process of gaining meaning from print. When a literacy difficulty is impacting on academic outcomes for a particular student it is vital to identify factors which underlie, contribute to and maintain the difficulty in order for the intervention to be appropriate and not generic.

Intervention studies – the evidence

There are a number of texts which review the effectiveness of prevention and intervention studies and make recommendations on the implications for classroom practice and the teaching of reading (Catts & Kamhi, 1999; Gillon, 2004; McCardle & Chhabra, 2004; Rayner et al., 2001; Silliman & Wilkinson, 2004).

It is widely recognised that early intervention results in the best outcomes for children experiencing difficulties learning to read (Catts et al., 2002; Lundberg, Frost, & Peterson, 1988). Scientifically based research provides evidence for the effectiveness of instruction in areas including phonological awareness, phonics, vocabulary and comprehension in addition to word recognition skills (Armbruster, Lehr, & Osborn, 2003; McCardle & Chhabra, 2004).

Prevention research with children at-risk for reading failure has provided powerful evidence for the effectiveness of methods that directly teach phonemic awareness and phonic skills in a range of populations (Gillon, 2004; Torgeson, 2004). Studies have also shown that intervention programmes which incorporate phonological training as well as meaning based techniques are significantly more effective than programmes which develop either skill in isolation (Snowling, 2000a). Evidence is mounting that it is possible to substantially close the gap in reading ability for older children who may have struggled for many years (Torgeson, 2004).

However, such interventions need to provide instruction that is more explicit, systematic and intensive than can usually be provided in classrooms. The evidence exists that programmes provided in instructional groups of three to four children are effective. Teachers are rarely able to provide such appropriately focused and sufficiently intensive instruction within the constraints of their classroom. Speech pathologists play a critical role in supporting teachers and students in such service provision.

In Australia there is a wealth of intervention studies, many on a small pilot scale, many unpublished and many involving collaboration between speech pathologists, teachers and psychologists. These studies have often been funded by State Departments of Education but the results do not always reach a wider audience.

Research conducted within Australia has been highlighted by asterisk (and in green electronically) within the annotated bibliography in Appendix A.

In addition, Appendix B, describes a selection of research involving members of the S.P.A. literacy reference group or their colleagues.

The speech pathology profession

Speech Pathology Australia is the peak body representing speech pathologists in Australia. *Speech pathologists* are university educated professionals with specific knowledge and practical expertise in the area of sound awareness and oral language skills. Their training synthesises research from the disciplines of medicine and neurology, psychology, linguistics, education and child development - giving them a breadth of knowledge and experience. Speech pathologists complete extensive study in oral language development and disorders in areas such as phonetics, phonology, grammar, morphology, semantics and discourse. *Australian speech pathologists* are involved in ongoing important research in the field of literacy development and disorders.

The roles of speech pathologists

There are many roles that a speech pathologist can play to support teachers who teach reading, students who are learning to read and their parents. These include: screening, early identification, assessment, diagnosis, reporting, intervention, collaboration, advocacy and research . These are outlined below:

Early identification of students at risk for literacy failure

Speech pathologists are able to identify children who are at risk of literacy impairments before they start formal education through the assessment of oral language expression, comprehension and processing skills. In addition, they are able to analyse strengths and weaknesses in underlying processes and skills necessary for literacy development. This means that literacy problems can be addressed using targeted programmes before literacy failure occurs.

Direct work with students to improve language and literacy outcomes

Speech pathologists also work with children who are experiencing reading failure. Using theoretical frameworks based on solid research evidence, speech pathologists are able to identify factors which may contribute to the literacy problem and provide an intervention program that targets these factors. This may include:

- speech development
- phonological awareness development
- auditory and phonological processing skills
- semantic and vocabulary work
- developing expressive skills at the sentence and text level
- comprehension work at the word, sentence and text level.

In addition an intervention programme will develop strategies to help the students compensate for their difficulties so that they can achieve their full academic potential

Collaboration with parents, teachers, psychologists and other professionals

Parental involvement can help to reduce the risk of educational failure for a child. The OFSTED report (2004) showed that schools which encouraged parental participation in literacy development were achieving higher literacy outcomes. Collaboration with parents can involve individual sessions designed to raise awareness of how a parent can help a child – either in a preventative way or to support a programme. Speech pathologists are also able to offer counseling regarding the likely progress and outcomes for a child. Information sessions and talks are commonly run by speech pathology clinics and by speech pathologists in collaboration with schools.

Collaboration with teachers and other professionals can target general issues such as information on the role of speech and language in literacy development, key areas such as phonological awareness, identification and prevention programmes. Collaboration can also take place regarding the needs of specific students or groups of students experiencing literacy difficulties. Consultation may involve input on language as part of a team evaluation of a child's needs, and referral to other specialists as appropriate.

Speech pathologists also often provide a role that busy classroom teachers can rarely manage: they have the option of working intensively with individual children. This allows programs to be tailored to individuals, allowing speech pathologists to tune in carefully to the child's strengths and weaknesses as they carry out diagnostic teaching. Speech pathologists can therefore provide strategies specifically designed to target areas of need, rather than exposing children to more of the teaching activities that were used in the whole class context.

Undergraduate and postgraduate teacher education

Speech pathologists can make a valuable contribution to both undergraduate and postgraduate teacher education.

In pre-service training courses this can include contributing to the teaching programme and raising awareness of the place of language in literacy development.

The Human Communication Science course at Curtin University of Technology in WA and the Department of Speech Pathology and Audiology at Flinders University in SA provide a minor which can be undertaken by education students. Education students who undertake these units learn about the typical developmental patterns of language, how to monitor the language development of children in their classrooms, and strategies to manage language learning difficulties. LaTrobe University in Victoria includes a guest lecture on the role of language in learning difficulties and literacy in its pre-service teacher education course.

In post graduate education this contribution can be made through the provision of direct teaching or distance learning units designed by speech pathologists (ideally in collaboration with teachers and psychologists).

Curtin University of Technology in WA offers four distance education units – Later Language Development 1 & 2, Reading Development and Disorders, Spelling

Development and Disorders. Enrolled students generally come from both the speech pathology and teaching professions. Macquarie University likewise offers reading development and disorder training as part of a degree in Communication Disorders available to a range of professionals.

Professional development for classroom teachers

Speech Pathology Australia & speech pathologists around Australia offer professional development sessions on language and literacy to schools. The popularity of these workshops can be measured by the numbers of participants from all professions. For example, a recent workshop run for Speech Pathology Australia by Elizabeth Love and Sue Reilly (who have both speech pathology and education qualifications) titled 'Phonological Awareness – a critical skill for literacy' was attended by 21 teachers, 1 teacher's assistant, 55 speech pathologists and 3 other professionals. The Department of Education in South Australia has produced a teacher education package that skills teachers in the role of oral language as a literacy facilitator (Lawless & White, 2003).

A classic example is the development of First Steps by the Education Department of Western Australia. First Steps is a practical, classroom-orientated literacy resource that helps teachers to assess and monitor their students' literacy progress. It provides links with developmentally appropriate teaching strategies and learning activities. The original First Steps team comprised education department and speech pathology professionals. The combination of workshops and practical in-class support was considered a critical component of its success.

Another example of collaboration is that between the Department of Speech Pathology and Audiology at Flinders University and various school sectors in SA. Clinical educators with a group of speech pathology students provide negotiated services to different schools, both mainstream and special in government, independent and Catholic sectors. These services are individually packaged but typically involve teacher inservice about the linkages between oracy and literacy as well as assessment and intervention for children with literacy problems. Similar services have been offered by Human Communication Science course at Curtin University of Technology in WA and have led to the WA State Literacy Award for Forest Crescent Primary School in 2002 and the WA National Literacy Award in 2003 for Montrose Primary School. These are described in Appendix B.

Curriculum development

While curriculum is essentially the province of the educator, a speech pathologist can take a collaborative role in the integration of language and literacy and learning outcomes.

Individual education plan goals for students with oral language or phonological awareness deficits can be dovetailed with curricular outcomes to ensure both teachers and students meet with measurable success, supported by specialist intervention where needed.

Ongoing literacy research

There is always need for sound research, especially in Australia, which addresses the efficacy and efficiency of interventions. Speech pathologists can contribute to the evidence for successful literacy approaches through collaborative research with educationalists.

Research conducted within Australia has been highlighted by asterisk (and in green electronically) within the annotated bibliography in Appendix A.

Appendix B describes a selection of literacy related research involving members of the S.P.A. literacy reference group or their colleagues.

Speech Pathology Australia
Literacy Reference Group
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Appendix A**ANNOTATED BIBLIOGRAPHY**

- Adams, M. (1990). *Beginning to Read*. Cambridge, Massachusetts: MIT Press. This is a classic text which reviews the historical and current practices in relation to the teaching of reading. The practices are examined and evaluated in terms of known research findings in the fields of education, psychology and linguistics.
- Armbruster, B., Lehr, F., & Osborn, J. (2003). *Put Reading First: The Research Building Blocks of Reading Instruction*, from www.nifl.gov/partnershipforreading/publications/Cierra.pdf This is an on-line resource designed by teachers for teachers. It was developed by the Center for the Improvement of Early Reading Achievement (CIERRA), funded by the National Institute for Literacy (NIFL), US Department of Education. The findings and conclusions are based on the findings of the 2000 National Reading Panel Report. The National Reading Panel report was entitled Teaching Children to Read: An Evidence-based Assessment of the Scientific Literature on Reading and its Implications for Reading Instruction. The five areas of reading instruction are thoroughly explored; phonemic awareness, phonics, fluency, vocabulary and text comprehension.
- Ball, E. W. (1997). Phonological awareness: Implications for whole language and emergent literacy programs. *Topics in Language Disorder*, 17(3), 14-26. This article provides a good overview of the relationship between phonological awareness and early reading. Ball conducted a study of 38 children with low letter-sound knowledge in kindergarten were assigned to one of three groups; phonological awareness intervention, language intervention or no intervention. The group who received phonological awareness intervention performed significantly better than their peers on both word recognition and word decoding in first-grade. Integration of phonological awareness tasks into the classroom is discussed.
- Bishop, D. V. M., & Adams, C. (1990). A prospective study of the relationship between specific language impairment, phonological disorders and reading retardation. *Journal of Child Psychology and Psychiatry*, 31(7), 1027-1050. This study investigated children who had demonstrated early language impairment. If the language impairment had resolved by 5 1/2 years of age, literacy development proceeded normally, but if language remained impaired after 5 1/2 years of age these children had both reading difficulty and ongoing language difficulties. In particular, reading comprehension was affected.

- Catts, H., & Kamhi, A. (1999). *Language and Reading Disabilities*. Boston: Allyn and Bacon. This book addresses the underlying language basis of reading disabilities. Chapters include an explanation of the normal process of acquiring spoken and written language, a definition of reading disability, classification of reading disabilities and known causes. The final chapters cover appropriate intervention in terms of word recognition, phonemic awareness, text comprehension and written expression.
- Catts, H. W. (1991). Early identification of reading disabilities. *Topics in Language Disorder*, 12(1), 1-16. This article discusses how to prevent reading failure via language and phonological awareness screening and/or assessment of children. The validity of these approaches is examined. The conclusions emphasise that literacy difficulties should not be seen as a difficulty with written language per se but as evidence of a difficulty with aspects of spoken language. These deficits in spoken language are manifesting themselves as a difficulty with written language.
- *Coltheart, M. (1996). Phonological dyslexia: Past and future issues. *Cognitive Neuropsychology*, 13(6), 749-762. **Australian**. Individuals with phonological or 'deep' dyslexia have an inability to recall and therefore utilise the sound-symbol correspondence of our written system in order to decode words successfully. This is one type of phonological impairment. These individuals must rely upon recognition of words and prediction of the next word by the context of the sentence or paragraph. There is still much to be learnt about why this occurs. Though some individuals compensate well, particularly if language skills are strong, literacy is commonly severely impaired in these instances. Notably, some children appear to be progressing normally in the early years if they can memorise words and texts, but the deficiency becomes more evident after two to four years of schooling. Unlike the UK, which has enlightened 'dyslexia-friendly' schools, dyslexia is not diagnosed, recognised or funded in Australia's schools. It is likely that this 'head in the sand' attitude contributes to unnecessarily high levels of illiteracy in Australian schools.
- *Dawkins, J. (1991). Department of Employment, Education & Training, *Australia's language: The Australian language and literacy policy*. Canberra: **Australian** Government Publishing Service. An essential resource to understand the basis of the policy on literacy education. This document was produced after an extensive consultation process.
- *Department of Education and Children's Services. (2003). *Statistical update: Term 3 (midyear) 2003 Census; Students with Disabilities*. 7.3% of **South Australian** students receive special education funding of which 73% are known to have a language or communication impairment (2003). This represents over 9000 students in South Australia.

- *Department of Education, Training and Youth Affairs. (2000). *Literacy and Numeracy Benchmark Data* (Submission No 117.2 ed.). This National report shows that 15% of Year 3 boys and 11% of Year 3 girls in Australia failed to reach the reading benchmark in 2000. The benchmarks represent a minimum acceptable level of proficiency.
- *Dodd, B., & Gillon, G. (2001). Exploring the relationship between phonological awareness, speech impairment and literacy. *Advances in Speech Language Pathology*, 3(2), 139-147. This Australian article explores the appropriateness of wide-scale phonological awareness intervention for all students, including those with speech and language impairments. It is highlighted that more research is required to determine which students will benefit from phonological training. There is emergent evidence that phonological awareness training is beneficial to children with concomitant speech impairment.
- Elbro, C., Borstrom, I., & Petersen, D. K. (1998). Predicting dyslexia from kindergarten: the importance of distinctness of phonological representations of lexical items. *Reading Research Quarterly*, 33(1), 36-60. In this study a phonological stimulation program was implemented with preschool children of parents known to have dyslexia. Heritability would predict that at the very least 40% of these children would have dyslexia. Following phonological awareness stimulation training only 17% of these children were later diagnosed with dyslexia. The investigators also found that the skill of sound-letter correspondence was the strongest predictor of literacy success, but that phonological awareness training in the pre-literacy stage enhanced children's success in attaining this skill.
- Gallagher, A., Frith, U., & Snowling, M. J. (2000). Precursors of literacy delay among children at genetic risk of dyslexia. *Journal of Child Psychology and Psychiatry*, 41, 203-213. This study found that children aged 3 years 9 months who were later diagnosed as dyslexic scored more poorly on tasks of short-term auditory memory, rhyme knowledge, letter knowledge and non-word repetition than age-matched children who became normal readers. Therefore, screening for these skills at pre-school age could detect children at risk of literacy failure. At 6 years, poor letter naming was a striking feature of children later diagnosed as dyslexic.
- Gillon, G. (2002). *Phonological awareness intervention for children: From the research laboratory to the clinic*, from www.asha.org/about/publications/leader-online/archives/2002 or www.asha.org/about/publication/literacy/lit-basics.html This article provides a summary for speech pathologists of the relevant research findings in relation to phonological awareness. The role of the speech pathologist in providing intervention and collaborating with teachers is discussed. Specific activities are suggested and the need to undertake professional development is emphasised. A good overview for the profession.
- Gillon, G. (2004). *Phonological Awareness: From Research to Practice*. New York: The Guildford Press. This is a very readable and comprehensive text on all aspects of phonological awareness. The content includes normal phonological awareness development, assessment and intervention. The relationship with dyslexia and both speech and language impairments are fully discussed.

- Gough, P. B. (1996). How children learn to read and why they fail. *Annals of Dyslexia*, 46, 3-20. This article discusses the types of reading difficulties namely; dyslexia, hyperlexia (good decoding with poor comprehension) and the more common less-skilled reading disability. It is emphasised that true 'reading' is the product of decoding and comprehension that are both commensurate with age. This is represented as $R(\text{reading}) = D(\text{decoding}) \times C(\text{comprehension})$.
- Griffith, P. L., & Olson, M. W. (1992). Phonemic awareness helps beginning readers break the code. *The Reading Teacher*, 45(7), 516-523. This article provides a very readable and insightful explanation of how and why phonological awareness assists early readers. Many practical suggestions for the classroom are provided.
- Law, J., Boyle, J., Harris, F., Harkness, A., & Nye, C. (1998). *Screening for speech and language delay: A systematic review of the literature*, 2, from www.hta.nhs.uk/fullmono/mon209.pdf This review of the literature determined that speech and language delays were a frequent precursor of literacy difficulty. The median prevalence of speech and language impairments is 6%. Of these children 41-75% will experience reading problems by age 8.
- *Leitão, S., & Fletcher, J. (2004). Literacy outcomes for students with speech impairment: long-term follow-up. *International Journal of Language and Communication Disorders*, 39(2), 245-256. This study investigated the long-term academic and literacy outcomes for 14 students in **Western Australia** with a history of speech impairment. These students had ongoing impairment of phonological awareness, reading accuracy and spelling. Weaknesses in reading comprehension were also found.
- Lewis, B., & Freebairn, I. (1992). Residual effects of preschool phonology disorders in grade school, adolescence and adulthood. *Journal of Speech and Hearing Research*, 35, 819-831. The researchers studied the reading and spelling performance of people who had experienced delays in their speech and/or language development. While the speech and language difficulties had resolved by the time of the study, all had long-term reading and spelling weaknesses compared to control subjects without this history. Those subjects with both speech and language difficulty were most impaired.
- Liberman, I. Y., & Shankweiler, D. (1985). Phonology and the problems of learning to read and write. *Remedial and Special Education*, 6(6), 8-17. This article explains that the demands of literacy development are greater than those required for speaking and listening. For literacy to develop, an understanding of the sound structure of the language is necessary and this is known as phonological awareness. This article explores the reasons for impaired development of these phonological skills and how they may also impact on both word recognition and language comprehension.

Lundberg, I. (2002). The child's route into reading and what can go wrong. *Dyslexia*, 8, 1-13. This article explains the two routes to reading success. One involves phonological development which leads to successful decoding and the other involves the development of language and its role in comprehension. The importance of vocabulary development is emphasised and children at risk include those from lower socio-economic backgrounds. Evidence is provided to support the view that successful literacy approaches must include both phonological and language enrichment. Lundberg also explodes the common myth that reading aloud to children is sufficient to prevent literacy failure. A review of the literature is reported and less than 10% of the reading ability outcome can be attributed to this factor.

Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly*, 33(Summer), 263-284. This study reports that children who received PA intervention outstripped peers in literacy outcomes in later years. The researchers also found that children could segment sounds *before* being exposed to the letter symbols. It has often been suggested that this is not achievable. Lundberg et al. believe that short term memory for sounds is at the core of phonological awareness deficits.

*Mallen, S. (1996). Addressing pre-literacy skills in the preschool setting. *Australian Communication Quarterly*(Autumn), 21-24. This special project funded by the Department of Education and Children's Services. This [Australian](#) research was conducted with two matched-pair groups of children in two pre-school settings. These children had obtained the lowest scores at the commencement of the study on the Screen of Phonological Awareness (SPA) normed on students 4-6 years of age. In each setting one group of children received one session per week targeting phonological awareness over a seven week period. The results demonstrated that significant gains in phonological awareness skills were achieved as a result of intervention compared to the control groups who received no intervention.

*Mallen, S., Sanchez, L., & McCormack, P. (2004). The reading abilities of students with auditory processing disorder. *IALP Congress Proceedings*, 1-6. This [Australian](#) research has shown that students with auditory processing disorders (APD) have significantly lower listening comprehension abilities than students without APD. Short-term memory, listening comprehension and vocabulary knowledge correlated significantly with reading comprehension ability for the APD group. It is concluded that auditory processing difficulties impact negatively on vocabulary development and this in turn, places these students at risk for poor reading comprehension.

*Ministerial Council on Education, Employment, Training and Youth Affairs. (2001). *National Report on Schooling in Australia; National Benchmark Results*. This update reports that in [Australia](#) 10% of Year 3 students failed to attain the reading benchmark and 10% of Year 3 students failed to attain the writing benchmark in public schools in 2001. The benchmarks represent a minimum acceptable level of proficiency and do not reflect whether a child is functionally literate in the classroom.

- National Institute of Child and Human Development. (last modified 2004). *Report of the National Reading Panel: Teaching children to read*
www.nichd.nih.gov/publications/nrp/findings.htm The National Reading Panel conducted a literature review of current teaching practices including silent reading, shared reading, phonics, guided reading, comprehension and computer technology. This is a very accessible and balanced review of the findings and determinations. The NICHD considers reading failure to be a national public health problem in the US.
- OFSTED. (2004). *Reading for purpose and pleasure: An evaluation of the teaching of reading in primary schools.*, from www.ofsted.gov.uk/publications/index.cfm
This report details the findings of a large scale survey conducted in the UK. Schools which were achieving good literacy outcomes were compared to schools with low literacy outcomes. Some of the major findings were that successful schools engaged in 1) early identification of students at risk for poor outcomes 2) a whole school approach to maximising literacy potential 3) an ability to be critical of current teaching practices 4) the teaching of a broad range of teaching strategies informed by research and 5) active engagement of parental support.
- Rayner, K., Forman, B., Perfetti, C., Pesetsky, D., & Seidenberg, M. (2001). How psychological science informs the teaching of reading. *Psychological science in the public interest*, 2(2), 31-74. A thorough monograph explaining why mastery of the alphabetic principle is essential to reading proficiency. Reading and writing models are outlined with reference to dyslexia. Teaching methods are analysed, including a discussion of why teaching instruction has become a politically charged issue.
- Roth, F., Speece, D., & Cooper, C. (2002). A longitudinal analysis of the connection between oral language and early reading. *The Journal of Education Research*, 95(5), 259-274.
- *Rowe, K. S., Rowe, K. J., & Pollard, J. (2004). *Literacy, behaviour and auditory processing: 'Building fences at the top of the cliff in preference to 'ambulance services' at the bottom.* Paper presented at the 2004 ACER Research Conference, [Adelaide, SA](#). Many children who appear inattentive and disruptive in the classroom are found on investigation by an audiologist to be experiencing auditory processing difficulties or disorder. These children are greatly at risk for poor literacy outcomes (see Mallen reference in this bibliography). This important article outlines that it is not difficult to screen for auditory processing difficulties and effective management strategies can then be implemented to prevent academic failure.
- Savage, R., & Carless, S. (2004). Predicting curriculum and test performance at age 7 years from pupil background, baseline skills and phonological awareness at age 5. *British Journal of Educational psychology*, 74(2), 155-171. 453 5-year old children were evaluated on phonological awareness measures and orthographic (written) measures to determine the validity of using these measures to predict outcomes. Learning Support Assistants were trained to administer the tests. Two

- years later the data was then collected from teachers on the children's performance on the National Curricular Key Stage 1 outcome measures for English, Maths and Science for 7-year olds. The results showed that both the phonological and orthographic measures could predict 12 of the 13 outcome measures. Other important predictive factors were socio-economic status and gender. It was concluded that training support teachers to screen children in this way was a valuable exercise to prevent literacy failure.
- Scarborough, H. S. (1990). Very early language deficits in dyslexic children. *Child Development, 61*, 1728-1743. Scarborough reports that 65% of children born in a family with a history of dyslexia will have a reading disability. Scarborough found that both phonological awareness capabilities and letter naming abilities at 5 years of age were significantly poorer in children who were later diagnosed as dyslexic. In particular, rhyming skills and matching first sounds were weaker in these children. Vocabulary knowledge and oral language skills were also poorer at 3 1/2 years of age in this population but for many of these children these difficulties had resolved by 5 years of age.
- Shankweiler, D. (1989). How problems of comprehension are related to difficulties in decoding. In D. Shankweiler & I. Y. Liberman (Eds.), *Phonology and reading disability*: University of Michigan Press. This study explores how both word decoding and language deficits may have a common source in phonological processing, and in particular, short-term memory for sounds.
- Siegel, L. S. (1993). Phonological processing deficits as the basis of a reading disability. *Developmental Review, 13*, 246-257. This study aimed to establish whether phonological awareness abilities were independent of IQ. If true, then reading ability could be predicted from PA, but not from IQ. This turned out to be the case. IQ has repeatedly been found to be non-predictive of reading ability.
- Snowling, M. J. (2000). *Dyslexia* (2nd ed.). Oxford: Blackwell. This excellent text covers all aspects of dyslexia from definitions of reading disability to individual differences and effective remediation.
- Snowling, M. J., Bishop, D. V. M., & Stothard, S. E. (2000). Is preschool language impairment a risk factor for dyslexia in adolescence? *Journal of Child Psychology and Psychiatry, 41*, 587-600. These researchers found that students with a history of pre-school language impairment had significant reading difficulties at 15 years of age, despite normal reading ability at 6 years of age. They believe that this demonstrates that underlying language weaknesses will compound over time.
- Stanovich, K. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*(4), 360-406. The 'Matthew effect' is often referred to as the principle in which once a reading deficit exists, the reduced reading experience will further compound the problem. This highlights that there is a reciprocal relationship between reading experience and reading success.

- Swank, L. K., & Catts, H. W. (1994). Phonological awareness and written word decoding. *Language, Speech and Hearing Services in Schools, 25*, 9-14. Phonological awareness measures were shown to be predictive of decoding ability in first grade and were higher than the predictive value of IQ.
- Torgesen, J. K., & Davis, C. (1996). Individual difference variables that predict response to training in phonological awareness. *Journal of Experimental Child Psychology, 63*, 1-21. Responsiveness to phonological awareness training and in particular, development of sound segmentation skills could be predicted from verbal ability. Sound segmentation skills in the first year of schooling are believed to be one of the strongest predictors of later decoding ability.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1994). Longitudinal studies of phonological processing and reading. *Journal of Learning Disabilities, 27*(5), 276-286. In the review of the literature the researchers highlight that poor readers are consistently found to have weak phonological awareness skills. It is known that phonological awareness skills can be trained, but it is vital that the skills are directly applied to both sound-letter correspondence and the reading process. They cautioned that in their longitudinal study some children were more resistant to phonological awareness training and that further research is required to understand why this is the case.
- van Kleeck, A. (1990). Emergent literacy: Learning about print before learning to read. *Topics in Language Disorder, 10*(2), 25-45. This article provides a thorough review of the aspects of pre-literacy that are crucial to the development of literacy. These aspects include book knowledge, print conventions, language, phonological awareness, letter naming and understanding of a variety of text structures.
- van Kleeck, A., & Schuele, C. M. (1987). Precursors to literacy: Normal development. *Topics in Language Disorders, 7*(2), 13-31. This article thoroughly outlines the stages leading to normal literacy development.
- *Waring, S., Prior, M., Sanson, A., & Smart, D. (1996). Predictors of 'recovery' from reading disability. *Australian Journal of Psychology, 48*(3), 160-166. Children with reading disabilities in Grade 2 were followed up in Grade 6 to investigate both the persistence of those reading difficulties and the factors that influenced reading outcome at Grade 6. Of those readers who 'recovered' from reading difficulty, the factors that contributed to this recovery were IQ, language abilities, working memory and the utilisation of decoding as a reading strategy. The importance of phonological skill development is emphasised.
- Watson, B., & Miller, T. (1993). Auditory perception, phonological processing and reading ability/disability. *Journal of Speech and Hearing Research, 36*, 850-863. The researchers investigated undergraduates with and without reading and spelling difficulties. They found a significant relationship between speech perception, auditory memory and phonological awareness abilities in those experiencing literacy difficulty. Development of speech perception (for example

hearing differences in sounds such as 'b' vs. 'p' or 'v') or auditory memory skills are not routinely taught in mainstream schooling.

Westby, C. (2004). 21st Century literacy for a diverse world. *Folio Phoniatica and Logopedica*, 56, 254-271. A fascinating and insightful must-read on the issues facing literacy education in the world today. This article reviews the literature on the cognitive and linguistic skills necessary for proficient reading, including those required for decoding scripts and comprehension of text. Among the range of skills for reading discussed, Westby makes the point that research internationally has resulted in considerable understanding of the role of phonemic awareness in the development of fluent reading for both typically developing children and children with specific reading and language disabilities. Westby makes the case also that children with histories of oral language learning disabilities are at high risk for experiencing difficulty in reading. For effective teaching or reading, Westby adds that educators and speech-language pathologists need a thorough understanding of (a) characteristics of the scripts to be learned; (b) phonological structures of the languages; (c) morphological and syntactic structure of oral and written forms of language; (d) text organisation; (e) values and beliefs of the community; (f) language genres or functions used in the community; and (g) characteristics of language delays and disorders in different languages. Literacy abilities within society are discussed broadly in the context of the United Nations worldwide literacy mandate.

*Westwood, P. (1999). *Spelling: Approaches to Teaching and Assessment*. Victoria: ACER. This book provides an overview of effective teaching of spelling. Explicit teaching and structured intervention are supported by research. Assessment guidelines are also provided.

*Westwood, P. (2001). *Reading and learning difficulties; Approaches to teaching and assessment*. Victoria: ACER. This is a comprehensive guide to effective teaching of reading. It includes the reading process, teaching methods, development of strategies, learning difficulties, assessment and intervention. The need for a balanced approach to suit all learning styles is emphasised.

Yopp, H. K. (1992). Developing phonemic awareness in young children. *The Reading Teacher*, 45(9), 696-703. This is a very practical 'how to do it' guide for teachers to assist phonological awareness programming in the classroom.

* denotes Australian research

SAMPLES OF INTERVENTION RESEARCH IN AUSTRALIA**SOUTH AUSTRALIA****Addressing pre-literacy skills in the pre-school setting (Mallen, 1995, 1996)**

This special project was funded by the Department of Education and Children's Services. This research was conducted with two matched-pair groups of children in two pre-school settings. These children had obtained the lowest scores on the SPA (Mallen, 1998) at the commencement of the study. In each setting one group of children received one session per week targeting phonological awareness over a seven week period. The results demonstrated that significant gains in phonological awareness skills were achieved as a result of intervention compared to the matched groups who received no intervention.

Mallen, S. (1995). Developing preliteracy skills to enhance early reading potential. *Voice*, 3(2), 6-8.

Mallen, S. (1996). Addressing pre-literacy skills in the preschool setting. *Australian Communication Quarterly* (Autumn), 21-24.

Mallen, S. (1998). *Screen of Phonological Awareness*. South Australia: Hyde Park Press.

To improve phonemic awareness in our pre-school children by implementing a program of phonemic awareness within the context of our Early Childhood Curriculum (Diana Bleby, Jane Jackson, Leanne Konitzka)

A series of projects were conducted in DECS schools in the mid -90s in the Riverland region of SA under the guidance of the school speech pathologists. Two of the studies showed again that phonological awareness skills could be raised significantly over a short period of time (6 weeks). It was perceived by the teachers involved that these skills had generalised to literacy tasks as well. A third study showed that students who were perceived as 'good readers' by teachers achieved significantly higher scores on a screening test based on the SPA (Mallen, 1998) than those students perceived to be 'poor readers'.

Mallen, S. (1998). *Screen of Phonological Awareness*. South Australia: Hyde Park Press.

Phonological Awareness (Malone, 2004)

This research was published in the SA Primary Principal's Association journal. The research was conducted in Salisbury Junior Primary School. After the first year it was established that 16 children who obtained higher scores on the Screen of Phonological Awareness (SPA scores) (Mallen, 1998) in their Reception year were on average reading books that were 8 levels higher than their control group peers by Year 1. In the second year of the study, a group of children who obtained low scores on the SPA at the beginning of Reception were selected. These children participated in phonological awareness intervention and significantly raised their SPA scores by the end of the year. By Year 1 these students were reading at 4 levels above their peer control group. A particularly interesting finding for the researchers was how well the SPA scores could predict literacy success.

Malone, J. (2004). Phonological Awareness. *SAPPA Journal*.

Effective Early Reading Intervention: A comparison between inclusive and withdrawal models (Roxburgh, 2004)

This study was undertaken by an undergraduate teacher as her final project. Year 1 students were allocated to one of three groups. One group received individual phonological awareness intervention (withdrawal), the second group received group intervention (inclusive) and the third group received no intervention. Both intervention groups scored significantly better on re-testing than the group who received no intervention, and the group that received individual intervention scored more highly than the group intervention, though not significantly so.

Roxburgh, S. (2004). *Effective Early Reading Intervention: A comparison between inclusive and withdrawal models. Unpublished.*

WESTERN AUSTRALIA***‘Catch them before they fall’ pilot project (2002)***

Summary of Pilot Early Identification Project conducted in 9 schools by the Child Study Centre Dyslexia Project at the University of Western Australia and the WA Department of Education’s Speech and Language Outreach Team.

Measures of phonological awareness, working memory (using sentence imitation), letter name/sound knowledge and family history were taken in early term 3 and levels of risk established. Teachers and education assistants were trained in supporting students’ phonological awareness and oral language development, after which they implemented these strategies with students “at risk” over 6 to 8 weeks. Re-testing took place in the middle of term 4. 80% of all children improved in phonological awareness skills, including 88% of the “at-risk” group. These are very encouraging results, though must be regarded as tentative because this was a pilot study. The total cost of the project was approximately \$7,500 (approximately \$830 per school).

This provided Professional Development for the teachers and education assistants, data analysis by the Project, 1 day of teacher relief per school, and catering etc.

Professional Development provided a theoretical framework for teachers and their assistants based on the best current understanding of research into predictors of language and literacy development. Staff at participating schools are now confident in the use of a method for early identification of children “at risk” for literacy and language difficulties and will go on using the knowledge and skills they gained during this project.

‘Catch them before they fall’ project (2004)

A Project of the West Coast Education District of the Department of Education and Training WA (DoET) in consultation with the Child Study Centre (CSC) Dyslexia Project and DoET Speech and Language Outreach Team

Aim: The project was designed to support students with identified speech and language impairments/difficulties that would affect their ability to acquire academic and social competencies

The Plan consisted of three main components:

Identification of students in Kindergarten, Pre-Primary and Year 1 were identified as being at risk in terms of their speech and language and phonological awareness (PA) skills using standardised measures.

Intervention: Teachers were given access to resources to plan and delivery quality intervention strategies for speech/language and phonological awareness.

Evaluation of gains made by Pre-Primary and Year 1 students identified initially as at risk for literacy problems because of poor PA.

School Participation: 11 schools (9 participant and 2 control).

Student Numbers: Kindergarten: 328 (Experimental = 295; Control = 33)
Pre-Primary: 429 (Experimental = 378; Control = 51)
Year 1: 252 (Experimental = 217; Control = 35)

Intervention (Terms 3 and 4 2003)

Experimental Group Early Childhood Education representatives from each school trained in Language and PA by Speech and Language Outreach Team (SLOT).

Classroom-wide oral language enhancement activities conducted by teachers in Kindergarten, and oral language and phonological awareness in Pre-Primary classes using the SLOT professional development modules and existing within-school resources. Year 1 children identified as at risk targeted in small group with PA and oral language enhancement activities. These activities were also developed from the SLOT professional development modules and existing within-school resources.

Control Group Schools accessed services contracted from within school funds.

KEY Findings

- Children in Pre-Primary and Year 1 improved in PA during the second half of the year.
- For Year 1 children, competence in speech/language together with Peer and Conduct problems appeared to be related to children's capacity to improve in PA.
- The results suggest that focus on PA and oral language is worthwhile to improve children's capacity to take advantage of early childhood literacy education.
- Staff at participating schools became confident in the use of a method for early identification of children "at risk" for literacy and language difficulties.
- Teachers confirmed that the framework allowed them to make creative use of existing resources to develop PA and language enrichment programmes for children "at risk". Although the schools were offered further support from the project to follow through with their PA enhancement activities, they were mostly able to operate independently. This further increased the cost-effectiveness of the initial Professional Development.

WA State Literacy Award winner in 2002: Forest Crescent Primary School.

Forest Crescent Primary School in Perth, Western Australia has been developing its approaches to language and literacy in collaboration with speech pathologists and speech pathology students since 1999. In-service training run by speech pathologists and speech pathology students has been provided for early childhood teachers, and these teachers now routinely screen the oral language skills of all children in Preprimary classes. In-service training has also been provided by speech pathology students for teacher assistants. Small group activities for oral language development are run with the assistance of parent helpers and final year speech pathology students from Curtin University of Technology. Speech pathology students provide detailed assessment of children identified as potentially at risk of literacy difficulties, and targeted, in-class

intervention / support for these children during term 3 of the academic year. Each year, students run an information session on oral language and literacy for interested parents. This initiative won the WA State Literacy Award for Forest Crescent Primary School in 2002.

WA National Literacy Award winner in 2003: Montrose Primary School

Montrose Primary School in Perth, Western Australia, has had collaborative involvement with speech pathologists and speech pathology students from Curtin University since 2002. Final year students, under the supervision of a speech pathologist, work across all years of the school commencing with a kindergarten screening program, and then teacher identified children at risk for all subsequent age groups. Individual, small group or within class approaches are used, with a number of trained Education Assistants available to support children as required. This initiative won the National Literacy Award for Montrose Primary School in 2003.

VICTORIA

The Department of Education and Training in Victoria conducted a study which supported better outcomes for beginning school students when teachers were aware of listening memory and auditory processing skills in their students. The Victorian Study into auditory processing was carried out by ACER and the Royal Children's Hospital. The auditory processing tests tapped into short term memory and working memory. The researchers standardized the tasks for a prep population (5 year olds in their first year of school in Victoria).

The research phase involved target schools, in which teachers of new prep students gave the test to each child, and recorded their responses. Subsequent to that, those teachers attended an hour of training on how to modify their sentence length and language to more closely approximate the memory constraints they had observed in their prep students. The research included a control group of schools and teachers.

At the end of the prep year, the research evaluated the students and reported better literacy outcomes and behaviour in students from the schools in which the auditory processing assessment had been carried out. The Dept of Ed, Employment & Training (DEET) produced a training video and accompanying test tape and recommended that it become part of the prep entry screening protocol.

Pollard, J and Rowe, K.S (1999) "*What did you say? Auditory processing for students*" Targeting Excellence: Continuing the Journey. Conference Proceedings. Melbourne, Department of Education and Training, Victoria. pp 51-53.

Rowe, K & Pollard, J. (2000) "*Listening and Learning: Auditory processing in children and it's effects on literacy and behaviour*" Early Years of Schooling P-4 Conference. High Expectations - Outstanding Achievement. Conference Proceedings. Melbourne, Department of Education, Employment & Training, Victoria. June 4-5, 2000 (CDROM).