

Oral language supports early literacy: A pilot cluster randomized trial in disadvantaged schools

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Abstract

This study examined the impact of teacher professional development aimed at improving the capacity of primary teachers in disadvantaged schools to strengthen children's expressive and receptive oral language skills and early literacy success in the first 2 years of school. Fourteen low-SES schools in Victoria, Australia were randomly allocated to a research ($n = 8$) or control arm ($n = 6$), resulting in an initial sample of 1254 students, ($n = 602$ in research arm and $n = 652$ in control arm). The intervention comprised 6 days of teacher and principal professional development (delivered by language and literacy experts), school-based continuing contact with the research team and completion by one staff member of each research school of a postgraduate unit on early language and literacy. Schools in the control arm received standard teaching according to state auspiced curriculum guidelines. Full data were available on 979 students at follow-up (time 2). Students in the research arm performed significantly better on Test of Language Development: Primary (Fourth Edition) sub-tests ($p \leq .002$) and the Reading Progress Test ($F = 10.4(1)$; $p = .001$) than students in the control arm at time 2. Narrative scores were not significantly different at time 2, although students in research schools showed greater gains. Findings provide "proof of concept" for this approach, and are discussed with respect to implications for teacher professional development and pre-service education concerning the psycholinguistic competencies that underpin the transition to literacy.

Keywords: *Oral language, early literacy, teachers.*

Introduction

Childhood language and early literacy impairments affect ~17% of 4 year olds (Reilly, Wake, Ukoumunne, Bavin, Prior, Cini, et al., 2010). The long-term educational and social impact of persistent oral language and literacy impairment is high for affected individuals, families, schools, and the wider community (Schoon, Parsons, Rush, & Law, 2010). The ability to use oral language effectively impacts the child's ability to learn in the classroom, to interact with their peers, and to develop literacy and numeracy skills. Oral language competence is unarguably crucial for academic success (Catts, Fey, Zhang, & Tomblin, 1999; Nation, 2005; Snowling, 2005). In their review of the literature on causes of reading difficulties, Vellutino, Fletcher, Snowling, and Scanlon (2004) highlighted the impact on early literacy of oral language-based weaknesses, most particularly deficits in phonological, semantic, and syntactic knowledge. Oral language competence has been defined by Snow (2009, p. 102) as

The ability to engage successfully with a range of communication partners via the spoken word, in order to conduct a wide variety of personal, social, educational, commercial and professional relationships. Such engagement should be reciprocal at the level appropriate to the nature of the interpersonal relationship and should conform to a range of developmental, cultural, and socio-linguistic norms.

As well as supporting the transition to literacy in the early school years, oral language competence is the means by which children establish and maintain relationships with others, especially peers and teachers. Evidence indicates that reduced oral language competence in the early years compromises psychosocial development and can predispose to high-prevalence mental health problems, such as depression and anxiety, with such problems persisting into adulthood (e.g., Schoon et al., 2010). Language difficulties in childhood and adolescence are also linked with externalizing behaviour disorders (Snow & Powell, 2008, 2011). Evidence from

Australian longitudinal studies demonstrates increased levels of behavioural problems in children with language impairment, as early as the pre-school years (Prior, Bavin, Cini, Eadie, & Reilly, 2011). Further, once children are in school, they are subject to what Stanovich (1986) described as the “Matthew Effect”, a Biblical reference to the notion that “The rich get richer, and the poor get poorer”. Applied to reading skills, this axiom holds that children who enter school having already achieved key psycholinguistic milestones will be better equipped for the challenges of reading and writing. Those who arrive at school with under-developed skills in these domains will not, however, be ready for an exclusive focus on learning how to read, particularly if this is at the expense of further opportunities to strengthen oral language competencies that form the basis of the transition to literacy.

It has been observed (Berko Gleason, 1993) that while learning to *speak* is a task for which humans are generally well biologically prepared (assuming adequate levels of interaction with others and exposure to the spoken word), learning how to *read and write* is a social construction derived from humans’ motivation to record information and experiences. Children require specific instruction in order to become proficient readers and writers. Not surprisingly then, in most Western countries, the early years of school (i.e., the first 3 years of primary school¹) have a significant emphasis on the transition to literacy (Centa, 2005). Early years classrooms focus on students being able to read fluently and for understanding, and being able to produce text of their own. While decoding and reading fluency are important components of reading competence, the child’s *comprehension* of that text has an overarching significance for academic success. Reading comprehension difficulties are commonly co-morbid with oral language difficulties (Nation, 2005) and Snowling and Hulme (2011) have recently referred to the notion of “homotypic comorbidity” between language development and reading ability, positing that “... a reading disorder is simply a later manifestation of what was observed earlier as a disorder of spoken language development” (p. 5). Clearly, then, the question of instructional techniques in the classroom is an important one for speech-language pathologists (SLPs) to both examine and influence.

A particularly important predictor of literacy success is well established psycholinguistic skills in the pre-school years (Catts et al., 1999). Such skills include the cognitive processes, e.g., visual, auditory, and memory skills, which allow for language processing, comprehension, and production, and underpin children’s successful transition to literacy (Catts et al., 1999). Children who enter school having already achieved these skills (e.g., phonemic and morphological awareness, letter knowledge) will be better-equipped for the challenges of reading and writing. However, recent research provides

compelling evidence of inequalities in fundamental developmental domains in Australian children. Hay and Fielding-Barnsley (2009) reported on a cohort of ~450 Queensland children at school entry. One in four children in schools categorized as low socio-economic status (SES) were below benchmarks for alphabet knowledge and language competence, based on measures of receptive and expressive vocabulary. This was in comparison to one in 12 children in middle SES schools and none in high SES schools.

The Australian Early Development Index (AEDI; Centre for Community Child Health, 2011) is a population measure of children’s development at school entry. The AEDI has provided a geographic and SES-mapped “snapshot” of children’s early development at school entry, across five key domains: physical health and wellbeing, social competence, emotional maturity, language and cognitive skills (school-based), and communication skills and general knowledge. These dimensions were selected because of their associations with health and wellbeing in childhood and beyond. The AEDI is a teacher rated tool that is completed during the child’s first year of formal schooling. Language competence is strongly represented in the AEDI domains, underlining its importance for early academic success and for overall “school attachment”, a broad construct said by Libbey (2004) to encompass “A student’s sense of belonging and being a part of school, whether or not students like school, level of teacher supportiveness and caring, presence of good friends in school, (and) engagement in current and future academic progress” (p. 281). The AEDI comprises teachers’ ratings of students’ language and cognitive abilities including basic literacy skills; for example, letter identification, sound-letter correspondence and rhyming; writing one’s own name; interest in books and reading; and numeracy skills such as counting to 20, and recognition of shapes and numbers. AEDI data from 2009 indicated that 6.1% of children in Victoria² were developmentally vulnerable in the domain of language and cognition. Eight per cent of children were developmentally vulnerable on the communication domain, which taps into storytelling and articulation skills, and the effectiveness of general communication. These high rates of language and communication difficulties at school entry, particularly for children in disadvantaged communities, are in keeping with the seminal work of Hart and Risley (1995), who described a clear gradient with respect to language exposure as a function of families’ socio-economic status. These SES-based gradients in children’s developmental vulnerability therefore demand a recalibration of the early years curriculum, away from a sole emphasis on literacy, to a dual emphasis on oral language competence and literacy.

In Australia, the report of the 2005 *National Inquiry into the Teaching of Literacy* (Department of

Education, Science and Training, 2005) stated that, irrespective of a child's social disadvantage and developmental level on school entry, evidence-based approaches to reading instruction should ensure that "significant positive effects on student achievement occur" (p. 12). This report also concluded that teacher education about evidence-based approaches to reading instruction is highly uneven, thus it is critical, at both pre-service and in-service stages of teachers' careers that this be redressed. Indeed, a recent qualitative study exploring teachers' pre-service knowledge about language and literacy instruction (e.g., phonics, phonemic awareness, and grammar) found that teachers felt extremely under-prepared to teach beginning readers (Harper & Rennie, 2009). Consequently, efforts to improve literacy outcomes for school-aged children must address both pre-requisite oral language skills and the capacity of teachers to implement oral language and literacy strategies in the classroom.

A number of researchers have noted that educational reforms aimed at improving student outcomes require increased depth of teacher knowledge with respect to content, as well as sustained and strategic changes in their instructional methods, if goals for improved student outcomes are to be realized (Borko, 2004; Guskey, 2002; Jeanpierre, Oberhauser, & Freeman, 2005). However, few published studies have targeted teachers' instructional approaches and student outcomes (Guo, Piasta, Justice, & Kaderavek, 2010; Justice, Kaderavek, Fan, Sofka, & Hunt 2009). Justice et al. (2009) examined the effect on pre-school children's print awareness of teacher use of a particular print referencing style during shared book reading. The children demonstrated significant gains on standardized measures of print and alphabet knowledge following an academic year of the different instructional approach. Recent interest has shifted to examining outcomes for both oral language competence and the transition to literacy; for example, the Teaching Early Literacy and Language (TELL) program in pre-school classrooms (Wilcox, Gray, Guimond, & Lafferty, 2011). This study targeted six skill areas across early literacy and language (phonological awareness, alphabet knowledge, print concepts, writing, vocabulary and complex language). Teachers in the TELL classrooms received professional development (PD), classroom support, and mentoring to implement the curriculum. Results of a randomized controlled trial comparing students' results at the classroom level found greater gains in phonological awareness, including sound awareness, rhyme, and letter-sound correspondence, as well as sentence length in the TELL classrooms. These findings suggest that curriculum packages which support teachers in classroom instruction of oral language and early literacy hold promise for promoting gains in student outcomes.

Related lines of research have evaluated the most effective ways to deliver PD programs aimed at

increasing teacher knowledge and improving instructional practice. Kennedy and Shiel (2010) identified key characteristics of effective PD for teachers as being: sustained intervention, on-site delivery that is customised to the school and/or teachers, and content grounded in the context of teaching. Neuman and Wright (2010) compared the impact of coursework and coaching on early childhood teachers' early language and literacy practice, and found that teachers who received coaching demonstrated significant improvements in objective measures of the literacy environment of their classrooms compared to both the coursework and control groups, immediately following the program and 5 months later. Carlisle and Berebitsky (2011) further evaluated PD \pm literacy coaching on the outcomes for both first grade teachers and their students. They reported instructional differences between the literacy coach and no coach teachers. In addition, students in the classrooms of teachers with a literacy coach demonstrated greater improvements in word decoding within the school year. Taken together, these findings clearly demonstrate the importance of incorporating tailored, on-site, and sustained PD for teachers in order to successfully change practice.

These pedagogical issues, together with increasing calls for more rigorous and evidence-based interventions to occur early in life, at critical developmental periods when they are most likely to counter early social disadvantage (Heckman & Carneiro, 2003) were central to the rationale underlying the design and implementation of the Oral Language Supporting Early Literacy (OLSEL) Pilot Project. The close nexus between early language competence and the transition to literacy, together with the need to strengthen classroom practices, formed the conceptual basis of the current study.

The aim of the OLSEL Pilot Project was to determine whether a specific focus on teacher PD concerning oral language competence in the first 2 years of primary school in low SES schools would result in improved oral language and literacy outcomes. It was hypothesized that an explicit focus on improving teacher knowledge and skills pertaining to oral language competence would translate into significant gains in the students' oral language competence, and in their early reading abilities.

The study was approved by the Monash University Human Research Ethics Committee and the Catholic Education Commission of Victoria.

Method

A pilot cluster randomized controlled trial (RCT) was conducted. RCTs are widely regarded as the most rigorous methodology for evaluating the effectiveness of new interventions (Pring, 2005), as they offer the highest level of protection against common threats to internal validity, such as allocation bias, maturation, and history.

Recruitment of schools and allocation into study groups

A multi-stage sampling process was employed. Following calls for expressions of Interest purposively distributed by the Catholic Education Commission of Victoria to low socio-economic status schools across the state of Victoria, 14 schools were recruited into the study. Eight schools were randomly allocated into the intervention cluster, and six into the control cluster, using stratification to ensure similar representation of schools across dioceses and rural/metropolitan regions. Once schools had been recruited, explanatory statements and consent forms were distributed to parents or guardians of randomly selected students, as well as to early-years teachers (saturation rather than random sampling was used for this group). Only students whose parent/guardian provided written consent were included, and replacement sampling was used in instances where such consent was not provided. Children for whom parent/guardian consent was not obtained completed all classroom activities and assessments; however their assessment results were not included in analysis for the study.

The mean Socio Economic Indexes for Areas (SEIFA)³ ranking of the research schools was 870.63 (SD = 20.8), and the mean SEIFA ranking in the control schools was 900.17 (SD = 20.1). This difference was not statistically significant ($t = -1.7$; $p = .11$).

An initial sample of 1254 students was identified for inclusion. To accommodate the study's resource

limitations, an *a priori* decision was made to further randomly allocate this overall sample into two streams, maintaining the proportional representation of research and control schools, and maximizing collection of reading outcome data. Stream A ($n = 602$ students) comprised Prep⁴ ($n = 278$) and Grade 1 students ($n = 324$) who completed baseline assessments of oral language and reading abilities, and Stream B ($n = 652$ students) comprised students in Prep ($n = 120$), Grade 1 ($n = 108$) and Grade 2 ($n = 424$) who underwent classroom-based reading assessment only. Baseline assessments were carried out in April–May of Study Year (SY) 1, with the final post-intervention assessments of the students' abilities occurring in October–November of SY2 (that is, 18 months after pre-assessment occurred). Figure 1 shows a summary of the study design.

Demographic characteristics of participating schools

In order to gain a more detailed profile of participating children, a range of SES and educational variables was examined. Receipt of the Educational Maintenance Allowance was used to identify students likely to be particularly economically disadvantaged. This financial assistance is provided by the State Government in situations where parents/guardians are eligible beneficiaries under the *Victorian State Concessions Act 2004*. Overall, 29.6% of students were in receipt of this allowance. This applied to 30.7% of students in the research schools, and

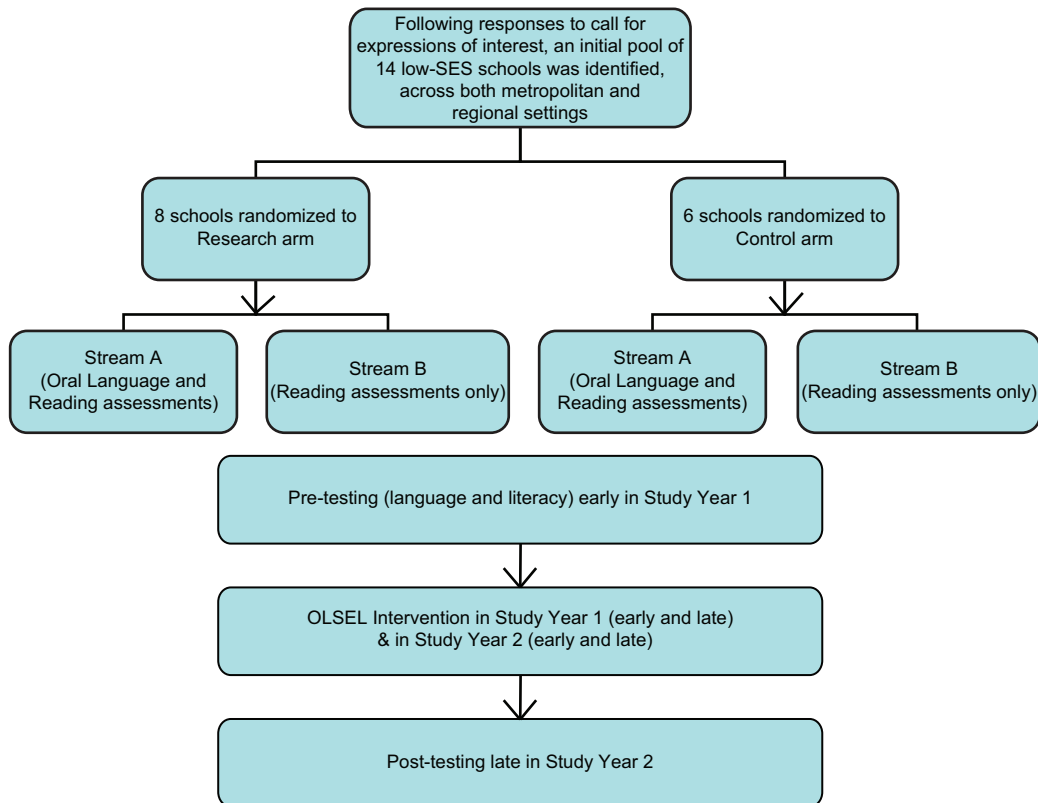


Figure 1. Study design overview.

27.7% in the control schools. This difference was not significant ($z = -1.1$, $p = .28$). The proportion of children in each study group in receipt of disability funding (Literacy, Numeracy and Special Learning Needs Program, funded by the Commonwealth Government) was also examined; 5.4% of the sample overall was in this category, 5.2% in research schools and 5.7% in control schools. This difference was not significant ($z = -.413$, $p = .68$). A small minority (1.6%) of students were from Aboriginal or Torres Strait Islander backgrounds, with 10 of these in research schools and nine in control schools; however, this difference was not significant ($z = -.772$; $p = .44$). Just over one fifth (22.8%) of the sample was from a language background other than English; this applied to 25.5% of students in research schools and 18.5% of those in control schools. This difference was significant ($z = -2.8$, $p = .005$).

When the composition of Streams A and B was compared, it was found that there were no differences with respect to family income ($z = -.64$, $p = .52$), language background ($z = -1.2$, $p = .24$), or disability funding ($z = -1.4$, $p = .16$). There was, however, a higher number of children in Stream A who were from indigenous backgrounds ($z = -2.4$, $p = .016$).

Measures employed

Reading and oral language measures. Student assessments included a standardized measure of reading skills, the Reading Progress Test (RPT; Vincent, Crumpler, & de la Mare, 2004a, b), which contains items examining four key domains: phonological awareness, print concepts, word knowledge, and cloze comprehension, represented via one summary standard score (no sub-test scores are provided on the different domains). Australian norms are available for this measure. Measures of oral language ability included the Picture Vocabulary and Syntactic Understanding sub-tests from the Test of Language Development: Primary–Fourth Edition (TOLD-4; Newcomer & Hammill, 2008); story grammar analysis (based on Snow & Powell, 2005), narrative analysis of story grammar (Price, Roberts, & Jackson, 2006), and grammatical analysis of a narrative re-telling (T-units)—The Renfrew Language Scales Bus Story Test (Renfrew, 1997), and selected sub-tests including syllable counting, blending, and segmentation tasks from the Sutherland Phonological Awareness Test-Revised (SPAT-R; Neilson, 2003). Tasks were selected for their psychometric rigour and their relative efficiency in terms of administration times. Personnel (SLPs and teachers) experienced in assessing early-years students completed all testing, after training, to ensure consistency in adherence to manual guidelines for administration.

Oral narrative samples were audiotaped and transcribed for story grammar analysis using an omnibus system developed by Snow and Powell (2004) and a

more detailed narrative coding system developed by Price et al. (2006), which is an adaptation of Stein and Glenn's (1979) story grammar framework. Narratives were assessed for the presence of the following elements—introduction, relationship between characters, initiating events, internal response, attempts/actions, and ending. The omnibus measure yielded a maximum score of 16. The narrative rubric yielded a maximum score of 39. Narrative analyses were conducted by four postgraduate speech-language pathology students, under the supervision and guidance of a clinical instructor in speech-language pathology at the University of Melbourne (author PE). The inter-rater reliability of the four raters was examined on a random sample of 20 transcripts, yielding an intra-class correlation coefficient for the total score (maximum 39 points) of .9.

A T-unit analysis was employed as a measure of expressive grammar. A T-unit is defined as one main clause with all the subordinate clauses attached to it (Hunt, 1965). All main clauses beginning with a co-ordinating conjunction were counted as separate T-units. This analysis was undertaken by two SLPs who were blind to participant study arm. Inter-rater reliability was checked on a random sample of 20 transcripts, and yielded a Pearson's r of .94.

Procedure

The OLSEL intervention. Teachers and principals were exposed to a range of activities that can be incorporated into the early-years classroom, using Munro's (2007, 2011) "ICPALER"—Ideas—Conventions—Purposes—Ability to Learn—Expression and Reception Framework. ICPALER draws on evidence that oral language competence underpins the transition to literacy, but is not always sufficiently well-developed at school-entry to support this important transition (e.g., Botting, Simkin, & Conti-Ramsden, 2006; Catts et al., 1999; Snowling & Hulme, 2012). It is known that successful readers require good vocabulary skills, grammar, phonological skills, and working memory in order to establish both word recognition (decoding) and text comprehension abilities. These psycholinguistic skills are reciprocally influenced by the ongoing development of both oral language competence and literacy (Snow, 1991). ICPALER, therefore, provides an explicit framework that teachers can use to promote a range of expressive and receptive language skills. It operates as a conceptual and pedagogical framework for teachers, and considers the underlying linguistic competencies (e.g., phonological, morphological, semantic) that a child has mastered, orienting teachers to specific classroom teaching strategies to scaffold students' acquisition of more sophisticated expressive and receptive language skills. In this study, four language domains were targeted in the teacher PD: phonemic and phonological awareness, vocabulary knowledge, awareness and application of story

grammar, and comprehension and use of longer and more complex sentences.

Supplementary Appendix A available online at <http://informahealthcare.com/doi/abs/10.3109/17549507.2013.845691> provides an overview of the PD schedule and program details in SY1 and 2 in the research schools.

OLSEL school leaders in each research school also enrolled in a University of Melbourne Masters level subject (EDUC 460 735 Oral Language Learning: The Primary Years). The University of Melbourne Handbook entry for this subject states that:

This subject uses contemporary research in oral language acquisition to develop frameworks that primary school educators can use to describe, monitor and teach speaking and listening knowledge and skills. The frameworks provide educators with the capacity to identify the complexity of the ideas communicated, the language conventions used, the knowledge of the purposes of communicating to achieve social goals and the ability to learn oral language. It will examine procedures for monitoring oral language development and use and analyse various assessment and diagnostic tools. It will also examine pedagogy associated with oral language education and a range of intervention strategies in speaking and listening. The links between oral language knowledge

and skills and academic success in literacy and numeracy will be explored throughout the subject.

The OLSEL PD focused on the link between early oral language competence and the emergence of literacy and academic success, and involved both teachers and school principals, in keeping with the notion that curriculum change needs organizational support as well as changed knowledge and skills (Deal & Petersen, 1990). Following their participation in these workshops, staff teams in each of the eight research schools worked to develop their plans to implement teaching initiatives focused on enhancing student literacy outcomes via a focus on two of the four aspects of oral language competence targeted by ICPALER. Examples of the types of actions and activities carried out in each of the research schools and the key PD areas targeted are listed in Table I. As can be seen, because these language domains are not mutually independent, many activities targeted more than one domain. Support to school staff in the development of implementation plans was provided by Catholic Education Commission of Victoria staff including school Advisers, education officers, Curriculum Consultants, and SLPs. Overall, therefore, the OLSEL intervention was not a lesson-based *program*, but rather a way

Table I. Teacher professional development: Language domains targeted and sample activities developed.

Activity	ICPALER language domain(s) targeted			
	Phonemic and phonological awareness	Vocabulary development	Story grammar	Understanding and using longer and more complex sentences
Improving the quality of language interactions targeting all aspects of ICPALER through targeted shared-book ("Big Book") instruction.	✓	✓	✓	✓
Targeting story re-telling, using full sentences as well as asking and answering a wide range of "wh" questions to scaffold use of the story grammar sequence.		✓	✓	✓
Strengthening of phonological awareness by facilitating analysis of words in the text being read (e.g., via onset-rime awareness, sound and word blending, and segmentation).	✓			
Cueing students to use thinking time and to "tune into the topic".		✓		✓
Discussion about characteristics of "good listening".	✓	✓		✓
Introduction of complex questioning techniques in teaching and learning interactions				✓
Ensuring students respond in sentences and use increasingly appropriate listening skills.				✓
Use of activities specifically targeting vocabulary extension by facilitating awareness of synonyms and antonyms and the ability to define word meanings		✓		
Implementing expanded use of Blank, Rose, and Berlin's (2003) questioning rubric		✓	✓	
Providing "helpful hints" and suggestions regarding oral language activities to parents to support oral language learning in the home.	✓	✓	✓	✓
Dramatizing and demonstrating word meanings.		✓		
Employing listening and following directions activities.				✓
Helping children to identify words that rhyme/ do not rhyme.	✓			

of providing teachers with strong theoretical knowledge about the psycholinguistic basis of reading, and linking this knowledge to their classroom activities.

Students in control schools received teachers' usual classroom practice, as per protocols set down within the Victorian Essential Learning Standards (VELS; Victorian Curriculum and Assessment Authority⁵). VELS outlines specific learning standards and instructional foci pertaining to reading, writing, and speaking and listening at each year level. An overview is provided at Supplementary Appendix B available online at <http://informahealthcare.com/doi/abs/10.3109/17549507.2013.845691>.

Data analysis. Standard parametric inferential analyses were employed in order to examine within- and between-groups differences, both at baseline and time 2. Bonferroni adjustment was used to control for an inflated Type-1 error rate with multiple comparisons (Keppell, 1991).

Results

As can be seen in Figure 2, 1254 children, across 14 schools, commenced the study in SY1, in Prep and Grade 1 (Stream A) and Prep, Grade 1, and Grade 2 (Stream B). At the end of SY2, full follow-up assessments (RPT, standardized language measures and the narrative task) were performed on 503 (83.5%) students in Stream A, and 568 (87.1%) students in Stream B completed the RPT-only, when students were in Grades 1–3. Retention was 87.6% in the research arm (across both Streams) and 81.8% across both Streams in the control arm.

Data on some students are missing because they were absent on the day of testing, and study resources did not allow additional school visits to follow-up such students. Thirty-nine (5.4%) students lost to follow-up were in research schools and 49 (10.8%) in control schools, and this difference was statistically significant ($z = -3.5, p = .000$). However, ATSI status ($z = -1.5, p = .12$), disability funding ($z = -1.05, p = .29$), language background ($z = -.83, p = .41$), and receipt of Education Maintenance Allowance ($z = -.511, p = .61$) were not significant markers of attrition.

RPT findings pertaining to Stream B (RPT at both pre- and post-intervention points but no oral language assessments) are presented in conjunction with the RPT results from Stream A. For the purpose of pre-post comparisons on RPT standard scores, the students in Stream B who were in Grade 2 at the study commencement are excluded; however, these students were included on the comparison of overall RPT percentage gain at time 2.

Oral language measures

Table II displays descriptive and inferential data pertaining to standardized oral language measures for Stream A at baseline and time 2, and includes percentage change. As can be seen in this table, with the exception of story grammar analysis and total T-units produced on the narrative re-tell, there were no significant differences between the research and control arms at baseline.

At time 2, Stream A students in the research schools achieved higher mean scores on all standardized measures, compared to their control-school counterparts, and also made significantly greater

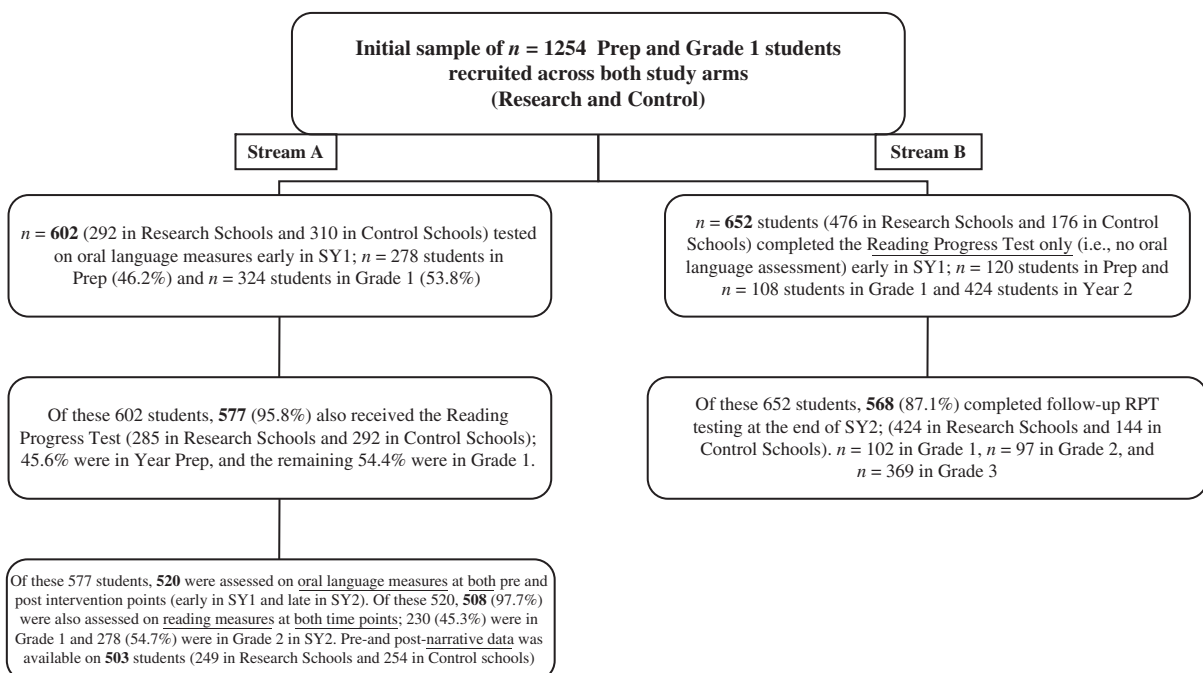


Figure 2. Student recruitment and retention. SY = Study Year; RPT = Reading Progress Test.

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Table II. Stream A—Baseline, follow-up, and change (pre–post) comparisons of research (RES) and control (CON) schools on standardized oral language measures and narrative language task.

	Baseline						Follow-up						Change score (pre–post)					
	Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
TOLD picture vocabulary standard score	Res	292	9.1	2.8	.67	ns	254	10.6	2.4	2.6	0.045**	23	1.52	3.0	3.08	0.002	27	
	Con	310	9.2	2.7			266	10.0	2.4				.74	2.8			42	
TOLD syntactic understanding standard score	Res	292	9.6	2.6	.57	ns	254	11.0	2.5	5.0	0.000**	46	1.39	2.6	4.8	0.000	42	
	Con	310	9.6	2.4			266	9.9	2.3				.30	2.5				
SPAT-R sub-tests total	Res	292	13.2	6.5	-.14	ns	254	20.6	2.9	3.5	0.000**	30	7.5	6.1	4.1	0.000	.36	
	Con	310	14.0	6.4			266	19.6	3.7				5.4	5.6				
Story grammar omnibus measure (Snow & Powell, 2004)—Bus story raw score	Res	291	4.6	3.0	-3.7	.000	254	9.3	3.2	-1.4	.886	n/a	4.8	3.1	3.52	.000	.33	
	Con	307	5.5	3.2			265	9.3	2.8				3.7	3.5				
Narrative story grammar score, Price et al. (2006) narrative scoring rubric—Bus story	Res	290	18.3	8.0	1.8	ns	250	24.7	7.3	-1.42	ns	n/a	6.5	7.6	-1.85	.065	n/a	
	Con	304	17.1	8.2			258	24.8	6.9				7.9	8.9				
Narrative syntactic analysis: T-units (Bus story)	Res	291	13.9	4.6	4.6	.000	254	17.0	4.1	-1.47	ns	n/a	1.4	1.1	-3.3	.001	n/a	
	Con	307	12.1	4.9			265	17.5	3.5				1.9	2.0				

TOLD = Test of Language Development: Primary–Fourth Edition (TOLD-4; Newcomer & Hammill, 2008); SPAT = Sutherland Phonological Awareness Test (Neilson, 2003).
*adjusted alpha = .005; **significant at adjusted alpha level.

gains on these measures and the omnibus measure of story grammar. Narrative analysis of story grammar, however, did not differentiate between the groups at either time-point, and in fact T-unit scores appear to favour students in control schools at time 2. Children in research schools scored significantly better on a general story grammar measure at time 2, despite significant initial differences between the groups favouring students in control schools (see Table II). Scores on five of the nine oral language measures were significantly higher in the research schools, notwithstanding the modified alpha (.005) employed, and effect sizes on the mean gain differences between groups were medium in size. No such differences were detected for the narrative analysis of story grammar or the T-unit analysis of the narrative retells.

Reading progress test

Table III displays the baseline and time 2 RPT standard scores for all students (streams A and B, in both research and control schools). Analysis of variance showed that scores in control schools were significantly higher at pre-test ($F = 15.4(1)$; $p = .000$), but by time 2, the difference between the groups favoured the research schools and was statistically significant ($F = 10.4(1)$; $p = .001$). RPT percentage gain was also significantly different between the groups at time 2, favouring research schools ($F = 62.6(1)$; $p = .000$).

When a between-groups analysis on RPT percentage gain was repeated including all students from Stream B (i.e., including those who commenced the study in Grade 2 and completed it in Grade 3, with a total n of 671), the research aim showed a mean gain of 12.5% ($SD = 12.7$), compared to the control arm's ($n = 391$) mean gain of 7.3% ($SD = 12.5$). This difference was significant ($t = 5.8$, $p = .000$).

Discussion

This pilot study examined the extent to which teacher PD concerning the importance of strengthening oral language competence in the early years value-adds the educational achievements of children attending low SES schools. While improvements occurred in both study arms, findings clearly showed significant advantages, across several oral language and reading measures for children in the research schools, and, in many cases, the intervention effects were medium in size. In particular, significant differences were evident on vocabulary, syntactic understanding, and some aspects of phonemic awareness (e.g., identification of initial sounds and word segmentation). At time 2, the significant difference on SPAT-R sub-tests total favoured the students in research schools. Study arms also differed significantly with respect to the degree of improvement achieved on reading skill

Table III. Reading progress test standard scores at baseline and follow-up, descriptive statistics and inferential (ANOVA) statistics—Streams A and B combined (excluding students in Stream B who were in Grade 2 at study commencement).

	Study group	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Reading progress test standard score at baseline	Research (<i>n</i> = 460)	90.5	13.5	15.4	.000
	Control (<i>n</i> = 316)	94.35	14.3		
Reading progress test standard score at follow-up	Research (<i>n</i> = 427)	105.1	13.9	10.4	.001
	Control (<i>n</i> = 280)	101.6	14.5		
Reading progress test standard score percentage gain at follow-up	Research (<i>n</i> = 422)	14.9	11.9	62.6	.000
	Control (<i>n</i> = 271)	7.3	13.1		

post, as compared to pre-intervention. This was particularly notable in view of the fact that students in research schools performed more poorly than their control peers at baseline, but at the time 2 assessment point were out-performing their control peers. The presence of a higher number of students from non-English speaking backgrounds in research schools is also an important factor to consider with respect to group differences at time 2.

Narrative abilities were the exception to the significant group differences found on oral language measures at time 2. Significant gains in an omnibus measure of story grammar knowledge were detected between the two groups at time 2. However, the more detailed analysis of narrative and syntactic abilities in the narrative re-tell task did not show differences between pre- and post-assessment for the research and control schools. These results suggest that students in research schools did demonstrate improvements in broad-based story grammar knowledge that were not mediated by specific features of syntactic or narrative complexity. The lack of apparent benefit of the intervention for narrative and syntactic skills is, however, difficult to explain. A rigorous and detailed coding procedure used previously by Price et al. (2006) was used to optimize detection of individual and group differences in ability. Given that the Victorian Essential Learning Standards for the early primary years include focus on "... patterns of text structure and organization of various kinds of texts, including narrative" (Victorian Curriculum Assessment Authority, nd) it is possible that children in both study arms received similar instruction in this particular area. It is also possible that this reflects the fact that teachers in the research schools could select their own areas of focus. This should be examined more closely in future studies.

Successfully making the transition to literacy has particular relevance in developed societies, in which educational and vocational opportunities are tightly yoked to academic outcomes. It is very difficult to succeed academically in the context of poorly developed literacy skills, and it is not surprising, therefore, that low levels of academic attainment, early school-leaving, and an absence of marketable employment skills are hallmarks in adulthood of

those who fail to make this transition. Such school leavers face an increased risk of social and economic marginalization across their lifespan (Snow, 2009). If shown to produce enduring academic benefits, this approach stands to strongly inform the pre-service and in-service education of teachers. Improved teacher practices should, in turn, promote improved school retention and academic achievement. This is an urgent priority, given The Industry Skills Council of Australia report *No More Excuses* (2011), which states that "Literally millions of Australians have insufficient language, literacy and numeracy skills to benefit fully from training or to participate effectively at work" (p. 1). The fact that more than seven million Australian adults are likely to experience difficulty with reading skills (Industry Skills of Australia, 2011) attests to the importance of ensuring that classroom practices are rigorously adhering to evidence-based principles and approaches, and that these produce benefits that endure across the primary school years, translating into improved student outcomes.

The gains evident in the students' oral language and reading competence were particularly pleasing given the relatively short period of time over which the intervention occurred (i.e., six school terms, or 18 calendar months). Previous researchers have noted that this level of gain following a primary focus on teacher PD is usually not achieved for a period of at least 2–3 years (e.g., Meiers & Ingvarson, 2005).

Our findings add further weight to existing evidence concerning the psycholinguistic basis of reading skills, and reinforce the important role played by SLPs in supporting early-years teachers to deliver reading instruction that is evidence-based. Optimal educational outcomes are most likely to occur where educational and clinical expertise is combined, promoting best practice and accurate identification of at-risk learners (Antoniazzi, Snow, & Dickson-Swift, 2009).

Limitations

This was a pilot intervention targeted at a small sample of disadvantaged schools in one education sector in one Australian state. The intervention

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needs to be conducted on a larger scale, stratifying for sector and levels of socio-economic disadvantage, and close attention needs to be paid to teacher variables with respect to the acceptability of the intervention. Given the lack of further assessment after the end of the intervention, it is not known to what extent this “head start” for children in low-socio-economic status schools confers long-term advantages, with respect to both academic and psychosocial aspects of school success; this is a focus of ongoing research efforts. Future research should also consider the possibility of differential benefits for students in certain disadvantaged sub-groups (e.g., language backgrounds other than English, or those receiving disability funding). Direct observation of classroom practice did not occur in either study arm, and this should be incorporated into future studies (notwithstanding its methodological challenges), so that ways in which the intervention influences the fostering of oral language and literacy skills in the classroom can be closely examined and better understood. It would also be desirable to examine Reading Progress Test items specific to the four skill domains to determine whether there were differential benefits for reading skills.

Summary and conclusions

Oral language and literacy difficulties are closely inter-related (Catts et al., 1999; Nation, 2005; Snow & Powell, 2004; Snowling, 2005) and each contributes to emotional and behavioural functioning in the school setting. The OLSEL pilot intervention was a successful “proof of concept” and has a number of key strengths, such as its

- grounding in published literature on the psycholinguistic basis of early reading;
- prevention focus in the early years—the developmental window in which appropriate instructional approaches are likely to yield the greatest benefit;
- ease of delivery via PD modules; and
- early positive results.

If shown in subsequent studies to improve the educational and psychosocial trajectories of children, this approach could be adapted for a range of school sectors, and pre-service teacher education curricula. Follow-up studies on children who take part in trials such as this are needed as a matter of priority. Teachers’ and principals’ responses to the intervention need to be studied, so that implications for pre-service teacher education can be examined and communicated with policy-makers in teacher education. The extent to which the intervention results in sustained change in teacher practice should also be a focus of future research efforts.

It has recently been observed by Dickinson (2011, p. 967) that “... the coming years will be a time when researchers look more closely at interactions in class-

rooms and strive to create professional development, coaching, and curricula that result in substantial improvements in teachers’ methods of fostering language learning”. In order to achieve further change in early-years language and literacy outcomes, then, SLPs need to engage with teacher education and professional learning.

Notes

1. Referred to as “elementary” school in the US.
2. Victoria (the location of the study described) is located in the south-east corner of Australia. It is the country’s most densely populated state, with 5.5 million people, 70% of whom live in the state capital, Melbourne.
3. The Australian Bureau of Statistics (ABS) Socio Economic Indexes for Areas (SEIFA) Index of Education and Occupation (IEO) was used as a basis for selecting low SES schools for inclusion in the pilot. This score is standardized against a mean of 1000 with a standard deviation of 100. This means that the average SEIFA score will be 1000 and the middle two-thirds of SEIFA scores will fall between 900–1100 (approximately) (Australian Bureau of Statistics, 2008).
4. In Victoria, the first year of formal schooling is known as the “Prep” (preparatory) year. Children must turn 5 before April 30 in the calendar year in which they commence school, and must commence school, at the latest, in the year that they turn 6 (Department of Education and Early Childhood Development).
5. VELs preceded the introduction of “AusVELs” in 2013.

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