EXAMINING THE EFFECTS OF TWO ALTERNATIVE EARLY LITERACY PROGRAMS:

READING RECOVERY
AND
SCHOOLWIDE EARLY LANGUAGE & LITERACY (SWELL)

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ABSTRACT

This study attempts to provide quantitative and qualitative data on the effects of two alternative early literacy programs in schools with a large enrolment of children at risk of literacy failure. The two
programs under review were the Schoolwide Early Language and Literacy Program (SWELL), a structured whole class program for kindergarten, Year 1 and Year 2, and Reading Recovery, an individualised intervention program, provided to low progress children in Year 1. One large and one small school from low income areas, where SWELL had been implemented in kindergarten and Year 1, were carefully matched for region, size, ethnicity and socioeconomic status with two schools where Reading Recovery was provided to low achieving students in Year 1. Pre-tests were carried out at the beginning of Year 1 to establish equivalence among subjects. Post-tests using five early literacy measures at the end of Year 1 indicated significantly higher scores for children in the SWELL schools on four of the measures. On the fifth measure, there was a significant effect, in favour of SWELL students, in the large SWELL school only. When children receiving either individualised or group intervention were examined separately, it was clear that Reading Recovery was the most effective form of intervention for the children it accessed. However, as not enough children were able to benefit from this individualised intervention in the control schools, particularly in the large school, no significant differences emerged between control and experimental schools for all at risk children receiving intervention on any of the five literacy measures. Implications of these results for the most effective delivery of early literacy programs to students in schools with a large enrolment of low progress children were then discussed.

There is no doubt that the acquisition of literacy is an educational, ethical and economic imperative. While, fortunately, most children acquire the concepts of reading, writing and spelling at school with ease and enjoyment, far too many at risk and disadvantaged children find these tasks both daunting and elusive. There is a growing body of evidence that suggests that children who have experienced quality preschool programs and close parent/preschool liaison will find the early encounters with a school literacy curriculum a much easier process than their less fortunate peers (Gullo & Burton, 1993). Conversely, children whose preschool experiences have been less satisfactory and who come from less supportive homes, both emotionally and cognitively, will find the transition from home to school a much more problematic one. However, in the light of both the resilience and the vulnerability of young children, and assumptions underlying a general risk-and-protective framework, (Cichetti, 1984; Sroufe & Rutter, 1984), there is a strong expectation that less than ideal forms of child care and parental interaction can be compensated for by positive experiences in the classroom (Belsky & Mackinnon, 1994). Indeed, early classroom experiences are much more critical in shaping the potential for success of children who are at risk of school failure, than they seem to be for middle-class children. This has been
found to be particularly so in the acquisition of literacy, where early instructional variables appear to be intimately associated with children's literacy success.

This proactive role of the school, in respect of literacy, has been reinforced by a recent longitudinal study which found that schools which had a well-developed reading program in kindergarten produced long-term benefits for all students, but particularly so for those classified as socially disadvantaged or at risk (Hanson & Farrell, 1995). Converging evidence on the critical role of early school instructional programs has also been provided by Scanlan and Vellutino (1996) in their longitudinal study of 1400 middle to upper-middle class kindergarten children whose first language was English. Their conclusion was that 'the reading success of children who enter school lacking in the rudimentary reading skills appears to be more sensitive to instructional variation than is the success of children who enter with better-developed skills' (p 62). Furthermore, they identified instructional programs that placed greater emphasis on phoneme awareness, alphabetic mapping and word identification skills as those most likely to prevent reading impairment in at risk middle class children. The importance of early exemplary literacy instruction has also been recognised by Slavin and his associates from Johns Hopkins University with the development of the Success for All Program, (Slavin, Madden, Karweit, Dolan & Wasik, 1992), designed particularly for disadvantaged students, and showing impressive effect sizes which maintain into Year 3.

To a lesser extent, the critical role of systematic instruction in kindergarten also underlies the philosophy behind the Reading Recovery Program in New Zealand. This is an internationally acclaimed and widely reviewed (see Shanahan & Barr, 1995) individualised early intervention program which is provided only to those children who have failed to benefit from a year of formal reading instruction in kindergarten. In New Zealand, a small country with high literacy rates, standardised procedures for school enrolment, and most elementary regular teachers trained in the Reading Recovery Program (Watson, 1988), there is a homogeneity of classroom instruction in the kindergarten year not necessarily typical of other educational systems. This combination of uniform systematic kindergarten literacy instruction, followed by an individualised intervention in sympathy with the Year 1 classroom program, appears sufficient to meet the literacy needs of most low-progress New Zealand children. However, in many schools and school systems where a majority of students could benefit from additional support, (as in the United States and Australia), a different set of issues emerges (Hiebert, 1994, p.23).

Currently, in NSW, Australia, as in many other countries, Reading Recovery has also been adopted as the main intervention program for at risk readers in Year 1. However, early schooling in NSW differs
considerably from that in New Zealand, so that the efficacy of Reading Recovery in New Zealand cannot be automatically generalised to Australian conditions (Center, Wheldall, Freeman, Outhred & McNaught, 1995). In NSW, children can start school from the age of 4 years 6 months and it is possible to have an age discrepancy of almost one year in kindergarten classes. This age disparity influences selection procedures for Reading Recovery intervention in Year 1, since Reading Recovery teachers typically select the oldest low progress children for immediate placement in the Program. Furthermore, there is no uniformity of early literacy instructional practices in the kindergarten year in NSW. More recently trained teachers tend to use a whole language approach to curriculum objectives, as most teacher training institutions have adopted this philosophy of early literacy acquisition for the last 15 years. More experienced teachers, on the other hand, seem to be using a more phonically based approach, with a significant number of early educators adopting an integrated position. In addition, teacher training in early literacy does not occupy a large part of many preservice programs, with the result that many newly graduated teachers must learn on the 'job', adopting the methods that are characteristic of the specific school to which they have been appointed. Consequently, many children who are either socially disadvantaged or otherwise at risk do not receive uniformly systematic instruction in their kindergarten year, making their selection for Reading Recovery intervention more problematic than it appears to be for their New Zealand counterparts. Furthermore, children in Australia, on discontinuation from the Reading Recovery Program, re-enter a Year 1 classroom often less sensitive to the intervention program than is the case in New Zealand.

The NSW system of education, while also centralised, is the largest in the Southern Hemisphere and has, as its constituency, an extremely socially and ethnically diverse group of children, differing dramatically in its exposure to early literacy concepts. Similar disparities between students' prior literacy experiences can be found in the urban and suburban school systems of the USA (Hiebert, 1994). We know from research in the US (Shanahan & Barr, 1995), and in Australia (Wheldall, Center & Freeman, 1993), that children in both these countries entering the Reading Recovery Program in Year 1 have lower literacy scores than their counterparts in New Zealand, and that the overall level of literacy, as measured by book level reading, is lower among regular Australian children at the beginning of Year 1 than it is in New Zealand. It may be unduly optimistic to believe that an individualised program, no matter how effective for the students that it accesses in its country of origin, can, on its own, address the concerns of a large cohort of low progress students found in many Australian schools. If we are to achieve the most effective early literacy instruction for our large number of at risk learners, we should be looking at the quality of instruction in the kindergarten
year, the specific intervention procedures that follow in Year 1 and the children that they target, as well as the classroom program in Year 1 that supports that intervention.

At the present time, in a large number of disadvantaged schools in NSW, an early literacy program, derived from the USA Program, Success for All, but significantly altered and modified for Australian conditions is being evaluated. This program has been adapted and extended for use with Australian school children (Center & Freeman, 1994; 1995), in collaboration with researchers at Johns Hopkins University, Baltimore. The Program, known as Schoolwide Early Language and Literacy (SWELL), in its adapted and extended form, is based, like its USA counterpart, upon an 'interactive-compensatory' model of reading acquisition (Stanovich, 1980, 1984).

The interactive-compensatory reading theory that underpins both Success for All and SWELL was proposed by Stanovich (1980; 1984), drawing on the early work of Rumelhart (1977), which subsumed elements from both 'top-down' and 'bottom-up' reading theories of reading. 'Bottom-up' theorists, such as Gough (1972), who stress the need for processing every word, letter by letter, are now rarely translated into an instructional program, since the teaching of a strict hierarchy of phonic skills before accessing connected text is not a feature of most early reading classrooms. However the 'bottom-up' emphasis on explicit instruction in decoding, particularly for at risk students, in the initial stages of reading acquisition, has been shown to be essential in avoiding literacy failure for this group of students. (Adams, 1990; Stanovich, 1994.) The 'interactive compensatory' theory of reading acquisition, assumes that both psycholinguistic ('top-down') and phonological processes ('bottom-up') are carried out simultaneously and complement each other (Andrews, 1989). It negates the simple equivalence of learning to read with learning to speak, and insists that the phonemic structure of words, which is not apparent in speech, should be made explicit in script by teaching children the alphabetic principle. The 'interactive compensatory' theory acknowledges the importance of semantic and syntactic processes in skilled readers ('top-down') but recognises the primacy of phonological and orthographic processors ('bottom-up') in early reading acquisition. Indeed it is the very reliance on semantic and syntactic processes when phonological processes are inadequate that distinguishes poor from fluent readers, (Stanovich, 1984).

The SWELL Program assumes that essential prerequisites to reading develop during the pre-school years as children interact with a literary environment. However, it also acknowledges that some children have not been exposed to story telling, to concepts about print and to lively verbal exchanges with their parents and peers. Such children, upon arrival at school, do not understand the nature of text nor that letters and words represent speech, that they are meant to communicate a meaning, and that spoken and written words are made up of individual
sounds. SWELL attempts to develop these critical prerequisite literacy concepts, as a whole class program, in the first three-six months of kindergarten, through the Emergent Literacy Program. In the remaining months of kindergarten and in most of Year 1, the Becoming Literate program, which is the formal literacy instruction program, is introduced. However, several components of the Emergent Literacy Program, which are co-requisites of literacy acquisition continue to be developed and extended. In this way, SWELL attempts to build in the prerequisites to reading that may not have developed in all children before they arrive at school. It then teaches them, systematically, to crack the alphabetic code in the context of connected prose, since we know that not all children will manage this critical element on their own. Consequently, with the establishment of secure phonological recoding skills, children will have the ability to translate from print to speech independently. Furthermore, through many successful encounters with previously unfamiliar words, they will be able to acquire both the general and word-specific knowledge needed for efficient word recognition (Byrne & Fielding-Barnsley, 1995, p.489).

When Becoming Literate ends towards the end of Year 1, and the 'Learning to Read' (Chall, 1983) stage has been completed, the third component of SWELL, Towards Literacy Competence, is introduced. This component focuses on listening and reading comprehension strategies as children reach the stage of 'Reading to Learn' (Chall, 1983). As Stage 1 and 2 only are the foci of this investigation, a fuller description of these program components is included in the Method Section.

Preliminary evaluations of the SWELL Program in two experimental and two control NSW schools have indicated significantly higher scores in SWELL schools on tests of early literacy (Center & Freeman, in press), and further detailed investigations of SWELL in six disadvantaged schools in kindergarten and Year 1 have reinforced and extended these findings (Center, Freeman, Mok & Robertson, in preparation). In addition, while almost half of the lowest quartile of experimental students had achieved partial phonetic cue reading (Vandervelden & Siegel, 1995), none of the students in the lowest quartile of the control schools could read any pseudowords at all at the end of the kindergarten year. As this result indicates that low progress children in the SWELL schools had acquired some knowledge of both letter-sound knowledge and phonological sensitivity, critical co-requisites of reading acquisition (Share & Stanovich, 1995), it may be tentatively assumed that such an early kindergarten program may provide a sound basis for further quality individualised intervention in Year 1 for disadvantaged or at risk students.

In NSW, both the Department of School Education and the Catholic Education Office have mandated Reading Recovery as the preferred mode...
of intervention in Year 1. While, originally, funds were provided to schools to accommodate a Reading Recovery teacher, increasingly, schools are being urged to bear the costs of Reading Recovery intervention on their own. While a large corpus of evidence testifies to the success of Reading Recovery with many low-achieving children (see Shanahan & Barr, 1995, for a full review), many school executives, particularly those from large disadvantaged schools, though still committed to Reading Recovery, are actively looking for the best combination of early literacy programs, which may effectively target a larger group of at risk students than are currently being serviced in their schools. This study attempts to provide some quantitative and qualitative data on this issue, by comparing, in the first instance, the efficacy of SWELL and Reading Recovery in two large and two small low income schools.

METHOD

Schools

In 1995, four primary schools, in two different regions of the NSW Department of School Education were selected to take part in the study. Two of the schools were large, containing three to four kindergarten and three to four Year 1 classes. The other two schools were small, with fewer than two full classes per grade. In one large and one small school with a high proportion of children from low socioeconomic areas, SWELL had been operating for 2 years, in kindergarten and Year 1. In the other two schools, selected as control schools by the Department of School Education in terms of size, ethnicity and socioeconomic status, Reading Recovery had been used as an early intervention program for low progress students in Year 1.

Subjects

In February, 1995, at the beginning of Year 1, every child in each of the four schools was pretested on a measure of early literacy in order to obtain equivalence among the schools. As SWELL had been operating in the two experimental schools in kindergarten, it was possible that Year 1 students in the control schools, despite matching procedures, were not at the same literacy level as their counterparts in the experimental schools. At post-testing, at the end of the school year in November, all students who had received Reading Recovery or any other form of small group/individualised intervention and a randomly selected 50% sample (due to time constraints) of all other pretested children were administered five tests of early literacy. In the smallest school, (where SWELL was operating), it was possible to post test all students. In addition, a small number of students receiving both individualised and group assistance were absent on the post-testing days in one control school, which could skew results in favour of control schools. Thus the final effective sample of Year 1 students at post test consisted of 70 students in the two experimental
schools and 59 students in the two control schools. The mean age of the students in the experimental schools at post-test was 82.48 months with a standard deviation of 3.8, while that of the control group was 83.98 months with a standard deviation of 4.25. Within the experimental group, 64% were boys and 36% were girls, while the gender distribution in the control group was more equal; 48.9% were boys and 51.1% were girls. Both experimental and control schools tended to have the same number of children classified as IM (mild intellectual disability), ADD, emotional disabled and first phase ESL (English as a second language). Experimental schools, in addition, had 16 children recorded as high absentees, 5 children classified as having severe language disabilities and 7 Aboriginal children. Interview and questionnaire information revealed that teachers in the large experimental school had taught K-2 classes for a mean of 4.5 years, while in the large control school, teachers had taught K-2 classes for a mean of 8 years. In the small experimental school, teachers had spent a mean of 1.5 years teaching K-2 children, with a corresponding figure of 1 year for the small control school.

Materials
The test used in the pretesting of students in the four schools in order to establish equivalence was the Burt Word Test - New Zealand Revision (Gilmore, Croft & Reid, 1981). Test-retest reliability and internal consistency on all relevant age groups as stated by the authors exceeds 0.95. This test was used as a pre-test because it is standardised, has wide variability at the Year 1 level and correlates highly with most early literacy measures such as reading connected text, pseudoword decoding and developmental spelling. The five post-tests of early literacy used were the Passage Reading Test, the Expressive Word Attack Skills Test, The Yopp-Singer Phoneme Segmentation Test, The Developmental Spelling Test (Tangel & Blachman, 1995) and a Writing Test (Juel, 1988).

The Passage Reading Test (PRT) (Deno, Mirkin & Chiang, 1982) is a curriculum-based measure which Deno and his associates propose as an alternative to standardised reading comprehension tests because it can be administered repeatedly at short intervals to measure progress. The test measures the median number of words read correctly in one minute, from each of three passages of similar difficulty selected from a basal reader. Deno et al found high correlations (ranging from .73 to .91) between rate of reading words aloud from text accurately and reading comprehension scores (from published standardised tests). In this study, three passages of approximately the same difficulty were selected from a Year 1 reader and presented to the students. (Test-retest co-efficient for passage 1 = .96, for passage 2 = .96 and for passage 3 = .95).

The Expressive Word Attack Skills Test was developed at Macquarie
University Special Education Centre (1991) and is a criterion-referenced test measuring a student's phonological recoding. The person administering the test points to each item and asks the child to say the sound, blend or word. The test contains common consonant/vowel blends and examples of these in words, as well as regular pseudowords and word analogies, and is presented individually. (Test-retest coefficient = .93). In this study, only the pseudoword section of the test was used because of the need to keep testing to a minimum for such young students. (We used a test of pseudoword decoding since pseudoword reading has been found to be the best measure of phonological recoding skills (Hansen & Bowey, 1994), and it is one of the tasks that differentiates good from poor comprehenders of text, especially in the beginning stages of learning to read (Hoover & Gough, 1990).

The Yopp-Singer Phoneme Segmentation Test (Yopp, 1988) measures the ability of children to articulate the individual sounds of a word, separately and in order. The word list included in this test is based upon both familiarity and feature analysis. In our use of this test, we omitted every second word due to time constraints and the age of the students, and only 11 words were included. Yopp reported test reliability to be = .95.

The Developmental Spelling Test (DST) was developed by Tangel and Blachman for kindergarten students in 1992 and contained five words. To make it applicable for Year 1 students, the authors expanded it by an additional five words to reflect later developing spelling patterns. The scoring procedure developed for this test consists of a 7 point scale designed to measure spelling proficiency by taking into consideration the number of phonemes represented and the level of orthographic representation (see Tangel & Blachman, 1995 for more details of the marking procedure). Two raters shared the scoring of each spelling test and the average inter-rater reliability was 97.9%.

The Writing Test (based on Juel, 1988)
Students were tested in small groups and asked to write a story in response to a set of colourful pictures. The students were told to spell words as best they could and not to worry about spelling. When the writing task was completed, children read back the story they had written to the testers to resolve any possible discrepancies about the words that they had used. The scoring ranged from 1 (low) through to 7 (high) and followed the procedure outlined in Juel, 1988. Two raters shared the scoring of each protocol and the average inter-rater reliability was 97%.
Early Literacy Programs Operating in Experimental Schools

The two experimental schools in this study had been using the SWELL Program as an early literacy program since kindergarten and were about to commence the Year 1 section at the commencement of the study. In kindergarten, the first stage of the SWELL Program is called Emergent Literacy and a brief description of its components is outlined below.

The components of the SWELL program

Stage 1 - Emergent Literacy
(a) Story-telling and Retelling (STaR)

In the first 3 months of the regular kindergarten year a structured program of 20 minutes duration, (Story-telling and Retelling - STaR) is added to the typical kindergarten class curriculum. Research on story-telling indicates that children's oral language, comprehension skills and emergent writing are increased when they are actively involved in the reconstruction of stories by such techniques as structured retelling, dramatisation and role playing, particularly at the emergent literacy level.

Typically, a story takes two days to be read interactively. On day 1, the story is introduced through the activation of background knowledge, the discussion of critical vocabulary, the detailing of the purpose for listening to the story and the prediction by students of upcoming events in the story. The story is then read to the students, interspersed with literal, inferential and predictive questions by the teacher who thus models comprehension strategies for the students. Finally, there is a brief review of the story. On day 2, there is a class retell of the story, either through sequence cards, dramatisation or a combination of both activities, during which time a number of children individually retell the story to a volunteer so that their understanding can be continuously monitored.

(b) Learning about Print.

Connections between Speech and Print and Concepts about Print (Clay, 1979; 1985) are taught systematically through Big Book activities and generalised in the story retelling STaR component.

In the Connections about Print section, the concept of lexical awareness is introduced as children are taught to link the sight and sound of whole words and word parts through using words encountered in both Big Book and STaR activities.

In the Concepts about Print section, book format, the use of capital letters and some basic punctuation conventions are demonstrated in Big Book activities and generalised, where possible, in STaR lessons.

(c) Early (shallow) phonological awareness

Concepts such as recognition and production of rhyme and alliteration, are systematically introduced in context through BIG BOOK activities and generalised in the story retelling STaR component.

(d) Syntactic awareness

Syntactic awareness is developed through the use of oral cloze and
jumbled sentence procedures using familiar words and sentences from Big Book and STaR stories.

(e) Expressive and Receptive Language Development
The Peabody Language Development Program (Dunn, Smith & Dunn, 1981) or CLAS Program Plourde, 1995) is also added to the regular classroom program for 20 minutes daily to provide additional models for language use and expression as well as for development of specific vocabulary skills.

(f) Emergent writing
Emergent Writing is a regularly programmed activity accepting drawings, scribble, non-phonetic letter strips, invented and conventional spelling as valid communication.

(g) Intervention
All activities are systematically monitored and assessed during the individual retell sessions. Small group remediation in listening comprehension is delivered twice weekly by a volunteer and in early phonological awareness also twice weekly by a trained teacher to all those children who need additional assistance.

Thus all students who start Stage 2, Becoming Literate, will have had every chance to master the emergent literacy prerequisites prior to the systematic introduction of deeper level phonological awareness skills and phonological recoding within an interactive -compensatory model of early reading instruction. Furthermore, receptive/expressive language activities will be continued, an extended version of STaR with emphasis on higher order comprehension skills and a Becoming Writers program will be added in Stage 2 to maintain students’ listening comprehension, emergent writing and vocabulary skills.

Stage 2 - Becoming Literate
Becoming Literate is generally introduced in Term 2 of the kindergarten year and continues until almost the end of Year 1. It is suggested that for this stage of the program, the kindergarten and Year 1 classes are organised into homogeneous groups for the 50 minute Becoming Literate lesson, with an extra small class being created for the most at risk students.

A brief description of the components of Becoming Literate appear below.

(a) Sound/symbol correspondence (phonological recoding)
Sound/symbol correspondence is introduced systematically to help students crack the alphabetic code, and is practised in specially written shared stories. The sounds are introduced in a logical order from easy to hard, with the early presentation of those sounds which generate the most vocabulary and the separation of confusing sounds.
(b) Phonological/Phonemic Awareness
Later (deeper) phonological awareness concepts of blending, segmenting and phoneme manipulation are systematically developed and practised through the use of known sounds. These concepts are introduced first through the use of syllables, compound words and onset and rime.

(c) Exception or Sight Words
Exception or Sight words are taught systematically to promote reading fluency and to enlarge reading vocabulary.

(d) Shared Stories
These are specially written stories to accommodate research indicating that students learn to read in meaningful contexts while systematically acquiring metalinguistic (lexical, phonological, syntactic and pragmatic awareness) skills and phonological recoding skills (Adams, 1990). For this purpose, students read an entire book from the time they have mastered only three letter sounds. This book is part of a series of 'shared stories' which contain some material in small type to be read by the teacher and other material in large type to be read by the student. The students' text is about 60% phonically regular, (Beck, 1981) so that students will practise their word attack skills in context. The adult text adds background and richness to the story that would not be possible with the limited vocabulary of an early reader. In addition, pictures are used to represent certain words so that students can read interesting stories long before they even know the entire alphabet. Graded early story books with students matched to text should also be provided in the class library so that students may also experience 'real' books, at their independent or instructional level.

(e) Writing
Writing as a communicative skill is included in the program, since reading and writing, being mutually supportive, are connected at each step to the learner's knowledge of the system of written language. While writing, after exposure to reading, facilitates the reading process, writing activities also draw learners' attention to sounds in words and to letters that might symbolise these sounds (Ehri, 1989).

(f) Spelling
Spelling is taught concurrently with reading since both develop in parallel when the two are intertwined in a literacy curriculum. To enhance children's knowledge about the orthographic structure of English, students are systematically introduced to orthographic constraints using pseudowords (Treiman, 1993), to instruct students directly in permissible letter sequences.
Comprehension strategies are developed through listening comprehension activities based on stories, (at higher textual levels and through reading comprehension activities based on Shared Stories (at lower textual levels).

Assessments are carried out at the end of every 10 lessons to check on students' accuracy and fluency in reading connected and on their spelling. This allows for a rearrangement of classes for students in the homogeneous groups. The small groups established during Emergent Literacy to provide additional Listening Comprehension support for students with difficulties should continue during Becoming Literate. In this way, at risk students are receiving support both with decoding and with Listening Comprehension.

Becoming Literate normally ends towards the end of Year 1 when most necessary grapheme-phoneme correspondences have been mastered. However, any at risk students, in Years 1 or 2 can avail themselves of Becoming Literate, either in class groups or in individual tutoring, if they have not yet become `unglued from print' (Chall, 1983).

At the conclusion of Becoming Literate, which, for most schools coincides with the end of Year 1, the Reading Comprehension Program, Towards Literary Competence, which starts the cycle of 'reading to learn' (Chall, 1983), commences. Neither experimental school had commenced Towards Literary Competence at the time of post-testing.

Both large and small experimental school implemented the SWELL Program in Year 1. While, ideally, the Program assumes that all teachers who conduct SWELL lessons will have had previous inservice training on the Program, this was not the case for all teachers and such training cannot be mandated by the Department of School Education, the school executive or the researchers. The Program also strongly advocates the use of daily, individualised literacy intervention for at risk students, using one-to-one instruction to complement the classroom program. Lack of funds prevented each experimental school from implementing this procedure for its lowest achieving students in any systematic way. As an alternative, classes were streamed for the 50 minute literacy lesson (the usual arrangement for SWELL) but the most at risk students were placed in a smaller group than the more able children, in order to receive more individualised attention. All children who were classified as having mild intellectual difficulties or were first-phase ESL children were included in these smaller groups and, where possible, peer tutoring was also organised. These limitations to the desired implementation of the SWELL Program will necessarily work to the disadvantage of the SWELL Program in a comparative design such as we have chosen.
Early Reading Programs in Control Schools
The two control schools both had Reading Recovery operating in Year 1, but had organised its implementation somewhat differently. The large control school, like the large experimental school, had a high percentage of low achieving readers, including three children classified as mildly intellectually disabled and one from a second language background who did not qualify for Reading Recovery. As a result, the Reading Recovery teacher reduced the number of children with whom she worked individually from 4 to 3. The time saved was used to undertake additional small group intervention four days per week with 8 children who had been assessed on the Reading Recovery screening test as being in the lowest 20% of the Year 1 intake but were not receiving Reading Recovery. With this group of low progress children, the traditional Reading Recovery Program of concepts about print activities, early strategies of reading/writing, phonemic awareness tasks and guided reading activities were employed in a small group situation. In the real world, when only one Reading Recovery teacher operates in a large school with significant numbers of at risk readers, Reading Recovery teachers and executive staff must take such pragmatic decisions in order to access as many low progress children as possible.

In the regular classes in Year 1, experienced and novice teachers indicated that in their first year of teaching they had very little theoretical or practical knowledge about reading acquisition, and were guided by the approach of other staff members. If they had graduated from a teacher education program in the last 15 years, (which was the case of most Year 1 teachers in this school) they tended to adopt a whole-language approach to the teaching of early literacy, with an emphasis on deriving meaning from print. As a result of this orientation, they felt that graphophonic knowledge was only one means of word acquisition and that guessing from picture or semantic cues was an equally valid means of gaining meaning from print. They thus appeared not to distinguish between the word recognition level and the comprehension level, which has frequently been a criticism of the whole-language approach to word acquisition (Share & Stanovich, 1995). Consequently, teachers in Year 1 classrooms did not explicitly teach sound to print conversions, but encouraged children to read for meaning through listening to Big Books and through shared, guided and independent reading for 40 minutes per day. They also included writing, spelling and comprehension in language arts lessons. Systematic assessment was not a feature of most Year 1 classrooms and students were not grouped according to their word recognition and spelling ability.

The small control school, as might be expected, did not need to form an additional small group of at risk students, since the Reading Recovery
teacher could cater for all students designated as low progress on the screening test. During the year of the study, this teacher worked individually with 3 students carried over from the previous year and with 9 current Year 1 students. One of these students, not successfully discontinued, was referred for further individual assistance to the resource teacher, and two students who had not had their full quota of lessons were going to be carried over to the following year. Of these, one had received small-group intervention prior to admission to Reading Recovery. Two children with mild intellectual disabilities and one first-phase ESL child received small group intervention rather than Reading Recovery while children who were second-phase ESL and not among the lowest progress children in reading were given small-group assistance from the ESL teacher. Thus it appeared that in a smaller school, most of the children who had failed to profit from literacy instruction in the kindergarten year and who had no other compounding difficulties, were able to be included in the Reading Recovery Program, while the small number of other low-progress children were given small-group intervention.

In the regular Year 1 classrooms of the small control school, most teachers also tended to use a whole language approach to literacy acquisition. Lessons typically included whole language programming for three days per week, where shared reading, repetitive verse, story sequencing, predicting and answering questions and cloze exercises were carried out. Guided reading, listening post and modelled writing took place on the other two days.

Analysis of Data

The overall analysis attempted to determine whether there would be any differences in literacy attainment between students in low socioeconomic schools who had implemented SWELL in both kindergarten and Year 1, when compared with matched control schools who had implemented Reading Recovery in Year 1 but had otherwise pursued their regular classroom literacy programs. In addition, the analysis also examined the effect of school size in relation to the two literacy programs. Separate ANCOVAs, using the Burt Word Test as a covariate, were computed for the five early literacy measures, with experimental/control conditions and size of school acting as independent variables. Additional ANOVAs on all five literacy measures were also computed to ascertain the differences between those at risk children receiving individualised intervention and those in small group arrangements.

RESULTS

Table 1 shows the means, adjusted means and standard deviations for
Year 1 classes in control and experimental schools on the five early literacy measures. (While the Burt Test, given to all students at the beginning of Year 1, did not reveal any significant differences between the two groups at pretest, (t=-1.58, p=.116), there was a positive trend in favour of the experimental group).

(The Table 1 about here)

The ANCOVAs computed for all five early literacy measures indicated significant effects in favour of the experimental group on four tests, the Expressive Word Attack Skills (pseudoword reading), (F[1,124] = 4.41, p = 0.038), the Yopp-Singer test of Segmentation, (F[1,124] = 8.97, p = 0.003), the Developmental Spelling Test, (F[1,125] = 10.79, p = 0.001), and Writing Test, (F[1,83] = 6.72, p = 0.011). An interaction effect was evident only for the Passage Reading Test (reading connected text), (F[1,124] =4.92, p = .028).

Multiple comparisons performed on adjusted means for the Passage Reading Test indicated that significant differences favouring the experimental condition applied only to the large schools, (F[1,84] = 8.61, p = 0.004) while there were no significant differences between the small experimental or small control school on reading connected text (F[1,39] = .54, p = 0.466). Furthermore, while there were no differences between the experimental schools using SWELL on the basis of size, (F[1,67] = 1.05, p = .309), the small control school performed significantly better than the large control school on the Passage Reading Test (F[1,56] = 18.60, p = 0.000).

(It must be noted here that a number of children receiving small group instruction (including 2 IM children in the small control school were not able to be tested at post-test due to absence, with the result that overall scores presented for the small control school are probably slightly inflated).

Because of the predictive power of the pseudoword test (Word Attack Skills Test) for future literacy success, (Byrne & Fielding-Barnsley, 1995) we analysed it in more detail. We categorised the items as easy or hard, with single syllable cvc pseudowords being classified as easy items, and pseudowords with single syllable consonant digraphs, long vowels, vowel digraphs and two syllable words being categorised as the more difficult pseudowords. Because of the absence from post-testing of a number of low-performing children in the small control school, we present these fine-grained results for the large schools only.

Table 2 shows the means and standard deviations for large schools only on easy and hard pseudowords.
An ANOVA performed on the means of easy and difficult pseudowords for the large schools indicated a treatment effect in favour of the experimental school, \( F[1,77] = 11.83, p = .001 \), but no interaction effect based on item difficulty level, \( F[1,77] = .256, p = .114 \). A trend was observed for slightly larger differences on the more difficult items between experimental and control school than was evident for the easy pseudowords.

Further analyses were computed in order to compare the literacy achievement of those low progress students who had received individualised Reading Recovery intervention in control schools, those who had received small group intervention in control schools (the low achieving students in the control school not present at post-test could have inflated control small group scores), and those taught in a smaller class group in SWELL schools who did not receive any individualised intervention from a trained teacher because of financial constraints.

Table 3 shows the means and standard deviations for these three conditions.

The one-way ANOVAS computed for the five literacy measures indicated an overall significant effect for the Passage Reading test (reading connected text), \( F[2,39] = 10.32, p = 0.000 \) and the Word Attack Skills Test (reading pseudowords), \( F[2,39] = 6.97, p = 0.003 \), but not for the other three literacy measures, the Yopp-Singer Test of Segmentation \( F[2,39] = 1.15, p = .326 \), the Developmental Spelling Test, \( F[2,39] = 2.50, p = .095 \) and the Writing Test \( F[2,39] = 2.41, p = .119 \).

Orthogonal contrasts indicated that children who received individual Reading Recovery intervention outperformed the at risk students in SWELL small class groups on the Passage Reading Test (reading connected text), \( t = -2.578, p = .014 \), but there was no significant difference between SWELL small class students and a combination of Reading Recovery and small groups in control schools, \( t = 229, p = .82 \). A similar result was observed for the Word Attack Skills Test measuring pseudoword reading. For this measure, there was a significant difference between SWELL small class students and Reading Recovery students, favouring Reading Recovery students, \( t = -2.75, p = .009 \).
but no significant differences existed on pseudoword reading between SWELL students and a combination of Reading Recovery and small group students in control schools (t = -1.01, p = .316).

Table 4 shows the intercorrelations of all early literacy measures at the end of Year 1 with the Burt Word Test at the beginning of Year 1.

(Table 4 about here)

The correlation matrix reveals high to moderate intercorrelations between the covariate, (Burt Word Test) and the early literacy measures of PRT (reading connected text), EWAS (pseudoword decoding) and spelling (developmental spelling test). Significant but low correlations were found with the writing measure and no relationship, as could be anticipated, was found between Burt and the phonological awareness test of segmentation.

DISCUSSION

This study has attempted to provide some quantitative and some qualitative data about two early literacy programs for students who are attending disadvantaged schools and who may be at risk of developing literacy difficulties. We were also particularly interested to see whether the effects of both programs would be identical in both large and small schools which served children from low socioeconomic areas. The two Year 1 programs which were under review were the SWELL Program, which operates typically as a whole class program in kindergarten, Year 1 and Year 2, and Reading Recovery, an individualised intervention program offered to low progress children in Year 1 independently of the classroom literacy program operating in the regular class.

The results appear to suggest that a structured whole class program, based on an interactive compensatory theory of literacy acquisition, which is implemented in kindergarten and continued through Year 1 will raise the literacy levels of more students in disadvantaged schools than a traditional classroom program supplemented by individualised intervention for a defined group of low progress students. While this finding may be somewhat axiomatic, it supports the concerns of both Hiebert (1994) and Shanahan & Barr (1995), in their evaluations of the efficacy of Reading Recovery for schools with high proportions of low income students with poor literacy skills at school entry.

While we anticipated that this would be the case only in large disadvantaged schools, where individualised intervention can only be extended to a small proportion of low achieving students if only one
Reading Recovery is employed, it appears that the overall literacy superiority of SWELL students tended to be largely independent of school size on most of the early literacy measures used, (pseudoword reading, segmentation, spelling and writing). Our prediction was correct only in the case of reading connected text, where a significant effect, favouring SWELL students, was observed between large experimental and control school but not between the two small schools.

This result can perhaps be explained by the fact that students reading connected text at early levels of schooling may still be relying on contextual cues rather than on accurate word-specific knowledge that is associated with skilled pseudoword decoding. As whole language classrooms encourage the use of context in beginning reading, children in the control schools could be using this strategy quite effectively on the easy Year 1 test passages presented to them. With fewer at risk children in the small control school and with a small number of the lowest achieving students omitted from the post-test, this could well account for the absence of significant differences for reading connected text between small experimental and control school. This result notwithstanding, it seems that while the effectiveness of SWELL in a disadvantaged school system is not influenced by the size of the school, since all students are provided with the program, the effectiveness of Reading Recovery in a disadvantaged school is determined by school size, when only one trained teacher can be employed.

The superiority of students in experimental schools in pseudoword reading and their slight, but non-significant tendency to outperform their control counterparts on harder non-word decoding also need to be discussed. The SWELL Program, in its Emergent Literacy stage, carefully and systematically builds in the early metalinguistic skills of lexical and phonological awareness. It is now almost universally accepted that phonological awareness appears to play a causal role in reading acquisition and numerous training studies have demonstrated that kindergarten children, after training in phonological awareness, become more proficient readers (Ball, 1993; Ball & Blachman, 1991; Bradley & Bryant, 1985; Byrne & Fielding-Barnsley, 1993; Cunningham, 1990; Lundberg, Frost and Peterson, 1988; Torgesen, Morgan & Davis, 1992). Furthermore, the 'deeper' levels of phonological awareness, such as blending, segmenting and phoneme manipulation are built in to the second stage of SWELL, the Becoming Literate component, at the same time as grapheme-phoneme correspondences are taught and practised systematically in context in specially designed readers. Research has shown that unless children develop the ability to be analytic as well as 'holistic', they will have problems in the early stages of reading acquisition (Stanovich, 1994). It is for this reason that all of the most effective remediation programs for at risk children have explicit and analytic characteristics (Adams & Bruck, 1993; Chall, 1983, 1989; Felton, 1993). Thus, for at risk children, whose home experiences may have not necessarily equipped them with the pre- and co-requisites for reading acquisition, the SWELL Program, from the point of school entry
and continued throughout Year 1, appears to be successful in developing these critical skills. By providing as many children as possible with secure phonological sensitivity and phonological recoding skills it enables them to develop self-teaching mechanisms to independently acquire knowledge of specific word spellings and more general knowledge of orthographic conventions (Share & Stanovich, 1995, p.18).

The third analysis undertaken specifically examined the progress of the most at risk children in both experimental schools and control schools. Qualitative analysis of the resource deployment in the two control schools is necessary prior to a discussion of the results. Because of the large number of students who needed additional literacy assistance, the Reading Recovery teacher in the large control school decided to work with fewer students individually and to include additional low progress students in small group intervention. This ensured that almost twice the number of students that would typically be accommodated in Reading Recovery received some form of intervention from the Reading Recovery teacher. In the small control school, the Reading Recovery teacher did not need to teach a small at risk group herself, but small group intervention was extended to the most at risk students by the resource teacher. Furthermore, children who had not been successfully discontinued from Reading Recovery, or who were still awaiting individualised assistance were not excluded from this small group. Thus, both large and small control schools recognised the need for additional intervention apart from Reading Recovery and established small groups in order to supplement it. In SWELL schools, the most at risk children were placed in a smaller class group and progressed more slowly through the Becoming Literate Program. Individualised assistance, reinforcing program components through scaffolded interactions, was not able to be provided to these students because of financial constraints.

The results of the analysis indicate that the individualised Reading Recovery intervention for low progress students in control schools was significantly better than placement in the SWELL small class on tests measuring reading words in connected text and the decoding of pseudowords. It is obvious that a larger number of Reading Recovery students left the program with well developed reading strategies, knowledge of phonological awareness and phonological recoding than the low progress students from the small class intervention. However, there was no difference between these two intervention strategies on tests measuring segmentation, spelling and writing. Furthermore, when individualised intervention and small group intervention in control schools were added together and compared with small class intervention in experimental schools, this difference disappeared on all measures, as SWELL small class students tended to outperform their counterparts in the control small groups on all early literacy measures. Thus when
all at risk students in control schools are considered, it appears that one Reading Recovery teacher, while highly effective for low progress learners, still targets too few at risk students in disadvantaged schools to make a significant impact on the large number of low achieving children needing assistance.

While it is clear that, in this study, Reading Recovery intervention provided the most effective form of assistance to at risk students, as has been repeatedly documented (Pinnell, Lyons, DeFord, Bryk & Selzer, 1994; Shanahan & Barr, 1995), some caveats still need to be raised. In the first place, in our control schools, all IM and first phase ESL children were excluded from Reading Recovery intervention. These children were, however, included in either small group intervention (in control schools) or small class placement (in experimental schools), thus depressing the overall scores of students served by the two latter intervention strategies relative to Reading Recovery. Second, we know that about 30% of children selected for Reading Recovery will improve even without any intensive intervention, because of difficulties associated with selection procedures in most NSW schools (Center et al 1995), and will move rapidly through the program. Such children, who clearly can profit just from regular classroom tuition in Year 1, are unlikely to be in the SWELL small class or small group situation at the end of Year 1, as they would have been transferred, at least in SWELL classes, into a higher class after one of the regular assessments. Third, over 30% of students receiving Reading Recovery were still found, in this study, to be unsuccessful in decoding even the easy pseudowords, (see Center et al, 1995 for a further discussion of this issue) with no guarantee that these skills would be taught to them in the regular class upon discontinuation. And finally, there was the recognition, at least in one control school, that some students accepted for Reading Recovery would need additional assistance either before entry or after discontinuation from the program. When looking at efficacy and cost-effectiveness of early intervention programs and assessing the impact of Reading Recovery, issues of this type must be kept in mind.

An important result of this study has been the confirmation of the effectiveness of individualised intervention given daily and systematically to low progress students by trained Reading Recovery teachers (Pinnell et al, 1994). In addition, within our control schools, it is also clear that at risk students not receiving individualised Reading Recovery instruction make very little progress in literacy acquisition. This study therefore supports the proposition, which has also been clarified by Clay (personal communication), that Reading Recovery is not a general staff development effort that will permeate the instructional practices of schools (Shanahan & Barr, 1995, p.983). However, the results that emanate from the experimental schools suggest that a schoolwide early language and literacy program can
result in substantial benefits to a large cohort of both at risk and regular students in disadvantaged schools. Within such a program, it is also obvious that a small class intervention group is not as effective as an individualised program, but does show to advantage when compared with a small intervention taught by a Reading Recovery teacher. It is therefore imperative that individualised intervention also be factored in as an essential part of the SWELL program. While this has been mandated in Success for All schools in the US, financial constraints in our experimental schools inhibited its regular and systematic application. Whether this individualised intervention be Reading Recovery or one based on the classroom program still remains to be investigated and a study examining this issue is currently in progress.

Certainly, if Reading Recovery were the selected option, a program like SWELL, operating in kindergarten, would make student selection for individualised intervention a more accurate procedure than is currently the case and obviate the need for providing Reading Recovery to children who do not need such an expensive intervention. A structured program such as SWELL would also be more supportive in Year 1 for those students who are discontinued unsuccessfully from Reading Recovery and need continuing assistance.

In conclusion, we must stress the tentative nature of the results and the need for replication with a larger group of students for a longer period of time. Nevertheless, the results of this study underscore the fact that a systematic whole class early literacy program, based on the latest research in early literacy acquisition and supplemented by an individualised program for all needy students, for as long as is necessary, appears to be a better solution to the problem of literacy failure for low socioeconomic students than either alternative on its own. In view of the fact that the SWELL Program in our experimental schools was at an early stage of implementation, with a number of teachers not fully inserviced in its aims and objectives and with no individualised assistance provided to at risk students, the results are encouraging. This is perhaps not surprising since SWELL has been modelled on Success for All, a whole class program for disadvantaged students, which has been systematically monitored for at least 7 years (Slavin, Madden, Dolan, Wasik, Ross & Smith, 1994). The data presented by these authors demonstrates graphically that substantially greater literary success for disadvantaged students can be routinely ensured in schools through teacher commitment, parent involvement and the best available classroom programs. Of particular interest is the fact that the highest effect sizes are typically found for those students who are in the bottom 25% of their classes. Furthermore, the longer a school is in the program, the better the effects on reading performance seem to be for the whole grade. While we acknowledge cross cultural difficulties when transposing a program from one country to another and specific weaknesses in this study such as small sample size and lack of random allocation to treatment conditions, we nevertheless believe
that an investigation such as this is a tentative first step in establishing the optimal mix of early intervention programs that will best serve those children at risk of literacy failure in disadvantaged schools.

REFERENCES

Center, Y. & Freeman, L. (in press). A trial evaluation of the Schoolwide Early Language and Literacy Program (SWELL) for at risk and
extensive program for stimulating phonological awareness in preschool children. Reading Research Quarterly, 23, 263-284.

Table 1
Means, adjusted means and standard deviations for Year 1 classes in control and experimental schools on 5 early literacy measures.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control schools (N = 59)</th>
<th>Experimental schools (N = 70)</th>
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<tr>
<td>Passage Reading Test</td>
<td>M 44.16</td>
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<td></td>
<td>(M) - adjusted 47.68</td>
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<td></td>
<td>SD 28.44</td>
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<td>Word Attack Skills Test</td>
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<td></td>
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<td>8.72</td>
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<td></td>
<td>SD 4.57</td>
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<td></td>
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<td>Developmental Spelling Test</td>
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<td></td>
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<td></td>
<td>SD 10.08</td>
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<td></td>
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<td></td>
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Table 2
Means and Standard Deviations for large experimental and control schools on easy/hard pseudowords in the Word Attack Skills Test.
<table>
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<th>(N=40)</th>
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<tr>
<td>Easy Pseudowords</td>
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<td></td>
</tr>
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<td>2.03</td>
<td>3.35</td>
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<tr>
<td>Hard Pseudowords</td>
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<td></td>
</tr>
<tr>
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<tr>
<td>SD</td>
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Table 3: Means and Standard Deviations for SWELL small class students, Reading Recovery students and small group students in control students.

Table 4: Correlation matrix for all early literacy measures

<table>
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<tr>
<th></th>
<th><em>Burt</em>*</th>
<th>PRT</th>
<th>Yopp</th>
<th>EWAS</th>
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<th>Writing</th>
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<td>.74</td>
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<tr>
<td>Writing</td>
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<td>.49</td>
<td>.23</td>
<td>.51</td>
<td>.54</td>
<td></td>
</tr>
</tbody>
</table>

*Burt The Burt Word test used as a covariate at the beginning of Year 1
#EWASExpressive Word Attack Skills Test
+Yopp Yopp Segmentation Test
**PRTPassage Reading Test