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Early intervention in the home for children at risk of reading failure

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In this study, Ruth Fielding-Barnsley and Nola Purdie evaluate the effects of an eight-week dialogic reading intervention with an experimental group of 26 at-risk children in the year prior to formal schooling. The results on measures of literacy taken during the first year of formal schooling, compared with results of a control group of 23 children, will encourage all those working to involve families in early intervention.

Early identification of children who are at risk of developing specific reading disability has long been regarded as being crucial for successful remediation (Snow, Burns and Griffin, 1998). However, such identification must lead to immediate intervention if there is to be any benefit for the child. In addition, the intervention should be directly related to the weaknesses identified, well-grounded in theory, effective and easy to administer.

The focus of the current study is on identifying children at-risk *before* the first years of formal schooling. The reasoning behind this is that such children are very capable of overcoming their disadvantages before formal schooling, with the assistance of their families (Fielding-Barnsley, 2000; Jordan, Snow and Porche, 2000).

The intervention in this study was based on a method developed by Arnold and Whitehurst (1994), and Whitehurst, Arnold, Epstein, Angell, Smith and Fischel (1994) known as dialogic reading. Dialogic reading involves families reading *with* their children rather than *to* their children.

Theoretical background

Parental and family influences can profoundly enhance the quality and quantity of literacy experiences of children (Snow et al., 1998) and lead to improved measures of early reading (Adams, 1990; Purcell-Gates and Dahl, 1991). According to a study by Bus, van Ijzendoorn and Pellegrini (1995) parent—preschooler reading explains 8% of the variance in the outcome measures of language growth, emergent literacy, and reading achievement in Year One.

Home language and literacy experiences have been identified as crucial for later reading success (CIERA, 1998). These experiences include joint book reading with family members. A study by Torgeson and Burgess (1998) found that the two most powerful predictors for reading success are letter name knowledge and phonemic knowledge (the conscious awareness of the sounds in spoken words), and these are important components of a dialogic reading programme.

The Colorado twin study suggests that reading disability has a significant inherited component (Cardon, Smith, Fulker, Kimberling, Pennington, and DeFries, 1994), and that children who have a parent or sibling with a noted reading problem have an increased chance of developing similar problems (Gilger, Pennington and DeFries, 1991). Reading disability is defined as 'an inability to distinguish and process the sounds that make up speech' (Lyon, 1995) resulting in slow, inaccurate reading and reduced comprehension of written text. There have been several family studies which have shown that reading disorders tend to run in families (DeFries, Vogler and la Buda, 1986). More recently, however, researchers have been able to untangle the shared influence of the environment and genetics in similar family studies. DeFries et al. (1986) studied 1044 individuals in 125 families with a reading disabled child. There were 125 matched control families. The siblings and parents of the reading disabled children performed significantly worse on reading tests than the families of the control children.

Although recent research evidence points to the importance of alphabet knowledge and phonemic awareness for early reading success (Byrne and Fielding-Barnsley, 2000; Schneider, Roth and Ennemoser, 2000), there are other factors that have not gained equal emphasis. Torgeson (1998) identified weak general verbal abilities as being an

area of concern. Individual differences in vocabulary development also may have long-term consequences in reading development (Hargrave and Senechal, 2000). Kame'enui and Simmons (1999) noted that vocabulary growth appears to be a result of reading rather than direct instruction in vocabulary. Familiarity with the basic purposes and mechanisms of reading are also included as predictors of later success in reading in the National Research Council Report (1998).

It is particularly pertinent that training in phonological awareness in isolation is not always successful for at-risk kindergarten children. Torgeson, Morgan and Davis (1992) reported that 30% of their at-risk sample had no measurable gains in phonological awareness following an eight-week training programme. However, when alphabet knowledge instruction was combined with phonological awareness for a group of at-risk children it proved more successful (Borstrom and Elbro, 1997).

Several studies have targeted individual components of the present study; vocabulary development (Hargrave and Senechal, 2000; Robbins and Ehri, 1994); reading achievement (McCormick and Mason, 1986); oral language (Wells, 1985; DeBaryshe, 1993); and phonological awareness (Burgess, 1997). Fielding-Barnsley (2000) explored three components (rhyme, concepts about print, and vocabulary) with low socioeconomic status (SES) children. The most comprehensive intervention study undertaken to date focused on vocabulary, comprehension, sound awareness, letter recognition, environmental print and concepts of print (Jordan et al., 2000). Results from these studies clearly indicate the value of early intervention that targets individual reading skills through dialogic reading.

The intervention used in the current study is based on a method developed by Arnold and Whitehurst (1994) and Whitehurst et al. (1994) known as dialogic reading. Dialogic reading involved families reading *with* their children rather than *to* their children. Parents, or other family members, are instructed in the methods of dialogic reading, which include asking questions, providing feedback, and eliciting increasingly sophisticated descriptions from the child. Additional instruction is also provided to develop an awareness of rhyme, concepts about print (CAP), and alphabet knowledge (Fielding-Barnsley, 2000). In the classic study by Tizard, Schofield and Hewison (1982), highly significant improvements associated with parental involvement in children's reading were reported. In a replication of this study, however, it was found that improvements were largely due to teacher effect (Macleod, 1996). Thus, questions were raised about the effectiveness of parent involvement when they are not given any special training. As Sylva and Evans (1999) concluded in their evaluation of parent involvement programmes. 'We need to know more about the effective ways to involve teachers and parents... Do parents need more structured guidance in order for there to be a beneficial effect on their child?' (p. 284). Such questions were taken into account in the design of the present study.

Two major considerations for the current intervention programme were that it should be easy to implement and cost effective. Intervention programmes offered in school contexts often lack these prerequisites. For example, the most common intervention in Australian and New Zealand schools is Reading Recovery, which involves hours of individual instruction, thereby necessitating a huge investment in both time and money (Chapman, Tunmer and Prochnow, 2001). Not only is Reading Recovery costly but it also leaves children in a vulnerable position until they are six years old. As Torgeson (1998) pointed out 'the best solution to the problem of reading failure is to allocate resources for early identification and prevention ... in the majority of cases, there is no systematic identification until third grade, by which time successful remediation is more difficult and more costly' (p. 32).

The aim of our study was to implement a dialogic reading programme with a group of at-risk children in the year prior to formal schooling, and to assess its effectiveness by comparing literacy achievements in Year 1 of the experimental group with the literacy achievements of a control group of children who were similarly at risk of reading failure. Transfer and generalisation of skills were also assessed in the testing programme.

Method

Participants

The experimental group was made up of 26 children (9 girls, 17 boys; mean age 70.2 months), and 23 children (6 girls, 17 boys; mean age 70.5 months) made up the control group. The children in the experimental group were located in 17 schools and the children in the control group were selected from three of the 17 schools. The children in the control group were selected from only three schools as the majority of the experimental children attended these three schools, or example six experimental and eight control children attended the same school. Where there was only one experimental child attending a school, no match was made. The majority of experimental children were matched with control children in the same school and this assisted in controlling for differences in teaching methods across schools and between experimental and control children. All children were nominated by their parents for inclusion in

the study. Families were deemed to be 'at risk' if one or more members had a history of reading disability. The family member could be a parent, sibling or other blood relative. All children in the control group were included in an intervention programme after post-testing.

Measures

Time 1 testing took place in the first two weeks of term (February) before formal reading instruction had commenced. Testing took place in a quiet location away from the classroom. The tests were administered individually and in the same order to each child. Time 2 testing took place during November of the same year.

Time 1 measures

The Peabody picture vocabulary test (PPVT— 111) (Dunn and Dunn, 1997). This test is a measure of receptive vocabulary. A matrix of four pictures is shown to the child, who is then asked to choose the picture that matches the spoken word provided by the tester.

Rhyme recognition test (Byrne and Fielding—Barnsley, 1991). This test of rhyme awareness requires the child to identify which of three words sounds most like the target (e.g. cat. hat, clock, bed).

Concepts about print test (CAP) (Clay, 1979) is a measure of a child's exposure to books. Test items include: book orientation, print not picture tells the story, direction of print, word-by-word matching. For more advanced readers, there are items that focus on a more complex understanding of common punctuation marks.

Recognition of initial consonant sound and alphabet (RICSA) (Fielding-Barnsley, 2000). This test requires the child to identify the first sound in a word (e.g. 'What is the first sound you hear when I say "Sam"?'). The test of alphabet recognition involves the child being shown a line of five letters of the alphabet and being asked to circle the name of the alphabet letter given.

The rhyme recognition test and the RICSA test are measures of phonological awareness, phonemic awareness and alphabet knowledge respectively.

Time 2 measures

All of the Time 1 tests were used except for alphabet knowledge. In addition, children completed the following tests of early reading and spelling.

Reading/word identification. The children were presented with two lists of 15 words. The researcher used a template that exposed one word at a time. The child was asked 'Can you read these words to me?' The word list contained 20 regular words and 10 irregular words which were presented in the order of two regular words followed by one irregular word, for example *in, sat, was*. A full list of words in the order presented is shown in Table 1.

WORD LIST ONE	WORD LIST TWO
in	hand
sat	best
was	right
top	step
set	help
eye	laugh
pen	silk
yes	stand
gone	monkey
hit	piano
box	camel
said	sugar
went	dragon
next	tent
there	knife

Table 1. Word list for reading/word identification

Spelling. The children were asked to spell ten words (*in, fun, bath, play, sand, milk, grunt, jelly, crows, helping*). The words were selected to represent most of the 26 graphemes and also to include examples of consonant clusters, diphthongs and digraphs. The words were said once, repeated in a sentence, and spoken a third time. The test is an amended version of one used by Liberman, Rubin, Duques and Carlisle (1985). Liberman et al's scoring system was used, which gives credit for each correct phoneme that the child uses in representing the spoken word; the scoring therefore values accurate segmentation. A correct spelling, such as 'crows', earns the maximum six points. A spelling that represents all phonemes with conventionally acceptable letters, such as 'cros' or 'kroz', earns five points. If the word contains some but not all phonemes it is given a partial score, such as 'cos', that is awarded four points, two phonemes such as 'cs' earns three points, one phoneme with a conventional letter such as 'k', is given two points, and one phoneme with a related letter, such as 'g', earns one point. The maximum number of points achievable for the ten words is 52.

The intervention

An initial meeting with each experimental group family took place in the family home. A trained research assistant presented the families with videotaped instruction exemplifying good practice in dialogic reading. This video recording was developed by one of the authors in a pilot study reported elsewhere (Fielding-Barnsley, 2000). Three families are shown on the videotape, with each family concentrating on a different aspect of dialogic reading. There are examples emphasising rhyme, vocabulary and CAP. Each family also received written information about the dialogic reading process, thereby extending the visual information provided on the videotape. This was in the form of a four-page pamphlet developed by The University of New England School of Psychology's Early Literacy Team (Byrne, Fielding-Barnsley, Delaland, Mackay and Black, 1999). This pamphlet contains sections on: 'How to promote pre-reading skills in your child; Read with your child; Let your child tell the story; Play with speech sounds; Rhyme and alliteration; Teach your child about the alphabet; and Teach your child about the sounds that make up words ... and how letters stand for these sounds.'

Each family was provided with a selection of eight picture books, a *Parents' Handbook* (Barrs and Ellis, 1998), and a reading together record form. The books were selected from *The Reading Together Series* (Barrs and Ellis, 1998) and included a variety of genres: rhyme, fictional stories, factual texts, alphabet books and traditional songs. The books were selected to fulfil the requirements of the study in that they provided for development of rhyme awareness (phonological awareness), alphabet knowledge, alliteration (phonemic awareness) and rich vocabulary. The selection of the alphabet book was influenced by Murray, Stahl and Ivy's (1996) study that showed greater gains were made when children used alphabet books with example words to demonstrate sound values.

Families were asked to read each book with their child at least five times during the eight-week intervention. Elley (1989) advocated this method as being the most successful for improving vocabulary skills. (Additional details of the intervention can be found in Fielding-Barnsley and Purdie, in press).

The design of the programme also took into consideration potential 'time constraints' that busy families may encounter. In most cases a parent did most reading at the children's bedtime but older siblings also did some after school. Each experimental family was asked to read each of eight books with their children at least five times during the eight-week intervention (requiring reading 1.4 books per day). The average number of readings per book was 6.5, indicating that parents were able to comply with the minimum requirements of five readings per book.

Results

Differences in tests of pre-reading skills

Descriptive statistics for the children's scores on the five measures of pre-reading skill are shown in Table 2. Results from a one-way analysis of variance (ANOVA) revealed that at Time 1 (the third week of their first year at school the experimental group scored significantly higher than the control group on PPVT, initial consonant, rhyme and CAP. The groups were not significantly different on final consonant. The difference between the groups approached significance on alphabet knowledge. These results suggest that, overall, the intervention had successfully improved the pre-reading skills of children in the experimental group.

At Time 2 (end of their first year at school), the children were tested again on the same measures and scores had improved for both groups, although the experimental group maintained a significant advantage on final consonant and CAP.

To explore which aspects of the intervention were related to scores on reading and spelling at the end of the first year at school, we examined the correlations between the five pre-reading scores at Time 1 and

the reading and spelling scores at the end of the year. Table 3 presents these results. CAP and alphabet knowledge were significantly and strongly related to reading and spelling; initial consonant and final consonant were significantly and moderately related to spelling.

Table 2. Test results (means and standard deviations) for experimental and control groups at Times 1 and 2

Test C	Time 1				Time 2			
	E		C		E			
	M	SD	M	SD	M	SD	M	SD
PPVT	77.73	9.69	69.48	18.20	88.69	10.00	81.65	19.35
Initial consonant	9.46	1.45	5.61	14.20	9.69	.62	8.91	2.19
Final consonant	4.31	4.40	2.52	3.41	9.00	2.15	6.30	3.52
Rhyme	8.62	2.12	6.83	3.26	9.31	1.46	8.26	2.36
CAP	13.46	2.86	9.87	13.20	17.04	3.29	14.52	2.45
Alphabet	22.04	4.56	19.48	4.88				
Spelling					39.73	9.23	26.17	11.82
Reading					14.96	8.54	6.70	6.00

Note: PPVT – Peabody picture vocabulary test; CAP = concepts about print

Table 3. Correlations between Time 1 test scores and reading and spelling scores at Time 2

	Reading	Spelling
PPVT	.301	.310
Initial consonant	.157	.405*
Final consonant	.365	.410*
Rhyme	.249	.320
CAP	.536**	.613**
Alphabet kn.	.677**	.738**

Notes: * correlation is significant at the .05 level; ** correlation is significant at the .01 level

Discussion

This study provides evidence that a dialogic reading intervention instituted prior to formal schooling is advantageous for children who are assessed as being at risk of developing a reading disability. The small sample size dictates caution in interpreting the study results, although it is possible that the gains noted may have been even larger. The power of a statistical test to detect significant and meaningful differences is reduced when the sample size is small (Cohen, 1988), and thus the chance of making a Type 1 error is increased.

The elements of the intervention used in this study reflected recent understanding about the need to develop a range of skills in order to become a successful reader. However, many interventions have focused solely on phonemic awareness (e.g. Byrne and Fielding-Barnsley, 1993; 1995; 2000). Whilst phonemic awareness is 'necessary' for the acquisition of reading, it is not 'sufficient'. A recent paper by Stanovich (2000) refers to this issue. It is well known that Stanovich's earlier work (1986) emphasised the importance of phonemic awareness, but he now acknowledges that early exposure to print is linked to a variety of cognitive outcomes necessary for fluent reading, such as increased vocabulary, content knowledge and verbal fluency. Bus, Van Ijzendoorn and Pellegrini (1995) also advocate a focus on developing a variety of skills. They suggest that book reading, as it occurs in dialogic reading 'may affect children's understanding of the written language register more than it affects the mechanical skills of encoding and decoding print involved in reading' (p. 5). The written language register is very different from that of spoken language and may be very difficult construct for some children to understand. The dialogic

reading intervention in this study exposed children to the written language register and included a focus on specific skills such as concepts about print, awareness of rhyme, alphabet knowledge, alliteration, and vocabulary knowledge.

The effects of many educational interventions such as Reading Recovery are not long lasting (Chapman et al., 2001). The results from the current study are particularly encouraging because benefits from the intervention were still evident over a year later. Not only were experimental group children ahead of the control group on several of the measures of specific skills (final consonant and concepts about print), they also were ahead of the control group on tests of reading (word identification) and spelling. A further point of note about this study is that the intervention was low-cost in terms of time and training, unlike some interventions that require extensive teacher training and lengthy implementation time (Chapman et al., 2001).

Once families are trained in the technique of dialogic reading, they can continue to use the methodology with the identified child as well as with other children in the family. Thus, identification and early intervention may be better placed in the home.

Many parents are uncertain about how to help their children as readers. Parents can be taught that it is just as important to teach their children pre-reading skills as it is to teach word recognition (often interpreted as 'reading'). Teachers of beginning readers may also use dialogic reading in their classrooms to teach pre-reading skills. Big Books are an ideal medium for implementing all the ideas promoted in dialogic reading.

Conclusion

Whilst it is acknowledged that children from families with a known reading disability will be at risk of developing reading problems (Gilger et al., 1991), it is important to acknowledge that much can be done to alleviate these problems. By building on the identified strengths of each child and scaffolding areas of weakness, it should be possible to assist these children. The most important factor is to implement early intervention that includes the family (Slavin, Karweit and Wasik, 1994).

It is acknowledged that the parents in this study were self-nominated and may have been more enthusiastic and motivated to implement the dialogic reading programme. In future intervention studies it may be helpful to make the programme available to all parents of preschool children. This would fulfil home—school partnerships, which are a focus of national curricula in the UK (National Foundation Stage Curriculum) and Literate Futures in Australia. Instruction could be provided at evening meetings and all parents, not just those with a history of reading disability, would benefit. This would also eliminate any feelings of embarrassment in having to acknowledge that your family has a history of reading disability. The families who do have a history of reading disability will be empowered and will also be assisted in understanding their own disability,

In a study undertaken by Lazar and Darlington (1982) 2000 young adults were recorded as having achieved school competence, avoided assignment to special education, and developed positive views of themselves as a result of well implemented parental programmes. Evidence such as this is reason enough to continue with well designed early parental involvement programmes. Perhaps we need to take note of one of the national goals of education in America that 'All children in America will start school ready to learn and every school in America will promote partnerships with parents' (Ysseldyke, 1999. p. 136). Parents are usually willing partners in the process of teaching children to read but they do need to know *how* to help their children.

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