PHONOLOGICAL PROCESSING AND THE READING RECOVERY PROGRAMME

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ALEXANDRA JOSEPHINE IVERSEN
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ABSTRACT.

This study had three aims. First to determine whether those children entering the Reading Recovery programme were deficient in phonological processing ability. Secondly, to see whether the Reading Recovery Programme provided for the adequate development of phonological processing strategies, and thirdly, to ascertain whether a Reading Recovery programme, modified to include systematic training in phonological processing strategies, would be more effective.

Sixty four First grade children identified as being the lowest scorers on the Diagnostic Survey (Clay), and the Dolch Word Test, were given either a standard Reading Recovery programme or a Reading Recovery programme modified to include systematic training in phonological processing strategies. Each child was matched on the basis of his/her scores on letter identification and dictation with a child from the other group, and with a child for whom no Reading Recovery was available, but who was receiving a standard intervention programme. Three tests measuring phonological processing ability were also administered pre and post-treatment, and at the end of the year. At the end of each child's programme an average child from the same classroom was also tested.

The results supported the evidence that children experiencing difficulty in reading may be particularly deficient in phonological processing strategies. The results also confirmed the evidence that the Reading Recovery programme is very effective in bringing nearly all of the lowest scoring children up to average levels of performance in reading and writing in a matter of weeks. Furthermore, those children receiving the modified Reading Recovery programme reached the criteria for discontinuation (that is, they had acquired a set of strategies that would enable them to continue to learn to read as they read increasingly more difficult material), in significantly fewer lessons.

Thus it would appear, for children experiencing difficulty in reading, the teaching of phonological processing strategies that make explicit the relationship not only between sounds and letters but also letters and sounds, increases the rate of learning. The type of educational setting that this teaching should take place in is discussed, as are the implications of such learning in relation to the child's growing control over the reading process.

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CHAPTER 1.

INTRODUCTION.

1.1. Motivation.

This study arose out of a desire to assist young children who were experiencing difficulty in reading and writing, to maximize their chances of catching up with their age peers before they had become failures not only with regard to literacy, but in the general academic area.

It endeavours to bring together sometimes opposing areas of research and to show that rather than conflicting, an understanding of the basic principles of each may lead to more powerful programmes for those at risk.

1.2. The Research Questions.

The study sought answers to three questions.
Are children entering the Reading Recovery programme (Clay 1985) deficient in phonological processing?
Does the Reading Recovery programme provide for the adequate development of phonological processing?

Does the inclusion of more explicit and systematic
training in phonological processing strategies, that is
phonological awareness and phonological recoding,
increase the effectiveness of the Reading Recovery
programme?

1.3. The Study.

These questions were addressed by using an intervention
experiment employing a between subjects group design, to
look at the differential effects of different programmes
on children matched initially on phonological processing
ability.

One group of children received their standard Reading
Recovery programme. A second group of children received a
Reading Recovery programme modified to include systematic
training in phonological processing, and a third group of
children received their usual Chapter One and Literacy
support services. The children were initially matched one
to one on the results of tests of phonological
processing. After the experiment they were again tested,
as was a fourth group of children who had always been
considered average performers, and who came from the same
classrooms as the treatment children.

1.4. Overview.

Chapter Two contains a review of the literature and seeks to examine theoretical perspectives from the field of emergent literacy and the field of phonological processing and apply these findings to Reading Recovery, an early intervention programme designed to reduce the incidence of reading failure by providing a second chance for young children to catch up with their age peers. Chapter Two also addresses the concept of differential attainment and shows how small initial differences in literacy ability can soon manifest themselves into wide differentiations in general academic achievement.

It also seeks to clarify the separate issues of what children need to know in order to become independent readers and writers, and how this should be taught. Chapter 3 describes the research methodology employed, and includes the design, the materials and the procedure. Chapter 4 presents the results and discussion, and is followed by general discussion and conclusions in Chapter 5 which also addresses some implications for educational practice and further research.

CHAPTER 2.

REVIEW OF THE LITERATURE.

2.1. THE CONTRIBUTION OF EMERGENT LITERACY.

Modern researchers in the field of emerging literacy, for
example Bissex (1980); Cazden (1972); Clay (1966, 1979a,
1982 1986a, 1991); Ferriero & Teberosky (1982); Goodman
(1985, 1990); Strickland & Morrow (1990); and Teale &
Sulzby (1986), suggest that the acquisition of literacy
is a very dynamic, active process whereby children learn
to read and write as they interact with their
environment. Children build theories, which they test,
refine and adapt, as they notice novel features in
reading, writing and oral language, thus continually
raising their level of understanding. This interaction is
found to begin well before the point of entry into formal
education, (e.g. Goodman 1985; Harste, Woodward & Burke
1984), and is often embedded in activities beyond
literacy itself (e.g. Heath 1986; Taylor & Dorsey Gaines
1988; Teale 1986).

Communication is a critical factor in emerging literacy, (e.g. Hood 1980), as children learn in social situations with more able peers and adults (Vygotsky 1972, 1978). These significant others "scaffold" the tasks in order to foster learning, increasingly withdrawing the assistance as the child takes over the control (Cazden 1983; Vygotsky 1972, 1978; Wood, Bruner, & Ross 1976). Within this social situation however, children are particular as to what they attend to at particular times (Bissex 1980; Blum, Taylor & Blum 1979), so that ultimately common concepts are acquired at different rates and stages. This may be reflective of the developing needs of the children at the time, and also the literacy experiences they have come into contact with both before and after the point of entry into formal schooling. It thus seems appropriate to view children's literacy competencies at any moment in time, as being located at some point along a continuum of understandings, strategies and behaviours that signal their growing control over the tasks of understanding messages in reading and creating messages in writing.

2.2. THE CONTRIBUTION OF PHONOLOGICAL PROCESSING.

2.21. Overview.

One of the competencies that children need to develop increasing control over as they learn to read and write is phonological processing. This includes two separate concepts. The first, phonological awareness, which takes place in the absence of print, and second, phonological recoding which requires both the ability to map phonology onto print and the ability to translate letters and letter clusters into phonological form.

This subject, as it relates to reading acquisition, has received much attention in the literature over the past decade (e.g. Bradley & Bryant 1983, 1985; Bryant & Bradley 1985; Cunningham 1990; Goswami & Bryant 1986; Juel 1988; Juel, Griffith & Gough 1986; Lundberg, Olofsson & Wall 1980; Lundberg, Frost & Petersen 1988; Perfetti, Beck, Bell & Hughes 1987; Stanovich 1986 a, 1986b; Stanovich, Cunningham & Cramer 1984; Stanovich, Cunningham & Feeman 1984; Tunmer 1990, Tunmer & Hoover in press; Tunmer, Herriman & Nesdale 1988; Tunmer & Nesdale 1982, 1985; Vellutino & Scanlon 1987; Wagner & Torgensen 1987).

It is suggested that phonological awareness is necessary during the acquisition of reading to assist with the decoding of novel words in text, and in writing to create spellings. It is evidenced in such early behaviours as the ability to recognize or produce rhyme (Bradley & Bryant 1983, 1985; Calfee, Chapman & Venezky 1972; Doehring, Trites, Patel & Fiedorowiez 1981), the ability to segment words into constituent phonemes (Fox & Routh 1975; Goldstein 1976; Helfgott 1974; Williams 1980), the ability to blend phonemes into words (Chall, Rosewall & Blumenthal 1963; Fox & Routh 1976; Goldstein 1974, 1976, Helfgott 1974) and the ability to invent spellings (Mann, Tobin & Wilson 1987; Morris 1983; Read 1978; Zifcak 1977).

More complex behaviours that suggest a more sophisticated control over phonological awareness are the ability to delete phonemes (Bruce 1964; Calfee et al 1972; Doehring et al 1981; Morais, Cary, Alegria & Bertelson 1979; Read, Yun-Fei, Hong-Yin & Bao-Qing 1986; Rosner 1975), the ability to specify a deleted phoneme (Stanovich, Cunningham & Cramer 1984), and the ability to reverse phonemes (Alegria, Pinot & Morais 1982).

2.22. Phonological Awareness Defined as a Metalinguistic
Ability.

Phonological Awareness, has been described, along with
word awareness, syntactic awareness and pragmatic
awareness as one of the four metalinguistic abilities
required in learning to read (Downing 1986; Henderson
1986; Mann et al 1987; Tunmer & Hoover in press; Tunmer,
Herriman & Nesdale 1988; Tunmer & Rohl 1990; Vellutino &
Scanlon 1986; Yaden 1986).

Metalinguistic ability in this instance suggests a
shifting of attention from the content to the structures
which carry the message, and is thought to develop during
middle childhood roughly in line with Piaget's level of
concrete operations, when children become competent at
such tasks as conservation and reversibility. This
suggests that a certain level of cognitive development
needs to be reached before children are able to perform
those metalinguistic strategies required in the
acquisition of reading and writing. It is possible
however, for children entering school with little or no
metalinguistic ability to learn to read and write,
provided they have the appropriate cognitive capacity.
This learning in turn, provides spinoff skills, which
provide the basis for more advanced metalinguistic
performance.

2.23. Phonological Awareness Specifically Defined.

More particular and specific definitions of phonological

awareness include the following;

The very basic understanding that the sounds of syllables

can be broken down into relatively small sets of

recurring smaller sounds and ultimately that those

smaller sounds correspond to graphemes (Adams 1990).

The conscious awareness of and ability to manipulate

language as an object (Ehri 1985).

A type of linguistic awareness that spoken utterances

consist of sequences of phonemes (Mann et al 1987).

Conscious access to the phonemic level of speech stream

and some ability to cognitively manipulate

representations at this level (Stanovich 1986a).

The ability to reflect on and manipulate the phonemic

segments of speech (Tunmer 1990; Tunmer & Hoover in

press; Tunmer & Rohl 1990)

Each definition implies a conscious, controlled skill

which is important in helping readers break the

orthographic code, and is entirely separate from and does

not develop as rapidly or spontaneously as the reception

and production of speech.

Young children unconsciously and automatically

discriminate between the speech sounds that signify

meaning differences, therefore they do not consciously

need to attend to the sounds in words until they need to read and write. At this point they need to be able to push their attention down from the level of comprehension to sound units (Adams 1990), and as phonemes per se cannot always be related to specific graphemes, or segmented into speech, as they may be overlapping, the task, in essence, becomes abstract, as the phonological units being dealt with are abstract. In other words, the development of phonological awareness relates to the child's ability to stand back from and control his/her intellectual processes. Thus it requires "control processing" (Tunmer 1990; Tunmer & Hoover in press; Tunmer & Rohl 1990), which may not be spontaneously acquired, but can be successfully taught.

2.24. Alternative Definitions of Phonological Awareness.

The definition of phonological awareness has been broadened by other researchers to include awareness of larger phonological units.
For Morais, Bertelson, Cary & Alegria (1986), phonological awareness is a conscious concentration, but they broaden their definition to include syllables. It is argued however, (Tunmer & Rohl 1990) that as syllables, unlike phonemes, can be separated into sound units, such segmentation may not need metalinguistic ability.

Treiman (1987) has suggested that there is an intermediate level of phonological structure between segmentation of syllables and phonemes which is the ability to segment syllables into onsets and rimes. In her definition, phonological awareness means awareness of the phonological units of spoken language, and she suggests that a hierarchical view of the unit be adopted to allow for the discrimination between phoneme and syllable. She further suggests that transition between the two would be gradual rather than in clearly defined stages. Treiman maintains that this distinction is an important one as it helps us to understand the relationship between phonological awareness and literacy. Bryant & Goswami (1987) and Goswami (1986) found that the ability to segment syllables into onsets and rimes was in fact advantageous when related to the recognition of regular spelling patterns, but found that more phonological awareness was required for beginning readers to get to irregular spelling patterns.

2.3. THE RELATIONSHIP OF PHONOLOGICAL AWARENESS TO LITERACY.

Phonological awareness relates to literacy in several major ways.

2.31. The Causal Relationship.

The first suggests, that phonological awareness is causally related to learning to read. Evidence for this comes from different studies. First, there are those studies that find that phonological awareness is correlated more highly with reading acquisition that any other measures such as social class, parent education, I.Q. and reading readiness tests (Bradley & Bryant 1983, 1985; Bryant & Bradley 1985; Goldstein 1976; Juel, Griffith, & Gough 1986; Mann 1984; Share et al 1984; Stanovich, Cunningham & Cramer 1984; Stanovich, Cunningham & Feeman 1984b; Tunmer & Nesdale 1985; Zifcak 1981).

Second, are those studies which assess phonological awareness at the preschool and kindergarten level and find it to be a reliable predictor of beginning reading ability (Ball & Blachman 1991; Blachman 1984; Bradley & Bryant 1983,1985; Bryant & Bradley 1985; Fox & Routh 1975; Lundberg, Olofsson & Wall 1980; Mann 1984; Olofsson 1985; Perfetti 1985; Rosner 1971,1974; Share, Jorm, MacLean & Matthews 1984; Williams 1984). In fact, phonological awareness has been shown to be the best of thirty nine measures in predicting reading success after two years (Share et al 1984), to predict future reading

ability even when the influence of present reading ability is statistically partialled out (Perfetti 1985; Vellutino & Scanlon 1987), or when any children showing reading ability are excluded (Bradley & Bryant 1983; Tunmer, Herriman & Nesdale 1988), and when such measures were administered to kindergarten children who had already been screened for further literacy support (Mann 1984).

Thirdly, there are those studies, for example Bradley & Bryant (1983,1985); Bryant & Bradley (1985); Fox & Routh (1984); Lundberg, Frost & Petersen (1988); Olofsson & Lundberg (1985); Torneus (1984); Trieman & Baron (1983); in which specific phonological awareness training has been given, resulting in improved performance in literacy skills.

The strong view of the causal relationship between phonological awareness and learning to read suggests that phonological awareness not only facilitates the acquisition of literacy, but that some minimal level is required to get readers underway (Gough & Hillinger 1980; Gough & Tunmer 1986; Jorm & Share 1983; Juel, Griffith & Gough 1986; Stanovich 1986; Treiman & Baron 1981; Tunmer, Herriman & Nesdale 1988; Tunmer & Hoover in press; Tunmer & Nesdale 1985; Tunmer & Rohl 1990).

Evidence for this comes from studies using pseudowords. Juel, Griffith & Gough (1986); Tunmer, Herriman & Nesdale (1988); and Tunmer & Nesdale (1985), showed that some children performed well on phoneme segmentation, but performed poorly on pseudoword decoding. However, there were no children with poor segmentation skills who performed well on the pseudoword decoding task, showing that some minimal form of phonological awareness appears to be necessary , but not sufficient in itself for decoding. This is not meant to imply however, that phonological awareness is a prerequisite for reading instruction, as this is a separate issue.

2.32. The Consequential Relationship.

Another major area in which phonological awareness is related to literacy is in the suggestion that phonological awareness is a consequence of reading acquisition. Ehri (1979,1984,1985), Perfetti (1985), Perfetti et al (1981), and Wagner & Torgesen (1987) for example, have found that reading acquisition facilitates phonological awareness. Further support comes from Morais, Cary, Alegria & Bertelson (1979), who found that illiterate adults lacked phonological awareness, while adults who had recently become literate, showed some measure of this ability.

2.33. The Reciprocal Relationship.

Independent studies in each of these area brings us to yet another major way in which phonological awareness relates to literacy learning. This suggests that phonological awareness is both a cause and a consequence of learning to read (e.g. Perfetti, Beck, Bell & Hughes 1987; Tunmer & Rohl 1990). These studies suggest that not only is there a reciprocal relationship between phonological awareness and learning to read, but that this relationship leads to a snowballing or bootstrapping effect for both phonological awareness and literacy development. Thus, with some minimal level of phonological awareness, children are able to take advantage of the orthographic cipher which is necessary in learning to read. The more children learn to read, the more phonological awareness develops, which assists them to read, not only more text, but increasingly more difficult text.

Adams (1990) suggests that the ability to count the phonemes in a syllable is only beginning to stabilize by the end of the First Grade. Calfee, Lindamood & Lindamood (1973) argue that the ability to add, transpose and delete phonemes continues to develop through the grades. Thus the degree of difficulty of the phonological

awareness task could suggest whether the attribute being tested was a cause or consequence of learning to read.

A hierarchical concept is also used in the measurement of phonological awareness, with differing tests suggesting different degrees of difficulty. For example, oddity tests such as those used by Bradley & Bryant (1985) which ask children to compare and contrast words by rhyme and alliteration, are easier than blending tasks (Goldstein 1976), which give children the phonemic segments and ask them to put them back together again.

Blending tasks are easier than segmentation tasks, though Fox & Routh (1976) argue that some segmentation ability is needed in order to blend, and this would depend on whether the word concerned was heard or viewed. Phoneme manipulation tasks (e.g. Bruce 1964) are seen as being the most difficult of all.

The results of all tests of phonological awareness however, measure the same underlying construct (Yopp 1988), and all show a strong correlation between phonological awareness and reading.

2.34. The Relationship of Phonological Awareness to Other Aspects of Reading and Writing Development.

Phonological awareness has also been shown to interact with parts of the processes deemed necessary in order to be able to read and write independently, namely its relationship to alphabet knowledge, spelling, and comprehension.

2.35. The Relationship to Letter Name Knowledge.

Letter name knowledge is one of the best indicators, yet not apparently causally connected to reading performance. Studies by Ehri (1983); Ehri & Wilce (1980,1985); Mann (1986); Masonheimer, Drum & Ehri (1984); Walsh, Price & Gillingham (1988) for example, have shown that alphabet knowledge is essential for the acquisition of both reading and writing. To use the alphabetic code, children have to be able to segment either sound, letter, or both to make a connection between the letter and the phoneme it represents. Studies (Bryant & Bradley 1985; Liberman, Rubin, Duques & Carlisle 1985; Morais, Cary et al 1979), suggest that it is hard to attain phonological awareness without some knowledge of alphabet letters. Conversely, Ohnmacht (1969) found little benefit from teaching letter names without the corresponding sounds because, as most letter names contain the phoneme to which the letter

generally refers, only children who can segment phonemes will benefit from letter name knowledge. It is by using the alphabetic code in producing such examples as <u>L</u> to represent elevator that children are able to make their first real connections between the spoken and written word. The development of phonological awareness is vital in allowing children to reflect on and manipulate the sounds in words which enables them to progress beyond this point, to the stage where they are able to approximate spellings such as <u>blaosis</u> for blouses and <u>tabl</u> for table.

2.36. The Relationship of Phonological Awareness to Spelling.

Phonological awareness has been shown both to predict and be causally related to spelling development (e.g. Liberman, Rubin, Duques & Carlisle 1985; Mann, Tobin & Wilson 1987; Morris 1981). Liberman et al (1985) found that the phonological accuracy of the pre-conventional spellings of kindergarten children was highly related to phonological awareness even when controlled for general intelligence. This was confirmed by Mann, Tobin & Wilson (1987), and Rohl & Tunmer (1988). The latter found that average and good spellers performed better on tasks of

phonological awareness than poor spellers in a spelling
age match study which compared poor Fifth Grade spellers
with average Third Grade and good Second Grade spellers.
This study, while suggesting that phonological
segmentation skill is causally related to spelling
acquisition, could also suggest a reciprocal relationship
between spelling and phonological awareness.
As phonological awareness becomes more developed,
discrimination becomes more sophisticated, and children
learn to hear and record less dominant consonants,
consonant blends and vowels. This enables them to write
more, which in turn allows them to learn and commit to
memory more regular spelling patterns in printed words.
This reciprocal payoff, allows writers to shift from
exclusive reliance on sound/letter associations to
supplementing this strategy with known patterns involving
digraphs, letter clusters, syllables, prefixes, suffixes,
and root words which make up the general rules of
conventional spelling. Other evidence for such a causal
relationship has been reported by, for example, Cataldo &
Ellis (1988).

This reciprocal relationship between phonological
awareness and writing interplays with the reciprocal
relationship between writing and reading. In discussing
the latter relationship Clay (1985:54), suggests that a

case can be made "for the theory that learning to write letters, words and sentences actually helps the child make the visual discriminations of detail in print that he will use in his reading." Given that a reciprocal relationship also exists between reading and phonological awareness, it is easy to see the importance of daily reading and writing opportunities.

2.37. The Relationship of Phonological Awareness to Comprehension.

The relationship between phonological awareness, and comprehension is seen to take place indirectly, in conjunction with syntactic awareness, through phonological recoding ability (e.g. Stanovich, Cunningham & Feeman 1984b; Tunmer 1990; Tunmer & Hoover in press; Tunmer & Nesdale 1985).

Phonological recoding is the ability to render letters and letter clusters into phonological form and alternatively to map phonological elements of speech onto print. It may draw on morphophonemic rules that speakers know unconsciously, such as the difference in pronunciation of the suffix ed in looked and jogged, and also on the person's ability to translate single graphemes to single phonemes, clusters of graphemes to clusters of phonemes, and the person's knowledge of analogies, or a combination of all of these.

Phonological awareness is necessary for phonological recoding, as readers must be able to analyze the internal structure of the spoken word to discover the relationship between the phonemes and the graphemes (e.g. Juel, Griffith & Gough 1986; Tunmer & Nesdale 1985). When this ability is used in conjunction with language prediction skills, or syntactic awareness, it offers the reader the mechanism for comprehending unfamiliar words in meaningful text and writing unfamiliar words in meaningful messages. Children who are unable to recode, will encounter difficulties at novel words in text, as they will have no way of finding out the sound pattern and thus predicting or checking the meaning.

Gough & Tunmer (1986) suggest that any person will have trouble comprehending text if they are both unable to understand the language being read, and if they cannot recognize the words.

2.4. EARLY LITERACY LEARNING.

2.41. Introduction.

There are conflicting findings in the literature between the meaning emphasis proponents (e.g. Goodman 1967; Goodman & Goodman 1979; Smith 1971), and the code emphasis proponents (e.g. Chall 1967, 1978, 1979, 1983,

1989), as to the most appropriate way to teach children to learn to read. Unfortunately, amid this debate, the two separate issues of how children learn to read and how children should be taught to read have often become indistinguishable. For example, beginning readers and writers need to come to the understanding that there are systematic correspondences between the elements of spoken and written language. This does not imply however, that only one type of systematic phonic instruction will enable children to realize this.

2.42. The Learning Context.

How children learn to read can best be discovered by looking not only at the learner (Clay 1979, 1985, 1991), but also at the context in which the learner has developed (Vygotsky 1972, 1978). In observing the overt reading behaviours of young children over time we can see how they use their ever increasing prior knowledge of the world in general, and literacy in particular, to refine their understandings about print, and the way it works in stories, paragraphs, sentences, words and letters. We are then able to make inferences about which processes the learner currently controls, which processes are on the way to being controlled, and which processes the learner has yet to attend to.

2.43. Methods of Instruction.

By looking at the socially interactive context of the preschool environment in which the foundations of literacy learning have so often been laid, we can formulate a general theory of learning, and the type of environment which will foster such learning.

Ideally on entry to school, learning to read should continue to develop naturally for young children, guided by competent teachers who are able to build on children's current strengths, and extend their literacy learning within daily opportunities for reading, writing and talking. In fact, the reality of the situation, is that the type of programme encountered in the formal education system will reflect either that system's, that school's or that teacher's theory of literacy learning, and different emphases will be placed accordingly. Thus those following a top down semantically driven theory will emphasize different behaviours from those following a bottom up decoding theory.

Clay (1990:238) warns us that there are "costs and risks in any programme emphasis" especially for some children. Those children who are able to make good progress regardless of the programme emphasis, are those children who are able to learn beyond the programme. This ability is usually only possessed by high progress readers.

Ferriero & Teberosky (1982), for example, suggest that children with little previous literacy experience often encounter problems on entry to school.

There also appears to be a difference of opinion in the literature as to whether methods of instruction make any difference to the acquisition of phonological awareness. Tunmer & Bowey (1984), Tunmer & Herriman (1984) and Tunmer & Nesdale (1985) assert that as the development of phonological awareness is related to other aspects of cognitive and linguistic development and develops independently, it should not be overly affected by the method of instruction, though some methods, such as those which allow children to practise phonological awareness skills, may exert some influence. Clay (1985) agrees that programmes don't seem to make the difference. Children who succeed in a variety of different programmes are those who appear to be able to make the connections between the sounds which go with letters, those who fail are probably those who are unable to do so.
Adams (1990:416) reviewing the literature comes out in favour of "good phonic instruction" that is "systematic instruction on letter sound correspondences," designed to "develop children's sensitivity to spellings and their relations to pronunciations," which should be given "paramount importance". Alegria, Pinot, and Morais

(1982) and Morais, Cary, Alegria and Bertelson (1979),
also suggest that reading instruction emphasizing
decoding skills greatly influences phonological
awareness.

While concurring that children do indeed need to know
about letter/sound, sound/letter relationships as part of
becoming readers and writers, the emergent literacy
perspective, as espoused by Strickland and Cullinan
(1990) for example, would be that such learning has
already been occurring for children as they interact with
their preschool environments. It must be remembered that
phonological awareness is only one aspect of what is
needed for children to become competent, independent
readers and writers. On entry to school, this learning
can be successfully developed when necessary, embedded in
a balanced literacy programme consisting of real reading
tasks where books are read to, with and by children, and
writing includes approximated and regular spellings and
is an integral part of the daily programme.

2.5. DIFFERENTIAL ATTAINMENT.

2.51. Introduction.

In any group of beginning readers however, no matter the efficacy of the literacy programme, there will be some, who, after a year of school, have failed to engage with the system for some reason or another, and will have started to fall behind their age peers.

2.52. The Role of Phonological Awareness in Differential Attainment.

It has been suggested widely over the past decade that phonological awareness accounts for much of the difference evidenced in early literacy behaviours (e.g. Felton & Wood 1989; Pratt & Brady 1988; Stanovich 1986a; Vellutino & Scanlon 1987).

Children deficient in phonological awareness are unable to make use of the alphabetical principle to assist with the searching for and checking of cues in text. They are also impeded in the speed and automaticity with which they can recall from, and incorporate new words into their store of known vocabulary. For these children, texts will soon become too difficult, especially as picture support is withdrawn. This in turn will lead to a marked difference in the amount of exposure to print, or

reading mileage, for good and poor readers. Clay (1979) found that after a year at school, the high progress readers read in excess of 20,000 words, compared with average readers who read between 10,000 and 15,000 words, and low progress readers who read only 5000 words. Similar findings regarding the vastly differing amounts of exposure to print have been reported by Allington (1980, 1983, 1984); Biemiller (1977, 1978); and Juel (1988).

If we accept that phonological awareness is both a cause and a consequence of learning to read, we can see clearly that the low progress reader is soon unable to take advantage of the snowballing effects of reading and learning to read.

2.53. The Concept of Negative Matthew Effects.

Walberg & Tsai (1983) first coined the term "Matthew Effects" in education by using the Biblical analogy of the rich get rich and the poor get poorer. Stanovich (1986) adopted the same terminology in reading to show how such small differences in early reading ability can

lead to cumulative advantage or disadvantage, that is positive and negative Matthew Effects, leading to self fulfilling, self reinforcing behaviours, which soon evidence themselves as wide differences in reading ability in particular, and academic achievement in general.

As far back as 1979 Clay stated emphatically "that where a child stood in relation to his age mates at the end of the first year at school, was roughly where one could expect to find him at 7 or 8" Clay (1979:13). She, in New Zealand, along with Lundberg (1985) in Sweden, and Juel (1988) in America, have all found that children who are making poor progress after one year at school, continue to make poor progress. As these three countries have different ages for entry into formal education, employ different first year programmes, and, in the case of Sweden, speak a different language, it appears that there must be some other common factor which causes those who are failing after one year at school to continue to fail. Following the simple view of reading (Gough & Tunmer 1986), Juel reported a longitudinal study following children from First to Fourth Grade. She describes the negative Matthew Effects in her study as a "vicious circle" for those children who did not develop good word recognition skills in the First Grade.

2.54. Programme Implications.

We can therefore see from the proceeding evidence that
waiting for age or maturation is not a viable educational
option for those who are having trouble with phonological
awareness. Neither is it a viable option cognitively.
Tunmer, Herriman & Nesdale (1988) found that poor
segmentation skill was not evidence of some special
cognitive deficit, but rather indicated a slower rate of
cognitive development. This developmental lag hypothesis
was supported by comparing pre-literate children with low
levels of phonological awareness and below average
decentration ability, with children with low levels of
phonological awareness but above average decentration
ability. The latter group showed greater phonological
awareness during the year than the former. This leads to
the conclusion that phonological awareness skills can be
taught. We have further evidence for this from Bradley &
Bryant (1985) and Lundberg, Frost & Petersen (1988), who
both report beneficial effects from training programmes
either before or after the commencement of formal reading
instruction.

2.6. SYSTEMIC INTERVENTION.

The foregoing body of research can be considered in relation to assumptions that should underpin educational practices within an education system.

In any system there should be three areas of intervention. First, is the area of promotion and protection to ensure the prevention of a problem. This would encompass high quality teacher training, based on up to date research, both at the preschool and school level, and the reflection of this research in appropriate classroom practice.

The second area would be that of early diagnosis and intervention to lower the problem rate, and would encompass short term programmes specifically designed to catch pupils up with their age peers. Even after such specific training has been given there are still often major individual differences (Wallach & Wallach 1979; Williams 1980) which lead to the necessity for the third area of intervention, namely long term programmes which are designed to assist children overtime to prevent chronic conditions occurring.

2.7. READING RECOVERY.

2.71. Reading Recovery as a Systemic Intervention.

Reading Recovery is one early intervention programme
which is currently, successfully implemented in many
different education systems. In New Zealand it operates
at the national level, in Australia at the state level in
the Capital Territory and Victoria, and at both the state
and the district level in several states in the United
States of America. Studies (e.g.Clay 1985, 1990b ; Clay
& Watson 1982; Huck & Pinnell 1985; Pinnell, DeFord &
Lyons 1988; Pinnell, Fried & Estice 1990; Smith 1986;
Wheeler 1984), have all shown that not only is Reading
Recovery very sucessful for children after the first year
of operation, but that when followed up years later, the
children continue to make good progress in their normal
classrooms.

2.72. Reading Recovery Defined.

The Reading Recovery Programme has been variously, and
often inaccurately, described.
Whereas Wasik and Slavin (1990:4) point to children being
taught "the metacognitive strategies for predicting

events in stories, using pictures and context, monitoring
the correctiveness or plausibility of their own reading,
and correcting their own errors", Adams(1990;412)
describes it, along side other programmes such as Jeanne
Chall's Reading Laboratory at Harvard, as a programme
designed to "develop a thorough appreciation of
phonics".

In effect the Reading Recovery Programme is a system-wide
intervention designed to reduce the incidence of reading
failure within that system. In order to do this in the
most expedient and economical fashion, children requiring
extra help with reading and writing are identified using
a wide range of observational procedures, after one year
at school. They are then given a daily, one to one lesson
by a highly trained specialist Reading Recovery teacher.
This lesson is in addition to their classroom literacy
programme, and is based on their particular strengths and
weaknesses so that within as little as 12 to 20 weeks
they have made accelerated progress and have returned to
average levels of performance within their regular
classrooms.

Reading Recovery is not a packaged approach to teaching
reading. It adheres to the philosophy embodied in the
emerging literacy perspective, that is, that children
bring to school different amounts of knowledge about
their world, and their language and show that they know

how to use this knowledge in their everyday reading, writing and oral language activities. Reading Recovery also works on the premise that the many things needed to become successful readers and writers are learned, and that this learning occurs for many children in a balanced first year programme.

Because the programme accepts as its cohort those children who have, for some reason or another, not engaged with the system in the first year of instruction, and who are thus at the tail end of the achievement distribution, and because it addresses their differing needs both on entry to the programme, and over time within the programme, it has to have an instructional flexibility which allows it to encompass a variety of processing behaviours. This programme flexibility is also essential in allowing each child to make accelerated progress.

This early intervention and accelerated progress, allows an education system to intervene before the children have habituated incorrect responses for so long that they are in fact "learning to be learning disabled" (Clay 1986b), and have acquired all the attendant social and emotional problems associated with such a label.

2.73. The Reading Recovery Programme.

The Reading Recovery Programme was designed by Marie Clay
following extensive observational research of beginning
readers and writers (Clay 1966, 1979, 1982, 1985, 1991).
The programme provides those lowest achieving children
with a second chance to catch up. Each child's daily,
individual lesson is heavily biassed towards reading a
variety of short, interesting texts and writing stories,
and also offers the student opportunities to practise,
and to build on, the competencies s/he already controls,
and to formulate ways of knowing how to deal with
increasingly difficult material, which enables him/her
not only to learn to read, but to learn by reading.
The reading process for Clay (1991:243) hinges on the
child being an active problem solver, who has to gain
inner control over a wide range of strategies so that
"within the directional constraints of the printer's
code, verbal and perceptual behaviour are purposefully
directed in some integrated way to the problem of
extracting a sequence of cues from a text to yield a
meaningful and specific communication."
As expected the Reading Recovery procedures reflect this
point of view. Clay (1987) suggests that the teacher is
not teaching items of knowledge so that the children can
recognize them in text. What the teacher is doing is

teaching the child how to work on text, and implicit in this, is a knowledge of some items. What a child needs to be able to do, is to use pieces of information from the meaning, the syntax, the words, the visual information and the phonology of language, and to work flexibly around these in order to search for and check on information in reading and writing. "The message is search any knowledge you have to help you solve the problem" (Clay 1989:9).

The teacher and the child work together within a zone of proximal development (Vygotsky 1972) which constantly pushes the child's learning ahead of what s/he can accomplish independently. As the child demonstrates increasing control over the reading and writing process, the teacher encourages the child to take more responsibility for the decision making, thus fostering independence.

This independence has enabled children to continue to learn back in the classroom after their Reading Recovery programme has been discontinued. Follow up studies in New Zealand (Clay 1980; Clay & Watson 1982), and in the United States of America, Pinnell et al (1988), show that those children who receive a complete Reading Recovery programme continue to make acceptable progress for at least the following three years.

2.74.   Some Alternative Observations.

Glynn, Crooks, Bethune, Ballard & Smith (1989), and Wasik
& Slavin (1990), have each reported that the positive
effects of Reading Recovery appear to be diminishing
after discontinuation.

Wasik and Slavin rationalize this by suggesting that the
size of the difference may not be diminishing, but the
importance of the difference may be. They suggest that a
difference of, for instance, three months may be a big
difference at the end of the First Grade, but a small one
at the end of Grade 6.

Glynn et al surmise that some of this difference may be
accounted for by a classroom group placement at the time
of discontinuation, which is anything from 1-3 levels
lower than that which the child was reading in his/her
Reading Recovery programme. They hypothesize that this is
" to allow for the consolidation of reading skills
developed rather quickly in Reading Recovery" (1990:124).
They recommend subsequent monitoring to see if the
benefits of the programme emerge later as they do with
some other intervention programmes, for example the
Headstart programme in the United States of America.

Tunmer (1989,1990) offers another explanation for the
somewhat modest gains seemingly apparent one year after
discontinuation of the Reading Recovery Programme which

were reported by Glynn et al. He suggests that Reading
Recovery temporarily increases the rate of reading
development, but does not systematically address the
development of either syntactic awareness or phonological
awareness. This, he suggests, may lead to the children
leaving the programme deficient in these metalinguistic
abilities.

Syntactic awareness can be measured by tasks which
require children to reflect on sentence structure. A
cloze task which asks children to select appropriate
words using the surrounding meaning and syntax would
provide such a measure. Glynn et al, using an oral cloze
task found that the children who participated in Reading
Recovery did not benefit over the comparison children for
whom no Reading Recovery programme was available.
Because Glynn et al appeared to ignore the writing
component of the Reading Recovery Programme and did not
design any specific measures to assess the children's
knowledge of graphophonic information, the argument
cannot be made with the same certainty regarding
phonological awareness. However, Nicholson (1989) feels
that the overall mix of activities in the Reading
Recovery Programme may not lead the children into getting
a clear understanding of the way sounds are encoded in
print.

Drawing on the research into phonological awareness, Tunmer suggests that deficiency in this area is highly probable, and proposes that children who are failing may need more intensive, systematic instruction in this metalinguistic ability than that afforded by a Reading Recovery programme.

2.75. The Relationship of Reading Recovery and Phonological Awareness.

As the Reading Recovery procedures were developed in 1976 and 1977, they need to be viewed in relation to the available literature of the time. Clay (1989) states that the role of phonological awareness was not clear at that time and appeared to be more an outcome of learning to read. It was assumed that because Reading Recovery encompassed a wide range of behaviours, teachers would deal with phonological processing as necessary, usually through the daily writing task, so no special procedures were designed to foster its acquisition. It is during this daily writing task that children are able to build phonological awareness. As children construct messages, they have to pay attention to letter detail, letter order, letter sound sequences and the links between oral and written language.

Procedure 5 (Clay 1985), provides for specific training in hearing the sounds in words in sequence as part of the daily writing task. Following a technique devised by Elkonin (1973), the children's first attempt to segment words into their constituent sounds are done in the absence of print. Children are asked to show what they can hear with counters not letters. As they become more competent, they are encouraged to write the corresponding letters for the sounds they can hear. When the children have good control over hearing and recording consonants and some vowels, the teacher introduces them to the mismatch between the sounds of language and spelling patterns.

Those children who, in spite of daily opportunities to read and write don't seem to be formulating and testing a theory of the reciprocal nature of reading and writing for themselves, are provided for in procedures 10 and 11. Procedure 10 provides for "developing links between how the child analyses the sounds in words he needs to write or check in his reading and how the child analyses the letters and letter clusters in a word in his reading against the word he is trying to say" (Clay 1985:75). In the reading task a child may be encouraged to sound the initial letter of a problem word in text in order to make him/her " more conscious of a strategy that would

help him/her eliminate the words that would fit the context, but not the first letter cues." (Clay 1985:75). Sometimes this articulation may have to go beyond the first letter or letter cluster until the word that would fit the context semantically, syntactically and visually, becomes apparent. This blending task is directly related to phonological awareness.

Procedure 11 addresses word analysis, as determined by a child's needs rather than a teacher's instructional sequence, and aims to help the children learn how to use, not only letters, but chunks of information, to analyze and solve unknown words. Children are invited to build, dismantle, substitute and/ or add letters, and reform words with magnetic letters to foster the visual analysis of words in text. This segmentation of words into syllables, onsets and rimes, and constituent sounds also fosters the development of phonological awareness.

Although the preceding procedures allow for the development of phonological awareness incidentally, provision is made on page 57 of the Reading Recovery Procedures (Clay 1985), for paying particular attention to a particular weakness. This may include, "A training in hearing sound sequences, first and last sounds and clusters of sounds." At the beginning of a child's

clusters of sounds." At the beginning of a child's
instructional programme this may necessitate a temporary
detour from text reading and writing. The proviso is that
the teacher return to text reading as soon as possible,
preferably within the same lesson.

It would appear from the foregoing information that
although no specific procedure is labelled as such, there
is opportunity within the Reading Recovery lesson for the
development of phonological awareness both overtly and
covertly.

2.8. SUMMARY.

It has been assumed throughout this chapter that the
acquisition of reading and writing involves very complex
processes that start long before the point of entry into
formal education.

Within the reading and writing processes there are many
areas of knowledge which children have both to know, and
to know how to use. These include prior experience of the
world, oral language patterns, book and story structures,
and cues from the message and the sentence structures.
Children also need to know, and know how to use the
letters, letter clusters and spelling patterns that make
up the words in print.

Underlying this knowledge is the development of four metalinguistic abilities, pragmatic awareness, word awareness, syntactic awareness and phonological awareness, which are thought to be essential in the acquisition of reading and writing. Metalinguistic abilities are thought to be cognitive structures which develop independently from language, and require children to be able to stand back from the product and reflect on, and examine, the processes.

Even though each of these metalinguistic abilities is important, phonological processing which includes phonological awareness and phonological recoding, has been singled out for particular attention, as, without the ability to articulate sounds and attach them to corresponding graphemes, children are not able to extract precise messages from print. A wide body of research over the last decade has pointed to the causal, predictive and reciprocal relationship between the acquisition and development of literacy and phonological processing.

The optimum context for the development of literacy takes its cue from the early childhood years, where children formulate, test and refine their naive theories of the world in relation to the new experiences they encounter. Children are active problem solvers and constructors of

knowledge who are encouraged, reinforced and praised for their attempts by more capable peers and adults. Ideally this situation should continue in the school environment.

It has been suggested that what children need to learn and how they should be taught has often become confused. Many theorists have become polarized regarding what they consider to be the key elements of the reading and writing processes. Such polarity is reflected in policy making which has lead to a variety of classroom programmes many of which are particularly narrow in focus.

The position taken in this paper, is that children should learn to read and write by reading and writing in programmes that are balanced, and broad enough to cater for children with different entering ability, different strengths and weaknesses, different learning styles and who make different rates of progress. Necessary understandings, should arise from context, be addressed, and returned to context, rather than be taught as isolated skills.

No matter what the initial programme, there are those children who after a year of instruction appear to be falling behind their age peers. This small initial

difference soon manifests itself as a wide gap both in literacy learning and general academic ability. Research has suggested that phonological awareness may be the cause of such differences, and programmes which train children in phonological awareness have shown beneficial results.

Reading Recovery is a successful early intervention programme. The programme addresses a wide range of reading behaviours with the emphasis on teaching children a number of strategies to assist them to develop a self extending system, whereby, as they continue to read increasingly difficult material, they also learn by reading.

Critics of the programme have suggested that children entering Reading Recovery may be deficient in phonological awareness, and that the overall combination of activities may not give the children the opportunity to get a consistent grasp of the way sounds are encoded in print. If this is in fact the case, the children could leave the programme still deficient in phonological awareness which would soon negate the apparent gains made by Reading Recovery.

2.9. TOWARDS BREAKING THE CYCLE OF NEGATIVE MATTHEW EFFECTS.

Clay (1989) suggests that there are three types of initiatives aimed at breaking the cycle of minimal progress.

The first suggests the identification of some developmentally important variable, and the introduction of training programmes specifically designed to rectify this. Given that phonological awareness is one such developmentally important variable, programmes such as those reported by Bradley & Bryant (1983,1985), and Lundberg, Frost & Petersen (1988) exemplify appropriate intervention.

The second refers to programmes or specific instructional procedures that are designed and specially packaged to assist all those children experiencing reading failure according to a specific definition. Distar in the United States may be one such example.

Thirdly there are those programmes such as Reading Recovery that work from the assumption that learning to read and write involves gaining control over a wide range of behaviours necessary to understand very complex processes. As active participants in the process,

children have to learn how to fit all the pieces together. This being the case, they will enter the programme with different strengths and weaknesses, approach the task in different ways, and make different rates of progress.

2.10. THIS STUDY.

The aim of this study is to combine two of the aforementioned initiatives, namely that of using a programme such as Reading Recovery which addresses a wide range of behaviours, and teaches children not only the behaviour, but when and how to apply it, but also that of identifying an important variable, in this case phonological processing, to see if the combination of the two would lead to a more powerful programme for children at risk.

On the evidence of the literature, it was predicted that this study would show that children who were failing to keep up with the peers after one year of literacy instruction would indeed be deficient in some aspects of phonological processing regardless of the type of first year instruction they had been exposed to.

It was also predicted that the Reading Recovery programme would adequately provide for the development of

phonological processing, because provision had been made for such learning both overtly and covertly in the procedures.

It was further predicted that the modified Reading Recovery programme would be more powerful than the standard programme because of the systematic instruction which teaches children how to use phonological processing strategies for both reading and spelling.

CHAPTER THREE.

METHOD.

3.1. SUBJECTS.

The Children.

The children were all First Graders in Rhode Island, and
were aged between 6.0 and 6.5 on the 1st September 1991.
The mean age for the treatment groups was 6 years 2.5
months. These children had all been designated as
requiring extra services in reading at the end of the
Kindergarten year. Depending on the system operating in
individual school districts, this decision had been made
on the results of either the Metropolitan Achievement
Test,(MAT 6), a standardized test administered to
kindergarten children in March of that year, or, if the
school district did not use this test, the results of the
personal battery of tests given by the qualified Reading
Specialist attached to each school. In either instance,
the test results were supported by a referral from the
Kindergarten teacher. From this pool of children, the
Reading Recovery teachers tested, on average, the ten

lowest ranked children in their school with the Diagnostic Survey (Clay 1985) and the Word Recognition Test (Dolch 1939). From this group of children, each teacher then chose the four lowest performers across the range of these observation procedures for the Reading Recovery Programme.

In the two Reading Recovery Programmes, 23 schools across 13 school districts, and 26 Reading Recovery teachers were involved. The 64 children were drawn from 34 different classrooms. In the standard intervention programme, 7 schools and 7 reading specialists were involved. These 32 children were drawn from 13 different classrooms. The schools were representative of both high and low socio- economic groups, and also of children from varied ethnic backgrounds, with English as either their first or second language. The classrooms the children were drawn from ranged from those employing exclusively a traditional basal approach to reading, to those which had embraced the "Whole Language" philosophy.

Three distinct types of classroom were identified. The first was a straight, traditional, basal classroom where the children were receiving either whole class or ability group phonics and skills instruction. The children followed the instructional sequence by completing a workbook exercise. However, it should be noted, that the workbook exercises were often not related to the phonic

or skill elements that had been taught in the
instructional part of the lesson. In schools using the
older basal series, this was the entire reading and
writing programme, but schools using some of the newer
basal materials had incorporated the use of the text
extenders in these series for independent reading.
The classrooms identified as "Whole Language" classrooms
were typically at the other end of the scale. The
children were surrounded with "literature". Reading
instruction was at the class or individual level only,
and proceeded through the children's own language
experiences and "big books" to the independent reading of
the literature. No phonics instruction was evident, but
words were taken from the language experience stories for
memorization. Writing was in the form of journal writing
with approximated spelling being the way for children to
write unknown words. All the children's attempts were
highly valued, but there was no teacher intervention to
help the child move to more conventional spelling either
by tuning in more closely to the sounds in words in
sequence, making links from known to unknown, knowing how
to write some words correctly, or knowing where to find
required words in the environment.
The third type of classroom was identified as "mixed". In
these rooms the teacher was seen to be combining some
aspects of the whole language philosophy with the basal

reading series. Children still met in ability groups for reading instruction which included work in phonics, but follow up activities included writing a response to the story in a journal as well as, or instead of, the workbook exercise. The reading programme also included language experience and the reading of big books.

3.2. DESIGN.

The experiment, a closely matched, intervention study, employed a between subjects group design, in order to look at the differential effects of different programmes on children matched initially on phonological processing ability.

Children from each of two Reading Recovery Groups were matched on phonological processing ability with each other and with a group of children who were receiving their normal reading support services but for whom no Reading Recovery programme was available.

Both Reading Recovery groups received their standard Reading Recovery lessons, but in addition, the children from one of the Reading Recovery groups received additional training in phonological processing as part of their Reading Recovery lesson. When each child from both of these groups was ready to have his/her Reading Recovery programme discontinued, and was again tested

with the same battery of tests, the matched control group child was also retested. At this time another child from the same classroom as each Reading Recovery child, who was considered by the classroom teacher to have always been an average student and who was currently performing at average levels was also tested.

Although all the children were individually tested at the beginning and the end of the study, and at the end of the year, with the complete Diagnostic Survey including records of reading behaviour to assess each child's easy, instructional and frustrational levels of performance on text (Clay 1985), The Dolch Word Recognition list (Dolch 1939), and three tests of Phonological Processing (Yopp Singer 1988, Bruce 1964, and a test of pseudoword decoding), the children who were selected to participate in the study were matched on the basis of their performance on two subtests of the Diagnostic Survey, Letter Identification and Dictation.

As it was impossible to get an exact match using raw scores, the 1978 stanine scores (Clay 1985) were used for the Letter Identification and Dictation test and children were individually matched using the closest raw scores within the stanine range. Table 1 shows the resulting 40 matched groups of three children with their stanine scores for both the Letter Identification and the Dictation tests.

Table 1.

Stanine Scores of Groups of Children Matched on

Letter Identification and Dictation Tests.

n	Letter Identification	Dictation
2	1	1
3	2	1
1	2	2
2	3	1
7	3	2
5	3	3
7	4	2
5	4	3
2	4	4
1	5	2
2	5	3
2	5	4
1	5	5

3.3. MATERIALS.

3.31. The Tests.

Researchers have used a variety of instruments to test
beginning reading, most of which are positively and
significantly correlated. The tests chosen for this study
were intended to reflect a wide range of beginning
reading behaviours, and comprised The Diagnostic Survey
(Clay 1985), a word recognition test (Dolch 1939), a

phoneme segmentation test (Yopp 1988), a phoneme deletion test (Bruce 1964), and a test of pseudoword recoding. It was predicted that children would not reach ceiling levels of performance on the phoneme deletion, and the pseudo word decoding tasks.

The Diagnostic Survey (Clay 1985).

The Diagnostic Survey consists of a range of controlled observational procedures, which are all administered on an individual basis. These procedures include a letter identification task, a word recognition task, a concepts about print task, a writing vocabulary task, a dictation task for hearing and recording the sounds in words, and a running record of the child's oral reading behaviour as s/he reads a selected text.

The Letter Identification Test (Clay 1985).

The first subtest of The Diagnostic Survey assesses the children's ability to identify alphabet letters by letter name, or letter sound, or a word starting with that letter. This test was chosen because knowledge of letter names may indicate some minimal knowledge of phonological

awareness as most letter names contain their sound. For example, the symbol b̲ contains the sound /b̲/. The test was also chosen because phonological awareness has been shown to interact with reading in the relationship between phonological awareness and alphabet knowledge. Letter name knowledge is one of the best indicators, yet apparently not connected causally to reading performance. To use the alphabetic code children have to be able to segment either sound, or letter, or both to make a connection between the letter and the phoneme it represents. Studies (Bradley & Bryant 1985, Liberman , Rubin et al 1985, Morais, Carey et al 1979) suggest that it is hard to attain phonological awareness without some alphabet letters.

The children were presented with 26 upper case and 28 lower case letters to identify. These letters are listed in Appendix 1. Scoring was based on the number of letters correctly identified by alphabet name, sound, or a word starting with that letter. The tester's score sheet is presented in Appendix 2.

The Concepts about Print Test (Clay 1985)

The Concepts about Print Test, Sand (Clay 1972) and Stones, (Clay 1979), indicates how sensitive a child is

to significant concepts of printed language. Some of these concepts are book handling skills, directional behaviour, visual scanning, and concepts of words and letters, and punctuation.

The child was invited to help the tester by indicating _ certain features of print as the tester read either Sand or Stones to the child.

The test was presented in the standard format which is described in Appendix 3. Scoring was based on the number of items correctly scored out of a possible 24. The scoring standards are presented in Appendix 4.

The Word Test (Clay 1985).

This test was originally designed to reflect the extent to which a child was accumulating the basic vocabulary of the Ready to Read Reading Series in New Zealand. This series was the instructional series used in New Zealand Primary Schools at the time when the Diagnostic Survey was developed. It was included as part of this battery of tests in order to give added evidence of a child's behaviour when confronted with short high frequency words in isolation.

After a practice example, the children were asked to read the fifteen words in list B of the test at initial

testing, and the words from either list A or list C at the end of the programme. All attempts were noted, but only correct responses scored. The test words are listed in Appendix 5.

The Writing Test (Clay 1985)

This test of writing vocabulary has been found to be both reliable and valid (Clay 1985), and a good indicator of a child's visual discrimintation of print, knowledge of letters and sequencing behaviour. The children were given a maximum of ten minutes to write down, on a blank piece of paper, all the words they new, with prompting from the tester if necessary. Each word written accurately, or accurately in exact mirror image, was counted as correct. Sets of words such as and, band, sand, hand, were each scored individually, as were plurals, and word families generated by adding and changing the suffix, for example, jump, jumps, jumped, jumping, jumper.

The Dictation Test (Clay 1985).

The Dictation subtest of the Diagnostic Survey tests the children's ability to hear and record the sounds in

words. The children were read a short passage which was
then re-read to them slowly so that they could write down
the words. Passages were chosen from either Form A or
Form C of the Dictation Test of the Diagnostic Survey
which, together with the scoring standards, is described
in Appendix 6. Scoring allowed one point for each phoneme
correctly identified out of 37. Phonemes re-occuring in
the sentence were not scored.

This test was chosen because it combines the use of
segmenting words into their constituent sounds aurally,
with the ability to recode the sound thus segmented to
the appropriate alphabetic symbol graphically. This
behaviour is commonly observed in young children who are
inventing their own spellings in beginning writing. It
taps the cognitive processes of hearing stimulus items,
holding them in memory while segmenting them into
constituent sounds, identifying the sounds in given
positions within the word, making a judgment about which
alphabet symbol matches the identified sound and then
recording that symbol. Because many of the mental
operations are the same as those that are tested by some
tests of phonological awareness, this test was seen as
having construct validity.

The Running Record (Clay 1985).

The running record is a neutral observation procedure
during which the observer uses a standard set of
conventions to record a child's reading behaviour as s/he
reads a given passage. An analysis of the running record
gives the observer insights into the types of reading
strategies, for instance locating, searching, and
checking behaviours, that the child is using. An
examination of the error and self correction behaviour
also provides evidence of how well the child is
integrating cues from the meaning, the language and the
visual information. Using a mathematical formula the
observer is also able to ascertain whether the material
the child is reading is at an easy 95%-100% accuracy, an
instructional 90%-94% accuracy, or a frustrational level,
below 90% accuracy.

At initial testing the tester gave the child an overview
of a simple one line caption book which had a high level
of picture support. The child was then asked to read this
book independently. The tester took a running record. If
the child scored 90% or above accuracy, s/he was credited
with being able to read at Level 1. If the child scored
below 90% accuracy, the child was invited to draw a
picture and tell a one line story about it which the
tester scribed underneath the picture. The child was then

asked to read this sentence back to the tester while the
tester took a running record. If the child scored 90% or
above accuracy, s/he was credited with being able to read
at Level 0. If the child scored below 90% accuracy s/he
was credited with being able to read at Level 00. At the
end of the programme the Reading Recovery teacher
provided the independent tester with three passages of
100-150 words which s/he judged that the child would be
able to read at an easy, independent, and frustrational
level respectively. The child was also asked to read the
Text Reading Test. The Running Record form is presented
in Appendix 7, the conventions for recording the reading
behaviour in Appendix 8, and the formula for converting
raw scores to accuracy percentages is in Appendix 9.

The Word Recognition Test (Dolch 1939).

This test, contains a list of 220 short, high frequency,
and short, high interest words, and is used frequently in
Rhode Island Schools to test word recognition knowledge.
The words, listed in Appendix 10 are arranged in levels
corresponding to basal reading material levels, and
teachers using basal programmes frequently teach these
specific words prior to text reading. The children were
presented with the words individually. The tester

proceeded to present words until the child had offered no
response or offered an incorrect response to ten
consecutive words. The child was then asked to scan the
list for further known words, which, if correctly
identified, were added to the score. All attempts were
noted, but only correct responses scored. At initial and
discontinuing testing, the children were presented with
the words up to and including Grade 2. At the end of the
year, the Grade Three list was also included.

The Phoneme Segmentation Test (Yopp Singer 1988).

In the phoneme segmentation task, the teacher presented 4
examples, and then 22 words orally for the children to
segment into phonemes. Each correct response was
acknowledged, and each incorrect response was corrected
by the teacher before proceeding to the next item.
Teachers noted each child's responses but only each
unaided correct response was scored. The specific
instructions given to the children and the stimulus items
used are described in Appendix 11. The test was
discontinued if the child was unable to respond correctly
to at least one of the examples or when the child gave an
incorrect response or no response to 10 consecutive
items.

This test was specifically designed for use in a study on the validity and reliability of phonemic awareness tests (Yopp 1988). It was found to be a most reliable test having a reliability coefficient of .95. It was also found to be the most valid test of those reviewed, when measuring tasks that require the respondent to perform only one operation, such as segmenting, blending, or isolating given sounds.

The Phoneme Deletion Test (Bruce 1964).

In the phoneme deletion task, the teacher presented the child with 5 examples and then 30 test items from which either initial, medial or final phonemes had to be deleted. These items, the administrative procedure, and the phoneme to be deleted in each item are presented in Appendix 12. Teachers noted the children's exact responses but only correct responses were scored. The test was discontinued if the child was unable to respond to at least one of the examples or when the child gave no response or an incorrect response to 10 consecutive items.

This test, reviewed by Yopp (1988) has a reliability coefficient of .92 thus exceeding recommendations by Hills (1981) and Jensen (1980) that acceptable standards

should be at least .85 and .90 respectively. When subjected to factor analysis, this test showed the greatest loadings for "Compound" phonological awareness (Yopp 1988). This means that it requires the respondents to preform more than one operation and therefore places a greater burden on memory. In this instance the children are asked to isolate a given sound and hold it in memory, while recalling the remaining sounds and then blending them together to form a new word.

Together, the Phoneme Segmentation test (Yopp Singer), and the Phoneme Deletion test (Bruce), provided the best predictive validity for acquisition reading (Yopp 1988).

The Pseudoword Decoding Test.

In the pseudoword decoding task, the children were presented with forty single syllable words that were constructed to correspond with English orthography. Before being asked to read the pseudowords aloud, the children were told that the words were not real words that they would be able to understand. Rather they were words that may be spoken by visitors from outer space, and the children should try to pronounce them. The children continued to read the words until they offered

no response to 10 items in a row. The teacher noted all

attempts but scored only correct responses.

This test of pseudoword decoding was included in the test

battery to assess how well children were able to use

their phonological ability in a situation where they were

required to decode unknown words without the aid of

contextual information. Pseudowords were chosen to

control for the event that children might already know

regular English words. The lists of pseudowords and the

instructions given to the children are described in

Appendix 13.

The Text Reading Test (Scott Foresman 1979).

The Text Reading Test was administered at the end of each

child's Reading Recovery programme as part of the post

test discontinuing data. This test required the child to

read a story of 153 words. The researcher wrote a

standard introduction to the text and trialled it using

the Running Record procedure (Clay 1985) with a group of

average First Grade students in December. It proved to be

too difficult, so, after an analysis of the errors made,

the introduction was modified and the text re-trialled

with another group of average First Grade students. From

this trial, the standard introduction and scoring

criteria were arrived at. These are presented in Appendix
14.

The teacher undertaking the discontinuing testing gave
this standard introduction to the child, and then took a
running record of the child's reading behaviour as s/he
read the text unaided. If the child scored above 90%
accuracy, s/he was credited with having read the text
"unseen". If the child read the text at less than 90%
accuracy, s/he was given the opportunity to re-read the
text again the following day, and, if attaining an
accuracy level of 90% or above, was credited with having
read the text "seen". The text was said to be too
difficult for any child who was unable to reach a 90% or
above accuracy level on the second reading.

This test was chosen rather than a standardized test of
reading subskills, to reflect what children do when they
are reading books. This particular passage was chosen
because it is at a comparative level to that which
schools expect children to be able to read nearing the
end of First Grade. It is a complete story in itself, and
the language is not stilted or contrived. It is a
manageable length for 6 year olds and still has some
picture support. It has words in it that children cannot
decode by sounding out, e.g. those starting with a silent
"k". In these instances the children would have to use
their semantic and syntactic knowledge to identify the

words. It also contains words that the children would not be familiar with, and would need to use visual information as well as the surrounding context to extract the author's precise message. Finally, it contains words that require some visual searching beyond the initial and final letters, even though transposition of the words would not affect the meaning or the structure, for example," ghost" and "giant".

The Text Reading passage is presented in Appendix 15.

3.32.   The Assessed Book Level.

There are no set Reading Recovery books as the philosophy underpinning the programme is that children should learn how to read a variety of different types of books for a variety of different purposes.

Books used in a Reading Recovery Programme are typically short, single story, children's literature trade books which reflect a wide range of authors, illustrators, stories and language patterns. These books are arranged in a gradient of twenty levels, each level offering further challenges to the beginning reader. The books are not levelled by using any readability formula, rather children are asked to read the books, and using the

child reads a book with 95% to 100% accuracy, the book is one that the child is able to read independently. If the child reads a book with 90% to 94% accuracy, this is deemed to be the instructional level and would require teacher support. If the book is read with less than 90% accuracy it is said to be difficult material for that child.

The initial trialling and levelling of books was undertaken in New Zealand where teachers were able to use a graded series of books known as Ready to Read as a benchmark when observing children's reading behaviour, thus enabling them to compare which books from that series and which other books the children could read at 90% to 94% accuracy. In this way the teachers assessed the instructional level of new material.

Books available in any one geographical area are printed in a "Booklist" which is available for Reading Recovery teachers to use when selecting books for the children in the programme to read. This list serves as a guide only, as a child's ability to read any text is subtly influenced by many variables. These influences may include background experience with books and the concepts contained within them, interest in and attitude to the chosen book, control over book language and concepts about print, and the child's increasing control over the integration of cues from the context, the language and

the print, which enables him/her to search for and monitor ongoing comprehension. In the Reading Recovery Programme particular attention is paid to the daily selection of a new book for the child to read. The aim is for the child to be presented with a text that, while allowing for the integration of his/her current reading strategies, also presents some new challenge. With teacher support, and the child's developing control over the reading process, this book, after an initial reading by the child on the day it is introduced, should be able to be read by the child the following day at 90% or above accuracy.

Although there is no blueprint for assigning a book to a particular level, Peterson (1991) has described some predictable characteristics within each gradient of difficulty. Levels 1-4 contain books which consist of repetition of 1-2 sentences with consistent placement of print. The illustrations provide essential support for the text. Levels 5-8 still retain moderate to high picture support, but text is extended to repetition of 2-3 sentences and may contain some variation of pattern. Stories in levels 1-8 usually involve familiar items and activities.

The books in levels 9-12 serve as a link between the earlier levels and the more difficult material. There is

great variation in style of writing and sentence length. Less familiar and peculiar events are incorporated with illustrations providing only moderate support. In levels 13 -15 sentence patterns continue to vary and may contain repeated, cumulative patterns, dialogue, and specialist vocabulary. This is continued in levels 16-20 and elaborated into longer stories, with extended descriptive passages. Illustrations, at this stage, enhance, rather than provide support for reading.

These levels may also be compared loosely to Basal series to give teachers some bench mark as to a child's progress as compared to his classroom peers. Levels 1-2 correspond to Readiness, levels 3-4 to the Preprimer 1, levels 5-6 to the Preprimer 2, and levels 7-8 to the Preprimer 3. Levels 9-12 match the Primer level with level 13 being the transition to Grade One which corresponds to levels 14-16. Level 17 is the transition to Grade 2, and levels 18-20 parallel Second Grade reading materials.

3.4. PROCEDURE.

3.41. The Teachers.

The 30 teachers involved in the programme were all reading specialists with Masters Degrees in reading, who had been chosen by their school districts to participate in Reading Recovery training. In all instances except three, where two teachers were working in the same school, each teacher worked in a different school building. They, rather than classroom teachers had been chosen to implement the Reading Recovery Programme because, at that stage, there were no mechanisms in place in any school district to release classroom teachers for one to one tutoring of children.

The teachers were divided into two groups by virtue of their geographical location, and to ensure a balance of both high socio-economic and low socio-economic schools and inner city and rural schools for each Reading Recovery Inservice Class. The teachers who were to be in the Intervention Group, were informed of the research project, but were unaware of which children, or if any of the children they were teaching, would be taking part. The teachers in the Standard Reading Recovery group were unaware of the intervention, and, as the groups were drawn from different areas, there was no chance of

teachers in the Standard Reading Recovery group introducing intervention procedures to their children.

3.42. Chronology.

Table 3 shows the chronology of events from the last two weeks of August 1990 when the teachers were divided into two groups to attend the Inservice Class on either Wednesday or Thursday, until the last of the children involved in the study had his/her Reading Recovery programme discontinued in March 1991.

Table 2

Chronology of Events -

Significant Dates During the Implementation of the

Modified and the Standard Reading Recovery Programmes.

Month	Action
August 2nd half	* Teachers divided into two groups
September 1st/2nd half	* Teachers trained by the Teacher Leader in assessment procedures i.e. the Diagnostic Survey, and the Dolch Word Test.
September 2nd half	* Teachers tested children for the Reading Recovery programme and selected the lowest four. * Teachers trained by the Teacher Leader in administering the tests of phonological processing ability i.e. phonemic segmentation, phoneme deletion and phonological recoding. * Teachers administered the phonological processing tests to all the children selected for the Reading Recovery programme. * Teachers started attending weekly inservice classes on either Wednesday or Thursday. * Teacher Leader tested children for the contol group with Diagnostic Survey, Dolch Words and the three tests of phonological processing.
October 1st half	* Teachers began Roaming Around the Known with the children in the Reading Recovery programme. * Teacher Leader matched children in triplets, one from each group on the basis of scores from the Letter

	Identification and the Dictation tests (Clay), and the three phonological processing tests.
October 2nd half	* As each child completed 10 lessons Roaming Around the Known, the teacher moved into the instructional phase of the Reading Recovery programme._ * Teachers began teaching children behind the one way mirror at the inservice class.
November 1st half	* Teachers at the Thursday class were trained by the Teacher Leader in the intervention procedures. * Teachers at the Thursday class implemented the intervention with all children able to identify 35 or more alphabet letters.
November 2nd half	* Teacher Leader began visits to individual teachers in their school buildings to observe and give feedback on teaching.
December 1st half	* Teacher Leader trained an independent person from each school to administer the Diagnostic Survey, The Dolch Word test, The tests of phonological processing and the Text Reading Test. * Teacher Leader trialled the Text Reading test with average First Grade children.
January/ February/March	* Children were independently tested with the entire battery of tests and left the Reading Recovery programme. * Teacher Leader retested standard intervention group children. * Reading Recovery Teacher tested an average child from same class as discontinued Reading Recovery child.

3.43. Teacher Training for Test Administration.

At the end of August 1991, the teachers who were to
participate in the Reading Recovery Training Programme
were divided into two groups of fifteen to attend the
Reading Recovery Class either on Wednesday or Thursday.
In the second and third week of September they were
trained how to administer, score and interpret the
observational tests of The Diagnostic Survey (Clay 1985),
how to take, score, and analyze a running record of
reading behaviour (Clay 1985), and how to administer the
Dolch word test (Dolch 1939). This training was conducted
by the same Reading Recovery Teacher Leader, and each
class received four two-hour sessions. The teachers were
given opportunity to practise these techniques on
children who would not be part of the Reading Recovery
Programme, and were given specific, written feedback on
their attempts. The teachers then used the same
procedures to test widely among those children who had
already been identified as needing further literacy
support at the end of the previous year. In smaller
schools the teachers tested all the children who had been

identified, while in larger schools up to fifteen children were tested. The teacher then selected the four lowest performers across the range of tests for the Reading Recovery Programme.

After instruction on administration and scoring procedures, the teachers then gave the three tests of phonological processing to those children.

In December, the Teacher Leader trained another teacher from each of the 23 school buildings involved in the Reading Recovery Programme, to administer The Diagnostic Survey, the Dolch test, the three tests of phonological processing, and the text reading test, so that testing at the end of each child's programme could be undertaken by a completely independent, neutral person.

3.44 Matching of Children.

While the teachers were undertaking this initial testing, the researcher, who is also the Reading Recovery Teacher Leader, went to schools where no Reading Recovery Program was available, and, using the same battery of tests, tested children fitting the same criteria, who had been receiving their normal reading/language support services since the beginning of the school year. These were funded by either Chapter One or Literacy.

The Chapter One programme provides federally funded instructors for reading, mathematics and language arts. It covers children from Kindergarten to Grade 12 who must be below the 50th percentile when tested with a standardized test. Funding determines the percentage of children that can be serviced from that group, with School Districts typically looking at the bottom 40%. Traditionally support has been in the form of small group pull out programmes, which occurs at least four days a week. Although an in-class support model was also operating in some schools, all the children in this standard intervention group whose instruction was federally funded, were receiving small group,(typically 6-7 children), out of class reading support.

The Literacy programme is funded by State money that is allocated to each town. It is typically set aside for Grades 1 to 3 but can, in certain circumstances, be extended to Grade 6. The programme covers broad areas. Funding may be used to bring literature and process writing into the classroom, to supplement or replace the basal reader, to reduce class size, to provide staff development or to provide supplementary services. In the case of children in the control group, the funding was being used to provide supplementary services in the form of small group instruction in reading on four days of the week.

For all the standard intervention group children whether
state or federally funded, the teacher in charge of the
small group instruction was a certified reading
specialist.

These children were matched one to one, with a child with
the same scores on the letter identification test and the
dictation test from each of the two Reading Recovery
classes. None of the children in the standard
intervention group was able to read beyond even the
simplest one line caption book at an instructional level
(90-94% accuracy). It was of note that all the matched
triplets also fell into the same stanine band for the
Word Test (Clay 1985) and the Writing Test (Clay 1985),
thus leaving the Concepts about Print Test as the only
measure in the Diagnostic Survey, and the Dolch Word
Test, where there were differences in the children's
initial scores. In effect not even these differences
proved to be statistically significant. None of the
children scored on any of the tests of phonological
processing.

3.45. The Reading Recovery Lesson.

Following selection in the second half of September, the
Reading Recovery children received their normal Reading

Recovery lessons each beginning with ten lessons which were given entirely to consolidation of what was already known, (Roaming around the Known, Clay 1985:55,56) and then moving into instruction based on individual strengths and needs.

A typical Reading Recovery lesson follows the following format. The half hour lesson begins with the child reading two or more familiar books to provide the opportunity for the consolidation and integration of behaviours which s/he already controls. This is followed by the reading of a less familiar book which was introduced by the teacher and read by the child at the close of the previous day's lesson. During this reading the teacher takes the role of a neutral observer and records all the reading behaviours that the child exhibits using a standard set of conventions. This is referred to as taking a Running Record. At the conclusion of this reading, the record is analysed, and the teacher draws the child's attention to the most important new area of learning that is evidenced by the record, and that s/he feels the child is ready to develop control over. If necessary, the child then works at letter identification using a variety of activities including plastic letters at a magnetic board. The writing segment of the daily lesson then takes place. The child is invited to tell a one or two sentence story, which s/he

writes as independently as possible. While engaged in this activity, the child learns how to write some short high frequency words correctly in every aspect (Getting Fluency, Clay 1985:64), how to hear and record the sounds in words using the Elkonin technique,(Elkonin 1973 in Clay 1985:65,66) and how to generate unknown words from memorable known examples. The teacher then copies this story onto a strip of card and cuts it into language units which s/he knows that the child will be able to reassemble using his/her current range of reading strategies. The lesson ends with the teacher introducing a new book that is within the child's control but incorporates a new challenge. This book is then read by the child with appropriate teacher support if and when necessary. Within this suggested format each child's programme is different depending on individual strengths and weaknesses.

3.46 Lesson Length.

Each child's Reading Recovery lesson lasted for 30 minutes. Teacher's were encouraged to use mechanical timers, not only to ensure the time of the total lesson, but also to mark ten minute intervals within the lesson, so that adequate time was given to familiar and recent reading, writing, and the introduction and reading of the

new book. The time factor was reinforced at the inservice class, by the use of the timer for the observation lessons, and by follow up discussions on the most effective and poweful use of the allotted 30 minutes. As all the teachers had other Chapter One and Literacy support services to administer, and as they were only allocated 2 hours per day for tuition on an individual basis, there was no possibility of them extending the Reading Recovery time.

3.47. The Reading Recovery Inservice Class for Teachers.

Starting the week after the training in the assessment procedures, the teachers began attending a two hour inservice class weekly during which they learnt how to instigate the Reading Recovery procedures and how to make the most appropriate teaching decisions in order to aid accelerated learning by their children. Each week, starting at the beginning of October, two different teachers taught one of the children they were working with behind a one way mirror for their peers to observe. During these lessons the rest of the class, guided by the Teacher Leader, learned how to observe children's reading behaviour closely, how to articulate this behaviour in light of reading theory and how to make the most

appropriate teaching decisions based on their observations. The second hour was spent relating what they had seen to the Reading Recovery procedures (Clay 1985), in order to clarify and extend their own understandings, and to provide feedback for the teachers who had taught. In the early part of the year, the components of the lesson and the recording procedures were introduced to the teachers during this second hour.

3.48.   The Intervention.

At the first meeting in November when the teachers in both groups had been introduced to all the components of the Reading Recovery lesson, the phonological processing intervention was introduced and demonstrated to the Thursday group.

The intervention took the place of the letter identification segment of the Reading Recovery lesson when the children demonstrated that they could identify at least 35 of the 54 alphabet letters. Generally this meant that for all but two children, the intervention began in the fourth week of their programme which, allowing for the ten lessons Roaming around the Known, was the second week of instruction, that is, the child had typically received between 5 and 8 instructional

lessons. The intervention then continued until the child's Reading Recovery programme was discontinued. Bradley & Bryant (1985) suggest that acquisition readers in general, and readers experiencing difficulty in particular, may not be aware of the interrelatedness of the sounds and the visual patterns shared by different words. The phonological processing intervention was designed to help children make this association by making them more aware of the sounds shared by different words, and to give them the idea that words with common sounds often share the same spelling patterns.

The intervention required the children to manipulate magnetic letters to make, break and build new words that had similar visual and/ or phonological elements. The teacher chose a suitable word from one of the three books that the child had read earlier in the lesson, or if no such word was evident, selected such a word from the Dolch word list. Starting with the manipulation of initial sounds/letters, the teacher modelled the task, then, within each lesson gradually passed the control over to the child. For example, using the word and the teachers followed the following format.

The teacher made the word and with the magnetic letters, and said, "This word says and, what does this word say?" The child responded, "And." The teacher then jumbled the letters and asked the child to make and. If the child was

in any way unsure, the teacher provided a model using other magnetic letters. When the child had made the word, the teacher said, "What word have you made?" After the child's response, the teacher jumbled the letters again and asked the child to make and again. This process was repeated, each time asking for the name of the word until the child demonstrated that s/he could perform this task fluently. The teacher then put s in front of and and drew the child's attention to what s/he had done by running his/her finger underneath the word and saying, "Look if I put an s in front of and it says sand." The teacher then asked the child to say the new word. The teacher then removed the s and said, "If I take the s away it says and. You make sand." When the child had completed the task, the teacher asked, "What word have you made?" and then asked the child to make and. This process was repeated making hand and band. The teacher then made sand, then band, then hand and then and asking each time what the word was. S/he then asked the child to make and, hand, sand and band. At this point the teacher passed more of the control of the task over to the child by asking the child to use the letters to make a word, then another, then another, each time telling the teacher the word s/he had made. Throughout the task the teacher positively reinforced all correct responses by using

specific praise, which reinforced the process the child
was engaged in as well as the product.

This procedure was repeated daily using different words,
until the child demonstrated that s/he knew how to
manipulate initial sounds/letters/clusters. The teacher
then moved to final and then medial sound/ letters /
clusters modifying the instructions slightly when
changing medial letters and when deleting initial and
final letters/letter clusters that did not leave a
complete word.

Within each daily segment the teacher was required to
model the task, allow the children to manipulate the
letters, require the child to read the words they made,
and allow the children to initiate some of the learning.
Even though the children were asked to read the words
that both they and the teacher had made, it was not
important for them to know or learn the words. The
purpose of saying the words was to help the children
hear, as well as see, similarities in spelling patterns.
As the child demonstrated control over the tasks, the
teacher worked for flexibility and fluency among the
words, for example, by asking the child to change, as to
has to hat to that to pat to pit to pot to got to get, or
by asking the child to use three letters to make a word,
use four letters to make a word, change one letter to
make another word, change the first/last/middle letter or

letter cluster to make another word. Later in the
programme the child was asked to do this as a writing
task rather than manipulate the magnetic letters.
However, the aim of the Reading Recovery programme is not
— to teach all the items in a category, but to enable
children to use some items and some strategies for
comparing and generating from the known to the unknown.
Working on this premise, the teachers, whenever possible,
chose clear and memorable examples from the text that had
just been read, and required children to use their new
gained strategic knowledge when they needed it to assist
with solving novel words in reading and to spell unknown
words in writing.

Thus the children learned, not only that some words were
visually and phonologically similar, but, within the
context of the surrounding lessons, strategies for
knowing how and when to apply such knowledge.

To ensure that teachers did not neglect to implement the
intervention daily because they were unable to choose a
suitable word from the text, they were each given a list
of frequently occurring words and some suggestions for
how they might use them. This list is in Appendix 16.

The Standard Reading Recovery group whose teachers met on
Wednesday, continued with their usual Reading Recovery
lessons. When the childen no longer needed letter

identification work, this segment was assimilated into the general Reading Recovery time which allowed these teachers more time to concentrate on the teaching points, including word analysis, that arose incidentally from the child's responses during the lesson.

3.49. Discontinuing the Reading Recovery Programme.
Post testing.

The decision to discontinue a child's Reading Recovery programme was cross checked in more than one way. First, the Reading Recovery Teacher decided that the child had a set of strategies in place that would enable him/her to continue to learn as s/he read increasingly difficult material in the classroom situation. In consultation with the classroom teacher, s/he then ascertained that the teacher was in agreement with this decision, that the child was reading at average or above levels for that class, and that there was a suitable instructional situation which would enable the child to continue his/her learning in both reading and writing. If satisfied that this was the case, recommendations for discontinuing the programme which are detailed in Appendix 17, were then forwarded to the Teacher Leader who made the decision as to whether or not retesting was

appropriate. Then, the previously trained, independent person was asked to test that child using the full Diagnostic Survey including Running Records of reading behaviour on familiar, not so familiar, and unseen material, the Dolch test, and the Test of Text Reading. Because of the great variation in classroom programmes, and the fact that some of them did not use any kind of graded material, the Test of Text Reading was administered to ensure uniformity. Children had to be able to read this text either the first time it was introduced to them, or on the next day, that is, unseen the first day, or seen the next day, at 90% or above accuracy to be discontinued.

After weighing all the evidence from the teacher's recommendations and the test results, the final decision regarding discontinuing the child's Reading Recovery programme was made by the Teacher Leader. In making this decision, the Teacher Leader took into account the following considerations. First, using the 1978 stanines (Clay 1985:133) she confirmed that the children were indeed at, or close to, the 5th stanine across the range of tests in the Diagnostic Survey. Secondly, she interpreted this score with reference to the behaviours exhibited by the child, to be satisfied that the child had in place a self improving or self extending system (Clay 1985,1991), which would enable that child to

continue to increase his/her control over reading and writing even with a "not noticing teacher" (Clay 1985:82). Thirdly, she needed to be satisfied that the child had in place the strategies to cope with the transition from Reading Recovery to classroom instruction. To this end some Reading Recovery Teachers taught the child his/her final few Reading Recovery lessons in the classroom, and incorporated those aspects of the classroom programme that the child was not so familiar with, for example, filling in workbook pages in traditional basal programmes and selecting appropriate reading material in some "Whole Language" programmes. In every case, both the testing and the Teacher Leader's considerations merely confirmed the decision that the Reading Recovery teacher had made, and all children recommended for discontinuing were in fact discontinued. At that point in time, the child was retested with the three tests of phonological processing, and these scores together with the number of lessons that the child had had, and the type of classroom s/he was drawn from were also noted.

While these procedures were in progress, the Reading Recovery teacher used the same battery of tests including the tests of phonological processing, to test an average child from the same classroom. The standard intervention

An inspection of these books showed that the modified Reading Recovery group used the Elkonin technique on average 54% of the time that the child was in the programme. The standard Reading Recovery group used the technique 51.8% of the time. While these percentages may not seem very high it should be noted that the first ten lessons of any child's programme is given to consolidating what is already known and that no new learning is introduced. It would have been inappropriate for teachers to use the technique during this time. Towards the end of a child's Reading Recovery programme there were also many lessons when the use of the sound boxes would have been contrary to both acceleration and independence. In these cases, the child had demonstrated that s/he could write words independently by knowing how to write some words from memory, by making links from known words to write unknown words, and hearing the sounds in sequence and writing the words directly into his/her story. A further factor is that these teachers were in training and did not implement the teaching of this technique until it had been introduced and demonstrated at the inservice session.

CHAPTER 4.

RESULTS AND DISCUSSION.

4.1. Pre-treatment Measures.

The means of the three comparison groups for all pre-treatment measures are presented in Table 3.

Table 3

One-way ANOVAs of Means of Three Comparison Groups for

All Pre-treatment Measures. (a)

Variable	Modified Reading Recovery group mean ($n = 32$)	Standard Reading Recovery group mean ($n = 32$)	Standard Intervention group mean ($n = 32$)	F (2,93) (b)
Age (months)	74.71(1.97)	74.40(1.93)	75.34(4.18)	0.87
Text Level (c)	0.38(0.49)	0.53(0.51)	0.56(0.50)	1.29
Letter Identification (d)	43.03(7.71)	42.38 (7.40)	43.13(8.43)	0.09
Concepts about Print (e)	11.75(3.21)	11.22(2.95)	9.84(3.73)	2.82
Clay Word Test (f)	1.16(1.22)	0.91(1.09)	1.41(1.66)	1.10
Dolch Word Test (g)	4.34(4.05)	4.19(4.45)	5.25(5.42)	0.48
Writing Vocabulary	4.91(2.48)	4.03(2.88)	5.41(2.65)	2.17
Dictation (h)	10.56(5.30)	11.25(5.91)	11.88(6.58)	0.39
Phoneme Segmentation (i)	0.00(0.00)	0.00(0.00)	0.00(0.00)	
Phoneme Deletion (j)	0.00(0.00)	0.00(0.00)	0.00(0.00)	
Phonological Recoding (k)	0.00(0.00)	0.00(0.00)	0.00(0.00)	

(a) Standard deviations in parentheses. (b) All F ratios were insignificant, $p > .05$.
(c) Maximum score =26. (d) Maximum score =54. (e) Maximum score = 24
(f) Maximum score =15. (g) Maximum score = 179. (h) Maximum score = 37.
(i) Maximum score = 22. (j) Maximum score = 30. (k) Maximum score = 40.

One-way analyses of variance showed no significant
differences between the means of any of the pre-treatment
measures. Although the three comparison groups were
closely matched on letter identification and dictation,
it turns out that this procedure produced a close match
on all remaining measures as well.

As previously mentioned, no children in any of the
comparison groups were able to respond correctly to any
of the items on the three phonological processing
measures (phoneme segmentation, phoneme deletion and
phonological recoding). Yopp (1987) reported that five
year old kindergarten children averaged 11.8 items
correct on a phoneme segmentation test identical to the
one used in the present study, and 7.9 items correct on a
phoneme deletion test also identical to the one used in
the present study. The extremely poor performance of the
six year old "at risk" children on the various
phonological processing measures provides support for the
hypothesis that such children are particularly deficient
in these skills.

4.2. Measures at Discontinuation.

The means of the three comparison groups for all measures
at discontinuation are presented in Table 4. One-way
analyses of variance revealed highly significant

differences between the means of all discontinuation
variables. Individual comparisons of cell means revealed
that for all measures the means of both Reading Recovery
groups were significantly greater than the control group
mean (Newman-Keuls Multiple Range Test $p<.05$). The
analysis further revealed that on one measure, phoneme
deletion, the mean of the standard Reading Recovery group
was significantly greater than the mean of the modified
Reading Recovery group.

Table 4

One-way ANOVAs of Means of Three Comparison Groups for
All Measures at Discontinuation. (a)

Variable	Modified Reading Recovery group mean ($n = 32$)	Standard Reading Recovery group mean ($n = 32$)	Standard Intervention group mean ($n = 32$)	F (2,93) (b)
Text Level (c)	16.59(0.91)	16.43(0.88)	3.28(2.08)	944.06
Letter Identification (d)	52.50(1.27)	52.78(1.01)	49.00(6.63)	9.15
Concepts about Print (e)	19.31(2.40)	19.50(1.74)	13.72(3.49)	49.31
Clay Word Test (f)	11.66(2.15)	12.16(1.85)	5.56(3.83)	56.86
Dolch Word Test (g)	93.84(23.74)	93.81(29.07)	20.22(13.93)	108.18
Writing Vocabulary	40.03(10.25)	38.28 (6.42)	15.69(9.15)	76.95
Dictation (h)	33.25(3.32)	34.00 (2.53)	23.34(8.68)	36.61
Phoneme Segmentation (i)	16.88(4.53)	17.63 (4.46)	6.21(5.18)	58.17
Phoneme Deletion (j)	11.00(5.85)	14.00 (6.16)	3.91(5.31)	25.69
Phonological Recoding (k)	8.19(6.69)	9.00 (7.07)	1.41(2.31)	16.69

(a) Standard deviations in parentheses. (b) All F ratios were significant $p<.001$.
(c) Maximum score = 26. (d) Maximum score= 54. (e) Maximum score = 24.
(f) Maximum score =15. (g) Maximum score = 179. (h) Maximum score = 37.
(i) Maximum score = 22. (j) Maximum score = 30. (k) Maximum score = 40.

In general the results show that the two Reading Recovery groups performed at very similar levels at discontinuation. The results further show that the children in the Reading Recovery groups performed much better on all measures than the children in the standard intervention group. The latter children seem to be particularly behind in text level, the Dolch Word Test, and the three phonological processing measures, which is consistent with the large body of research indicating that phonological processing ability is essential for reading progress.

4.3. Comparison with Average Children.

It is important to note that the statistically significant results in favour of the two Reading Recovery programmes over the standard intervention may not be due to the assessment procedures and teaching of Reading Recovery per se, but rather to the type of instruction. Reading Recovery involved one-on-one instruction, whereas the standard intervention involved instruction in small groups (usually 6 or 7 children). It may therefore be more useful to compare the performance of the children from the same classrooms who were judged by their classroom teacher to be performing at an average level in reading. These data are presented in Tables 5 and 6.

Table 5.

Test of Significant Differences between Means of Modified

Reading Recovery Group and Corresponding Classroom

Control Group on Discontinuation Measures [a]

Variable	Modified Reading Recovery group mean ($n = 32$)	Classroom control group mean ($n = 32$)	$t(62)$
Letter Identification	52.50(1.27)	52.90(1.25)	1.29
Concepts about Print	19.31(2.40)	17.78(2.04)	2.75*
Clay Word Test	11.66(2.15)	12.31(2.18)	1.21
Dolch Word Test	93.84(23.74)	99.59(32.78)	0.80
Writing Vocabulary	40.03(10.25)	35.81(12.25)	1.49
Dictation	33.25(3.32)	33.69(2.86	0.56
Phoneme Segmentation	16.88(4.53)	12.69(6.82)	2.89*
Phoneme Deletion	11.00(5.85)	9.43(4.98)	1.15
Phonological Recoding	8.19(6.69)	6.31(6.07)	1.17

[a] Standard deviations in parentheses * p <.01.

The results indicate that not only are the children in
the Reading Recovery groups performing as well as the
classroom controls, but often significantly better,
especially on the phonological awareness measures
(phoneme segmentation and phoneme deletion). The latter
finding is most likely due to the fact that both the
standard and modified Reading Recovery programmes include
explicit instruction in phonological awareness (i.e. the
use of "sound boxes", a technique developed by Elkonin
1973). The means of both Reading Recovery groups for the

variables from the Clay battery (letter identification, writing vocabulary, and dictation), are well within the average range for children of this age according to published norms (Clay 1985).

Table 6

Tests of Significant Differences between Means of Standard Reading Recovery Group and Corresponding Classroom Control Group on Discontinuation Measures [a]

Variable	Standard Reading Recovery group mean (n = 32)	Classroom control group mean (n = 32)	$t(62)$
Letter Identification	52.78(1.01)	52.81(1.20)	0.11
Concepts about Print	19.50(1.74)	17.19(2.43)	4.38***
Clay Word Test	12.16(1.85)	12.13(2.47)	0.06
Dolch Word Test	93.81(29.07	87.97(36.16)	0.71
Writing Vocabulary	38.28(6.42)	33.22(10.94)	2.26*
Dictation	34.00(2.53)	32.72(3.06)	1.83
Phoneme Segmentation	17.63(4.46)	14.06(5.31)	2.91**
Phoneme Deletion	14.00(6.16)	9.78(5.68)	2.85**
Phonological Recoding	9.00(7.07)	6.78(5.43)	1.41

[a] Standard deviations in parentheses. * p <.05.
** p <.01. *** p <.001

4.4. Length of Time in The Reading Recovery Programme.

The most significant finding of the study is presented in Table 7.

Table 7

Mean Number of Lessons to Discontinuation as a Function of Type of Reading Recovery Programme.

Type of Reading Recovery Programme	n	Mean	Standard Deviation	t(62)
Modified	32	41.75	10.62	5.70*
Standard	32	57.31	11.22	

p <.001

Although the results shown in Table 4 indicate that the two Reading Recovery groups performed at very similar levels on all variables at discontinuation, the result shown in Table 7 indicates that it takes the children receiving the standard Reading Recovery programme much longer to get to the same point. The difference in the mean number of lessons to discontinuation between the two Reading Recovery groups is highly significant and suggests that the standard Reading Recovery programme is 37% less efficient than the modified Reading Recovery programme. The results also support the hypothesis that readers experiencing difficulty need explicit instruction

to make them aware of the interrelatedness of the sounds
and visual patterns shared by different words.

4.5. End of Year Measures.

Although the standard Reading Recovery group took more
lessons to reach the same level of performance as the
modified Reading Recovery group, it may be the case that
the extra lessons received by the children in the
standard Reading Recovery programme helped them to
consolidate their emerging reading skills to a greater
extent than the children in the modified Reading Recovery
programme. This would predict that the standard Reading
Recovery group would eventually overtake the modified
Reading Recovery group. However the results shown in
Table 8 indicate that this did not occur. At the end of
the year the two groups performed at very similar levels
on all measures. The modified Reading Recovery group was
slightly ahead on text level.

Table 8

Tests of Significant Difference between Means of Modified and Standard Reading Recovery Groups on End of Year Measures [a]

Variable	Modified Reading Recovery group mean (n = 32)	Standard Reading Recovery group mean (n = 32)	$t(62)$
Text Level [b]	19.56(2.12)	18.38(2.31)	2.14*
Letter Identification [c]	53.81(0.54)	53.53(0.67)	1.85
Concepts about Print [d]	22.09(1.47)	21.34(1.66)	1.92
Clay Word Test [e]	13.88(1.10)	13.56(1.56)	0.92
Dolch Word Test [f]	153.88(44.61)	143.41(40.41)	0.98
Writing Vocabulary	47.84(12.07)	52.22(15.70)	1.25
Dictation [g]	35.47(1.90)	35.78(1.34)	0.76

[a] Standard deviations in parentheses.
[b] Maximum score = 26. [c] Maximum score = 54.
[d] Maximum score = 24. [e] Maximum score = 15.
[f] Maximum score = 220. [g] Maximum score = 37.
* p <.05.

The results shown in Table 9 indicate that the children in both groups continued to make significant gains on all measures after discontinuation. The mean text levels of both groups indicate that the children were progressing very satisfactorily, and were beginning to read materials appropriate for second grade.

Table 9

Tests of Significant Differences between Means of Repeated Measures as a Function of Type of Reading Recovery Programme.

—

	Modified Reading Recovery Group Means (*n* = 32)			Standard Reading Recovery Group Means (*n* = 32)		
Variable	Discontin-uation	End of Year	*t* (31)	Discontin-uation	End of Year	*t* (31)
Text Level	16.59	19.56	8.36**	16.43	18.38	4.71**
Letter Identification	52.50	53.81	5.68**	52.78	53.53	4.82**
Concepts about Print	19.31	22.09	7.53**	19.50	21.34	5.34**
Clay Word Test	11.66	13.88	5.83**	12.16	13.56	3.86**
Dolch Word Test	93.84	153.88	10.29**	93.81	143.41	9.60**
Writing Vocabulary	40.03	47.84	3.15*	38.28	52.22	5.16**
Dictation	33.25	35.47	3.97**	34.00	35.78	3.88**

* $p < .005$.   ** $p < ..001$

A particularly interesting finding was that the number of lessons to discontinuation was negatively correlated with two end of year measures, text level and the Dolch Word Test (see Table 10).

Table 10

Predictive Correlations between Number of Lessons to

Discontinuation and End of Year Reading Measures

Criterion Variable	Both Reading Recovery Groups Combined (*n* = 64)	Modified Reading Recovery Group Only (*n* = 32)	Standard Reading Recovery Group Only (*n* = 32)
Text Level	-0.45***	-0.31*	-0.43**
Dolch Word Test	-0.38***	-0.42**	-0.34*

p <.10.   ** *p* <.05.   *** *p* <.005.

This suggests that children who take longer to reach a
particular criterion (i.e. a self-improving system (Clay
1985, 1990), which enables the child to take
responsibility for using such strategies as checking,
searching and self correcting in order to participate
fairly independently at average classroom reading
levels), may progress more slowly in the future
regardless of which Reading Recovery group they are in.
However this finding leaves open the possibility that
despite the effort taken to match the two Reading
Recovery groups carefully at the beginning of the study,
more of these children (i.e. those who have taken longer
to establish a self improving system), may have been
included in the standard Reading Recovery group. This

would then account for the findings shown in Table 7. To
rule out this possibility, separate correlations were
computed for each Reading Recovery group. As shown in
Table 10, these correlations were again negative and
similar in magnitude to the correlations for the two
groups combined. This suggests that the children who
took longer to acquire a self-improving system were
distributed evenly between the two Reading Recovery
groups. These results also strengthen the assumption
that the variable, number of lessons to discontinuation,
is a measure of the rate of learning; that is, it
strengthens the construct validity of this variable.

CHAPTER 5.

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GENERAL DISCUSSION AND CONCLUSION.

5.1. General Discussion.

This intervention study of children experiencing difficulties with beginning reading was used to examine three hypotheses.

First, it was hypothesized that children who were experiencing difficulty in beginning reading, and who were the lowest achievers when tested with a wide range of observational procedures, which resulted in them being selected for a Reading Recovery programme, would be particularly deficient in phonological processing ability. Second, that the Reading Recovery programme would provide for the adequate development of the phonological processing skills necessary for both reading and spelling. Thirdly, that those children who had a Reading Recovery programme modified to include explicit instruction in the relationship between the visual

patterns and the sounds shared by different words would make superior gains to those children who received a standard Reading Recovery programme.

The results of the data analyses from the tests of the Diagnostic Survey, the Dolch word test and the tests of phonological processing provide evidence in support of these hypotheses.

5.2. The Phonological Processing Deficiency Hypothesis.

At initial testing, none of the children in either of the Reading Reocvery groups or the Standard Intervention group were able to respond correctly to any of the items on the three tests designed specifically to test aspects of phonological processing. This was somewhat surprising in relation to the phonemic segmentation test where some segmentation ability had been demonstrated by some children on the dictation test in the Diagnostic Survey. However, it may be that the dictation scores were influenced in two ways. First, it may be that some of the short high frequency or short high interest words asked for in the dictation test, were already in the child's writing vocabulary, for example I, a, to, the, we, in, can, dog. Secondly, it may be that the child's segmentation ability was limited to dominant consonants in initial and/or final positions, rather than the

ability to segment an entire word into its constituent phonemes. In any event, the results appear to provide support for the hypothesis that the children at the lowest end of the achievement distribution after one year at school are indeed particularly deficient in phonological processing ability.

5.3. Phonological Processing and the Standard Reading Recovery Programme.

While there is ample evidence from New Zealand, Australia and The United States of America that Reading Recovery is a very effective early intervention programme for moving children experiencing difficulties in reading and writing up to average levels of performance within a matter of weeks, suggestions have been made that the overall mix of activities may not lead the children to getting a clear understanding of the the way in which sounds are encoded in print. It has also been suggested that at the end of their Reading Recovery programme these children may still be lacking in phonological processing ability which may account for those huge initial gains seeming somewhat modest in some instances after the children have had their Reading Recovery programme discontinued for several months.

Post-testing for all three intervention groups, plus two classroom control groups, showed that the children in the Reading Recovery programme had not only made superior gains when compared with the standard intervention group, but also, were performing as well as, or significantly better than, the average classroom controls, not only in reading and writing ability but also in the tests relating specifically to phonological processing. These results provide confirmation for the second hypothesis.

A possible explanation for these results is that in the Reading Recovery programme, the relationship between a sound and the letter/letters it represents is made explicit in the daily segment of the writing lesson. Teachers, using the Elkonin technique provide a scaffold for the child's increasing competence in this area, first by helping the child to hear the sounds in words in the absence of any print, thereby fostering phonological awareness. When the child demonstrates that s/he is able to perform this operation, and is able to write some letters, the task changes to one of phonological coding as the child is required both to hear and record the sounds. At a stage when the child is able to hear and record most of the consonants and some vowels in his/her daily story, the teacher introduces the mismatch between the sounds of words and conventional spellings by having

the child record the letters s/he expects to see.
Ultimately the child is able to perform this task in
sequence from first to last letter, letter/cluster, in
the novel words s/he needs to write.

The child has further opportunity to consolidate this
strategy of linking sound to letter, when s/he is
required to check a prediction s/he has made in reading
to ascertain whether the response looks right as well as
being gramatically correct and meaningful.

5.4. Phonological Processing and the Modified Reading Recovery Programme.

While many children are able to perform the complex task
of hearing and recording letters and letter clusters
representing the sequential sounds in words, to compose
messages in writing, and to check their responses in
reading, many children, especially those in Reading
Recovery programmes, do not appear to be able to analyze
the letters in the words they want to read, to assist
them to eliminate those words that would fit with their
language predictions, but not the initial letter/letter
cluster cues. By incorporating both the visual and
phonological analysis of words into this intervention,
and by progressing from a manipulative activity to a

writing activity, both of which required reading, it was hoped that the children would ultimately be able to coordinate these two complex strategies.

It was hypothesized that if such a component replaced the letter identification component of the Reading Recovery programme, when the child was able to identify many of the letters correctly, it may make the operation of linking graphemes to phonemes more explicit and thus lead to greater gains being made by these children.

This hypothesis seems to be confirmed by the results presented in Table 7 which show that the children who participated in these activities were able to have their Reading Recovery programmes discontinued much sooner than were those children who received the standard Reading Recovery programme.

5.5. Confirmation from Related Research.

These results, showing that children who receive explicit instruction in phonological processing embedded in real reading and writing tasks, rather than unrelated skill and drill activities, are entirely consistent with findings by Cunningham (1990) and Hatcher, Hulme and Ellis (submitted 1991).

Cunningham (1990) found that while both Kindergarten and First Grade children benefitted from phonological

awareness training, the children who were required to
think about how, and when to use their new found
knowledge, and were given the opportunity to practice
utilizing this knowledge, were significantly better on
transfer measures of reading achievement than were the
children who were drilled in such skills in isolation.
Hatcher, Hulme and Ellis (1991), confirming their
phonological linkage hypothesis, used a programme based
on the Reading Recovery programme and incorporated
explicit phonological awareness training into it. They
found that, for 6 and 7 year old readers experiencing
difficulty with reading, an intervention involving a
combination of phonological awareness training and
reading instruction was more effective than either
reading instruction alone or phonological awareness
instruction alone.

5.6. Explaining Negative Correlations in Terms of a Bootstrapping Process.

The negative correlations between the number of lessons
to discontinuation and end of year testing can be further
explained in terms of the "bootstrapping process" of
reading and learning to read (Stanovich 1986a).
Reading Recovery children have to make accelerated
progress in order to reach average levels of performance

in such a short period of time. They also have to be independent of the Reading Recovery teacher so that they continue to learn back in the classroom without the intensive one to one support. To achieve both these aims the children need to have, not only a set of known items, but also a set of strategies in place that will enable them to use these items in conjunction with their developing theories of the world and their theories of oral and written language to solve text problems. Strategies such as predicting what may come next in a story, searching for, and using information in the meaning, structure and print cues, linking to and from prior knowledge, making generalizations from existing rules to extend the known set, self-monitoring and self correction, are all strategies that children need to be able either to orchestrate, or to move flexibly between, depending on the difficulty level of text and the nature of the problems to be solved. It is suggested that the strategy of knowing how to use the relationship between graphemes and phonemes (that is phonological processing), to solve problems in both reading and writing, is crucial to the formulation of the aforementioned strategies.

It is further suggested that those children who develop control over these strategies more quickly will be advantaged by the bootstrapping process of learning to read and learning by reading, thus they will continue to

learn from reading, at a faster rate than those children who take longer to develop the control.

5.7. Implications for Traditional Literacy Support Programmes.

The results show unquestionably that the standard Reading Recovery and the modified Reading Recovery programmes are much more efficient than traditional support programmes. While many school districts may still feel that one to one instruction is a not viable option for them, the power of the principles underpinning the Reading Recovery programme cannot be denied.

5.8. Implications for Reading Recovery Programmes.

For school systems using Reading Recovery to reduce the incidence of reading failure, the modified Reading Recovery programme would appear to enable teachers to recover even more children each year, thus making the programme even more cost effective.

5.9. Implications for Literacy Programmes in General.

The question of what children need to know in order to
become independent readers and writers and how this
should be taught, was addressed in the introduction to
this study.

Cunningham (1990), and Hatcher et al (1991), have
suggested that the teaching of phonological processing
skills should be embedded in reading and writing tasks
rather than taught as isolated skill and drill. The
results from this study support this argument but also
take it a step further. The study points to the fact that
there are a range of strategies that children need to
control in order to become readers and writers who are
able to learn more about reading and writing each time
they read and write, thus extending their inner control
over the process (Clay 1991), and that all of these
strategies should be addressed explicitly in the context
of both reading and writing.

5.10. Limitations of the Study.

Although not one of the research questions, it would have
been of interest to see how the average classroom control
group and both the Reading Recovery groups were
performing at the end of the year. Unfortunately

resources did not permit this testing to be undertaken for the former groups.

5.11. Implicatons for Further Research.

The question of the mix of the activities in the Reading Recovery programme was first questioned by Nicholson (1989).

This study has shown that by altering the mix of activities, children who received a Reading Recovery programme modified to make explicit the relationship between the phonemes and graphemes shared by some words, were able to join their age peers in average groups in the classroom in a much shorter time than it took those children who received a standard Reading Recovery programme.

Questions for further research may be-

*   Should this intervention have been implemented sooner or later in the Reading Recovery programme? The arbitrary 35 letters was decided on simply because it was thought that once the children were able to identify this many letters, the balance could be taught incidentally during the course of the lesson, especially during the

writing segment of the lesson when the child could hear a sound but could not identify the corresponding letter.

* Is there any other way that the particular mix of activities could be modified to enable those children at the bottom end of the achievement distribution to gain control over the complexities of the reading process even sooner?

* Are there implications arising from this study that can be utilized in First Year programmes which would enable even more children to learn to read without the second chance afforded by the Reading Recovery programme?

APPENDICES.

A   F   K   P   W   Z

B   H   O   J   U

C   Y   L   Q   M   —

D   N   S   X   I

E   G   R   V   T

a   f   k   p   w   z

b   h   o   j   u   a

c   y   l   q   m

d   n   s   x   i

e   g   r   v   t   g

:

LETTER IDENTIFICATION SCORE SHEET

Date:_____

Name:_____ Age:_____

Recorder:_____ Date of Birth:_____

TEST SCORE: | /54

STANINE GROUP: |

	A	S	Word	I.R.		A	S	Word	I.R.
A					a				
F					f				
K					k				
P					p				
W					w				
Z					z				
B					b				
H					h				
O					o				
J					j				
U					u				
					a				
C					c				
Y					y				
L					l				
Q					q				
M					m				
D					d				
N					n				
S					s				
X					x				
I					i				
E					e				
G					g				
R					r				
V					v				
T					t				
					g				
			TOTALS					TOTAL SCORE	

Confusions:

Letters Unknown:

Comment:

Recording:
A Alphabet response: tick (check)
S Letter sound response: tick (check)
Word Record the word the child gives
IR Incorrect response: Record what the child says

Concepts About Print Test

Administration and scoring

Before starting, thoroughly familiarise yourself with this test. Use the exact wording given below in each demonstration. (Read the instructions from the printed text for each administration.)

Say to the child, :'*I'm going to read you this story but I want you to help me.*'.

Cover

Item 1	Test:	For orientation of book. Pass the booklet to the child holding the book vertically by outside edge, spine towards the child.
●	Say:	'*Show me the front of this book.*'
	Score:	1 point for the correct response.

Pages 2/3

Item 2	Test:	Concept that print, not picture, carries the message.
	Say:	'*I'll read this story. You help me. Show me where to start reading. Where do I begin to read?*'
Read the text.		
	Score:	1 for print. 0 for picture.

Pages 4/5

Item 3	Test:	For directional rules.
	Say:	'*Show me where to start.*'
	Score:	1 for top left.
Item 4	Say:	'*Which way do I go?*'
	Score:	1 for left to right.
Item 5	Say:	'*Where do I go after that?*'
	Score:	1 for return sweep to left.

(Score items 3-5 if all movements are demonstrated in one response.)

Item 6	Test:	Word by word pointing.
	Say:	'*Point to it while I read it.*' (Read slowly, but fluently.)
	Score:	1 for exact matching.

Page 6

Item 7	Test:	Concept of first and last.
Read the text.		
	Say:	'*Show me the first part of the story.*' '*Show me the last part.*'

	Score:	1 point if BOTH are correct in any sense, i.e. applied to the whole text or a line, a word or a letter.

Page 7

Item 8	Test:	Inversion of picture.
	Say:	'*Show me the bottom of the picture*' (slowly and deliberately).
		(Do NOT mention upside-down.)
	Score:	1 for verbal explanation, OR, for pointing to top of page, OR, for turning the book around and pointing appropriately.

Pages 8/9

Item 9	Test:	Response to inverted print.
	Say:	'*Where do I begin?*' '*Which way do I go?*' '*Where do I go after that?*'
	Score:	1 for beginning with 'The' (**Sand**), or 'I' (**Stones**), and moving right to left across the lower and then the upper line. OR 1 for turning the book around and moving left to right in the conventional manner.
Read the text now.		

Pages 10/11

Item 10	Test:	Line sequence.
	Say:	'*What's wrong with this?*' (Read immediately the bottom line first, then the top line. Do NOT point.)
	Score:	1 for comment on line order.

Pages 12/13

Item 11	Test:	A left page is read before a right page.
	Say:	'*Where do I start reading?*'
	Score:	1 point for left page indication.
Item 12	Test:	Word sequence
	Say:	'*What's wrong on this page?*' (Point to the page number 12 — NOT the text.)
Read the text slowly as if it were correct.		
	Score:	1 point for comment on either error.

Item 13 Test: Letter order.

Say: *'What's wrong on this page?'* (Point to the page number 13 — NOT the text.)

Read the text slowly as if it were correct.

Score: 1 point for any ONE re-ordering of letters that is noticed and explained.

Pages 14/15
Item 14 Test: Re-ordering letters within a word.

Say: *'What's wrong with the writing on this page?'*

Read the text slowly as if it were correct.

Score: 1 point for ONE error noticed.

Item 15 Test: Meaning of a question mark.

Say: *'What's this for?'* (Point to or trace the question mark with a finger or pencil.)

Score: 1 point for explanation of function or name.

Pages 16/17

Test: Punctuation.

Read the text.

Say: *'What's this for?'*

Item 16 Point to or trace with a pencil, the fullstop (period).

Item 17 Point to or trace with a pencil, the comma.

Item 18 Point to or trace with a pencil, the quotation marks.

Item 19 Test: Capital and lower-case correspondence.

Say: *'Find a little letter like this.'*

Sand: Point to capital T and demonstrate by pointing to an upper case T and a lower case t if the child does not succeed.
Stones: As above for S and s.

Say: *'Find a little letter like this.'*

Sand: Point to capital M, H in turn.

Stones: Point to capital T, B in turn.

Score: **Sand:** 1 point if BOTH Mm and Hh are located.
Stones: 1 point if BOTH Tt and Bb are located.

Pages 18/19
Item 20 Test: Reversible words.

Read the text.

Say: *'Show me was.'*
'Show me no.'

Score: 1 point for BOTH correct.

Page 20
Ensure you have two pieces of light card (13 x 5cm) that the child can hold and slide easily over the line of text to block out words and letters. To start, lay the cards on the page but leave all print exposed. Open the cards out between each question asked.

Item 21 Test: Letter concepts.

Say: *'This story says* (**Sand**) *"The waves splashed in the hole"* (or (**Stones**) *"The stone rolled down the hill").* *I want you to push the cards across the story like this until all you can see is* (deliberately with stress) *just one letter.'* (Demonstrate the movement of the cards but do not do the exercise.)

Say: *'Now show me two letters.'*

Score: 1 point if BOTH are correct.

Item 22 Test: Word concept.

Say: *'Show me just one word.'*
'Now show me two words.'

Score: 1 point if BOTH are correct.

Item 23 Test: First and last letter concepts.

Say: *'Show me the first letter of a word.'*

'Show me the last letter of a word.'

Score: 1 point if BOTH are correct.

Item 24 Test: Capital letter concepts.

Say: *'Show me a capital letter.'*

Score: 1 point if correct.

Scoring Standards

Item	Pass	Score
1	Front of book.	
2	Print (not picture).	
3	Points top left at '*I took...*' (Sand); '*I walked...*' (Stones).	
4	Moves finger left to right on any line.	
5	Moves finger from the right-hand end of a higher line to the left-hand end of the next lower line. or moves down the page.	
6	Word by word matching.	
7	Both concepts must be correct, but may be demonstrated on the whole text or on a line. word or letter.	
8	Verbal explanation, or pointing to top of page, or turning the book around and pointing appropriately.	
9	Score for beginning with 'The' and moving right to left across the lower line and then the upper line, OR, turning the book around and moving left to right in the conventional movement pattern.	
10	Any explanation which implies that line order is altered.	
11	Says or shows that a left page precedes a right page.	
12	Notices at least one change of word order.	
13	Notices at least one change in letter order.	
14	Notices at least one change in letter order.	
15	Says 'Question mark', or 'A question', or 'Asks something'.	
16	Says 'Full stop', 'Period', or 'It tells you when you've said enough' or 'It's the end'.	
17	Says 'A little stop', or 'A rest', or 'A comma'.	
18	Says 'That's someone talking', 'Talking', 'Speech marks', 'Print' (from computers).	
19	Locates two capital and lower case pairs.	
20	Points correctly to both *was* and *no*.	
21	Locates one letter and two letters on request.	
22	Locates one word and two words on request.	
23	Locates both a first and a last letter.	
24	Locates one capital letter.	

LIST A	LIST B	LIST C
Practice Word the	Practice Word said	Practice Word is

I	and	Father
Mother	to	come
are	will	for
here	look	a
me	he	you
shouted	up	at
am	like	school
with	in	went
car	where	get
children	Mr	we
help	going	they
not	big	ready
too	go	this
meet	let	boys
away	on	please

Administration and scoring
Select one of the following alternate Forms: A. B. C. D or E.

Form A   I   h a v e   a   b i g   d o g   a t   h o m e .
             1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16

T o d a y   I   a m   g o i n g   t o   t a k e   h i m
17 18 19 20   21 22   23 24 25 26 27   28 29 30   31 32 33

t o   s c h <u>oo</u> l .
34 35   36 37

Form B   M u m   h a s   g o n e   u p   t o   <u>th</u> e   <u>sh</u> o p.
             1   2   3   4   5   6   7   8   9   10 11   12 13   14 15   16 17 18

<u>Sh</u> e   w i l l   g e t   m i l k   a n d
19 20   21 22 23   24 25 26   27 28 29 30   31 32 33

b r e a d.
34 35 36   37

Form C   I   c a n   s e e   <u>th</u> e   r e d
             1   2   3   4   5   6   7   8   9   10   11

b o a t   <u>th</u> a t   w e   a r e   g o i n g
12 13   14   15 16 17   18 19   20 21   22 23 24 25 26

t o   h a v e   a   r i d e   i n.
27 28   29 30 31   32   33 34 35   36 37

Form D   <u>Th</u> e   b u s   i s   c o m i n g.   I t
             1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

w i l l   s t o p   h e r e   t o   l e t   m e
16 17 18   19 20 21 22   23 24 25   26 27   28 29 30   31 32

g e t   o n.
33 34 35   36 37

Form E   <u>Th</u> e   b <u>oy</u>   i s   r i d i n g   h i s   b i k e.
             1   2   3   4   5   6   7   8   9   10 11 12   13 14 15   16 17 18

H e   c a n   g o   v e r y   f a s t   o n   i t.
19 20   21 22 23   24 25   26 27 28 29   30 31 32 33   34 35   36 37

SUMMARY OF RUNNING RECORD

Name:_____ Date:_____ D. of B._____ Age:___ yrs ___ mths

School:_____ Recorder:_____

SUMMARY OF RUNNING RECORD

Text Titles	Running Words Error	Error Rate	Accuracy	Self-Correction Rate
1. Easy _____	_____	1:_____	_____%	1:_____
2. Instructional_____	_____	1:_____	_____%	1:_____
3. Hard _____	_____	1:_____	_____%	1:_____

Directional Movement _____

ANALYSIS OF ERRORS   Cues used and cues neglected

Easy _____

Instructional _____

_____

Hard _____

_____

CROSS CHECKING ON CUES

Page		E	SC	Cues Used* E SC

CONVENTIONS

: Accurate   reading   ✓   ✓   ✓

: Substitution $\dfrac{\text{went}}{\text{want}}$ $\left(\dfrac{\text{child}}{\text{text}}\right)$

: Repetition   (R) R or $\overset{\frown}{\vee\ \vee}\ R$

: Self-correction (SC) $\dfrac{\text{went}}{\text{want}}\ \Big|\ \text{sc}$

: Omission $\dfrac{-}{\text{very}}$

: Insertion $\dfrac{\text{little}}{-}$

: Told   (T) $\overline{\text{thought}}\ \Big|\ \text{T}$

: Appeal (A) $\overline{}\ \Big|\ \text{A}$
                              sometimes

: TTA
Try that again   [TTA   ]

CALCULATION AND CONVERSION TABLES

Error Rate	Percent Accuracy
1 : 200	99.5
1 : 100	99
1 : 50	98
1 : 35	97
1 : 25	96
1 : 20	95
1 : 17	94
1 : 14	93
1 : 12.5	92
1 : 11.75	91
1 : 10	90
1 : 9	89
1 : 8	87.5
1 : 7	85.5
1 : 6	83
1 : 5	80
1 : 4	75
1 : 3	66
1 : 2	50

CALCULATIONS
RW = Running Words
E   = Errors
SC = Self-corrections

ERROR RATE
$\dfrac{\text{Running words}}{\text{Errors}}$

e.g. $\dfrac{150}{15}$ = Ratio 1 : 10

ACCURACY
$100 - \dfrac{E}{RW} \times \dfrac{100}{1}$

$100 - \dfrac{15}{150} \times \dfrac{100}{1}$ %

= 90%

SELF-CORRECTION RATE
$\dfrac{E + SC}{SC}$

$\dfrac{15 + 5}{5}$ = Ratio 1 : 4

Dolch Word List by reading levels

Pre-primer

a	look
and	make
away	me
big	my
blue	not
can	one
come	play
down	red
find	run
for	said
funny	see
go	the
help	three
here	to
I	two
in	up
is	we
it	where
Jump	yellow
little	you

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Primer

all	out
am	please
are	pretty
at	ran
ate	ride
be	saw
black	say
brown	she
but	soon
came	so
did	that
do	there
eat	they
four	this
get	too
good	under
have	want
he	was
into	well
like	went
must	what
new	white
no	will
now	with
on	yes
our	

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Grade One

After	let
again	live
an	may
any	of
as	old
ask	once
by	open
could	over
every	put
fly	round
from	some
give	stop
going	take
had	thank
has	them
her	then
him	think
his	walk
how	were
Just	when
know	who

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Grade Two

always	or
around	pull
because	read
been	right
before	sing
best	sit
both	sleep
buy	tell
call	their
cold	these
does	those
don't	upon
fast	us
first	use
five	very
found	wash
gave	which
goes	why
green	wish
its	work
made	would
many	write
off	your

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Grade Three

about	laugh
better	light
bring	long
carry	much
clean	myself
cut	never
done	only
draw	own
drink	pick
eight	seven
fall	shall
far	show
full	six
got	small
grow	start
hold	ten
hot	today
hurt	together
if	try
keep	warm
kind	

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PHONEMIC SEGMENTATION TEST. (Yopp Singer 1988).

Directions for administering the test.

Say to the child -

"Today we are going to play a word game. I am going to say a word and I want you to break the word apart. You are going to tell me each sound in the word in order. For example, if I say old you will say o-l-d. Let's try the first few words together."

Use three more examples, ride go mom.

Administer the test.

If the child responds correctly say "That's right" or nod. If the child gives an incorrect response, correct him/her.
Record exactly what the child says.
Score as correct only the words that the child responds to accurately on his/her own.

Test Items.

dog	lay	keep	race
fine	zoo	no	three
she	job	wave	in
grew	ice	that	at
red	top	me	by
sat	do		

Score 0 - 22

PHONEME DELETION TEST.   (Bruce 1964)

Directions for administering the test.

Say to the child.

" Now we are going to play another word game. This game
is to find out what word would be left if you take a
sound away from it. For example, if I say 'What word will
be left if you take the k away from cat, you will say
at.'
Now you try one. What word will be left if you take the p
away from pin?"

Use two more examples-
cried omitting the d
bright omitting the r

If the child is having difficulty give two more examples
using familiar names e.g.
Johnny without the final E sound
Sandy without the initial S sound.

Administer the test.

Record exactly what the child says.
Score as correct only the words the child responds to
accurately. Score 0 - 30.

Test Items.

s-t-and (middle)   c-old (first)
j-am (first)   part-y (last)
fair-y (last)   we-n-t- (middle)
ha-n-d- (middle)   f-r-og (middle)
star-t (last)   n-ear (first)
ne-s-t (middle)   thin-k (last)
f-rock (first)   p-late (first)
ten-t (last)   s-n-ail (middle)
lo-s-t (middle)   b-ring (first)
n-ice (first)   le-f-t- (middle)
s-top (first)   car-d (last)
far-m (last)   s-p-oon (middle)
mon-k-ey (middle)   h-ill (first)
s-pin (first)   ever-y (last)
for-k (last)   pin-k (last)

PSEUDOWORD RECODING TEST.

Directions for administering the test.

Say to the child

"This is the last word game we are going to play. I have
a list of funny words I want you to read. They are words
that are spoken by people from another planet. Let's
pretend that we are going to visit them and want to talk
to them. Try and see if you can say their words the way
they do."

Point to the first practice word.

Say -   "Here is the first one. It says nad. Now you try.
Respond to the child's attempts on the two practice words
by saying either -

(a) "Good that's right" for a correct response

(b) "Good try, the word says _____" for an attempt

(c) "You try it" for no response followed by either (a)
    or (b) after the attempt.

Say to the child, " I am not going to help you now
      because
I want to see what you can do all by yourself."

Administer the test.

Record exactly what the child says.
Score as correct only those words correctly and normally
pronounced.
Discontinue the test if the child makes no response to
ten items in a row.

WORD LIST

Practice Words.

nad

hig

slue

----

cib	ort	phay	clur
gof	tev	nelp	derb
urj	vaw	flass	folp
juk	yaz	scrong	sark
ker	fute	vute	shald
maun	kaje	shile	plair
nep	nime	throve	worch
poy	voe	toin	knop
quar	peke	spawk	ceft
rus	nue	spleek	flage

TEXT READING TEST. SOMETHING AT THE DOOR.
(Scott Foresman 1979)

The following passage is to be read by children as part
of the discontinuing survey. To be discontinued, the
child should be able to read this passage at an
instructional level, i.e. 90%-94% accuracy.

Directions for administering the test.

Give the child a synopsis of the story by saying -

"This book is called Something at the Door.
It is a fairy tale about a witch who moved to a new house
and went in her new front door. A ghost and a giant, who
were her friends, came to see her new house. While they
were drinking tea they heard a loud knock at the door.
They were all so frightened, they began to shake with
fright.
The story has a surprise ending. I want you to read the
story by yourself. I will only help you if you get really
stuck."

Open the book and read the first three words while
pointing. "Once upon a......."

Take a running record of the child's reading of the rest
of the book. (150 words). Remember to use the most
neutral response of "You try it," if the child stops at
an unknown word. Follow this by telling the child the
word if no response is made.

If the child scores 90% or above, credit the child with
having read the text "unseen." If the child scores less
than 90% ask the child to reread the story again the next
day. This will then be credited as " seen" material. If
the child scores less than 90% on the second reading, the
material is too difficult.

Something at the Door

Once upon a time a witch moved into
a little house in the woods.

The witch put her broom by the front door
and her hat on the shelf.
Then she called her friends to come and
see her new house.

—

A ghost and a giant came to see her house.
The witch asked them to stay for tea.
They all sat down and began to drink tea.
Just then they heard a loud knock at
the door.

"What's that noise?" asked the ghost.

"I don't know," said the witch.

They all began to shake with fright.
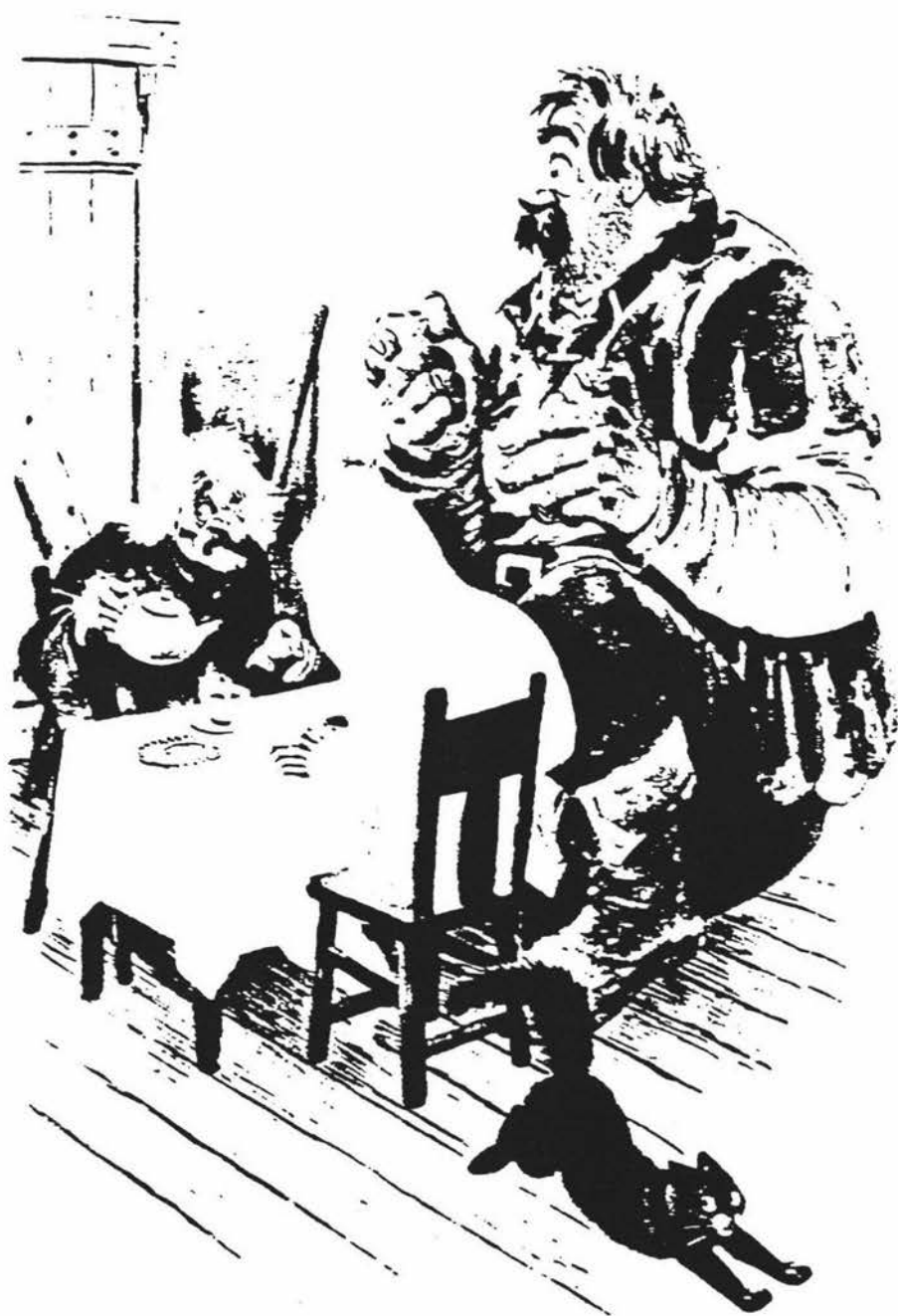
The knob on the door began to turn.
The giant put his hands over his eyes.
The ghost hid behind the giant.
The witch hid behind the ghost.

Then the door opened, and a little girl
came into the room.

"Hello," she said. "I live next door, and
I made a plate of cookies for you."

LIST OF FREQUENTLY USED WORDS AND SOME SUGGESTIONS FOR USING THEM.

am	an, as, at.
am	dam, ham, ram, Sam, clam, sham, tram.
and	band, hand, land, sand.
at	bat, cat, fat, hat, mat, pat, rat, sat, flat, that, splat.
away —	day, hay, lay, may, pay, say, clay, play.
big	dig, pig, jig.
big	bag, bog, bug.
big	bid, bin, bit.
can	fan, man, ran, tan, clan, flan, an.
can	car, cat, cash, cart.
come	some.
come	came.
down	gown, town, drown, frown.
find	fend, fond, fund.
find	kind, mind, wind, blind.
for	far, fir, fur.
get	bet, let, met, net, pet, set, wet.
get	got, gut.
go	no, so.
go	goes, going.
help	helps, helped, helper, helping.
his	hill, him, hit.
in	is, it.
in	bin, din, fin, pin, sin, tin, thin.
jump	bump, lump, clump, slump, stump, trump.
like	bike, hike, Mike, pike, strike.
like	lake, Luke.
like	life, lime, line.
look	book, cook, hook, took, crook ,shook.
look	looked, looking, looks.
make	bake, cake, fake, sake, take, wake, flake
make	made, male, mane, may, maze.
me	be, he, we, she.
mommy	daddy, pretty.
must	bust, dust, gust, just, rust.
must	mast, mist, most
my	by, cry, dry, fly, shy, sty.
not	dot, hot, jot, lot, pot, rot, shot, slot, trot.
on	in, an.
our	out.
run	rub, rug, rum, rut.
the	that, this, their, there, them, then, they.
under	after, brother, father, her, mother, sister, teacher, water.
went	want, wont.
went	bent, dent, lent, rent, sent, tent.

RECOMMENDATIONS FOR DISCONTINUING CHILDREN

Name:_____

Date:_____

School:_____

1 SETTING (Same class, new class, book level, teacher's reaction, size of group etc.)

2 SURVIVAL (Detail what behaviours will ensure coping in group instruction)

3 RUNNING RECORD ANALYSIS (Detail cues used and cues neglected)

4 COMMENT ON IMPROVEMENTS SINCE PREVIOUS SUMMARY AND PREDICTIONS

RECOMMENDATIONS: (for class teacher, or further teaching or further assessment)

Signed:_____

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