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The Effectiveness of a Phonological-Based Intervention for Students in their First Year of School

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Abstract

New Zealand has a long tail of underachievement in reading with the results of international literacy surveys consistently showing that while some New Zealand students are among the best readers in the world, the gap between the best and poorest readers continues to widen. Research evidence indicates that a potential reason for the increasingly large gap is a lack of focus on the explicit teaching of phonologically-based decoding skills in the early years of school. The purpose of this study was to first determine the levels of alphabet knowledge and phonological awareness in a group of students at school entry and compare these levels to a group of slightly older students also in their first year of school. A second aim was to evaluate the efficacy of a nine-week explicit intervention that targeted phonologically-based skills for improving decoding ability. This study is a modified replication of a study conducted by Greaney and Arrow (2012). The study is a non-randomised, pretest-intervention-posttest design with one control group. A total of 30 students were included in the study. The intervention group involved a new entrant class while the control group involved a year one class. All students were assessed using a range of phonologically-based assessments. The intervention group received the intervention in addition to their regular literacy programme while the control group only received their regular literacy programme. The results showed that the students within the intervention group entered school with a range of phonological awareness and alphabet knowledge. A key finding was that the students who had received the intervention significantly outperformed the control group on two measures of isolated decoding (the Burt word reading test and pseudoword reading) when pretest letter sound knowledge was controlled. The results of this study highlight the importance of using phonologically-based assessments with students as soon as they start school in order to identify those at risk and plan effective programmes to meet the needs of these students.

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Chapter 1: Introduction

Being able to read text in its various forms unlocks the ability to participate and actively engage in the world. The ability to read facilitates access to information, enabling us to participate fully in life. Without the ability to read and write life options are limited dramatically, for as Tunmer and Prochnow (2009, p.154) state, "Becoming literate is arguably the most important goal of schooling. The ability to read is basic to success in almost every aspect of the school curriculum it is a prerequisite skill for nearly all jobs, and is the primary key to lifelong learning. Literacy determines, to a large extent, young children's educational and life chances and is fundamental in achieving social justice."

However, according to international literacy survey results, about 20% of New Zealanders are not equipped with this extremely important life skill (Tunmer, Chapman, & Prochnow, 2004). New Zealand's position on the international literacy surveys has continued to drop since ranking 1st in the 1970 inaugural survey to the current position of 26th (Greaney, 2011) and, with the continuing drop, the gap between the best and poorest readers continues to widen.

Tunmer and colleagues (Arrow & Tunmer, 2012; Tunmer, et al., 2004) suggest that a possible solution for the tail of underachievement in reading is early assessment and instruction that is targeted to meet the differing phonological processing needs of students at school entry. However, there is no national standard for school entry in the recent government initiative, National Standards (Ministry of Education, 2009), which were designed to target the 20% of students underachieving in reading, writing and mathematics in New Zealand.

Rationale

The ability to read is the foundation for all learning in all curriculum areas (Ministry of Education, 2010). Without this fundamental skill, everyday life is a

real challenge. New Zealand fosters a predominantly whole language approach to reading instruction and reading intervention (Nicholson, 2002; Smith & Elley, 1997) but national and international research suggests that this approach to early literacy teaching and intervention does not meet the needs of those most at risk of reading failure (Juel & Minden-Cupp, 2000; Tunmer, Chapman, & Prochnow, 2003). This contrast between the research evidence and teaching practice continues to have implications for New Zealand's poorest readers (Tunmer, et al., 2003). The need to bridge the gap between what is consistently demonstrated to be best evidence-based practice for preventing and remediating struggling readers in the research, and what actually happens in schools, is a key motivation for this research.

New Zealand's increasing literacy achievement gap between its best and poorest readers (Tunmer, et al., 2004) is evidence that the current approach to reading instruction and intervention has not been successful for many students. Tunmer, Chapman and Prochnow (2004) suggest that the gap is most likely the result of negative Matthew effects triggered by a predominantly whole language approach to teaching reading that fails to cater for the variance of phonological processing skills of new entrants. Students with high literate cultural capital benefit from the whole language approach, however conversely, students with low literate cultural capital suffer because of it (Arrow & Tunmer, 2012).

Alphabet knowledge and phonological awareness are important emergent literacy skills, with research demonstrating that they are predictors of future reading success (Adams, 1990; Blachman, 2000; Foulon, 2005; Stuart & Coltheart, 1988; Tunmer, et al., 2004). Though most New Zealand schools assess a selection of emergent literacy skills upon school entry, it is rare that the assessment battery includes any phonological measures despite the range of national and international evidence specifying these skills as essential, though not sufficient, for reading to occur (Greaney & Arrow, 2010). A lack of appropriate early literacy assessments in new entrant classrooms leads to missed opportunities to identify students at risk of reading failure and subsequently provide them with appropriate instruction to meet their needs.

The Present Study

This study aimed to assess the effectiveness of a nine-week intervention that explicitly taught phonological strategies, decoding and spelling skills to a class of new entrant students in an attempt to improve decoding skills. The lessons averaged about one hour in length and occurred three times a week. The activities were designed to be in addition to the regular class literacy programme. This study also aimed to examine the effectiveness of such an intervention on students with less emergent literacy knowledge.

Overview

This thesis is comprised of six chapters. The second chapter reviews the literature and includes a discussion of two prominent theories of word reading, the Multiple Cue Theory and the Simple View of Reading. This chapter also discusses precursors to literacy including the role of literate cultural capital and the importance of phonological awareness and knowledge of the alphabet for students' reading development upon school entry. The two key approaches to teaching reading: whole language and code emphasis, and early reading assessment, are also addressed in chapter two. Chapter three describes the methodology and research design used in the study. The results are presented in chapter four. Chapter five discusses the findings of the study in relation to the literature and considers the practical implications of the study. Chapter six completes the thesis by drawing conclusions from the findings of the current study in relation to the literature and the nature of reading assessment and instruction within the New Zealand context and also suggests implications for future research.

Key Terms and Definitions

Decoding – decoding is the ability to decipher printed words into spoken words using letter to sound correspondences. It includes the act of sounding out unfamiliar words (Moats, 2000).

Comprehension – comprehension refers to the meaning or understanding a reader gains from printed text. Comprehension occurs during and after text has been decoded.

Alphabetic Principle – the alphabetic principle is the understanding that sounds in speech (i.e. phonemes) are represented by letters and letter combinations in printed words (Moats, 2000).

Literate Cultural Capital – literate cultural capital refers to the set of pre-literacy skills, knowledge and experiences a student possesses prior to school entry (Tunmer, Chapman, & Prochnow, 2006). It includes, but is not limited to, knowledge of the alphabet, concepts about print, letter writing ability, knowledge of words and word parts, vocabulary and grammatical development and phonological awareness.

Matthew Effects – Matthew effects refers to the influence literate cultural capital, teacher expectations, practice and motivation have on students' reading development (Catts & Kamhi, 2005). It is an adaptation of the biblical text, 'the rich get richer and the poor get poorer' (Center, 2005). In other words, students with an abundance of positive early literacy experiences are likely to learn to read easily and continue to benefit from their emerging reading skills, conversely, students with a lack of early literacy skills and/or negative early literacy experiences are likely to struggle to learn to read (Stanovich, 1986).

Phonological Awareness – phonological awareness is a conscious understanding that spoken language is made up of various levels of sound

units. These include sentences, words, syllables, onset-rime units and phonemes. Phonological awareness comprises the ability to consciously attend to, reflect on and manipulate (Catts & Kamhi, 2005) these sound units in speech in various ways including the ability segment, blend, delete and substitute the various phonological sound units. Phonological awareness develops over time (Blachman, 2000). Some phonological awareness tasks are simpler than others. Phonological awareness is a broader term than phonemic awareness (Moats, 2000).

Phonemic Awareness – phonemic awareness is one aspect of phonological awareness. It refers to the ability to consciously manipulate phonemes in speech. Phonemes are the smallest unit of speech (Torgesen, Mathes, & Patricia, 2002).

Chapter 2: Literature Review

Introduction

An extensive amount of national and international research focusing on the reading acquisition process and the most effective ways to teach struggling readers currently exists (e.g. (Blachman, Tangel, Ball, Black, & McGraw, 1999; Tunmer & Chapman, 2002; Vellutino, Scanlon, Sipay, & Small, 1996). The findings from this research provide reasons for New Zealand's increasing gap between the best and poorest readers. Several conclusions can be drawn from the research base. One key finding is that the variance in students' pre-literacy skills upon school entry can predict later reading achievement (Tunmer, et al., 2006). Another key finding is that students experiencing reading difficulties are likely to have deficiencies and weaknesses in phonological processing skills (Chapman & Tunmer, 2001; Vellutino, et al., 1996). One important component of phonological processing is phonological awareness. Phonological awareness is particularly important because it has consistently been found to be related to reading and word recognition in particular (Catts & Kamhi, 2005). Phonological awareness skills include the ability to detect and generate rhyming words, count syllables, and segment and blend phonemes. Another key finding is that students can be identified as at risk of failing to learn to read even before they begin formal reading instruction using information gained through various phonological awareness assessments (McCardle, Scarborough, & Catts, 2001). The consistency of these findings add clarity to the knowledge of what is evidence-based best practice when it comes to identifying, preventing and remediating struggling readers.

This chapter begins by discussing two key theories that underpin the practice of reading teaching. The first is the 'Multiple Cue Theory' and the second is the 'Simple View of Reading'. The two main approaches to the teaching of reading,

the whole language approach and the code emphasis approach, are then compared and contrasted. The chapter then considers the importance of students' literate cultural capital at school entry and discusses critical pre-literacy skills including, phonological awareness, phonemic awareness and knowledge of the alphabetic principle. Additionally, early literacy assessment practices and tools are discussed in terms of the types of assessments that are available and the types of assessments that are readily used within New Zealand schools. A summary of the research surrounding phonologically-based reading interventions is then provided followed by a description of the context of the present study. The chapter concludes with the research aims and hypotheses for the current study.

Theory

The Multiple Cue and the Simple View are two theories that influence the philosophy behind the approaches and assessments teachers use to teach reading. The differences between the two philosophical approaches in teaching practice are particularly distinct for students in the early years of school. At this early stage of reading acquisition, students develop strategies to decode print and the two theories approach this challenge in very different ways. Research demonstrates that the quality of early literacy instructional experiences, positively or negatively, sets the tone for students' future reading success (Torgesen, 1998). Therefore, it is important for students to receive the most effective research-based instruction in order to become successful readers.

The Multiple Cue Theory and Word Reading

Advocates of the Multiple Cue Theory subscribe to the idea that all cues are used equally and simultaneously when identifying unfamiliar words in text. These cues include prior knowledge, sentence structure, syntactic information, illustrations and visual or grapho-phonetic information. The Multiple Cue Theory is

the basis of the whole language or meaning-emphasis approach to teaching reading. Though the Multiple Cue Theory has been widely accepted within the New Zealand context of reading education, some researchers have suggested that it is flawed due to it being based on the incorrect assumption that skilled readers use minimal word-level information when reading unfamiliar words (Tunmer & Greaney, 2010). The Multiple Cue theory has been presented using several similar diagrammatic representations over the years and has had different names, for example the Searchlights Model (Stuart, Stainthrop, & Snowling, 2008). While these representations (see Figures 1 to 3) all look slightly different, they carry a similar message, which is that all cues are to be of equal importance. However, further analysis indicates that many teachers and commentators consider that the context-meaning cues are of prime importance.

In support of this statement, Frank Smith (1978) proposed a model of reading that emphasises two types of cues required for reading, 'visual information' and 'non-visual information'. He described the reciprocal relationship between the visual and non-visual information thus: "The more non-visual information you have when you read, the less visual information you need. The less non-visual information you have when you read, the more visual information you need" (Smith, 1978, p. 14). In other words, the greater the prior and contextual knowledge you have about a subject you are about to read, the less word level information you are likely to need when reading unfamiliar words within the text. Conversely, the less prior and contextual knowledge you have about a subject you are about to read, the more word level information you are likely to need. However, Smith (1978), emphasises how visual and non-visual cues are not equal when he states, "There is a severe limit to how much visual information the brain can handle" (Smith, 1978, p. 15). He describes a 'bottleneck' between the eyes and the brain and goes on to stress the importance of readers relying on their eyes as little as possible when reading.

To illustrate this process Smith (1978) uses three cumulative diagrams (see Figure 1). The first panel in Figure 1 shows that reading is the result of using both visual and non-visual information; the second panel shows the reciprocal relationship between the two sources of information and the third shows how non-visual information is superior to visual information through the ‘bottleneck’ effect.

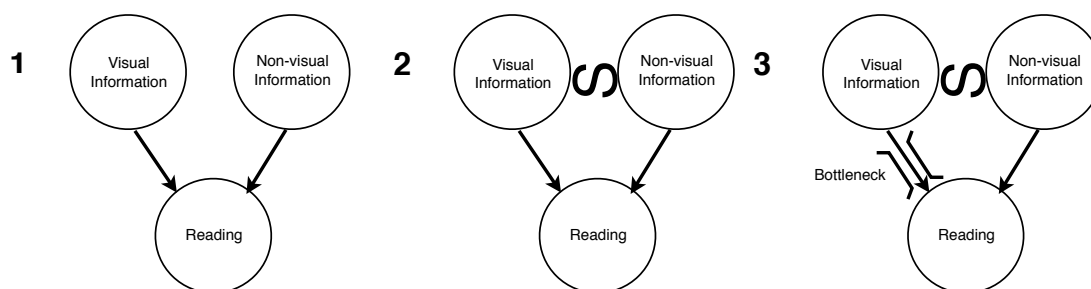


Figure 1: *Reading from Behind the Eyes* (Smith, 1978, p. 14-16)

Greaney (2011) highlights that the same ‘hierarchy’ of cues that emphasise the context-based cues of being of greater importance are represented in many publications used by whole language theorists depicting the Multiple Cue Theory (Clay, 1985; Hood, 2000; Ministry of Education, 2010; Smith & Elley, 1997) For example, Clay (1985) when discussing the relative order of the cues that readers use when reading, states that;

“All readers, from five year old beginners on their first books to the effective adult reader need to use:

- The meaning,
- The sentence structure,
- Order cues,
- Size cues,
- Special features,
- Special knowledge,
- First and last letter sounds,

Before they resort to left to right sounding out of chunks or letter clusters, or in the last resort, single letters” (Clay, 1985, p. 7).

The above statement clearly demonstrates that Clay views the word-based cues as being of the least importance. In further support of her view, Clay (2005b, p. 111) states that when instructing for word identification, “In your *first attempts* (italics in original) to call features of print to the child’s attention, prompt for sentence structure, and then prompt for message.” She also warns that “undue attention to the details of letters, for example, can block the child’s ability to use his language knowledge and the meaning of the text, as part of his information base for decision making” (Clay, 2005a, p. 25). An adherence to such advice discourages teachers from using word level cues and underemphasises their importance.

Smith and Elley (1997) propose a similar model in which they describe the process of reading as ‘interactive’ whereby the reader accesses information from all cues to predict words (see Figure 2). This model suggests that Smith and Elley (1997) consider all of the cues to be of equal importance. However, in contradiction to this apparent equality of all cues, Smith and Elley emphasise context above word level cues when they state, “Context cues are emphasised in junior classrooms. Reading is easier when cues that come from the meaning or the sentence structure help the child fill any gaps” (1997, p. 26). In this model the use of the term ‘prediction’ implies that meaning comes before the reading of the text.

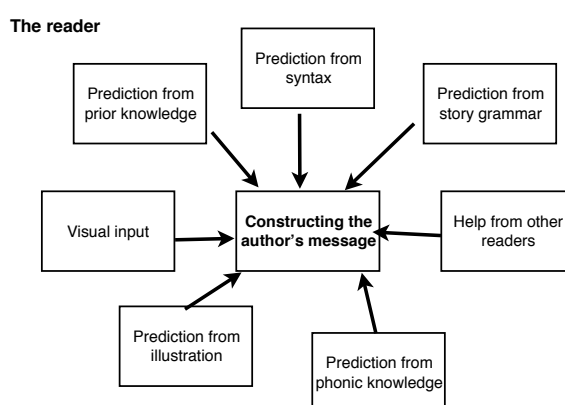


Figure 2: Diverse Cues for Constructing Meaning – Interactive Model (Smith & Elley, 1997, p. 86)

Finally, Hood (2000) suggests a model of the reading process that should be viewed as ‘cyclic rather than directional’ (p. 31) (see Figure 3). The term ‘cyclic’ proposed by Hood (2000) in this model is another way of emphasising the apparent equality of the cues. Other terms used to reinforce the equality of the cues include ‘interactive’ (Smith & Elley, 1997, p. 86) and ‘reciprocal relationship’ (Smith, 1978, p. 14). Hood’s ‘cyclic’ model suggests that readers use the cues equally and that no one cue is more important than another. However, in a paradoxical way, this model (in addition to Frank Smith, Smith and Elley and Clays’ models) also highlights a hierarchy of cues. The placement of ‘experience’ (prior knowledge) and ‘semantic’ and ‘syntactic’ (context cues) above ‘grapho-phonetic’ (letter-sound cues) again implies that context cues are superior to word level cues. This concern is noted by Beard (2003) and Adams (1998). They highlight that the use of this diagram in teacher education programmes underplays the importance of phonics due to the way in which grapho-phonetic cues are placed below all other cues. They suggest that the placement of grapho-phonetic cues, at the bottom of the diagram, indicates that these cues should be used as a last resort. It is clear that meaning is of paramount importance in all of the models described here despite the fact that, upon face value, all cues appear equal.

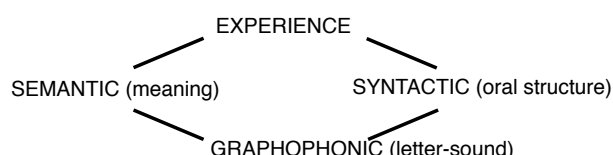


Figure 3: Hood's (2000) representation of the Multiple Cue Word Reading Model

In contrast to this view, other researchers maintain that grapho-phonetic cues are of more importance than contextual cues when learning to read new words (Chapman & Tunmer, 2003; Connelly, Johnson, & Thompson, 2001; Greaney, 2002; Greaney & Ryder, 2005; Honig, 2001; Nicholson, 1993; Tunmer & Chapman, 1998, 2002; Tunmer & Chapman, 2006). The belief that context level cues are more important than word level cues is often defended by educators and theorists that adhere to the Multiple Cue Theory of word reading when they

claim that skilled readers rely less on grapho-phonetic cues than struggling readers (Goodman & Goodman, 1976; Smith, 1979). However, the research evidence suggests the opposite, that in fact, poor readers are over reliant on context level cues and tend to use them to compensate for their poor decoding skills (Share & Stanovich, 1995; Tunmer & Chapman, 1998).

Stanovich (1986) argues that the good reader is not less reliant on visual cues than the poor reader but that the good reader is simply able to allocate less cognitive capacity to processing visual cue information and therefore has more capacity available to attend to context level cues and comprehension of the text. In support of this theory Brady and Moats (1997) highlight that good readers are acutely aware of the phonetic structure of words and have superior, fast and accurate word reading skills when reading both connected text and words in isolation compared to poor readers. Furthermore, Pressley (2006) argues that prioritising contextual over word level cues is essentially teaching students to “read the way poor readers read!” (p. 164).

The New Zealand education system emphasises the Multiple Cue Theory (e.g. Effective Literacy Practice (Ministry of Education, 2003), and thus, the whole language philosophy to reading instruction and remediation, which has implications for struggling readers. Greaney (2001) conducted a study that explored the prompts that New Zealand teachers use while instructing for word identification. The findings indicated that while the teachers did use a variety of cue sources, the majority of the prompts used activated context level sources of information. Adherence to the Multiple Cue Theory of word reading encourages teachers to underplay the importance of word-level teaching which leads to a de-emphasis on word level teaching strategies (Greaney, 2001). The prompts that teachers’ use influence and reinforce the strategies that students use when they attempt to read unfamiliar words, whether or not these strategies are effective. Adherence to teaching students to rely on context level over word level cues reinforces inefficient strategies for the students who are most at risk (Tunmer & Chapman, 2006). The evidence suggests that these students would

be better served if they were explicitly taught how the spoken language maps onto the printed word. An approach not fostered by those who adhere to the Multiple Cue Theory.

In summary, the Multiple Cue Theory of word reading fails to take into account recent research evidence about the best ways to teach students to learn to read in the early years of school although this theory is espoused by New Zealand's Ministry of Education (Ministry of Education, 2003). A recent review into the teaching of early literacy in the UK recommended a shift from the conceptual framework, the Searchlights Model of Reading (or the Multiple Cue Theory), to the Simple View of Reading within the National Literacy Strategy Framework for Teaching (Department for Education and Employment, 1998). The recommendation to shift from the Searchlights Model to the Simple View of Reading, enables findings and understandings obtained from scientific research evidence to be included within the conceptual framework that underpins teaching practice without losing the positive contributions the Searchlights Model offers (Stuart, et al., 2008). The theory underpinning early reading teaching practice directly impacts students' early reading experiences, preferred reading strategies and ultimately, reading success (Tunmer & Chapman, 2002).

The Simple View of Reading

As decoding plays a central role in the reading process, it also features as one of two key elements that enable the reader to understand print while decoding is necessary, it is not sufficient. To gain meaning from print the reader must be able to both decode the words and also have a sufficient level of linguistic comprehension. According to the Simple View of Reading, the act of reading comprises two main elements, decoding and language comprehension (Gough & Tunmer, 1986). This theory implies that a code-based approach to early reading instruction is necessary, especially for those with poorer emergent literacy skills (Connor, Morrison, & Slominski, 2006). Reading comprehension is the ultimate goal of reading and the Simple View emphasises that the two

components are of equal importance in acquiring reading comprehension as illustrated in Figure 4 (Wren, 2000).

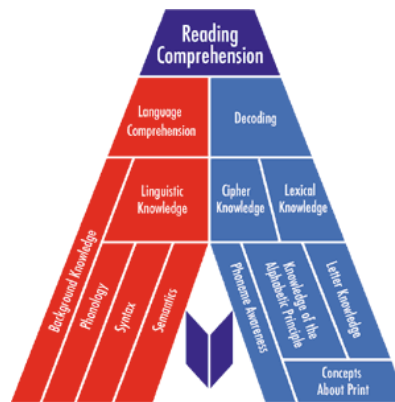


Figure 4: The Reading Acquisition Framework (Wren, 2000)

The first component of the Simple View is language comprehension, the ability to construct meaning from spoken language. The second is decoding, the ability to recognise written representations of words (Wren, 2000). According to the Simple View, reading comprehension is a product of language comprehension *and* decoding. These two components are made up of several sub skills and knowledge, some of which tend to begin to develop during the period prior to beginning formal literacy instruction such as letter knowledge and phonemic awareness (McLachlan & Arrow, 2010). The above framework (see Figure 4) clearly shows the parts that make up each of the two components that ultimately contribute to the fundamental goal of reading comprehension. This framework is a useful tool for educators to use when deciding on assessment tools to determine the relevant teaching needs of students with literacy learning difficulties.

The majority of poor readers tend to have difficulties with the phonology or the processing of sounds in spoken language (Moats, 2000). Therefore, many poor readers also require instruction that improves their understanding and awareness of the phonology of language, which is also referred to as phonological awareness. Students who enter school with low levels of phonological awareness and do not understand the alphabetic principle which is

the understanding that letters represent the sounds in spoken language (Moats, 2000) are immediately at a disadvantage compared to those who enter school with higher levels of this understanding. For many students the language structure is not self evident and direct and the systematic teaching of letter sound correspondences is often necessary from the outset of schooling (Moats, 2000). Learning to decode is dependent on an understanding of letter-sound correspondence rules also known as the orthographic cipher. Until students acquire this fundamental understanding, they will struggle to learn to read (Gough & Tunmer, 1986). Many students require direct, systematic teaching that includes an explicit emphasis on phonological awareness, phonological processing skills and teaching the alphabetic principle to become successful readers. Students who enter school with higher levels of phonological awareness and an understanding of the alphabetic principle are not disadvantaged by instruction that explicitly targets these components of early literacy acquisition. On the other hand, students who enter school with low levels of phonological awareness and do not yet understand the alphabetic principle are disadvantaged if they miss out on explicit instruction targeting these aspects of early literacy development (Arrow & Tunmer, 2012; Ehri et al., 2001).

Approaches to Literacy Instruction

As indicated, there are two distinct approaches to reading instruction each based on different theoretical foundations. These are the whole language and code emphasis approaches. While they are seemingly considered as dichotomous, whole language and code emphasis approaches can be combined into a literacy programme to include the best elements of each in what has been described as a balanced approach (Pressley, 2006). However, this section will describe some of the defining features of the two approaches to establish the key differences underpinning each approach and the implications for New Zealand in particular.

Whole Language

Literacy teaching practices in New Zealand over the past 40 years have tended to follow a whole language or constructivist philosophy of teaching reading. The constructivist philosophy of teaching reading is based on Piaget's cognitive-developmental theory in which students are seen as active learners who create their own meaning and construct their knowledge through being immersed in a print rich environment (Berk, 2005; Smith & Elley, 1994). In 1970 New Zealand ranked 1st in the inaugural International Association for the Evaluation of Reading Achievement (IEA) literacy survey. New Zealand's 14-year-olds were the best readers in the world. The philosophical shift from an explicit skill-based approach to a whole language meaning-based approach to teaching reading has resulted in a continued drop in New Zealand's ranking on the international surveys. In 1990 New Zealand ranked 6th, in 2003, 13th in and 2006, 26th (Greaney, 2011). The gap between New Zealand's top and bottom readers has been a consistent feature in these surveys and has continued to widen for over twenty years (Tunmer, Prochnow, Greaney, & Chapman, 2007). The international survey results are evidence that current literacy instruction, for a large number of students, is not particularly effective. National and international research evidence suggests more effective ways to meet the needs of all of our students, particularly those most at risk of reading failure.

The 20% tail of underachievement in reading in New Zealand includes an over representation of Maori and Pacific Island students. These students are likely to have come from low-income families and have had limited exposure to books and reading prior to school entry (Wagemaker, 1993, as cited in, (Tunmer, et al., 2003; Tunmer, et al., 2006). A probable solution for the tail of underachievement is instruction that is targeted to meet the differing phonological processing needs of students at school entry (Arrow & Tunmer, 2012; Tunmer, et al., 2004). Research evidence shows that many of the assumptions underpinning the whole language philosophy are of limited value, or even detrimental, to many students. The whole language approach that has been embraced in most New

Zealand primary classrooms is based on the assumption that learning to read is a natural process that occurs merely through exposure and immersion in rich literature. The whole language theory also maintains that students learn to read in the same naturalistic way that they learn to speak (Smith & Elley, 1997).

In whole language classrooms reading and writing instruction generally take place within 'real' contexts where sentence context cues are emphasised during reading lessons (Smith & Elley, 1997). In whole language classrooms word level skills are not usually explicitly taught but only as the need arises through the context of real reading and writing (Pressley, 2006). As discussed earlier, Clay (2005a) also believes that directing attention to word level details can ultimately negatively affect a student's ability to read text quickly and fluently. The whole language approach to teaching reading has also been endorsed by the Ministry of Education throughout its policies and publications that have been distributed to schools since the 1970s. Recent examples include 'Effective Literacy Practice in Years 1-4' (Ministry of Education, 2003), 'The New Zealand Curriculum' (Ministry of Education, 2007)', 'The Reading and Writing Standards for Years 1-8' (Ministry of Education, 2009) and 'The Literacy Learning Progressions' (Ministry of Education, 2010).

Tunmer, Chapman and Prochnow (2004), argue that New Zealand's predominately whole language/constructivist approach to reading instruction fails to address the inequalities of reading-related skills and knowledge of students at school entry and consequently is largely responsible for the gap between New Zealand's top and bottom readers. They suggest that instruction that is whole language in orientation creates Matthew effects (rich get richer and the poor get poorer) whereby those entering with larger amounts of literate cultural capital continue to benefit from whole language instruction, but those with limited literate cultural capital fail to respond adequately to the content based approach to reading instruction. It is argued that approximately 80% of students (e.g. those with high literate cultural capital) learn to read regardless of the philosophical underpinning of the instructional approach they are exposed to.

However, the remaining 20% (e.g. those with low literate cultural capital) struggle to learn to read, as they do not acquire the alphabetic principle unless it is made apparent to them through explicit, appropriate instruction (Lieberman & Lieberman, 1992).

Code emphasis

The other approach to teaching students to read is the code emphasis approach. This approach focuses on the explicit teaching and learning of strategies that develop students' knowledge of letter-sound correspondences, encourage students to use their knowledge of orthographic, or spelling, patterns to decode new words and to focus on words and word parts in isolation and in contextual reading. Code emphasis approaches also stress the importance of word level cues ahead of context level cues when students attempt to decode unfamiliar words. This is the key difference between the whole language and code emphasis approach.

A criticism of the code emphasis approach to early reading instruction is that it is often considered to not be necessary for those students who enter school with high levels of phonological awareness and alphabet knowledge. However, it has also been demonstrated to even be beneficial to these students who do enter with high levels of these phonemic awareness and alphabet skills (Arrow & Tunmer, 2012; Ehri, et al., 2001). A study conducted in Australia by Fielding-Barnsley (1997) explored the effects of a decoding and encoding programme (in comparison to a whole word programme) on a group of year one students who had all been trained to a high level of phonemic awareness and alphabet knowledge in preschool. The results indicated that students who had entered school with high levels of phonemic awareness and alphabet knowledge still benefited from a programme that explicitly taught decoding and encoding strategies. Their ability to read and spell novel and pseudowords was shown to be superior to those students who had received only the whole word programme. The results from this study indicated that the use of alphabet and

phonological training within a whole class context in new entrant classrooms was beneficial for both the students who had entered school with these skills and those who lacked them at the outset.

The whole language approach to reading has been shown to support students who enter school with high literate cultural capital. These students enter school with a good foundation of cognitive entry skills such as alphabet knowledge, phonological awareness and oral vocabulary. Students who have such a foundation of these skills upon school entry are generally able to benefit from reading instruction that is aimed at enhancing their reading and reading related skills through activities that are implicit and student directed. However, this approach does not meet the needs of students who do not possess these skills. This is because the one-size-fits-all whole language approach to early literacy instruction gives little attention to the different levels of abilities that students bring on school entry. In contrast, a code emphasis approach supports all students who enter school with and without these cognitive entry skills. Students who enter school without these pre-literacy skills require further explicit instruction to gain an understanding of the alphabetic principle. Explicit, structured, systematic, teacher-directed instruction is required for these students to acquire the skills that their more fortunate classmates may already have at school entry (Arrow & Tunmer, 2012). As previously noted, being exposed to this type of instruction does not necessarily disadvantage students who enter school with these skills. In fact, research has shown that these students continue to benefit from code emphasis approaches in terms of their spelling and reading development (see Fielding-Barnsley, (1997). Tuition that targets specific phonological-based deficiencies helps students acquire the skills they need in order to access effective strategies when they encounter word-level difficulties during reading. Many students within whole language classrooms are generally unlikely to have access to explicit instruction targeting phonological awareness and/or word level decoding instruction because (whole language) teachers tend to subscribe to the Multiple Cue Theory of word reading that views all cues as being of equal importance rather than giving more

focus to the more effective word level cues. The consequence of this multiple cue approach is that students are not taught to appreciate the value of the word-level cues as being the most effective sources for word identification.

New Zealand's predominantly whole language approach to reading instruction fails to meet the needs of the students most at risk of reading failure by not differentiating the instruction to accommodate the needs of students based on the set of literacy related skills and knowledge they bring at entry to school (Arrow & Tunmer, 2012). This, coupled with a lack of appropriate literacy assessments available for teachers of students in their first year of school, puts the most at risk students in danger of not being identified as at risk and not getting the instruction they require to become successful readers. The increasing body of evidence indicating that phonological awareness, phonemic awareness and an understanding of the alphabetic principle (components that are integral to the code emphasis approach) are critical for early reading development highlights the importance of, and relevance for, assessing these skills at school entry. This practice would allow early identification of those at risk and provide information upon which appropriate interventions can be designed with the aim of preventing reading failure (Smith, 1998b).

Literacy Knowledge and Abilities at School Entry

Students enter school with a range of emergent literacy knowledge, awareness and skills. The teachers of beginning school students are faced with the challenge of providing literacy programmes that cater for this variance in students' emergent literacy knowledge in the first year of schooling. Students' literate cultural capital, including their phonological awareness and knowledge of the alphabetic principle are key components to be considered when determining how prepared students are to begin learning to read, upon school entry. It is therefore important to also identify those at risk and to consequently design and provide effective literacy programmes to address the diverse needs of new entrant and year one students.

Literate Cultural Capital

Literate cultural capital is a term used to describe the range of students' reading related experiences prior to school entry (Tunmer, et al., 2006). Students' literate cultural capital is influenced by the amount and quality of literacy related activities and experiences they receive in the home, early childhood centers, and other settings, before they start school. When students enter school at age five they bring with them the knowledge and skills they have learnt about literacy through their emergent literacy experiences in the home and in early childhood settings. The skills within literate cultural capital include phonological awareness, knowledge of words, word parts and the alphabet, print awareness, oral language skills and vocabulary development and can be viewed on a continuum. Some students enter school with little language experience and exposure to written language while other students enter school with an abundance of such experiences (Catts & Kamhi, 2005). Tunmer and colleagues (Tunmer, et al., 2003; Tunmer, et al., 2004), argue that the spread between the best and worst readers in New Zealand is a result of Matthew effects (the rich get richer and the poor get poorer) triggered by the national whole language/constructivist approach to reading that doesn't account for the variance in literate cultural capital at school entry (Tunmer et al., 2008).

Research has shown that students who enter school with high levels of literate cultural capital are better equipped to receive literacy instruction at school, regardless of the type of instruction, than students who enter school with less of these skills (Pressley, 2006; Whitehurst & Lonigan, 1998). The range of precursor skills for successful reading between students at age five emphasises the need for instruction that is differential. Arrow and Tunmer (2012) note that students who enter school with low literate cultural capital generally require more explicit, systematic, teacher-directed instruction in order to learn to read; but students who enter school with high literate cultural capital benefit from more child-directed, implicit instruction. Students who enter school with low literate cultural capital should be provided with the same opportunity for success

in reading as their more fortunate peers. In support of this statement, Prochnow et al. (2012) state that, “The challenge for education policy makers in New Zealand, in our view, is to develop an approach to literacy education in which the new entrant with limited literate cultural capital has approximately the same probability of success in learning to read and write as the new entrant with an abundance of literate cultural capital; that is, an approach that does not contribute to cultural reproduction in New Zealand society” (p. 116-117). Therefore, the assessment of a student’s literate cultural capital upon school entry can predict whether or not that student is likely to become a successful reader. This emphasises the importance of appropriate new entrant assessments that provide insight into students’ literate cultural capital. Phonological awareness is one important component of students’ literate cultural capital.

The Importance of Phonological and Phonemic Awareness

Phonological awareness is a conscious awareness of the various segments of spoken language. It is an umbrella term that encompasses rhyme, syllable, onset/rime and phonemic awareness and includes the ability to identify, discriminate and manipulate units of speech (Torgesen, et al., 2002). According to a large body of research, phonological awareness is an important prerequisite of learning to read (Blachman, 2000) and does not come naturally to many students. Research has shown that a student’s difficulty to decode can often be attributable to this lack of understanding (Williams, 1987 as cited in Blachman, 2000). A lack of phonological awareness and phonological processing skills has been described as the ‘hallmark’ of poor readers (Whitehurst & Lonigan, 2001).

Phonological awareness has also been shown to be the ‘single best predictor’ of future reading achievement (Blachman, 2000; Tunmer, et al., 2004). According to Neilson (1999), the research has consistently shown that phonological awareness provides the strongest correlations with reading

achievement for both word recognition, and to some extent, reading comprehension. Therefore, the assessment and teaching of these skills at school entry is a logical step towards prevention and remediation of reading difficulties. Early assessment of phonological awareness allows teachers to first identify those at risk and to subsequently provide them with relevant instruction that enables them to learn the strategies they need to become successful readers.

Phonological awareness develops gradually over time (Blachman, 2000) and awareness of larger units of speech develop first as they are more easily identifiable than smaller units. Students need to understand that language is made up of words before they are able to gain an awareness that words can be split into syllables and phonemes. Therefore, phonological awareness tasks are not equal in terms of their difficulty (Torgesen, et al., 2002). As such, it is important that teachers move through tasks that are developmentally appropriate for the students they teach. The most difficult phonological awareness tasks are ones that require students to identify and manipulate phonemes which are the smallest segments in speech (Opitz, 2000). This aspect of phonological awareness is referred to as phonemic awareness.

Phonemic awareness is the conscious understanding that spoken words are made up of individual phonemes which are the smallest sound unit in speech (Torgesen, et al., 2002). As is the case with phonological awareness, phonemic awareness skills also differ in complexity. Blending and segmenting phonemes (e.g. what word is c-a-t?) are simpler phonemic awareness activities than deleting (e.g. say cat without the 'c') and substituting (change the 'c' in cat to a 'b') phonemes (Opitz, 2000). Juel (1988 as cited in Nicholson (2005) suggests that while phonemic awareness is necessary for learning to read, students do not need to be able to delete and substitute phonemes. Blending and segmenting phonemes are more important skills because these are the skills required when students attempt to phonologically produce unfamiliar words they encounter in regular reading.

It is also recognised that high levels of phonemic awareness is a predictor of future reading success (Smith, 1998b). Furthermore, Moats (2000) states that phonological or phonemic awareness, is a stronger predictor of reading success than intelligence, listening comprehension and vocabulary. Studies have also shown the relationship between phonemic awareness and reading progress to be statistically significant with several research studies consistently finding a correlation of .50 or more, (see Nicholson, (2005) for a summary)

Though phonological awareness and phonemic awareness should be viewed as critical components of effective early literacy programmes, they are not sufficient on their own. Other skills, including knowledge of semantics, syntax, the alphabetic principle and concepts about print, are also necessary (see Figure 4). Instruction that includes a combination of phonological awareness and phonemic awareness training and an emphasis on alphabet knowledge is likely to be more effective than instruction that only targets phonological and phonemic awareness (Ehri, et al., 2001).

The Alphabetic Principle

Letter name and sound knowledge have been shown to be two of the strongest predictors of future reading success (Adams, 1990; Foulín, 2005; Stuart & Coltheart, 1988). Letter name and letter sound knowledge are also necessary for acquisition of the alphabetic principle (Foulín, 2005). The alphabetic principle is the understanding that letters represent the sound segments in speech (Moats, 2000; Nicholson, 2005). Moats (2000), argues that an understanding of the alphabetic principle is 'critical' for early reading success. Byrne and Fielding-Barnsley (1991) and Gough and Walsh (1991) (as cited in Blachman, (2000) have found that students need both phonological awareness and knowledge of sound/letter correspondences to understand the alphabetic principle. Instruction that explicitly teaches the alphabetic principle and improves phonological awareness is essential for students with low literate cultural capital. These students have a 70-80% chance of having reading problems if they don't receive effective early instruction that aims to remediate their difficulties (see

Nicholson, 2005).

As already identified, both alphabet knowledge and phonological awareness make independent contributions to reading achievement. Research evidence also demonstrates that instruction that includes a combination of letter knowledge and phonological awareness is more effective than either element alone (Ehri, et al., 2001). A study conducted by Ball and Blachman (1991) investigated the extent to which phoneme awareness training in kindergarten contributed to early word reading and spelling in students in their first year of school. Three groups were included in the study. The first group received training in phonemic awareness and letter names and sounds. The second group received only letter names and sounds training and the third (control) group received no intervention. The results of the study showed that the students in the first group, who had received both phonemic awareness and letter instruction, significantly outperformed both of the other groups on measures of word reading and spelling demonstrating that instruction that combines letter knowledge and phonemic awareness is more effective than when either of the two elements is taught independently of the other.

The Role of Early Assessment in Literacy

Given how important early developing skills are, it is important to identify what students know and are able to do when they begin school. Assessing students in literacy can serve a number of purposes: to diagnose areas of strength or weakness, to make decisions about instruction, to monitor students' progress over time, to compare students' progress with other students and to identify students who require special assistance (Westwood, 2001). It is important that the purpose of literacy assessments and, additionally, the way in which the data is used, is clear from the outset. A particularly important conclusion drawn from the research on literacy assessment is that the earlier assessment occurs, the better the chance students at risk will be identified and provided with appropriate instruction. Torgesen (1998) argues that students who are poor

readers in first grade are likely to continue to be poor readers unless they are identified early and provided with appropriate interventions that are specifically designed to prevent reading failure. Another conclusion he draws from the research is that the majority of poor readers tend to have difficulties in phonemic awareness, regardless of their general verbal ability and intelligence. Therefore, interventions that address phonemic awareness are appropriate for the majority of poor readers. Furthermore, teaching that is structured, systematic and explicit have been shown to be critical ingredients in programmes for most students at risk of reading failure.

In order to identify the at-risk group, quality assessment measures are necessary. Utilising measures of pseudoword reading are useful in accurately assessing students' ability to apply their emerging phonological skills to decode unfamiliar words. A pseudoword is, by definition, a non-word (e.g. sev, tenopum, proost), and can only be read by activating the alphabetic principle whereby the pseudowords are read by utilising letter-sound correspondence knowledge. Many studies have employed the use of pseudoword assessments as a measure of decoding skill (Blachman, et al., 1999; Connelly, et al., 2001; Greaney & Ryder, 2005; Ryder, Tunmer, & Greaney, 2008; Tunmer & Chapman, 1998, 2002). Pseudoword assessments are unique in two main ways. Firstly, they eliminate the ability for students to use other sources of information to assist them in reading the words and secondly, students will not have encountered the words in previous reading experiences. Pseudoword assessments provide information that allows accurate analysis of students decoding skills and strategies. Pseudoword assessments are useful for students who have begun formal reading instruction and have already acquired the alphabetic principle and knowledge of some letter sounds. However, an initial assessment is useful even with students who have limited letter sound knowledge in order to compare their progress on subsequent pseudoword assessments.

Although most New Zealand schools assess students' early literacy skills upon school entry using a battery of assessments designed by the school such as a

measure of letter name and/or sound knowledge and the ability to write one's own name, phonological awareness measures are not usually included within the assessment battery (Greaney & Arrow, 2010). Running records of oral reading are the main assessment measure used to assess general reading progress in New Zealand in the first few years of school. However, the efficacy of running records has recently been questioned (Blaiklock, 2004). Concerns include a lack of clarity in the guidelines of whether running records are intended for use with beginning and/or fluent readers, a lack of comprehension assessment, a lack of evidence supporting the role of self-corrections in effective reading, flawed procedures for interpretation and analysis of oral reading errors, the ambiguity of the term 'unseen text' as well as difficulties in making comparisons between running records administered using different texts. Additionally, the time-consuming process of recording oral reading errors and the potential for misleading information that informs future teaching decisions add to the concerns about the usefulness of the assessment measure (Blaiklock, 2004). Despite all of these concerns, running records are the main assessment of students' literacy achievement in the first few years of school. The first main literacy assessment checkpoint for students in New Zealand occurs once they have attended one year of schooling.

The Observation Survey, designed by Clay (2002), is used to assess students' literacy skills after they have attended one year of schooling. Clay (1985) suggests the reason for delaying the first assessment for one year is to give students time to settle into school, adjust to the demands of the teacher and to stagger the testing load. While the Observation Survey contains six subtests: letter identification, concepts about print, word reading, writing vocabulary, dictation (or hearing sound in words) and running records to determine book reading level, there is no measure of phonological awareness. The 'dictation' or 'hearing and recording sounds in words' subtest has been confused as a measure of phonemic awareness but this task is ultimately a dictation or spelling task. The students are required to write the letters that represent the sounds in the words of a dictated sentence. This is not a measure of phonemic

awareness as phonemic awareness is an awareness that *spoken* words are made up of separate sounds but the 'hearing and recording sounds in words' test assesses written spelling skills. Phonemic awareness, on the other hand, includes the ability to manipulate sounds in *speech*, and does not require the use of letter knowledge or written skills (Ehri, 2004).

Assessments of phonological awareness, particularly phonemic awareness, and alphabet knowledge have been consistently shown to be effective in predicting the students who may be at risk of reading failure (Adams, 1990; McCardle, et al., 2001). A study that explored stage theories of reading development and investigated the relationship between phonological awareness and reading with preschool students in London, was conducted by Stuart and Coltheart (1988). They found that preschool students' phonological awareness and letter knowledge was an accurate predictor of reading achievement in the first year of school. Furthermore, they found that phonological awareness and reading acquisition have a reciprocal, causal relationship. These findings provide support for assessing students' phonological awareness and alphabet knowledge as early as possible. There is currently a lack of appropriate phonologically based literacy assessments available to New Zealand teachers for use with students in their first year of schooling (Greaney & Arrow, 2010), despite the fact that there are several published assessments of phonological awareness, (Adams, Foorman, Lundburg, & Beeler, 1998), phonemic awareness (Gough, Kastler, & Roper, 1984) and pseudoword reading (Bryant, 1975). Establishing which students have these difficulties early in their school career by using appropriate assessments, particularly phonological awareness assessments (McCardle, et al., 2001), provides teachers with an opportunity to prevent reading failure by targeting instruction appropriately by differentiating instruction to meet the needs of the students within their classes (Greaney & Arrow, 2012). If identified using appropriate assessments, students at risk are more likely to become successful readers if they are also provided with an explicit phonological awareness and alphabetic code training programme, than students who don't have this training (Blachman, et al., 1999). "The faster we

boost children's phonemic awareness skills, the more likely children with weaknesses in this area will become readers" (Smith, 1998b, p.22).

A lack of teacher awareness of the importance of phonological and phonemic awareness coupled with an absence of availability of phonological-based assessment tools for new entrant/year one teachers results in a corresponding lack of emphasis being placed on teaching that would enhance these skills. This ultimately leads to missed teaching opportunities. If teachers aren't knowledgeable about phonological and phonemic awareness and aren't adept at noticing students' deficiencies through observation and analysis of errors they will be less likely to plan for relevant teaching strategies and it will also be less likely that relevant and focused instruction will result. While not all students require an explicit programme in phonological awareness, it is necessary that all teachers of beginning readers should know why it is important and how and when to administer instruction targeting it (Blachman, 2000). Such professional development should also provide teachers with phonological assessment tools that they could use in their classes to help identify students at risk.

In addition to teachers utilising early literacy assessment information to improve student's literacy development at school, parents can support this learning at home. Parental awareness of assessment information pertaining to their children, combined with information on appropriate activities to support their children's literacy development at home, empowers them to support and reinforce the learning happening at school. Parental involvement is most effective when teachers provide one activity at a time with a clear explanation of how to complete the activity with their child at home (Opitz, 2000). Home-based activities provide students with opportunities to practice what they are learning at school and to share their successes with their families. Strong home and school partnerships are important for fostering students reading development.

Literacy Interventions

Phonological-based reading interventions are a focus of recent research. This research has come about largely because of the evidence indicating that many poor readers have difficulties in the phonological domain (Vellutino, et al., 1996) and that phonological awareness is the single best predictor of future reading success (Blachman, 2000; Tunmer, et al., 2004). The evidence indicates that if students, identified as having weaknesses in the phonological domain, are not provided with appropriate interventions, they are more likely to continue to be poor readers. This is often referred to as negative Matthew effects (i.e., the poor get poorer) (Stanovich, 1986). McNamara, Scissons and Gutknecht (2011) conducted a longitudinal study, in Canada, that followed 382 students from kindergarten to grade three. They found that students who were struggling with reading in kindergarten continued to struggle and fall further behind their peers with each passing grade. The results of the study supported the Matthew effects construct.

It is, therefore, widely accepted that students should be identified as at risk and provided with appropriate interventions as early as possible. Conner, Morrison and Slominski (2006) conducted a study that compared the effects of code-based and meaning orientated emergent literacy activities on reading and reading-related skills. They found that code-based activities improved students' alphabet and word-recognition growth while meaning-based activities improved students' vocabularies. Interestingly, only activities that were teacher or teacher and student-managed were associated with letter and word reading growth, whereas both teacher and student-managed activities improved vocabulary growth. This finding reinforces the importance of the teachers' role in providing explicit, systematic and structured instruction in phonologically-based activities because teacher-managed activities involve explicit instruction.

In support of teaching phonological-based skills early, Blachman and colleagues (1999) found that students who had participated in a kindergarten

phonological awareness programme followed by a reading programme that built on these knowledge and skills in grade one, significantly outperformed a group of control students, who had only received the regular school-based reading programme, on measures of reading achievement at the end of grades one and two. This finding supports the concept of early preventative instruction.

The research has also shown that phonological-based interventions are effective with both whole class and groups of students as well as with one-to-one tutor programmes. Center, Freeman and Robertson (2001) found that a phonologically-based whole class programme improved students' reading of connected text, reading of pseudowords and spelling levels more than a whole language-based programme. This indicates that literacy programmes, which include explicit instruction in phonological-based skills and strategies, are generally more effective than those that do not include this component. Similarly, Duff, Hayiou-Thomas and Hulme (2011) conducted a study that investigated the effects of a 10-week supplementary phonological-based intervention with 26 six-year-olds who had been identified as having reading difficulties. When their results were compared to a control group they showed that, during the intervention, the intervention group made significantly greater gains in early word reading, phonemic awareness and phonetic spelling compared to the control group. These findings, again, support the use of phonological-based interventions with groups of struggling readers and demonstrate that withdrawal interventions can also be effective when implemented within regular educational settings and with large groups of students.

The most effective phonologically-based interventions contain explicit instruction in both phonological awareness and the alphabetic principle rather than one or the other (Ball & Blachman, 1991; Ehri, 2003; National Early Literacy Panel, 2008; National Institute of Child Health & Human Development, 2000). Ryder, Tunmer and Greaney (2008) investigated the effects of an intervention that explicitly targeted phonological awareness and phonemically based decoding skills for students who had been identified as struggling

readers. Twenty-four 6 and 7-year-old students who were taught within a whole language instructional environment were assigned to either the intervention or control group. They found that the students within the intervention group significantly outperformed those in the control group on measures of isolated word reading, pseudoword reading and reading comprehension and these gains were maintained over time. These findings indicate the need for phonological-based interventions that include instruction in both phonological awareness and letter-to-sound correspondences with students who have developed reading difficulties. Furthermore, they demonstrate that when phonologically-based interventions are included within a whole language programme they can be equally as effective.

The concept of a balanced literacy programme has been explored in terms of practice and effectiveness. The two approaches to reading instruction (i.e. whole language and code emphasis approaches) both have strengths and weaknesses. Recent research has concentrated on which approach should be emphasised for which students, at what stage of schooling and at what point during reading instruction. The research suggests that the majority of students who are most at risk of reading failure are generally students who come from families with low socio economic status and have low literate cultural capital (Tunmer, et al., 2006). Arrow and Tunmer (2012) emphasise the importance of differential instruction whereby, students who come to school with low literature cultural capital require explicit, structured and systematic instruction in phonological-based skills and strategies. Conversely, students with high literate cultural capital, benefit from a more implicit approach. As mentioned previously, they also emphasise that students with high literate cultural capital will not be disadvantaged if they are exposed to explicit instruction however, students with low literate cultural capital will be disadvantaged if they do not receive it. The research also indicates that although both language prediction skill (integral to whole language reading instruction) and phonological recoding ability (integral to code based instruction) make strong independent contributions to reading, phonological recoding skill accounts for much greater independent variance.

This finding suggests that when beginning readers attempt to read unfamiliar words, grapho-phonetic cues should be used in the first instance and that contextual based cues are effective when used to confirm initial decoding attempts (Tunmer & Chapman, 1998; Tunmer & Chapman, 2006). Furthermore, research also indicates that students who report using word-based decoding strategies have greater reading achievement and higher academic self-beliefs than students who indicate that they prefer to use context-based strategies (Tunmer & Chapman, 2002).

In addition to the research indicating that phonological-based assessments, teaching strategies and interventions are appropriate for students most at risk and those who are already struggling readers, the research also indicates that phonological-based interventions do not need to be overly time intensive to be successful. Fifteen to twenty minutes per day has been shown to be sufficient (Smith, 1998a).

Summary

The research evidence indicates that phonologically-based reading interventions are effective for both preventing reading difficulties and for remediating them. The evidence also suggests that phonologically-based interventions are particularly effective with students who are most at risk of reading failure (i.e. those who enter school with low literate cultural capital). Phonologically-based interventions are therefore more likely to target the needs of the vast majority of students who make up the 20% tail of underachievement in reading than would interventions that don't include this focus. There is also a general consensus that the earlier that students are identified as at risk and provided with appropriate interventions, the more likely they are to become successful readers in the future. Furthermore, phonologically-based interventions have been shown to be successful with groups and whole classes of students and are therefore more cost effective than one-to-one approaches. Additionally, phonologically-based interventions can be effectively implemented

in addition to regular class literacy programmes regardless of whether these are predominantly whole language-based or code emphasis in approach and they do not need to be time consuming to maintain their effectiveness.

Research Context of the Current Study

Early intervention and prevention of literacy learning difficulties is a key focus of contemporary reading research. Countless international studies have focused on early literacy intervention, assessment, phonological processing training, decoding strategies and the importance of alphabet knowledge. Several national studies have also highlighted the importance of these skills, knowledge, assessments and practices within the New Zealand context. The evidence from both the international and national studies provides the foundation for the current study.

The current study is a modified replication of Greaney and Arrow's (2012) study, in which a phonological-based intervention was designed and implemented in a new entrant classroom to promote early literacy skills. The intervention class received a 10-week intervention that included four lessons a week that focused on explicit teaching of phonological-based skills. These lessons focused on both whole class and small group activities. The activities focused on letter names and sounds, letter writing, phonemic awareness, linking phonemic awareness to spelling and linking phonological-based skills to contextual reading and writing. Both groups (i.e. intervention and non-intervention controls) were assessed on three occasions using the phonological measures. The first assessment was at the start of the year (i.e. at school entry for the intervention group) prior to the intervention, the second assessment was at the conclusion of the intervention and the third assessment occurred when the students reached six years of age. The assessments included the Burt word reading test, phonological based assessments, phoneme segmentation task, pseudoword reading, letter sound knowledge and letter writing ability. The results from the students' Observation Survey data were also recorded as and when each intervention student had

their sixth birthday. The intervention group's results were compared with those from the older non-intervention control group, and they showed that the intervention group outperformed the controls on all assessment measures. These results highlight the importance of using early phonological-based assessments as a means of identifying specific weaknesses and for developing effective explicit instruction for addressing these weaknesses. Given the positive results of the Greaney and Arrow (2012) study, the current study aimed to replicate this research with modifications to both the assessments and the instructional tasks. These modifications include a pretest measure of vocabulary (Dunn & Dunn, 2007) in order to obtain more information about students' literate cultural capital and the use of controlled vocabulary texts in order to provide explicit opportunities for students to practice reading specific letter-to-sound correspondences within connected text.

Research Aims

The study had two main aims:

- To assess the alphabet knowledge and phonological-based literacy skills of a group of students early in their first year of school and to compare these skill levels with a group of slightly older students also in their first year of school.
- To design and implement an in-class supplementary intervention that focused on the explicit teaching of phonological-based skills to a group of early new entrant students and to evaluate the efficacy of this intervention for promoting reading development.

Hypotheses

This study had two hypotheses. It was first hypothesised that the alphabet knowledge and phonologically-based early literacy skills of a group of students early in their first year of school would be variable ranging from none to ceiling

and that students would find it easier to manipulate larger phonological units, compared to smaller units, at pretest. Secondly, it was hypothesised that the inclusion of a phonological-based intervention, taught in addition to the regular classroom programme, would improve students decoding ability more than the effects of the regular class literacy programme.

Chapter 3: Methodology

This chapter describes the methodology of the current study. It begins with an explanation of the research design followed by a description of the setting in which the study was conducted and a description of the participants.

Subsequently, an outline of the materials and procedures used within the study is presented for both the assessment tasks and the intervention activities. This study had two main aims. The first aim of the study was to assess the alphabet knowledge and phonological-based literacy skills of a group of students early in their first year of school and to compare these skill levels with a group of slightly older students also in their first year of school. The second aim was to design and implement an in-class supplementary intervention that focused on the explicit teaching of phonological-based skills to a group of early new entrant students and to evaluate the efficacy of this intervention for promoting reading development. This study received Massey University Ethics Committee approval (see appendix A).

Research Design

The current study involved a non-randomised, pretest-posttest intervention design with one control group. The design was non-randomised because the students were already allocated to classrooms at the outset of the study making random assignment impossible. Instead, cluster sampling was used in this study. The two classes involved in the study represented a cluster of the overall population where, each intact class formed a cluster, a group of people who are naturally together (Ary, Jacobs, & Sorensen, 2010). A key purpose of this study was to provide an intervention that could be easily integrated into a regular classroom literacy programme and completed in any school setting. Therefore, conducting the study within an established classroom setting was appropriate.

Two separate groups were used in the study. The first was the new entrant

class of students (seven girls and four boys). This class received the intervention that included 29 semi-structured in-class lessons during the second term of 2012. This group will be referred to as the 'intervention group'. The other group was a control group. The control group comprised a year one class of students (ten girls and nine boys) who had been at school for between three and four months (mean age = 63 months) so were slightly older than the intervention group of new entrants. This was the closest class in age to the intervention group available at the school. These students will be referred to as the 'control group'. Both the intervention group and the control group were assessed using the measures during term 1, prior to the intervention commencing and again immediately after the intervention concluded. The potential threat of the testing effect (i.e. the act of taking a test twice could potentially affect performance) (Ary, et al., 2010) was controlled by having a four-month separation of time between the pre and posttests. The data from the control group, who had received only their regular in-class literacy programme, was used to compare their literacy progress (on a series of phonological-based literacy assessments) with that of the Intervention group of younger students.

Setting and Participants

Setting

A key purpose of the study was to investigate the extent to which a phonologically-based intervention taught to a group of students early in their first year of school and as an additional supplement to their regular in-class literacy programme, was more effective for promoting early literacy development compared to a programme that involved mainly context-based whole language instruction. A series of semi-structured phonologically-based lessons were taught three times weekly over a nine-week period to a group of new entrant students. The intervention focused on the explicit teaching of phonological-based strategies to enhance decoding ability. The study took place in a decile 8, full primary school (e.g., years 1-8) situated in an urban centre in the lower North Island.

The regular literacy programme in both junior classes, the new entrant class (intervention group) and year one class (control group), followed a mainly constructivist, whole language approach that included activities such as guided reading, shared reading, student centered writing activities and a weekly visit to the school library. The 'Jolly Phonics' programme (Lloyd, 2007) had also been adopted by all junior classes. This involved daily instruction about the sound or sounds of the week, which included reading and locating the sounds within poems, performing actions for the sounds and printing the letter/letters that represent the sounds.

As an additional part of the regular in-class literacy programme, the students within both the control group and the intervention group had a homework book that contained a 'reading caterpillar' (see Figure 5), which had a series of words in isolation printed on a caterpillar for the students to learn to read, and a 'spelling spider' (see Figure 6) which had high frequency words printed in isolation for the students to learn to spell. Additionally, all students took their reading book they had worked on during their guided reading sessions home to read with their parents each day. Each student also had their own alphabet/high frequency word card readily available in the classroom to assist them with writing. The word card contained the letters of the alphabet and a selection of small high frequency words (e.g. I, it, the, and). Both classrooms had vibrant wall displays that included students' published writing and things that they had made to illustrate the letter sounds (e.g. igloos for 'i').

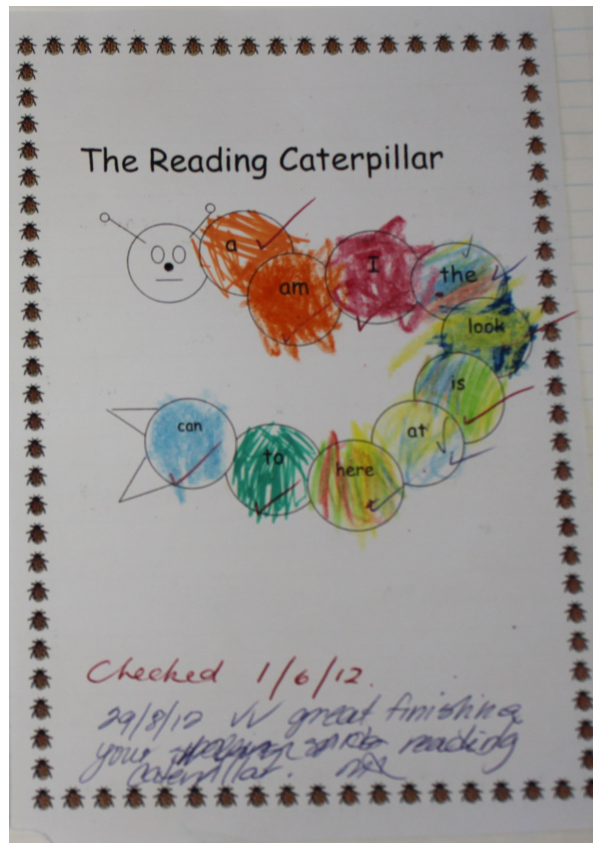


Figure 5: Reading caterpillar

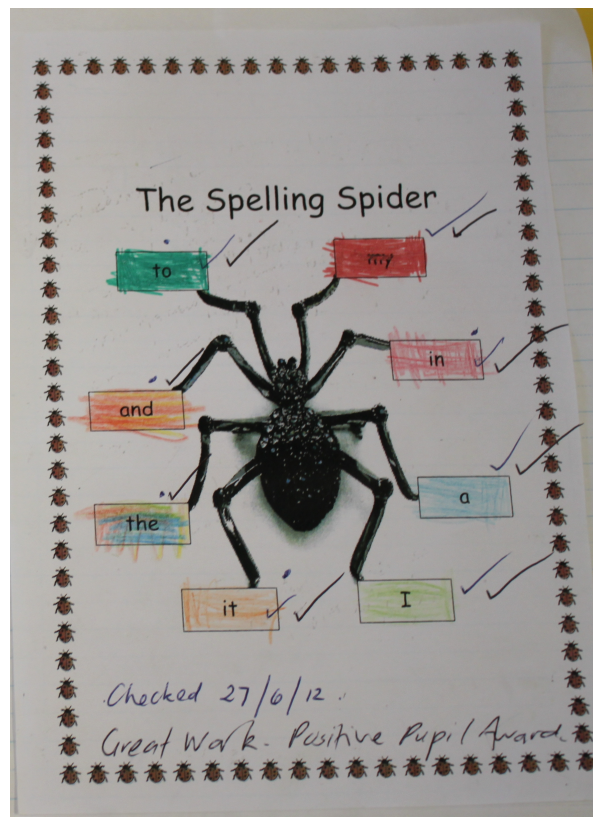


Figure 6: Spelling spider

Though the intervention classroom did include an emphasis on the explicit teaching of letter sounds through the Jolly Phonics programme (Lloyd, 2007) as well as reading in isolation through the use of reading caterpillars, guided reading lessons did not explicitly integrate these skills. Rather, phonics lessons were taught separately from reading lessons. This is generally representative of whole language-based classrooms. Ahead of making use of the letter to sound patterns they had been learning about in phonics lessons, the students were encouraged to make use of contextual cues another typical feature of whole language classroom guided reading lessons.

Upon entry to the school, all new entrant students are assessed using the school made 'new entrant assessment kit' that includes the following literacy assessment checklist tasks.

The ability to ...

- identify the lower case letter names and sounds,
- recognise own name (reading),
- write own name,
- hold a pencil correctly,
- copy under words,
- copy over words,
- identify the front and back of a book,
- explain a picture,
- know where to start reading,
- point one to one,
- know what a letter is,
- know what a word is,
- speak in a sentence and,
- read a basic word list.

Additionally, a booklet entitled 'Literacy Guidelines' produced by the school for the teachers' reference outlines expectations about how often reading, writing and printing are to be taught and what should be included in lessons. Running

records are the only form of reading assessment used in the new entrant and year one classes to monitor reading progress.

Participants

The intervention group and the control group combined to make an original total sample of 32 students. All of the students were all five years old for the duration of the study. However, the data collected for two students' who participated fully in the study will not be included in the analysis due to their ceiling scores on three of the five alphabet measures at the pretest phase. One of these students was part of the intervention group and one was part of the control group.

Additionally, five of the students, within the intervention class, were only present for the last few weeks of the intervention because their birthdays fell later in the term. These students were part of the lessons from when they started school. However, their results are not included in the study due to the limited time they had spent in the intervention programme. The total final sample considered for analysis included 30 students (intervention group $n=11$ and control group $n=19$).

Table 1. Summary of mean age and time at school as a function of group

Group Name	Total Number	Mean Age (months)	Standard Deviation	Time at School (months)
Intervention Group	11	60.36	0.67	0
Control Group	19	63.68	1.38	3

The intervention group had spent between two days and two months and the control group between two and eight months at school prior to the commencement of the study. Both groups attended the same school. The intervention group students were, on average, three months younger than the control group and had spent an average of three months less time at school than the control group. See Table 1 for an overview of the groups.

Materials and Procedure

Pre and Post testing

All testing was conducted on a one-to-one basis in a quiet room away from the classroom environment. The tests were administered in the order presented below. The time it took to complete the bank of assessment tools with each student ranged between forty minutes and one hour. Students were assessed over two occasions if they began to get tired or lost concentration. Table 2 provides a summary of the assessments and the administration timeframe.

Table 2. Summary of assessments as a function of group and time of testing

Assessment Measure	Pretests (Term 1)		Posttests (Term 2)	
	Intervention Group	Control Group	Intervention Group	Control Group
Lower case letter names (26)	✓	✓	✓	✓
Lower case letter sounds (26)	✓	✓	✓	✓
Upper case letter names (26)	✓	✓	✓	✓
Upper case letter sounds (26)	✓	✓	✓	✓
Letter writing (26)	✓	✓	✓	✓
Pseudoword - total words (50)	✓	✓	✓	✓
Pseudoword - total sounds (187)	✓	✓	✓	✓
Onset/rime (5)	✓	✓	✓	✓
Detecting rhyme (5)	✓	✓	✓	✓
Counting syllables (5)	✓	✓	✓	✓
Matching initial sounds (5)	✓	✓	✓	✓
Counting Phonemes (5)	✓	✓	✓	✓
Comparing word lengths (5)	✓	✓	✓	✓
Representing phonemes with letters (5)	✓	✓	✓	✓
Analysis of spelling growth (17)	✓	✓	✓	✓
Burt word test (110)	✓	✓	✓	✓
Peabody Picture Vocabulary Test	✓	✓		
Book Reading level (assessed by class teachers)	✓	✓	✓	✓
Neale Analysis of Reading Ability			✓	✓

Letter name and sound knowledge

Each student was presented with each of the 26 alphabet letters in a random order. Letters were individually presented using index card-sized alphabet cards. Firstly, the students were presented with 26 cards showing the lower case letters and were asked to name the letters and to say what sound each letter represents. Secondly, the same process was repeated for the upper case letters. The total maximum score for letter names and sounds was 26 for each of the four measures (i.e. 26 lower case letter names, 26 lower case letter sounds, 26 upper case letter names and 26 upper case letter sounds).

Letter writing task

For this task, the students were presented with a piece of paper with 26 spaces on it in the form of a grid and they were asked to write the letters of the alphabet in alphabetical order, from left to right across the page. The purpose of this task was to assess each student's ability to correctly write each letter. Either the upper or lower case versions of the letters were acceptable. The maximum possible score for the letter-writing task was 26.

Burt Word Reading Test

The Burt Word Reading Test (Gilmore, Croft, & Reid, 1981) was used as a measure of word reading as it is standardised for New Zealand students. The teachers' test manual reports that the Burt Word Reading Test has high test-retest reliability ($r > 0.95$) and high internal consistency ($r > 0.96$). It is often also used in conjunction with the Observation Survey (Clay, 2002). The students were asked to read aloud the words of the New Zealand Burt word test. Standardised recording and scoring protocols, as per the manual, were used. The total maximum score for this measure is 110.

Onset / Rime Task

This was a teacher made assessment that assessed students' onset/rime awareness. It consisted of five sets of cards with three pictures in each set. Two of the pictures in each set had the same rime unit and one didn't, (e.g. h-ouse,

m-ouse, b-ag). The students were asked to identify the two cards with the same rime unit (e.g. house and mouse in the above example). They received one point for each matching pair of cards that were correctly identified. The students were presented with a practice set before they were tested. The maximum possible score for this test was 5 (see appendix B). This assessment task had low test-retest reliability ($r=.36$). This task is subject to reduced reliability most likely due to the small number of items as well as the task involving an element of chance.

Pseudoword Test

The Bryant Test of Basic Decoding Skills (Bryant, 1975) consists of 50 made up words (e.g. buf, nuv and phune) that increase in difficulty. Although the words are not real, they comply with common letter to sound correspondences in real English words. Students are therefore encouraged to use their knowledge of letter-sound and spelling pattern correspondences to decode the words. The students were asked to read aloud each pseudoword after they were told that the words were 'alien words'. Testing stopped once 10 consecutive errors were made. Juel (1988) reported reliabilities of between .90 and .96 for this assessment measure.

Phonological Assessment Tasks

The phonological assessment tasks (Adams, et al., 1998) consisted of six short subtests that assessed rhyme detection, syllable counting, matching initial sounds, phoneme counting, comparing word lengths and representing phonemes with letters. There was a maximum score of 5 for each subtest making the maximum total score 30. An extra analysis was completed on the 6th subtest (representing phonemes with letters) that involved an analysis of the students' spelling growth. For this analysis students were marked with one point for each sound that was correctly presented in the right order (e.g. sun = 3, san = 2). The maximum score for the analysis of spelling growth was 17. The purpose of this second analysis was to ascertain the extent to which students phonological encoding improved between pre and posttest. Each of the

subtests has an accompanying practice activity that was used to ensure instructions were clear. A short description of each subtest is presented below.

Detecting Rhyme. The name of each of the pictures (e.g. sock, nail, clock, snail) on the card was told to each student and they were required to match the rhyming pairs by drawing a line between the rhyming pictures.

Counting Syllables. Students were asked to count the syllables in words by clapping out each syllable within each of the words presented in the test. The students then recorded the number of syllables using tally marks.

Matching Initial Sounds. For this task the students were required to match pictures of objects that began with the same initial letter sound (e.g. seal, sun, kite) by drawing a line between the matching pairs.

Counting Phonemes. For this task the students were required to count and show the number of phonemes in words (e.g. kn-ee = 2). A set of five words was presented orally and the students were asked to record how many phonemes were in each word using tally marks.

Comparing Word Lengths. For this task students were required to count the number of phonemes in five pairs of words (e.g. b-ow=2, b-oa-t=3) and identify the one, in each pair, that had the most phonemes by circling it (e.g. boat in the above example).

Representing Phonemes with Letters. This spelling task required students to correctly spell five words. The examiner said the name of the pictures representing the words (e.g. sun, mop, pot, frog and nest) and the students wrote the sounds they could hear as they attempted to spell each of the words.

Receptive Oral Vocabulary Test

Form A of the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007) was used as a receptive oral vocabulary measure during the pretest phase. This measure is standardised and as such, has norm tables. Standard administration and scoring procedures were used. This assessment has a practice page to ensure that the students understand what is expected before testing starts. The appropriate starting page is selected based on the student's age. The pages are presented in a flipbook. Each page of the flipbook has four pictures on it. The student is asked to 'show me' or 'point to' an item, emotion or thing on the page (e.g. 'show me happy', 'point to violin'). There are 12 pages in each set and 19 sets in total.

Book Reading Level

The classroom teachers provided book-reading levels for each student at both the pretest and posttest phase. These levels were established through monthly running records and overall teacher judgments for each student.

Neale Analysis of Reading Ability

The Neale Analysis of Reading Ability (Neale, 1999) was selected as a measure of reading comprehension, rate and accuracy. It was used only as a posttest measure.

The Neale Analysis of Reading Ability is both a standardised attainment test and a diagnostic tool and can be split into two sections, the standardised test and the diagnostic measures. The standardised assessment was used for the purposes of this study. The standardised test assesses students' reading accuracy, reading comprehension and reading rate. Reading accuracy was measured by tallying the total number of errors in a passage and then subtracting them from 16 or 20, depending on which passage the student was able to read. Reading comprehension was measured by asking students the comprehension questions after the reading of each passage and recording the total number correct. Measuring the time it took for each student to read each

passage assessed each student's reading rate. Standard administration and scoring procedures were used.

The results from Neale Analysis of Reading Ability were not used in the final analysis due to the majority of the students in both the intervention group and the control group not progressing past the practice passage or score highly enough on passage one to use the norm tables.

Intervention

The intervention was intended to supplement the existing class literacy programme and was designed to not place any additional workload on the classroom teacher. The students received their regular reading group lessons with their teacher as part of their regular programme after the researcher took the intervention lessons. Because, the intervention involved the whole class, it also allowed the class teacher to observe these sessions and to adopt some of the teaching practices into their regular literacy programme. All of the intervention lessons took place in the morning because this was the time allocated for literacy instruction and so fitted in with the regular class teachers planning.

Lesson Format

There were 29 semi-structured, 60-minute, whole class lessons taken over nine weeks. Each lesson contained a phonological-based letter/sound/word focus that also involved listening, reading and writing tasks. A summary of the main teaching points is presented in Table 3. See appendix C for a sample lesson plan.

Table 3. Overview of intervention programme

Week	Learning Outcomes <i>we are learning to ...</i>	Week	Learning Outcomes <i>we are learning to ...</i>
1	<ul style="list-style-type: none"> - listen for words that rhyme (rhyme recognition / discrimination), - say the names and sounds of all of the letters of the alphabet, - write the lower case letters l, t, i and j. 	6	<ul style="list-style-type: none"> - identify the last phoneme in words, - blend phonemes to make words, - count how many phonemes are in a word, - segment words into phonemes, - spell simple two and three letter words, - read words that include 'u' as an initial or medial sound, - print the letters 's' and 'f'.
2	<ul style="list-style-type: none"> - choose and produce words that rhyme (rhyme choice / production), - be secure with the five short vowel sounds, - read words that include 'a' as an initial or medial sound, - write the lower case letters r, n, m, h and k. 	7	<ul style="list-style-type: none"> - read, and write pseudowords, - blend phonemes to make words, - count how many phonemes are in a word, - segment words into phonemes, - know the short vowel sounds, - print the letters v and w.
3	<ul style="list-style-type: none"> - to count, blend and delete syllables, - say the five short vowel sounds, - read words that include 'e' as an initial or medial sound, - write the lower case letters u, y, b, p. 	8	<ul style="list-style-type: none"> - count how many phonemes are in a word, - substitute initial sounds, - work out when a sound has been switched in a word and what it has been switched with, - segment words into phonemes, - blend phonemes to make words, - revise rhyme, syllable and onset-rime awareness, - spell simple CVC words, - improve our sight word vocabulary, - revise the shapes of all of the letters, - print the letters x and z.
4	<ul style="list-style-type: none"> - blend and segment onset and rime parts together, - identify the five short vowel sounds, - read words that include 'i' as an initial or medial sound, - write the letters a, d, g and q. 	9	<ul style="list-style-type: none"> - review rhyme, - improve our sight word vocabulary, - spell simple two and three letter words, - to count, blend and delete syllables, - review onset/rime parts, - print all lower case letters correctly, - notice the differences and similarities between letters.
5	<ul style="list-style-type: none"> - identify initial and final phonemes, - review rhyme, - identify the five short vowel sounds, - read words that include 'o' as an initial or medial sound, - write the letters o, e and c. 		

While many of the phonological-based tasks began as oral activities, there was also a strong written element. Each student had their own workbook for the duration of the intervention where the written tasks were recorded. Tasks included printing, spelling, rhyme matching and phoneme counting activities. Figure 7 displays a written activity requiring the students to select and record the correct vowel in a selection of CVC (consonant, vowel, consonant) words. A teacher-modeling workbook was also used (along with a whiteboard) to model and extend lesson task requirements for the students. Figure 8 presents a sample modeling book activity that was used by the researcher to assist the students with decoding simple words and discriminating between the short vowel sounds during one of the intervention lessons. Students were also provided with a vowel strip containing the vowel letters (see Figure 9) to assist them when selecting the appropriate letter for each word for both the independent activities (Figure 7) and the whole class activities (Figure 8).

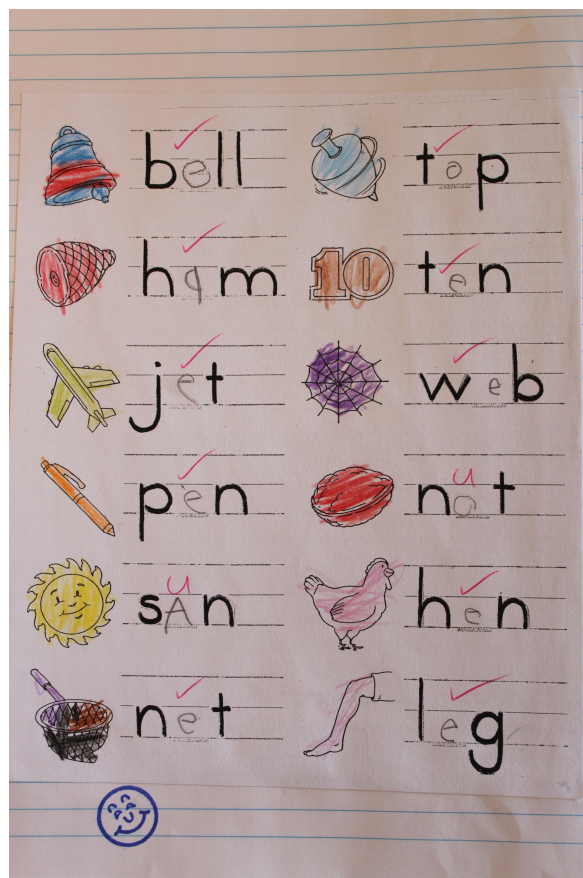


Figure 7: Student workbook sample

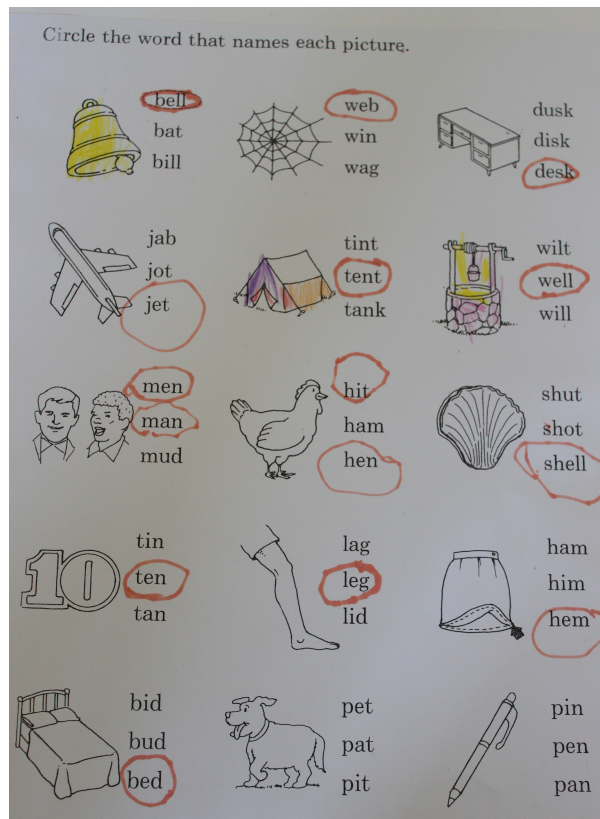


Figure 8: Modeling workbook sample

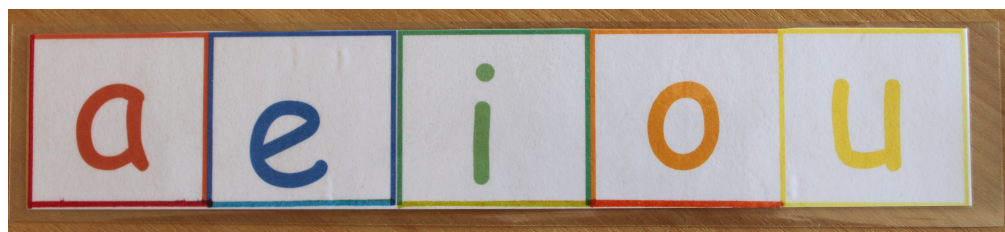


Figure 9: Vowel strip

The initial focus of the intervention was on alphabet knowledge, basic rhyme and syllable awareness and then progressed to include identification, blending, segmenting, substituting and deleting phonemes within basic CVC words. Throughout the lessons there were opportunities for the students to practice their developing decoding skills through shared reading book experiences using big books that contained controlled vocabulary, (see Figure 10 for a sample of a page). These books allowed for repeated practice of target sounds in connected text. Students were also provided with many opportunities to apply their phonological-based strategies to spelling simple words through written activities.

These activities included spelling CVC words in isolation, making up pseudo CVC words, differentiating between the short vowel sounds and selecting the appropriate vowel to insert into CVC words, (see Figure 7 for an example of a spelling activity).

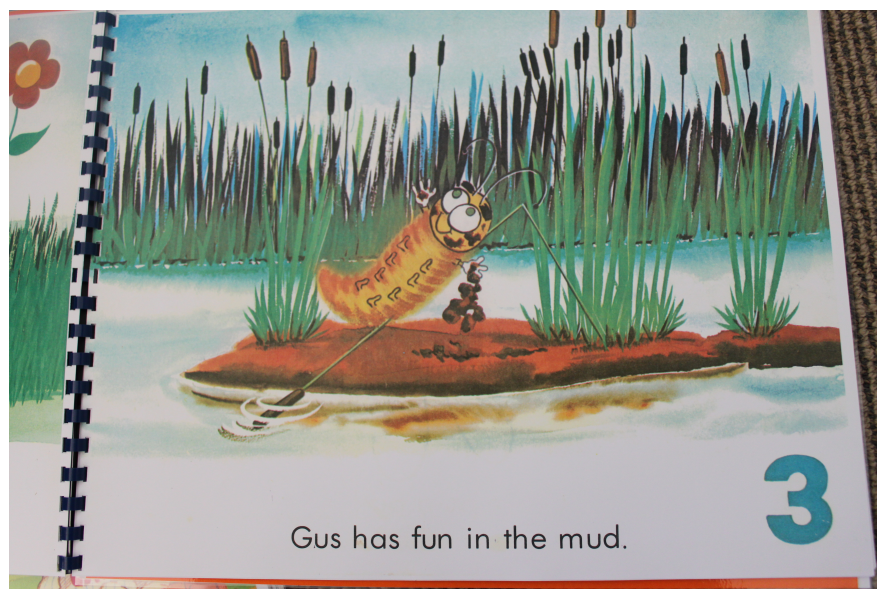


Figure 10: Sample page from a book using controlled vocabulary (Raabe, 1974)

Homework Component

Six students who demonstrated that they had low alphabet knowledge (as a result of the pretest assessments) were provided with a take home activity pack that included a set of alphabet cards with instructions for parents. These instructions included ideas explaining how to use the letter cards at home to help the student secure their knowledge of the letter names and sounds (e.g. 'show the cards in a random order, tell your child the letter name or sound if they are unsure and try again later'). The pack also included a printing practice book with letters to practice at home. These packs were provided on week one of the intervention, most of the students completed this homework every night and were keen to show it on the next school day. One extra take home activity involved cards with simple CVC words on one side and pictures on the other (e.g. cat, dog, man). The purpose of this activity was to encourage the students to both practice identifying the sounds in words and to spell them.

Games and Activities

Several games and activities were made up to engage the students and focus their attention on particular aspects of phonological awareness. Below is an example of one game, rhyming bingo, and one activity, hungry puppet, used in the intervention.

Rhyming Bingo (see Figure 11) – A set of rhyming bingo cards and boards were created to enhance rhyme detection and discrimination skills. The game was played with the same conventions as regular bingo. Each student had one board and eight counters (one counter for each picture on the board). The teacher had a stack of cards each with a picture of something that rhymed with a picture on the students' boards (e.g. the card had a picture of a sock and the student had a picture of a clock on their board). Once all of the pictures on a student's board were covered the student called out 'BINGO'. The student who covered all of the pictures on their card first won the game. The game continued until all of the students had filled their boards. The game was played in two ways. First, the teacher held up and said the name of a picture on a card and asked the students if any pictures on their boards rhymed with the card. The second way involved the teacher not showing the card to the students but instead saying the rime unit of the picture on the card (e.g. 'ock' for clock) and asking the students to find words that end with that rime unit on their boards.



Figure 11: Rhyming bingo

Hungry Puppet – This activity focused on enhancing students' syllable awareness. It involved the use of a puppet and several multi-syllable words printed out on card and cut into syllables (e.g. am-bu-lance) The students took turns coming up to the front of the class to hold a syllable card. The syllables for each word were counted and read aloud by the class. Then the hungry puppet came along and ate one, or more, of the syllables. The students then had to read the remaining syllables.

Summary

This chapter explained the methodology of the current study. The two main aims of the study were firstly, to determine the level of emergent literacy skills a group of students had upon school entry and compare these levels to a group of slightly older students also in their first year of school and secondly, to provide a nine-week intervention that explicitly taught phonologically based skills to improve students' decoding skills and strategies. The study involved a non-randomised, pretest-intervention-posttest design with one control group. Two groups were included in the study, one intervention and one control group. The intervention took place within an established classroom setting and involved 26 30-60 minute lessons over the course of one school term with the researcher providing the lessons. The students within the intervention group and the control group were assessed prior to the commencement of the intervention and after the intervention.

Chapter 4: Results

The purpose of this study was to implement and evaluate a regular nine-week whole-class intervention programme that aimed to promote literacy development through the explicit teaching of phonological-based strategies. Such strategies are expected to enhance the decoding ability of students at the beginning of their first year of school. A non-randomised, one-control group, pretest-intervention-posttest design was used to examine the effects of the intervention over time. The control group was an average of three months older than the intervention group.

This chapter presents the results of the analysis carried out to address the two hypotheses. The first hypothesis stated that students' alphabet knowledge and phonologically-based early literacy skills would be variable ranging from none to ceiling and that students would find it easier to manipulate larger phonological units, compared to smaller phonological units, early in their first year of school. The pretest mean scores for the intervention group on the alphabet and phonological based assessments were considered in order to address this hypothesis (see Tables 4 and 5). The second hypothesis stated that the inclusion of a phonological-based intervention, taught in addition to the regular classroom programme, would improve students decoding ability more than the effects of the regular class literacy programme. In order to investigate the effectiveness of the intervention for improving the intervention group's decoding development, against the control group's development in decoding, the gains in decoding are analysed using a repeated measures analysis of co-variance (ANCOVA) for the isolated word reading measures (pseudoword reading and the Burt Word Reading test) and the contextual reading measure (teacher determined book-reading levels), see Tables 7, 8, 9 and 10. Pretest letter sound knowledge was used as a covariate across all analyses. This was used due to letter sound knowledge being considered the main prerequisite for decoding (Gough & Tunmer, 1986). The significance level for all analyses was set to

$p < .05$ due to the small sample size.

Alphabet Knowledge and Intervention Gains

The students in the intervention and control groups showed variability in alphabet knowledge at the pretest phase. Both groups had gains in alphabet knowledge between the pre and posttest phases. Five measures were used to assess the students' level of alphabet knowledge (lower case letter name and sound knowledge, upper case letter name and sound knowledge and letter writing ability). Table 4 presents the means and standard deviations for all of the alphabet measures at pre and posttest for both the intervention and the control group.

Table 4: Means and standard deviations for all alphabet measures as a function of group and time of testing

	Pretest				Posttest			
	Intervention		Control		Intervention		Control	
	<i>n</i> =11		<i>n</i> =19					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Lower case letter names (26)	14.18	9.04	19.37	5.63	23.45	2.07	23.68	2.75
Lower case letter sounds (26)	8.36	6.70	15.89	5.80	21.18	5.55	21.95	3.22
Upper case letter names (26)	15.36	8.59	20.16	6.32	24.73	2.20	24.63	3.24
Upper case letter sounds (26)	9.27	6.77	16.68	6.16	22.82	5.02	22.74	3.78
Letter writing (26)	10.73	8.74	17.47	5.76	22.00	3.63	22.68	2.91

On all of the pretest alphabet measures, the intervention group's scores were below those of the control group but this would be expected given that the control group was, on average, three months older and had therefore received more instruction than the intervention group. However, of greater significance is that, by posttest, the scores (for all alphabet measures) for both groups were virtually equal, indicating the accelerated progress of the intervention group. Though there was a wide range in scores for these assessments, there was a common trend. The students tended to know more letter names than sounds

(e.g. lower case letter name $m=14.18$, lower case letter sound $m=8.36$). All except one student knew more letter names than sounds upon school entry. The difference between the mean letter name and letter sound scores decreased from pre to posttest this was particularly evident for the intervention group. For example, the difference between the means for the lower case letter names and lower case letter sounds went from 5.82 at pretest to 2.27 at posttest.

A one-way ANOVA was conducted to compare the mean scores for each of the alphabet assessments for both the control group and the intervention group at the pretest phase. This analysis highlights the control group's superior alphabet knowledge. However, as mentioned earlier, the control group was, on average, three months older than the intervention group, so this would be expected. The difference between lower and upper case letter names at the pretest phase was not statistically significant between the control group and the intervention group (lower case letter names, $F(1,28) = 3.78$, $p = .06$, upper case letter names $F(1,28) = 3.08$, $p = .09$). However, the difference between the groups for lower case letter sounds was statistically significant, $F(1,28) = 10.49$, $p < .05$ and upper case letter sounds $F(1,28) = 9.40$, $p < .05$ in favour of the control group. The findings from a one-way ANOVA for the letter writing assessment show that the control group's letter writing ability was also superior to that of the intervention group at pretest, $F(1,28) = 6.52$, $p < .05$. Again, as outlined earlier, this would be expected given their greater length of time at school.

The difference between the control and the intervention groups' scores on all of the alphabet measures at posttest were not statistically significant. Again, this demonstrated that the intervention group had caught up with the control group on these measures. Figure 12 shows the difference between the group means and progress trajectories for the control and intervention groups for combined letter sound scores (i.e. lower case and upper case letter sound combined) and letter writing scores at pre and posttest. Eight students (four in the control group and four in the intervention group) had a score between 50 and 52 for the

combined letter sound scores at posttest and fourteen students (nine in the control group and five in the intervention group) had a score between 24 and 26 for letter writing at posttest. Figure 12 illustrates that the results were affected by the restricted nature of the assessment creating a ceiling effect.

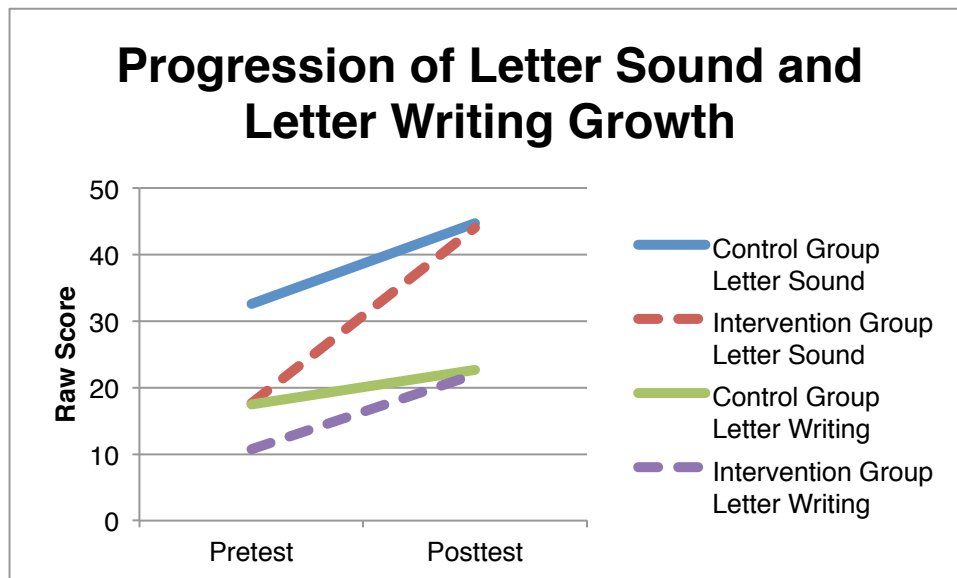


Figure 12: Mean total letter sound and letter writing scores for the control and intervention groups as a function of time of testing

Phonological Awareness and Intervention Gains

The six subtasks used to assess students' phonological awareness were: detecting rhyme, syllable counting, matching initial phonemes, counting phonemes, comparing word lengths and representing phonemes with letters. Two additional phonological assessments were also administered. The first was the analysis of spelling growth. Secondly, a teacher-made onset/rime assessment was administered. This assessment had low test-retest reliability ($r=.36$) most likely due to the a small number of items (5) per subtest and it being administered to a small sample and that it involved an element of chance. Due to the low reliability of this measure, the results were not analysed. Table 6 presents the pre and posttest mean and standard deviation scores for both the

intervention group and the control group on the six phonological awareness subtasks.

Table 5: Means and standard deviations for all phonological awareness measures as a function of group and time of testing

	Pretest				Posttest			
	Intervention		Control		Intervention		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Detecting rhyme (5)	2.55	1.29	1.63	1.80	4.18	1.83	2.95	1.93
Counting syllables (5)	2.91	1.70	2.89	1.49	2.36	1.43	2.74	1.52
Matching initial sounds (5)	2.09	2.07	2.32	2.14	3.91	1.87	2.89	1.97
Counting Phonemes (5)	1.64	1.03	1.58	1.02	2.36	1.57	2.53	1.22
Comparing word lengths (5)	2.64	0.92	2.21	1.51	2.82	1.25	3.11	1.20
Representing phonemes with letters (5)	0.36	0.81	0.58	0.77	2.91	1.87	2.53	1.61
Total phonological score (30)	12.18	4.19	11.21	4.69	18.55	6.41	16.74	7.06
Analysis of spelling growth (17)	4.36	4.99	6.89	4.88	13.73	4.03	13.00	4.23
Onset/rime (5)	3.64	1.29	2.84	1.34	4.09	1.22	3.95	1.13

In order to establish the level of phonological awareness the students brought with them upon school entry, the intervention group's scores for the six phonological awareness sub tasks at pretest are considered. Each of the subtasks had a total possible score of 5 with a maximum total phonological awareness score of 30.

The data in Table 5 indicates that the intervention students entered school with greater proficiency in identifying larger units of speech such as rhyme ($m=2.55$) and syllables ($m=2.91$) than with smaller units (e.g. counting phonemes, $m=1.64$), although they were reasonably proficient at matching initial phonemes ($m=2.09$). This finding is consistent with research evidence, which indicates that identifying, counting and manipulating syllables and rhyme units are generally easier tasks than identifying, counting and manipulating separate phonemes (Opitz, 2000). Both groups' average score for the syllable counting task decreased from pre to posttest. The mean scores for this subtask at pretest, as

shown in Table 5, were 2.91 (intervention group) and 2.89 (control group) 2.36 (intervention group) and 2.74 (control group) at posttest. The decrease in scores for both groups on this measure is likely to be attributable to the students increased sensitivity to the phonemes within words. This increased sensitivity may have meant that the students over analysed the syllable counting task. The intervention group performed well in the comparing word lengths task at pretest ($m=2.64$). The most difficult phonological awareness task at pretest for the intervention group was the representing phonemes with letters task. The mean pretest score for the intervention group on this measure was 0.36. This was essentially a spelling task (e.g. “write the sounds in sun”). It is not surprising that this was the most challenging task subtask for the intervention group when one considers the mean letter writing score for this group at pretest was 10.73 (out of 26). The low mean score for the spelling measure would have been affected by the students’ inability to correctly write many of the letters required to spell the words. However, the scores for the analysis of spelling subtest indicate that the intervention group improved their spelling skills to be equal with the control group on this measure at posttest. The pretest means for the analysis of spelling growth were 4.36 (intervention group) and 6.89 (control group) and the posttest means were 13.73 (intervention group) and 13.00 (control group) (see Table 5).

There was no significant difference between the two groups for the phonological awareness total score or on any of the six subtasks individually. The intervention group scored slightly higher than the control group on most of the phonological awareness subtasks at pretest and posttest. The total phonological awareness mean scores show that the control group (who had spend, on average, three more months at school than the intervention group) had lower levels of phonological awareness at both test points. Figure 13 illustrates the two groups total phonological awareness progress trajectories from pretest to posttest. This result demonstrates the positive short-term effects of the phonological based intervention programme in that the intervention group continued to outperform the control group.

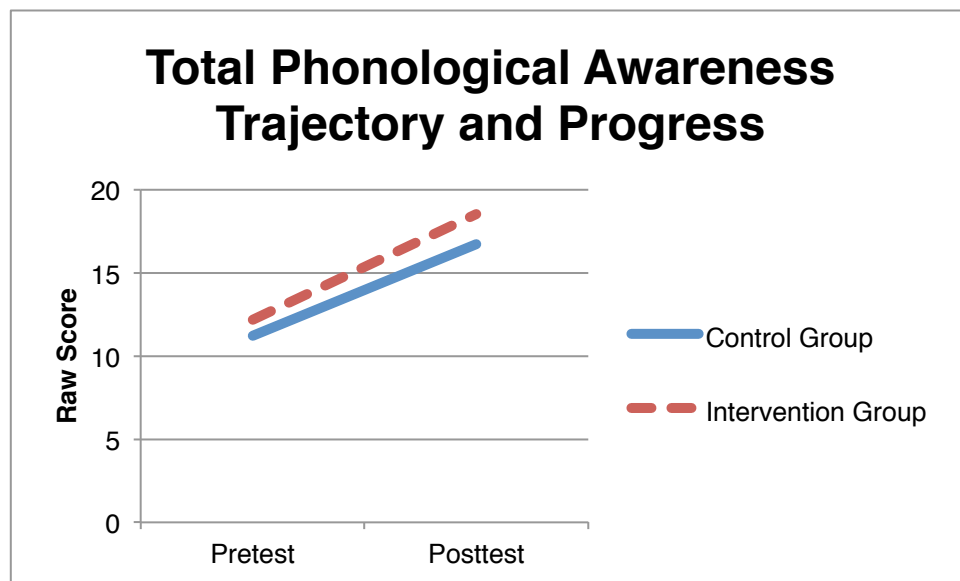


Figure 13: Phonological awareness progress (means) as a function of group and time of testing

Reading and Intervention Gains

Three measures of reading were used to assess decoding proficiency (pseudoword reading, the Burt word-reading test and book-reading level). The control group was slightly better on the reading phonemes in pseudowords measure ($m=3.79$ compared to $m=3.00$), and at reading isolated words in the Burt word-reading test ($m=3.26$ compared to $m=2.09$), and also had higher book-reading levels ($m=2.56$ compared to $m=1.27$) than the intervention group at the pretest phase. This was reversed at the posttest phase for the isolated word reading measures. Where, for the pseudoword (total sounds) the intervention group's mean score was 44.36 v 32.37, for the control group and for the Burt word reading test the intervention group's total mean score at posttest was 14.64 compared to 14.00 for the control group.

Table 6: Means and standard deviations for all reading measures as a function of group and time of testing

	Pretest				Posttest			
	Intervention		Control		Intervention		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PSEUDOWORD READING MEASURE								
Total words (50)	0.18	0.41	0.00	0.00	7.64	7.71	5.84	6.28
Total sounds (187)	3.00	5.33	3.79	3.39	44.36	40.46	32.37	28.07
ISOLATED WORD READING MEASURE								
Burt word test (110)	2.09	2.59	3.26	2.23	14.64	11.78	14.00	7.19
BOOK READING LEVEL								
As assessed by class teachers	1.27	0.47	2.56	0.89	3.73	1.56	6.80	2.12

Intervention Effectiveness

A two-way repeated measures analysis of covariance (ANCOVA) was used to establish the effect of the intervention on the students' decoding development. The independent variable was group type (intervention group and control group). The dependent variables were decoding (through assessment on the pseudoword test) (Bryant, 1975) and the Burt word-reading test (Gilmore, et al., 1981) and contextual reading (using book-reading levels assessed by the classroom teachers). The repeated measures factor was time (pretest and posttest). Because the control group scored higher on pretest letter sound knowledge this was added as a covariate to examine the influence of the intervention on reading outcomes over and above the influence of initial letter sound knowledge. Controlling for pretest letter sound knowledge (upper and lower case letter sounds combined) allowed the effects of the intervention to stand out.

Table 7: Tests of within-subject contrasts and between-subject effects for pseudoword total score

	MS	<i>df</i>	F	<i>p</i>
Within Subjects				
Time	11.70	1	0.84	0.37
Time *Pre Letter Sound	255.77	1	18.37	0.00
Time * Group Type	118.02	1	8.48	0.01
Error (Time)	13.92	27	-	-
Between Subjects				
Pre Letter Sound	278.31	1	18.94	0.00
Group Type	139.28	1	9.48	0.01
Error	14.70	27	-	-

The results of the two-way ANCOVA for pseudoword reading total score are presented in Table 7. There was no overall main effect of time, although there was an interaction with letter-sound knowledge indicating that when students did start with higher levels of letter-sound knowledge they developed better pseudoword reading abilities, $F(1,27) = 18.94$, $p < .05$. However, there was also a main effect of group type, $F(1,27) = 9.48$, $p < .05$, with the means (intervention group 7.64 and control group 5.84), showing that the intervention group performed better at posttest. The interaction was also significant, with the means indicating that the pattern of change over time was likely to be due to the gains from the intervention. The pretest data for pseudoword reading indicated a floor effect as the majority of the students within both groups scored close to zero. This was expected due to the students all being fairly new to school and having had only a few reading lesson experiences. The pseudoword assessment task would also have not been encountered by any of the students in either group through regular classroom reading experiences and was therefore not representative of any of the more familiar forms of reading assessment.

In order to gain a more accurate assessment of the students' decoding ability another score was obtained from this pseudoword reading assessment. This score represented the total number of phonemes read by each student. For example, if a student had read 'tiv' as 'to' they would score one point for correctly reading the initial phoneme. The total phoneme scores for the pseudoword phoneme task show that the intervention group's mean pretest score of 3.00 increased to 44.36 at posttest indicating a very positive gain. This gain also outperformed the control group who progressed from a mean score of 3.79 to 32.37 at posttest. The results of the two-way ANCOVA for pseudoword phoneme reading are presented in Table 8.

Table 8: Tests of within-subject contrasts and between-subject effects for pseudoword phoneme score

	MS	df	F	p
Within Subjects				
Time	3.01	1	0.01	0.93
Time *Pre Letter Sound	4357.78	1	13.00	0.00
Time * Group Type	2983.86	1	8.90	0.01
Error (Time)	335.22	27	-	-
Between Subjects				
Pre Letter Sound	7302.12	1	19.09	0.00
Group Type	3866.53	1	10.11	0.00
Error	382.57	27	-	-

As was found in the analysis for the pseudoword total reading assessment, there was no overall main effect of time, although there was an interaction with letter-sound knowledge indicating that when students did start with higher levels of letter-sound knowledge they developed better pseudoword phoneme reading abilities, $F(1,27) = 19.09$, $p = < .05$. There was a main effect of group type, $F(1,27) = 10.11$, $p = < .05$ with the means (intervention group 44.36 and control group 32.37) showing that the intervention group performed better at posttest for pseudoword phoneme reading. The interaction was also significant, with the means indicating that the pattern of change over time was likely to be due to the

gains of the intervention.

Table 9: Tests of within-subject contrasts and between-subject effects for the Burt word-reading test

	MS	df	F	p
Within Subjects				
Time	4.30	1	0.28	0.60
Time *Pre Letter Sound	361.76	1	23.29	0.00
Time * Group Type	162.46	1	10.46	0.00
Error (Time)	15.54	27	-	-
Between Subjects				
Pre Letter Sound	1029.99	1	42.01	0.00
Group Type	249.05	1	10.16	0.00
Error	24.52	27	-	-

The results of the two-way ANCOVA for the Burt word-reading test are presented in Table 9. Again, there was no overall main effect for time, although there was an interaction with letter-sound knowledge indicating that when students did start with higher levels of letter-sound knowledge they developed better isolated word reading abilities, $F(1,27) = 42.01$, $p = < .05$. The F score was significantly greater for the between subjects analysis, $F(1,27) = 42.01$, $p = < .05$, compared to the within subjects analysis $F(1,27) = 23.29$, $p = < .05$ indicating that the treatment (administered to the intervention group) had a strong effect on isolated word reading when pre-existing letter-sound knowledge was taken into account. There was a main effect for group type $F(1,28) = 10.16$, $p = < .05$, with the means (intervention group, 14.64 and control group, 14.00) showing that the intervention group was slightly higher at posttest for isolated word reading. The results of the two-way ANCOVA for contextual reading are presented in Table 10.

Table 10: Tests of within-subject contrasts and between-subject effects for book-reading level as assessed by the classroom teachers

	MS	df	F	p
Within Subjects				
Time	2.65	1	4.10	0.05
Time *Pre Letter Sound	18.68	1	28.85	0.00
Time * Group Type	0.38	1	0.58	0.45
Error (Time)	0.65	27	-	-
Between Subjects				
Pre Letter Sound	45.48	1	30.99	0.00
Group Type	11.98	1	8.16	0.01
Error	1.47	27	-	-

The ANCOVA for contextual reading showed that there was an overall main effect of time, $F(1,27) = 4.10$, $p = < .05$, and an interaction with time and letter-sound knowledge indicating that when students started school with higher levels of letter-sound knowledge they developed better contextual word reading abilities, $F(1,27) = 28.85$, $p = < .05$. There was a main effect for group type $F(1,27) = 8.16$, $p = < .05$, with the posttest means (intervention group, 3.73 and control group, 6.80) showing that the control group had made greater gains for contextual reading compared to the intervention group. It is worth noting that the control group had significantly higher contextual book-reading levels at the pretest phase, $F(1,28) = 19.59$, $p = < .05$. It is also worth noting that the classroom teachers obtained book-reading levels through informal assessment that included a combination of using seen texts for running records and making an overall teacher judgment of progress, both of which lack true validity and reliability.

Teacher Interview Findings

The results of a semi-structured interview with the teacher of the control group (see appendix D) indicated that she used all cues (e.g. read the word phonetically, look at the initial sound, look for picture cues, read for meaning)

when prompting students to decode unfamiliar words. However, she noted that when teaching students who were struggling with reading, she tended to emphasise word level cues (e.g. initial letter sounds) ahead of contextual cues when they encountered unfamiliar words. She also frequently revisited words that the students had found difficult during guided reading lessons and had completed some explicit word-level study with these words at the conclusion of the lesson. Additionally, her weekly literacy programme often included regular whole class word level instruction during spelling, printing and writing lessons. She also reported that she regularly incorporated the use of oral language games and songs into her literacy programme (e.g. rhyming games and songs).

Summary

In summary, the results indicated that the intervention group had entered school with varying levels of alphabet knowledge and phonological-based early literacy skills. In general, the students were better equipped to successfully complete phonological awareness tasks that had involved larger units of speech (e.g. rhyme and syllables) compared to smaller units (e.g. phonemes). The students also tended to have more knowledge of letter names than letter sounds upon school entry. This was expected given that letter names are more readily taught in preschool tasks (e.g. the alphabet song and ABC books) than are their sound equivalents.

The results further indicated that the intervention was successful in improving the decoding skills of the new entrants within the study. The intervention group outperformed the control group on all measures of isolated word reading once pretest letter-sound knowledge was controlled. While the control group outperformed the intervention group on the contextual reading measure assessed by the classroom teachers, this result should be interpreted with care due to the informal and subjective nature of the assessment. The inclusion of a seen text as the measure of reading ability and an overall subjective teacher judgment may result in low reliability evidence. Overall, the findings suggest that

a phonological-based intervention can promote and accelerate the development of new entrant students' alphabet knowledge, phonological awareness and decoding skills.

Chapter 5: Discussion

This study aimed to assess the phonological-based literacy skills of a group of students early in their first year of school and to compare these skill levels with a group of slightly older students also in their first year of school. The second aim was to implement an in-class supplementary intervention that focused on the explicit teaching of phonological-based skills to the group of early new entrant students and to evaluate the efficacy of this intervention for promoting decoding development. This chapter presents a discussion of the results in relation to previous similar studies. Limitations of the present study and implications for the assessment and teaching of reading in the first year of schooling in New Zealand classrooms will also be briefly discussed.

This study had two hypotheses. It was first hypothesised that the alphabet knowledge and phonologically-based early literacy skills of a group of students early in their first year of school would be variable ranging from none to ceiling and that students would find it easier to manipulate larger phonological units compared to smaller units at pretest. Secondly, it was hypothesised that the inclusion of a phonological-based intervention, taught in addition to the regular classroom programme, would improve students' decoding ability more than the effects of the regular class literacy programme. The results of the study support both hypotheses and these are discussed in detail.

Alphabet Knowledge and Phonological Awareness

The levels of alphabet knowledge and phonological-based early literacy skills the intervention group possessed on school entry was the focus of the first hypothesis. The results supporting this hypothesis showed that the students within the intervention group began school with alphabet knowledge and phonological awareness that ranged from zero to ceiling on the assessment measures. The results also showed that, on their school entry assessment, the

students within the intervention group had lower levels of alphabet knowledge in comparison to the control group, although this finding was to be expected given that the control group had already received three months of instruction. The results further indicated that the effects of the intervention accelerated the intervention group's alphabet knowledge to the same level as the control group at posttest demonstrating the positive effects of the added focus on the teaching of such knowledge.

It is generally acknowledged that many parents and most early childhood education centres teach letter names through activities such as the alphabet song, books and other materials. This is due to the widely held belief that knowledge of letter names is important for students to be ready for school and reading instruction. This practice is important given that knowledge of letter names has been shown to be one of the best predictors of future reading success (Foulin, 2005). However, an emphasis on early letter sounds is not usually present to the same extent. It was therefore expected that students would enter school with more letter name knowledge than letter sound knowledge. The results of the current study show that the students within the intervention group entered school with more letter name than letter sound knowledge. Both the letter name and sound scores increased from pre to posttest and the difference between letter name and sound knowledge narrowed from pre to posttest indicating that the intervention was successful in improving students' knowledge in these areas.

It was also predicted that students would enter school with more proficiency at manipulating larger phonological units compared to smaller units. This was due to the fact that phonological awareness is developmental (i.e. students develop an awareness of the concept of a word before they become aware of the concept of syllables) (Opitz, 2000) demonstrating that phonological awareness tasks differ in complexity (Torgesen, et al., 2002). The results supported this hypothesis indicating that students found it easier to manipulate larger as opposed to smaller units of speech upon school entry (e.g. counting syllables

was easier than counting phonemes). Interestingly, this effect was reversed from pretest to posttest for the syllable awareness subtask as the results showed that both groups' posttest scores for this measure actually regressed. A likely explanation for this is that as the students' phonological awareness improved and they gained more sensitivity to phonemes they may have over analysed the syllable counting task and incorrectly applied their knowledge of phonemes to the task. If this was true, then this result could be viewed only as a transitional consequence rather than a permanent behaviour.

Interestingly, the results of the current study showed that the intervention group entered school with more phonological awareness skills than the control group had (even after three months at school) and that the intervention group continued to have better phonological awareness skills posttest. This result suggests that the phonologically-based intervention programme had fostered the development of these skills to a greater extent than that which occurred with the comparison group which had received only a regular literacy programme that did not include the explicit phonological component. However, this result could also be attributable to the fact that the intervention group started out with more phonological awareness, in comparison to the control group, at the outset of the study. Findings from a study conducted by Blachman and colleagues (1999) found that students who participated in a kindergarten phonological awareness programme followed by a reading programme that built on this knowledge and skill set in grade one, had greater reading achievement gains at the end of grades one and two compared to a group of control students who had only received the regular school based reading programme. These findings in conjunction with the findings of the current study support the use of early phonologically-based programmes and interventions aimed at preventing reading failure and meeting the needs of all students.

The earlier students are identified as being at risk of reading difficulty and provided with appropriate interventions, the more probable the outcome of them becoming successful readers. Tunmer, Chapman and Prochnow

(2006) found that students who entered school with low literate cultural capital, (using a measure of phonological sensitivity, grammatical sensitivity, receptive vocabulary and letter-name knowledge), were at least one year behind in reading age at year seven. The phonologically-based early literacy assessments used within the current study allowed the early identification of those most at risk. The intervention and homework activities, involving explicit instruction in and practice of letter knowledge and phonological awareness, were planned to ensure explicit and targeted foci for this group. The use of early phonologically-based literacy assessments allowed the positive results made by those most at risk between pre and posttest to be acknowledged. Without appropriate early literacy assessment there is no benchmark to compare students progress. Early and focused literacy assessment data provides a better foundation from which teachers and schools can evaluate the effectiveness of their programmes and determine strengths and areas of weakness.

Decoding Development

It was further hypothesised that the effects of the phonological-based intervention, taught in addition to the regular classroom programme, would improve students' decoding ability more than the effects of the regular class literacy programme alone. Therefore, it was expected that the intervention group would make greater gains in decoding in comparison to the control group due to the effects of the phonologically-based intervention. This hypothesis was supported by the results, which showed that the intervention group demonstrated greater gains than the control group for the isolated measures of word reading but not the contextual measure. These results indicate that the phonologically-based intervention was successful in promoting decoding skills. It appears that the intervention group's significant improvement in alphabet knowledge between pre and posttest had a bootstrapping effect on their ability to decode both isolated words and novel pseudowords. However, this effect was not present in the analysis of the contextual reading scores. While the

control group significantly outperformed the intervention group on the contextual reading measure (i.e. book-reading levels), this result should be analysed with caution. This data is subjective due to the scores including the use of a seen text and overall teacher judgment. Book-reading levels were obtained using running records, which are fluency-based rather than skills-based. It must also be remembered that the control group was approximately three months older than the intervention group, so their higher book-reading level would be expected given their added exposure to literacy instruction. Similarly, Ryder, Tunmer and Greaney (2008) found that students' isolated word reading, pseudoword reading and comprehension skills were improved through an intervention that explicitly targeted phonological awareness training and phonemically-based decoding skills. These phonemically-based decoding strategies included phonemic awareness exercises and explicit teaching of letter-sound correspondences. They also found that the gains made through the twenty-four week intervention were maintained two years after the intervention and that the effects were generalised to the students' word reading accuracy in connected text. Additionally, Blachman, et al. (1999) found that the positive effects of a phonologically-based intervention were maintained over time and transferred to reading achievement. They found that students who received explicit instruction in phonological awareness and the alphabetic code in kindergarten and year one showed significant gains, compared to a control group, in reading at the end of grades one and two.

The current intervention included a balance of explicit instruction that focused on phonological awareness and alphabet knowledge-based tasks. The combination of phonological awareness and alphabet instruction has been shown to be more effective in supporting students' reading (decoding) and spelling development than when alphabet knowledge is taught without instruction in phonological awareness (Ball & Blachman, 1991). Most of the activities within the intervention were targeted at the whole class rather than with individuals or small groups. Students who entered school with reasonably high levels of alphabet knowledge and phonological awareness were also

included in all of the activities. Fielding-Barnsley (1997) conducted a study that found students who entered school with high levels of alphabet knowledge and phonemic awareness benefited from explicit decoding and encoding instruction and such instruction positively impacted on their ability to decode and spell both novel and pseudowords. The intervention in the current study included a combination of instruction that explicitly targeted alphabet knowledge and phonological-based decoding skills. As mentioned previously, the results indicated that the alphabet knowledge gains made by the intervention group had a bootstrapping effect on their ability to decode novel and isolated words. Additionally, the results of the analysis of spelling growth and the letter writing assessments indicated that the intervention had a positive effect on students' letter writing and spelling skills.

The Context of the Current Study

The present study replicated the Greaney and Arrow (2012) study with some modifications to the assessments and instructional tasks. The positive results obtained through the Greaney and Arrow (2012) study in which the intervention group out-performed the control group on every measure, provided reason for confidence that similar results would be achieved in the current study. However, there were several differences in the contexts of the two studies that contributed to the less positive findings in the current study. Firstly, the Greaney and Arrow (2012) study took place within a decile 1 primary school with a majority of Maori and Pasifika students. The present study took place in a decile 8 school with a majority of New Zealand European students. Maori and Pasifika students make up the majority of the tail of underachievement in reading in New Zealand (Wagemaker, 1993, as cited in (Tunmer, et al., 2003; Tunmer, et al., 2006). Because of this, there were a higher percentage of at-risk students present in the Greaney and Arrow (2012) study in comparison to the present study. Additionally, the regular classroom teachers that were part of the Greaney and Arrow (2012) study had followed a whole language/constructivist approach to reading instruction in which phonological-based teaching programmes were not

part of the regular in class lessons to the same extent that they were in the current study. The teachers who were part of the current study had included daily explicit teaching of letter to sound correspondences through the Jolly Phonics programme (Lloyd, 2007). Other aspects of this programme included the use of an action for each sound, letter formation printing sheets and books with many illustrations related to each sound, which would have also promoted the phonological-based learning of these students in all classes. So, in hindsight, the students in these classes were already receiving high quality literacy instruction, which suggests that they may not have been the ideal choice for the study (in terms of obtaining the greatest effects). Therefore the students in this study had more daily exposure to lessons targeting phonic-based skills than did the students in the Greaney and Arrow (2012) study. Another possible reason for the less positive findings in the current study compared to those in the Greaney and Arrow (2012) study was that the teacher of the control group regularly emphasised phonologically-based decoding and encoding skills during reading and writing lessons, particularly with students who were struggling to read and write, whereas the teachers within the Greaney and Arrow (2012) study tended to adhere entirely to a whole language-based philosophy that did not include any explicit phonological-based teaching and assessment tasks.

This research adds to the current body of knowledge by exploring the effects of a phonological-based intervention within a whole class, mainly whole language-based classroom in New Zealand. The majority of studies in this area have focused on small groups of students usually identified as struggling to learn to read or identified as at risk of failure. The current study differs from previous studies by exploring the effects of a whole class phonological-based intervention that included all of the students within the class, rather than with groups or individuals.

Limitations and Implications

Limitations

The first limitation in the current study concerned the small sample size. Nineteen control students were included in the study. The intervention group comprised only eleven students. The size of the intervention sample was based on the number of students who had started school at the commencement of the study. In other words, the intervention group comprised the natural roll of one new entrant class. The experience of the teacher within the control class was also a variable that possibly had a confounding effect on the results of the current study resulting in less apparent findings compared to those in the Greaney and Arrow (2012) study. For example, the teacher in the control class may not have been representative of a 'typical' New Zealand teacher in either her teaching of reading or her teaching philosophy of reading. She was an English-trained teacher who had taught spelling phonetically through a range of whole class, small group and independent activities including the use of 'letter fans' to build words, a weekly 'word family' which was referred to on several occasions throughout the week and spelling activity sheets that focused on particular spelling patterns. While the regular teacher tended to subscribe to the Multiple Cue Theory of word reading when prompting students to read unfamiliar words, she also reported that she prioritised word level cues when she encouraged students to read unfamiliar words phonetically. For example, when asked what prompts she used to help students read unfamiliar words she indicated that she would first get them to attempt the word phonetically, encourage them to look at the beginning sound and then look for picture and meaning clues. She also regularly focused her teaching on decoding ahead of comprehension for these students who were struggling to learn to read. When asked what she does to help struggling readers she specified that she focused her teaching on decoding skills for these students. For example, she reported that, when taking a guided reading lesson with a struggling student she spends time, after the reading of the story, teaching and reinforcing individual words,

letters and letter patterns in isolation. The difference in age and time at school between the control group and the intervention group provided a challenge when comparing the results of the two groups.

The lack of data for the control class at school entry was another limitation of the study. This occurred because the school had no relevant phonologically-based assessments that could have been used for comparative purposes. The control group scored below the intervention group on the phonological awareness tasks at the pretest phase. There is no clear explanation as to why this occurred. It would have been interesting to know how well the control group would have scored on these measures if they too had been assessed as they entered school. This would have allowed a measure of the extent to which the phonological awareness that students enter school with is developed within the regular class programme, compared to a classroom that explicitly emphasises phonological awareness training as a focus.

A further limitation of the study was the level of accuracy of the contextual reading measure. The Neale Analysis of Reading Ability (Neale, 1999), was too difficult for the majority of the students in both the control and the intervention groups and this resulted in a lack of accurate data being gained for contextual reading on a standardised measure. This, therefore, resulted in a reliance on the teacher-assessed book-reading levels as the only viable measure of contextual reading within the study. These results may be problematic due to the nature of the way in which the data was collected. For example, it is important to record whether book-reading levels are based on the reading of seen or unseen texts, as the reading of an unseen text presents the reader with a higher level of difficulty than would be expected when reading familiar texts. These factors make it difficult to be confident about the accuracy of any reading level comparisons between the students in the groups. Center, Freeman and Robertson (2001) also identify the problem of establishing an accurate reading level for very young students when they state that “for year one children at-risk, it is difficult to find a suitable standardised reading comprehension test, aside

from the diagnostic test, to administer” (p. 228). Chapman et al. (1998) highlighted another problem with using book reading level gain scores as a measure for early reading progress. These researchers suspect that comparison of such gain scores are only meaningful if a linear relationship between the amount of instruction and reading performance is evident. However, Chapman et al. (1998) maintain that because this relationship is not linear it can be expected that “The average increase in text level for a given period of instruction (is likely to be) greater for the lower level texts than for the higher level texts” (p. 8). Therefore, it would be expected that students who begin on low level texts would, in all probability, make greater text level gains than would students beginning at higher levels. However, research evidence has indicated that year one and two students’ ability to read words in isolation accounts for between 75% and 80% of the variance in reading comprehension (Center, et al., 2001). For this reason, measures of isolated word reading (e.g. The Burt word reading test (Gilmore, et al., 1981) and pseudoword reading (Bryant, 1975) were also used.

Practical Implications

The findings of the present study support the explicit teaching and assessment of early phonological awareness and alphabet knowledge with students from school entry onwards. Identification of students with difficulties in phonological awareness and/or low letter knowledge is important in order to prevent future reading problems developing as a result of these deficiencies. Several studies have indicated the importance of utilising this type of assessment, even with students in early childhood settings and in the first year of school (Torgesen, 1998). Interestingly, this emphasis on the early teaching and assessment of alphabetic knowledge is contrary to what Paris (2005) and the Ministry of Education (2010) would advocate. For example, Paris describes alphabet knowledge as a constrained skill and that such a skill “is distributed at different mastery levels between people only during the brief period of acquisition” (2005, p. 190). Paris also argues that a focus on learning alphabetic and phonemic

awareness skills is not necessary as “most children learn the alphabet during the first year of formal schooling” (2005, p. 194). However, Greaney and Arrow (2012) found that even after nearly three years of schooling many of the students in their study had still not satisfactorily mastered full alphabet (especially sounds) knowledge and were still performing poorly on many phonological awareness tasks. Furthermore, their general reading levels were also below average. So, Paris’ suggestion that all students will learn these constrained skills during their first three years of school is not supported by the research. There is a need to assess these skills very soon after school entry and to continue to monitor for progress throughout the first year of school to ensure that all students gain the maximum possible bootstrapping effects that such skills provide for the development of later reading success. This was the rationale for the current study.

Though most New Zealand primary schools do assess student’s literacy knowledge upon school entry, these assessments rarely include a measure of phonological awareness. Additionally, the first main literacy achievement checkpoint occurs after students have spent one year at school. The Observation Survey (Clay, 2002) is used at this point and does not include any measures of phonological awareness. Reading Recovery’s creator Marie Clay endorses the wait to fail approach (2005a, p.12), when she states “I recommend this check be done at the end of the child’s first year of formal instruction in New Zealand, [because] the child should be given sufficient time to adjust to the school situation and a variety of opportunities to pay attention to literacy activities.” This one year wait is not based on any research that indicates students need this long to adjust to school. The research does suggest, however, that this first year of instruction is a critical time for setting the foundations for future reading success. Gough and Juel (1991) as cited in Blachman et al. (1999) conclude that it is essential for students to learn decoding skills in their first year of schooling. They caution that if decoding skills, including phonological awareness, don’t develop early, it may be very difficult to change the direction that students’ reading achievement takes. The wait to fail

approach, supported by the Ministry of Education, does not serve the needs of students entering school with low phonological awareness skills and alphabet knowledge. Many studies over several decades have indicated the causal relationship between students' early phonological awareness, particularly phonemic awareness, and letter name and sound knowledge as indicators of future reading and spelling success (Adams, 1990; Foulin, 2005; McCardle, et al., 2001; Stuart & Coltheart, 1988).

Introducing a national measure of phonological awareness for students upon entry to school has the potential to identify many of the students who later contribute to the 20% tail of underachievement in reading. Individual teachers could also use the findings of the current study to justify the use and development of phonological-based teaching and assessment practices in their classrooms and schools. However, the identification and monitoring of students who are at risk of reading failure is only worthwhile if the information gained from the appropriate assessments is used to design and implement intervention programmes that employ appropriate teaching strategies to target students' needs. Professional development that focuses on training teachers to use the assessment data to improve teaching strategies and programmes would be appropriate.

Chapter 6: Conclusion

The findings from the present study indicated that a regular nine-week whole class intervention focusing on explicit, systematic instruction in alphabet knowledge and phonological-based strategies improved students' decoding skills to a greater extent than that which occurred within a regular classroom literacy programme that did not contain the explicit additional training. This was the case even when the regular class literacy programme included a phonic component (e.g. Jolly Phonics). Similarly, Greaney and Arrow (2012) demonstrated that students within a low decile school who had been taught by a predominantly whole language approach, benefited from a ten-week explicit phonological-based intervention. These findings suggest that all New Zealand new entrant students would benefit from a reasonably short, preventative, phonological-based programme that can be readily incorporated into existing classroom literacy programmes. Though not all students require explicit instruction in phonological awareness and alphabet knowledge (beyond that which they may receive as part of a whole language programme), for those at risk of reading failure, it is critical, if they are to become successful readers (Arrow & Tunmer, 2012; Torgesen, 1998). The results of the current study in combination with the results of the Greaney and Arrow (2012) indicate that philosophical shift from the Multiple Cue Theory to the Simple View would be beneficial to new entrant students in both low and high decile schools in New Zealand.

It is not necessary to sort struggling readers into categories, for example garden-variety poor readers (i.e. students who have difficulty with both decoding and comprehension) and those diagnosed with dyslexia (i.e. those who have good listening comprehension but poor decoding skills). This is because both groups require the same type intervention (Torgesen, 1998). This revelation in conjunction with the results from the present study and the Greaney and Arrow (2012) study support the concept of utilising interventions that target groups and

whole classes of students as opposed to one-on-one interventions, such as Reading Recovery. Small group and particularly whole class interventions are more cost effective than one-on-one intervention models. Addressing potential literacy problems early within the regular classroom environment allows teachers to focus on issues before they become ingrained behaviours that affect later literacy development and promote negative Matthew effects. Such expensive additional programmes (e.g. Reading Recovery) may also become less necessary. Additionally, the findings from the present study and the findings from the Greaney and Arrow (2012) study suggest that phonological-based interventions can be successfully delivered within the regular classroom setting in addition to existing literacy programmes. Currently, Reading Recovery is the main government funded literacy intervention available to schools for students within their first two years of schooling in New Zealand. The converging international and national evidence supporting the use of preventative, early, phonologically-based interventions with students within the New Zealand context provides a solid foundation upon which new literacy initiatives can be developed in a deliberate attempt to close the literacy achievement gap.

The New Zealand Ministry of Education (and New Zealand teachers generally) tend to follow a constructivist, whole language approach to teaching reading (Ministry of Education, 2009, 2010; Smith & Elley, 1994). Assumptions underpinning the whole language philosophy include the belief that students acquire the ability to read naturally in the same way that they acquire spoken language, that English is too irregular to be taught explicitly and that contextual cues are of more importance than word level cues when attempting to read unfamiliar words. These assumptions contribute to teachers downplaying the importance of word level cues and strategies. This philosophy has implications for struggling readers. The findings from the current study in addition to the findings from other national and international studies indicate the importance of explicit instruction in phonological awareness and word level strategies for students in their first year of schooling, particularly for those at risk of reading

failure and for older students who are struggling to learn to read. Center, et al. (2001) argue, for example, that “The most recent research on literacy acquisition for hard-to-teach students has indicated the need for explicit instruction in these skills as a necessary but not sufficient condition for remediation” (p. 228).

The concept of shifting the wide-spread philosophy of teaching reading to include an emphasis on the use of phonological-based assessments and interventions is a challenging one but it is one worthy of continued dedication and support. It is essential that the information gained from research into reading acquisition, including more effective ways to identify those at risk of reading failure, and the development of more effective programmes to remediate struggling readers, is made available to schools and teachers in order to challenge teachers’ thinking and to encourage them to reflect on their instructional practices. If the Ministry of Education encouraged teachers and schools to seek out and use information gained through current research findings from researchers that are independent of the Ministry, educators might then feel supported and encouraged to implement ideas and concepts into their programmes and to adapt their teaching practices to accommodate best evidence-based practices. The corollary of this is to be content with accepting the status quo ideology and methodologies promoted through national instructional guidelines that continue to favour interventions and assessments that tend to not acknowledge the relevance or effectiveness or necessity of utilising phonologically-based programmes in the classroom.

Further Research

The current study included a small intervention group sample in one school. Further research could involve larger sample sizes across more than one intervention classroom and school within different community contexts. This would allow more accurate conclusions regarding the efficacy of the intervention across settings to be established. Additionally, the development of students’

reading achievement could be tracked through longitudinal research in order to ascertain the long-term effects of the intervention over time. The researcher undertook all of the lessons in the current study. In order to determine the transferability of the intervention, classroom teachers could be trained to undertake the intervention themselves. This would allow further clarification over the significance of the programme across diverse classroom contexts.

The majority of the activities within the intervention took place outside of the context of real reading and when lessons did involve reading, the researcher did not use the reading books available within the school. The classroom teachers took all shared and guided reading lessons according to their regular teaching protocols. A future research avenue could be to include the shared and guided reading lessons as part of the intervention and explicitly teach the students how to transfer the skills learned in isolated word study lessons to situations involving the reading of connected text. If this element had been considered in the present study, the intervention group may have performed better on the contextual reading assessment measures.

Summary

The Ministry of Education appears to be reluctant to accept research evidence about the importance of early prevention and remediation of students at risk of developing reading difficulties (Greaney & Arrow, 2012). The Ministry of Education's recent policy developments 'The Reading and Writing Standards for Years 1-8' (Ministry of Education, 2009) and 'The New Zealand Literacy Learning Progressions' (Ministry of Education, 2010) have reinforced the wait to fail approach by not including a school entry benchmark standard but instead, making the first checkpoint after one year at school. This implies that the government has accepted the status quo of early literacy assessment and intervention as satisfactory for meeting the needs of students failing and at risk of failing to learn to read in New Zealand.

Delaying the first literacy assessment checkpoint until one year at school has

elapsed means that many students at risk of reading difficulties will be six years of age before they are identified and provided with a necessary intervention. This wait to fail approach also allows students to fall into bad habits and potentially gain negative self-perceptions about their reading ability due to repeated unsuccessful reading attempts. A school entry benchmark standard in literacy would encourage teachers to think about the discrepancy in literacy knowledge and skills students bring to school and would provide them with a tool to identify students at risk as soon as possible after school entry (Greaney & Tunmer, 2010).

Designing and implementing reading interventions with a view to drawing conclusions about how best to teach reading, is not a simple task. There are so many variables at play that need to be considered. Lyon & Moats (1997) express the level of complexity involved in designing, executing and replicating reading interventions. Careful consideration should, therefore, be taken when designing, implementing, interpreting and analysing the findings from reading intervention research. New research should build from a foundation of what has been consistently shown to be best evidence-based practice and should avoid practices that have been proven ineffective. In this way the knowledge base should continue to develop more solid conclusions about what is best practice when it comes to identifying, preventing and remediating reading difficulties.

The time is opportune for new literacy assessments and interventions to be developed and trialed within the New Zealand context. We should be able to acknowledge the good things that we are doing in literacy education and continue these as well as acknowledging the areas of weakness and address these. There is no sense in continuing to support ineffective systems and ideas with money, time and training. It is time for a fresh objective approach based on what we now know about the reading acquisition process for identifying, preventing and remediating reading difficulties in New Zealand. The time is right, now, to start the climb to return New Zealand to the number 1 ranking it received in the 1979 inaugural International Association for the Evaluation of Reading Achievement (IEA) literacy survey.

Appendices

Appendix A

Ethics approval letter.



MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA

9 February 2012

Sarah Wild
405 Grays Road
RD1
PORIRUA 5381

Dear Sarah

Re: HEC: Southern B Application – 11/81
The development of early reading skills in year one classes

Thank you for your letter dated 6 February 2012.

On behalf of the Massey University Human Ethics Committee: Southern B I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Nathan Matthews, Acting Chair
Massey University Human Ethics Committee: Southern B

cc Dr Keith Greaney
School of Educational Studies
PN900

Dr Alison Arrow
School of Educational Studies
PN900

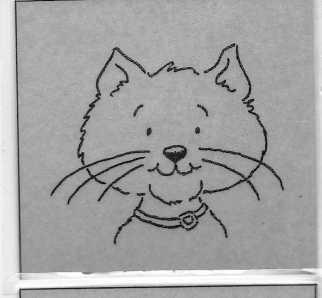
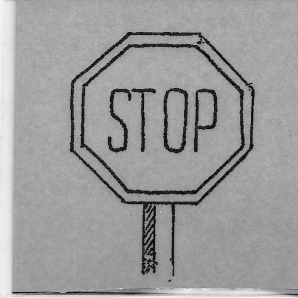
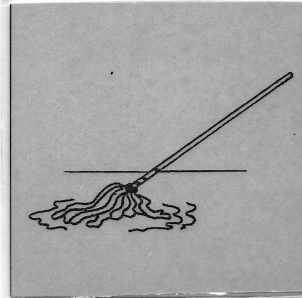
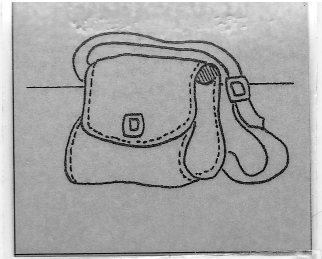
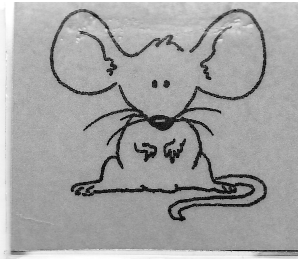
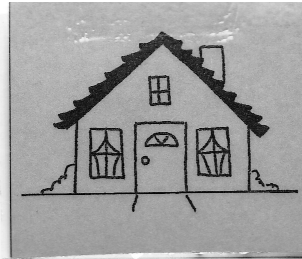
Prof Howard Lee, HoS
School of Educational Studies
PN900

Appendix B

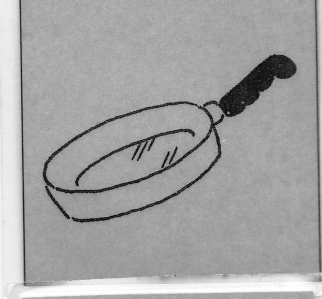
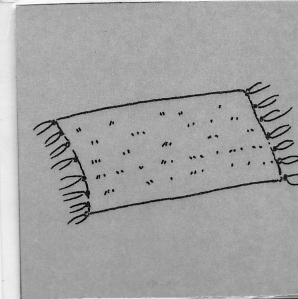
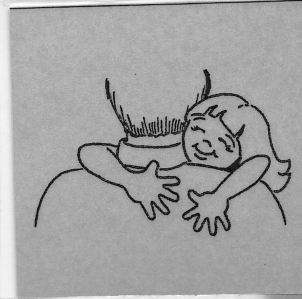
Teacher made onset/rime assessment.

Practice

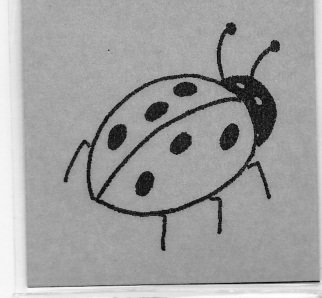
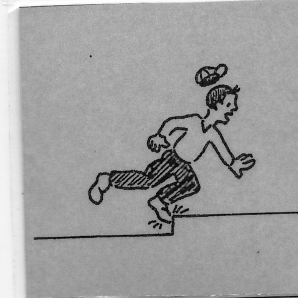
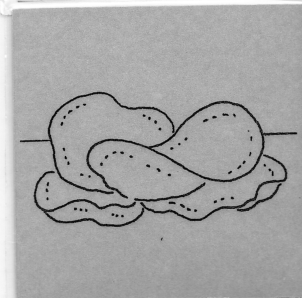
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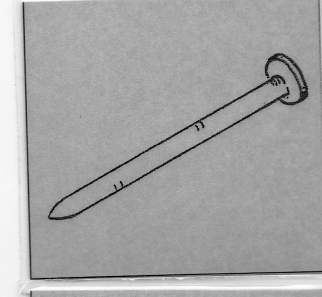
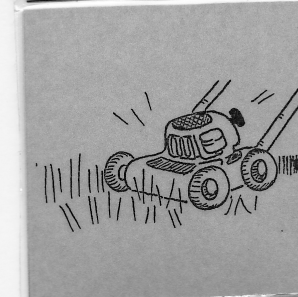
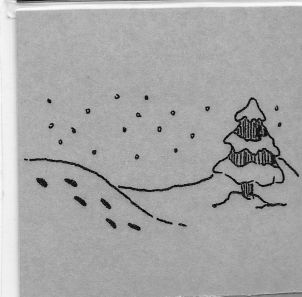
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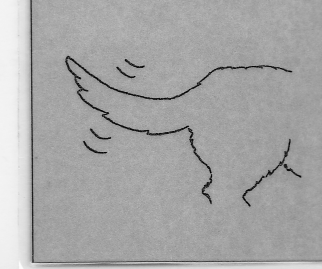
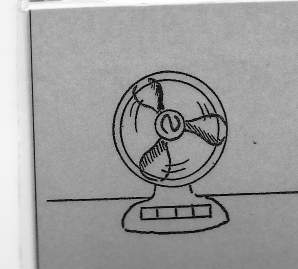
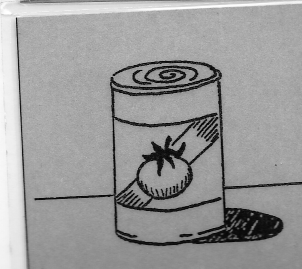
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Appendix C

Sample lesson plan.

The Development of Early Reading Skills in Year One Classes Intervention - Week 2 Plan

Week 1	Resources Required	Whole Class Warm up (5 min)	Activity 1 (10 min)	Activity 2 (10 min)	Activity 3 (10 min)	Whole Class Wind down (5 min)
Learning Objectives WALT...	1. choose and produce words that rhyme (rhyme choice / production), 2. to be secure with the five short vowel sounds, 3. read words that include 'a' as an initial or medial sound, 4. write the lower case letters r, n, m, h and k.					
Lesson 1	- Short vowel sound picture and cards, - 4 Mouse House game boards + dice - Dr Suess book	Silly Name Rhyming Fun: Make up words that rhyme with the children's names e.g. Maisie, Paisie. Say the made up name in the following poem 'I know a boy / girl whose name is Paisie stand up if your name is Paisie. The child stands up and says "My name is Maisie not Paisie". Once confident this child then chooses someone else and leads the rhyme. Teacher leads until the children become familiar with the game.	Short Vowel Sound Picture Sort: Have the children sort the pictures under the correct letter A - apple, astronaut, E - egg, empty I - igloo, insect O - octopus, ostrich U - umbrella, up.	Game - Mouse house: Split the class into four groups to play this game. Each player needs a counter. Everyone starts on the 'start mouse'. The first player throws the die and moves their piece that number of places. If the player lands on a picture square, they have to say the name of the picture and a word that rhymes with it (tell the children what the pictures are before starting the game). If they can't think of one the player skips a turn. If the player lands on a picture of cheese, they don't have to say anything. The winner is the first player to reach the 'mouse house'.	Rhyme Story - Read the children a Dr Suess story.	
Lesson 2	- Do you know' poem, - Short vowel sound 'a' match up, - printing letters r, n and m, - Higglety, pigglety pop! rhyme, - rhyming pair pictures (use cards from rhyme bingo) - modeling book - workbooks	Do you know? Sing the song 'Do you know?' to the tune of 'The Muffin Man' (refer to modeling book for resource). Children suggest pairs of rhyming words to sing in the song. Review Short Vowel Sounds	Higglety, Pigglety, Pop! Read the poem as it is first. Next substitute rhyming pairs	Short Vowel Sound 'A' Match Up: Match up the pictures with the words in 4 groups: 'sat, cat, bad, mad, fat, ham, nap, pan, rat' Read the following words together: 'and, at, has'	Printing - letters r, n and m: Teacher models the sounds the letters make and complete circling modeling book activity with the class. The models how to print the letters r, n and m in the modeling book pointing out how they are similar in shape. Refer to 'Casey Caterpillar' as this is what the teacher uses to teach letter shapes. Children complete their letter printing sheets in their books.	Squirrel in a Tree: Divide the class in half (squirrels an trees) Give the trees the picture cards that match the squirrels cards. The trees find a space in the classroom and remain stationary. When he teacher says 'Find a tree!' the squirrels move around to find their matching tree.
Lesson 3	- A ball or beanbag, - letter cards, - Big book 'Max', - workbooks, - Modeling book, - Rhyming Bingo game.	The Ship is Loaded with... Children sit in a circle and the teacher, holding the ball, says 'The ship is loaded with cheese ' then tosses the ball to someone in the circle who produces a sentence that rhymes with the original then everyone repeat the original sentence and the new sentence. Continue until there are no more rhymes then start with new cargo Examples: - cheese, peas, fleas, bees, keys, - dogs, hogs, frogs, logs, - cats, rats, bats, hats. Review Short Vowel Sounds	Shared Reading: Read the book 'Max' as a class decoding the words together as we go.	Word Study: Modeling book - Complete short vowel sound three letter word discrimination activity together. Read the words and decide together which word is correct. Independently - Look at the pictures and print the letter 'a' in the middle of each of the words if it is the correct vowel sound to use. Complete activity in work books.	Printing - letters h and k: Teacher models the sounds the letters make and complete circling modeling book activity with the class. The models how to print the letters h and k in the modeling book pointing out how they are similar in shape. Refer to 'Casey Caterpillar' as this is what the teacher uses to teach letter shapes. Children complete their letter printing sheets in their books.	Rhyming Bingo: As described in week one plan.

Appendix D

Interview with control class teacher.

Control Class Teacher's Literacy Programme:

1. What type of activities do you do with your class to teach and reinforce letter and letter cluster sounds?
2. What type of activities do you use to teach spelling?
3. What do you do to encourage children to spell words that they don't yet know, when they are writing stories?
4. What prompts do you use to help a child read an unfamiliar word during story reading?
5. Do you teach the children how to read and write words by looking at them in isolation, out of the context of a story? What do you do?
6. What kinds of games and activities do you use with your class, or encourage them to use independently, that require the children to explore and manipulate oral language? e.g. rhyme, syllables, phonemes etc....
- 7 What kinds of activities and prompts do you find most useful for encouraging children who struggle to read.
8. What kinds of activities and prompts do you find most useful for encouraging children who struggle to write.

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