

**ORAL LANGUAGE AND LITERACY: TEACHERS'
PHONOLOGICAL AWARENESS KNOWLEDGE AND
EFFECTIVE CLASSROOM PRACTICES.**

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Declaration of Originality

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

I also certify that the research reported in this thesis has been approved by the University of Canterbury Human Ethics Committee.

Signed: *J. L. D Carroll*

On: 29/04/2016

Acknowledgements

“A journey of a thousand miles begins with a single step”

–Lao-Tzu.

When I started this journey, I began with an “I can do this attitude”. Now several years later, the circle of “I can / I can’t”, has turned many rotations, hit a few bumps in the road and I am back to I can and I have. I still think of my primary supervisor’s words that “a PhD. is a significant piece of work” and now reflecting back, I far more fully appreciate the research process and how hard it can be to implement evidence-based practices.

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Jane Carroll

Abstract

International research into literacy acquisition makes evident that the large inequity of literacy outcomes, even in wealthy countries, continues, despite heavy investment in raising achievement for all children (United Nations Educational, Scientific and Cultural Organisation—UNESCO, 2009; United Nations Children’s Fund—UNICEF, 2010). There are a number of different approaches that incorporate key predictors of literacy that have been considered, and programs implemented to attempt to raise literacy levels and reduce inequality. Phonological Awareness (PA) has been recognised as one of the underlying constructs for literacy success and PA is one of the most powerful predictors of early literacy (Al Otaiba, Kosanovich, & Torgesen, 2012; Castles & Coltheart, 2004; Pressley, 2006; Yopp & Yopp, 2000).

Evidence of the benefits of PA to literacy development has been well documented within controlled outside of the classroom environment research settings (Ehri et al., 2001; Gillon, 2005a; McNeill, Gillon, & Dodd, 2009b). There have been PA approaches that have been implemented into classroom literacy practices (Ball, 1997; Carson, Gillon, & Boustead, 2013) and a large number of websites that teachers can access for information on assessing PA and classroom resources. However, there is less known about practices in early childhood or education settings, and whether teachers’ underlying knowledge, and skills, can appropriately support effective integration of PA into typical literacy programs during early childhood and early school years. For this reason, five investigations of teacher knowledge and practices that may support children’s phonological awareness development are

reported in this thesis.

The first study (reported in Chapter 2) examined the use of a phonological awareness test to assess the phonological awareness skills of 699 education professionals and paraprofessionals working in New Zealand primary schools and early childhood centres. Performance in a phonological awareness test was compared across speech-language therapists (SLTs, $n = 34$), primary school teachers ($n = 208$), teacher aides ($n = 49$), Resource Teachers of Literacy (RTLits, $n = 80$), Resource Teachers of Learning and Behaviour (RTLBs, $n = 26$), early childhood teachers (ECTs, $n = 51$), third year College of Education students (3YRBT, $n = 98$), and first year College of Education students (1YRBT, $n = 153$). The results indicated that the Phonological Awareness Test had construct validity and that there was large variability in New Zealand educators' capacity to segment words into sounds. SLTs performed at near ceiling (98% accuracy), whereas junior school teachers performed at 74% accuracy, teacher aides at 63%, ECTs at 56%, RTLits at 89%, RTLBs at 78%, third year College of Education students at 68%, and first year College of Education students at 55%. The data suggest that professional development in phonological awareness for all the educators, as well as pre-service teachers and teacher aides, is warranted.

In New Zealand, there is a national early childhood curriculum, Te Whāriki: he whāriki matauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum (MOE., 1996b), that is based on a social-constructionism theoretical framework and as such, is a broad but non-prescriptive curriculum. The second study (reported in Chapter 3) investigated the typical storybook reading practices of ten early childhood teachers reading to small groups of four-year-old children. Teachers' comments and discussion as they shared the storybooks with the children were transcribed and coded

to describe the types of comments teachers make and the extent to which their comments target emergent literacy skills. Two research questions were asked: (1) What are the levels of cognitive demand prompted by teachers' questions and comments? (2) What are the foci of the questions and comments made during story reading?

The results showed that the early childhood teachers predominantly focused on story content and meaning, with significantly fewer comments that drew children's attention to the print on the page or emphasised developing early phonological awareness skills important to word reading. A child's phonological awareness (PA) ability at school entry can reliably predict their early literacy success. Yet there is little evidence of the PA content knowledge that early childhood (EC) teachers have, and how they may use this knowledge to facilitate children's PA development within early childhood centres.

The third study (reported in Chapter 4) examined the PA knowledge of forty-three qualified early childhood teachers over time, in both verbal and written contexts and explored the effect of two professional development models on enhancing teachers' PA knowledge. At the beginning of the nine-week baseline phase, all teachers were asked to complete a questionnaire and were then assessed at four time points using two forms of a PA test (two verbal and two written test formats). At week nine, the early childhood centres and their teachers were randomly assigned to one of two conditions: professional development plus coaching (PD+C) or professional development only (PDOnly). Two centres, whose teaching staff were unable to access the PD, acted as a Control group. The PD+C and PDOnly groups participated in a 90-minute professional development session focusing on PA and enhancing emergent literacy skills during storybook reading. In addition, The PD+C

group received four individualised coaching sessions to facilitate increased use of PA within their teaching context. Teachers in the PD+C and Control groups were videoed during a typical storybook session with a small group of children.

The teachers' ability to correctly define PA compared to phonics was very low. PA total scores were consistent across the baseline phase but subtest results suggest high variability when comparing the individual items. There were differences in scores between verbal and written presentations of the same test version. At post-intervention, teachers in the PA+C and PDOnly groups' PA scores increased compared to the Control group. These results have implications for early childhood teaching. Incorporating PA into the curriculum in more explicit activities, and professional development models will be discussed.

The fourth study (reported in Chapter 5) explored the PA knowledge of primary school teachers over time. At the beginning of the nine-week research phase, all teachers were asked to complete a questionnaire and were then assessed at four time points using two forms of a PA test (two verbal and two written test formats). Unlike their EC colleagues, this group of forty-four registered teachers showed no difference in scores between verbal and written presentations of the same test version and no differences over time for their total PA test scores. On the Teachers Beliefs About Literacy Questionnaire (TBALQ) (Westwood, Knight, & Redden, 1997) there was a preference shown by the teachers for a balanced literacy instructional program.

The fifth study (reported in Chapter 6) explored the classroom implementation over time of two interventions. The first after a baseline-monitoring period of nine-weeks, was a professional development session with a teacher (teacher A). The children in teacher A's class PA skills were monitored and growth trajectories plotted. After eleven-weeks there were PA classroom resources introduced into

teacher A's literacy teaching program, the lead researcher coached teacher A to implement explicit PA instruction that was linked into teacher A's literacy program (e.g., initial and final sound sorting game of the letter that the teacher focused on in the printing lesson). Teacher A and the lead researcher further developed the resources. After the ten-week period, teacher A had completed nineteen-hours of explicit PA teaching and the children's PA trajectories were plotted. There was a greater increase in PA learning over the ten-week period when the resources and coaching were implemented than the eleven-week period after teacher A had received PD alone. Implications for classroom teacher implementation of explicit PA instruction in the first year of school are discussed.

The results from this thesis provide evidence that early childhood teachers and primary school teachers and other professionals associated with developing children's literacy skills have wide and varying metalinguistic knowledge, understanding, and use of phonological awareness in their work with children. The level of this knowledge varies significantly with the participants' level of specialist training; and also within subgroups of educators. However, studies within the thesis demonstrate that teachers' knowledge can be successfully enhanced through professional development and individualised coaching. The results also demonstrate that PA implementation at early childhood through storybook reading, and whole class based implemented PA instruction, alongside increased teacher knowledge and pedagogy, can support improved literacy success for young children. Overall, the thesis findings have important implications for the preparation and professional development of teachers working to enhance children's early literacy development.

Publications arising from this thesis

Carroll, J., Gillon, G., McNeill, B., & Schaughency, E. (2014). New Zealand early childhood teachers' storybook reading practices: The talk beyond the story. *Literacy Forum/Te Korero Panui Tuhituhi o Aotearoa*, 29, 13-24.

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The contribution from the candidate was 80%. The candidate received support with aspects of study design, data analysis and write-up of the article.

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List of Abbreviations

ANOVA	analysis of variance
C	comprehension
D	decoding
CELF-Pre	Clinical Evaluation of Language Fundamentals-Pre-school: Second Edition
EC	early childhood
ECT	early childhood teachers
ERO	Education Review Office
MOE	Ministry of Education
PA	phonological awareness
PCK	Pedagogical Content Knowledge
PIRLS	Progress in International Reading Literacy Study
R	reading
RTLb	resource teacher of learning and behaviour
RTLit.	resource teacher of literacy
RTR	Ready to Read instructional book series
RR	Reading Recovery
TBALQ	Teachers' Beliefs About Literacy Questionnaire
SCK	Subject Content knowledge
SLT	speech-language therapist
SVR	Simple View of Reading
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
1YRBT	first year College of Education students
3YRBT	third year College of Education students

Chapter 1: Literature Review

1.1 Introduction

Being literate, in the traditional sense of reading and writing, is fundamental to an individual's ability to function to their full potential within today's society (UNESCO., 2006). McLachlan, Nicholson, Fielding-Barnsley, Mercer and Ohi (2013) described literacy as being multifactorial in that it "involves individual, biological, social and cultural elements" (p.4). Therefore, being literate is important throughout the day, from being social, such as reading Facebook messages and sending texts, to academic use, such as study at school and beyond, and is critical for achieving life-long social, academic, and vocational success (UNESCO., 2009). Becoming literate, in the sense of developing fluency in reading and writing, does not typically occur until children enter formal literacy instruction (at age five years in New Zealand). The literacy learning process, however, starts much earlier, and is described as being on a continuum from emergent literacy, which is shaped through exposure to oral language experiences and interactions in social settings, to written language experiences, such as being read storybooks (Whitehurst & Lonigan, 1998).

The emergent literacy stage blends into the early reading stage and is where readers are able to use strategies, such as using the picture or first letter of a word, to help them to predict a written word. This stage then develops over time, with effective literacy instruction, practice and exposure, to a wide range of literacy experiences for the child to become a fluent reader, which is a complex process that involves the synthesis of many skills. A fluent reader is one who independently understands the text, how different texts work (e.g. reading for pleasure compared to reading and

understanding the complexities of a school textbook) and can relate this to his or her own ideas (Lyon, 1998; Lyon & Weiser, 2009).

Programs that encompass skills that are predictive of reading success are the most effective at developing competent and successful readers (Ehri et al., 2001). One powerful predictor and diagnostic marker for reading difficulties once a child starts formal reading instruction is phonological awareness (PA) (Ehri et al., 2001; Goswami, 2005; Pressley, 2006). Phonological awareness is defined by Gillon (2004) as “an individual’s awareness of the sound structure, or phonological structure, of a spoken word” (p2). The facilitation of PA is one of the key prerequisites for reading, as PA aids word recognition development, which also facilitates reading comprehension (Al Otaiba et al., 2012; Justice, 2006; Nelson, 2010).

There has been considerable research on effective PA instruction in controlled settings, such as clinics, over the last decades, but the majority of this research has been conducted outside the classroom environment and with individuals with identified educational needs or children deemed to be at risk (Bradley & Bryant, 1983; Bryne, Fielding-Barnsley, & Ashely, 2000; Cabell, Justice, Konold, & McGinty, 2011; Ehri et al., 2001; Gillon, 2005a; Hulme et al., 2002; MacDonald & Figueredo, 2010; McNeill, Gillon, & Dodd, 2009a; van Bysterveldt, Gillon, & Moran, 2006).

The long-term social, academic and economic success of individuals is based on the development of skilled reading and writing (UNESCO., 2009; UNICEF, 2010). Long-term economic effects of literacy difficulties on individuals, families and society have been highlighted in reports such as those published by the British National Literacy Trust (Morrisroe, 2014).

1.1.2 The teacher's role

Teachers, both in the early childhood (EC) and junior school years, play a critical role in developing young children's foundational and emergent literacy skills. The curriculum within which teachers work stems from the political, societal and historical traditions of the country or area in which it originates (Tayler, 2012). These traditions inform and shape the priorities and theoretical perspectives espoused within the curriculum documents. Political forces dictate many of the variables of classrooms, such as class numbers, resources available (for example classroom design, nationally provided resources) and foci for teaching. There is research that has evaluated the investment made into the training and teaching of teachers and impact on student performance. McKinsey (2007) studied twenty-five of the world's school systems and from the top ten performing school systems suggested that two important factors were getting the right people into teaching, and educating them to be effective (p.ii). This is reiterated by Darling-Hammond over many publications, who suggests that every child deserves a well-trained and professional supported teacher and that the strongest correlates of quantitative analyses of teacher preparation and certification are student achievement in reading and mathematics (Darling-Hammond, 1995, 2000a, 2000b, 2012).

Research indicates that PA has a greater effect on student literacy achievement than other classroom variables, such as class size, reading programs and financial resources (Hattie, 2009). The use of formative feedback, defined by Shute (2008) as "information communicated to the learner that is intended to modify the learner's thinking or behaviour for the purpose of improving learning" (p.153), has been linked to encouraging metacognitive thinking by making the learner part of the feedback-learning cycle at all levels of learning for both children and adult learners (Black,

Harrison, Lee, Marshall, & William, 2004; Schoenberger-Orgad & Spiller, 2014; Shute, 2008; Spiller, 2009).

Hattie's (2009) meta-analyses identified that teachers are among the most powerful influences on children's learning. He identified that the key to student's learning was making teaching and learning visible, that is, effective instruction where teachers deliberately included strategies such as meaningful feedback, modelling, and guiding learning practices.

A significant body of research has also focused on the importance of teachers' knowledge in the domain of language and, in particular, the basic concepts of the English language, such as phonological awareness (Al-Hazza, Fleener, & Hager, 2008; Carlisle, Correnti, Phelps, & Zeng, 2009; Carroll, Gillon, & McNeill, 2012; de Vries, van de Grift, & Jansen, 2013; Fielding-Barnsley, 2010; Hammond, 2015; Lonigan & Shanahan, 2010; Lyon & Weiser, 2009; McCutchen et al., 2002; Moats, 2008a; Piasta, Connor, Fishman, & Morrison, 2009; Snow, Griffin, & Burns, 2005; Spear-Swerling & Brucker, 2003; Stainthorp, 2004)

Children's phonological awareness, that is, "an individual's awareness of the sound structure, or phonological structure, of a spoken word" (Gillon, 2004, p. 4), is particularly important for early literacy success, as it helps children to decode written words (Gillon, 2004; Lindsay, Dockrell, Law, & Roulstone, 2010; McLachlan & Arrow, 2014; Piasta et al., 2009). How teachers' linguistic knowledge and knowledge of effective teaching strategies influence children's early literacy learning is an important area of current research focus. The results of a pilot study by Podhajski, Mather, Nathan, and Sammons (2009), involving seven American teachers, suggested that the students in the classrooms whose teachers participated in effective professional development that informs teacher knowledge in the area of the English

language structure had better reading and spelling outcomes than the control group.

This thesis focuses on increasing our understanding of teachers' knowledge in areas of importance to effective literacy instruction, particularly in the area of phonological awareness. It also examines how enhancing such knowledge influences children's emergent and early literacy skills

1.2 Emergent literacy

Early literacy success is a powerful predictor of later literacy success and academic achievement (Arrow, 2010; Arrow & McLachlan, 2014; Catts, Herrera, Nielsen, & Bridges, 2015; Catts, Kamhi, & Adolf, 2012; Cunningham & Carroll, 2011; Development., 2000; Justice, 2009; Poe, Burchinal, & Roberts, 2004; Serry, Rose, & Liamputtong, 2008; UNESCO., 2006). Researchers (Arrow & McLachlan, 2014; Bailet, Repper, Piasta, & Murphy, 2008; Cabell, Tortorelli, & Gerde, 2013; J. M. Carroll, Snowling, Hulme, & Stevenson, 2003; Ezell, Justice, & Parsons, 2000; Fielding-Barnsley & Hay, 2012; Hay & Fielding-Barnsley, 2007; Justice, Bowles, & Skibbe, 2006; Justice & Kaderavek, 2004; Van Kleeck, 2008; Wasik, 2010; Zucker, Ward, & Justice, 2009) have therefore increasingly focused on investigating emergent literacy skills that contribute to early literacy success and the journey that young children travel to gain foundational literacy knowledge and skills, prior to school entry.

During their preschool years, some children will be immersed in a range of oral language and print-based activities, while others will have limited language experiences (McLachlan, Carvalho, De Lautour, & Kumar, 2006; Munro, Lee, & Baker, 2008; Snowling & Hulme, 2012; Strickland, 1990; Wasik & Hindman, 2011; Whitehurst & Lonigan, 1998; Young, 2009).

The term *emergent literacy* was first introduced by Marie Clay in the 1960s to describe children's behaviours when they were using books and writing materials as a precursor to formal reading and writing acquisition (Clay, 1966). Clay employed a neo-Piagetian perspective in which the child learns about literacy through their own attempts (Sénéchal, LeFevre, Smith-Chant, & Colton, 2001). In contrast, Whitehurst and Lonigan (1998) proposed a much broader neo-Vygotskian perspective, with the child learning through interactions with more experienced others (Sénéchal et al., 2001) as the child's maturity and physical skills allow (Teale & Sulzby, 1986). Teale and Sulzby (1986) widened Clay's definition to "the skills, knowledge and attitudes that are presumed to be developmental precursors to conventional forms and the environments that support these developments" (p. 849).

1.2.1 Emergent literacy behaviours

Regardless of the perspective, Sénéchal et al. (2001) suggested that there are key behaviours or elements that contribute to emergent literacy skills which include a child's conceptual knowledge about literacy (e.g. knowledge of why you interact with a book); procedural knowledge (e.g. how you interact with a book); aspects of the language and metalinguistic skills (i.e. their awareness of the structure of their language, such as phonological awareness) (Sénéchal et al., 2001). These emergent literacy skills acquired through early language experiences, such as storybook reading, help children acquire a strong foundation for subsequent literacy instruction (Sénéchal, Pagan, Lever, & Ouellette, 2008).

More recently, emergent literacy has been defined by Justice (2006) as "reading and writing behaviours of young children before they become readers and writers in the conventional sense" (p. 3). It includes the skills children develop, such as phonological awareness; print concepts, defined as "knowledge of the rule-

governed organizational properties of print e.g., left-to-right directionality, combinatorial properties of letters to make words” (Justice et al., 2006); the meta-linguistic description terminology of print, for example, concepts such as letter, write; and the understanding of how books are organised and the function of environmental print (Justice & Kaderavek, 2004); alphabet knowledge, defined “as knowledge of the distinctive features and names of individual alphabet letters” (Justice et al., 2006); and finally, literate language which is defined as the use characterised syntactic and semantic language features that are related to reading and writing (Justice & Kaderavek, 2004).

1.2.2 Emergent literacy frameworks

In the literature, several emergent literacy framework perspectives are put forward. One perspective is developmental, with an emphasis on the progression of the development of the emergent literacy knowledge and skills, a “top-down” holistic model (Whitehurst & Lonigan, 1998), where the belief is that language as a whole must be understood before individual words and parts of spoken language can be comprehended. In this perspective, individuals are able to understand meaning from words and contextual clues. So when reading a book with a child, the adult does not expect the child to know every word; the book is read as a whole, with the child extracting meaning from the spoken words and illustrations.

Another perspective is that individual skills (such as PA, print concepts, alphabet knowledge and literate language) are targeted through direct exposure that is related to reading and writing (Justice & Kaderavek, 2004), and as such is termed a “bottom-up” approach. This approach was advocated by researchers who demonstrated that children’s PA (Burgess & Lonigan, 1998), print concepts (Tunmer, Herriman, & Nesdale, 1988), and alphabet knowledge (Burgess & Lonigan, 1998;

Tunmer et al., 1988), all provided unique and significant variance in later reading achievement predictions. This “bottom-up” reductionist system of learning individual component skills through direct exposure is often teacher- or parent-led.

1.2.3 Emergent literacy in context

The preschool years are one of the most critical learning periods for children, as their early literacy abilities contribute to their long-term reading outcomes.

McNaughton (1995) identified three different socialisation mechanisms that families use to help socialise children with literacy in this emergent literacy period:

- 1) joint activities, such as story reading with another person (parent, grandparent, sibling etc.);
- 2) personal activities, such as looking at a book on their own;
- 3) ambient activities which are immersed in daily life, such as seeing someone reading and writing email on a laptop or iPad, or reading the news either online or in paper form.

Emergent literacy practices are seen as being immersed within daily life and occurring within social contexts and meaningful activities (Allor & McCathren, 2003; Anderson, Anderson, Lynch, Shapiro, & Eun Kim, 2011; Apel, Brimo, Wilson-Fowler, Vorstius, & Radach, 2012; Beauchat, Blamey, & Walpole, 2009; Blewitt, Rump, Shealy, & Cook, 2009; Bowyer-Crane et al., 2008; Callaghan & Madelaine, 2012; Christ & Wang, 2011; Dickinson & Smith, 1994; Fletcher & Reese, 2005; Gambrell, 2004; Kaderavek & Justice, 2002; Lyon & Weiser, 2009; McLachlan & Arrow, 2010; Neuman & Wright, 2010; Sénéchal, LeFevre, Hudson, & Lawson, 1996; Snowling & Hulme, 2012; Storch & Whitehurst, 2002; Walsh, 2009; S. B. Wilson & Lonigan, 2010; Zucker, Justice, Piasta, & Kaderavek, 2010). Research has begun to focus on the notion of prevention of reading difficulties, that is, what factors

of emergent literacy can be enhanced during the preschool years for children within both home and pre-school environments, rather than remediation of reading difficulties during later school years (Justice, 2006).

Meta-analyses, such as the National Reading Panel's Developing Early Literacy Report (DELP) (Shanahan et al., 2008), have examined emergent literacy variables that predict literacy success. The DELP report focused on the skills and abilities of children aged from birth to five years of age that predicted later literacy success. Shanahan (2008), stated that there are six variables that positively (moderately to strongly) correlate with later reading success, even when factors such as IQ and socioeconomic status are taken into account.

These six variables are:

- 1) alphabet knowledge - knowledge of the names and sounds associated with printed letters
- 2) phonological awareness - the ability to detect, manipulate, or analyse the auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning
- 3) rapid automatic naming of letters or digits - the ability to rapidly name a sequence of random letters or digits
- 4) rapid automatic naming of objects/colours - the ability to rapidly name a sequence of repeating random sets of pictures of objects (e.g., "car," "tree," "house," "man") or colours
- 5) writing or writing name - the ability to write letters in isolation on request or to write one's own name

- 6) phonological memory - the ability to remember spoken information for a short period of time (p.vii).

The above skills are all interrelated and are acquired by children incidentally, but are also mediated by adults through socially constructed experiences (Hamer & Adams, 2003). Sénéchal et al. (2001) also suggested that print motivation, that is, the number of times that shared literacy activities are requested, is an important factor for the child's motivation to learn to read.

1.3 The New Zealand perspective

The New Zealand early childhood curriculum, Te Whāriki: he whāriki matauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum (MOE., 1996b), covers children from the age of birth to school entry. Te Whāriki means woven mat in Māori and reflects the integrated and holistic nature of the framework that consists of four principles and five strands with underlying goals.

The four principles at the centre of Te Whāriki are described as follows:

1. Empowerment - the early childhood curriculum empowers the child to learn and grow.
2. Holistic development - the early childhood curriculum reflects the holistic way children learn and grow.
3. Family and community - the wider world of family and community is an integral part of the early childhood curriculum.
4. Relationships - children learn through responsive and reciprocal relationships with people, places, and things (MOE 1996, p. 14).

The five strands and their associated goals of Te Whāriki are described as follows:

1. Well-being - the health and well-being of the child are protected and nurtured.

Goals: Children experience an environment where:

- their health is promoted;
- their emotional well-being is nurtured;
- they are kept safe from harm.

2. Belonging - children and their families feel a sense of belonging.

Goals: Children and their families experience an environment where:

- connecting links with the family and the wider world are affirmed and extended;
- they know that they have a place;
- they feel comfortable with the routines, customs, and regular events;
- they know the limits and boundaries of acceptable behaviour.

3. Contribution - opportunities for learning are equitable, and each child's contribution is valued.

Goals: Children and their families experience an environment where:

- there are equitable opportunities for learning, irrespective of gender, ability, age, ethnicity, or background;
- they are affirmed as individuals;
- they are encouraged to learn with and alongside others.

4. Communication - the language and symbols of their own and other cultures are promoted and protected.

Goals: Children experience an environment where:

- they develop non-verbal communication skills for a range of purposes;
- they develop verbal communication skills for a range of purposes;
- they experience the stories and symbols of their own and other cultures;
- they discover and develop different ways to be creative and expressive.

5. Exploration - the child learns through active exploration of the environment.

Goals: Children experience an environment where:

- their play is valued as meaningful learning and the importance of spontaneous play is recognised;
- they gain confidence in and control of their bodies;
- they learn strategies for active exploration, thinking, and reasoning;
- they develop working theories for making sense of the natural, social, physical, and material worlds. (MOE 1996, p. 15-16)

Te Whāriki was one of the first bicultural curricula and has been celebrated for its strength as a child-focused document with a prominent sociocultural emphasis (Blaiklock, 2013a). Te Whāriki was introduced in 1996, after considerable consultation within the EC sector, based on the following aspiration from Te Whāriki (MOE, 1996): "For all children to grow up as competent and confident communicators, healthy in mind, body, and spirit, secure in their sense of belonging, and in the knowledge that they make a valued contribution to society" (p 9).

However, Te Whāriki has been also been criticised for this broadly prescribed framework scope that could lead to Te Whāriki being difficult to implement in high-quality practices (Dalli, 2011; A. B. Smith, 2011; Te One, 2003) due to the lack of

narrow curriculum goals, particularly in the area of literacy. The *Working with Te Whāriki Report* (ERO., 2013), which reviewed 627 EC services, evaluated the implementation of the Te Whāriki and found that it was used in depth by 10 % of the EC services surveyed, 80% were making some use of the curriculum framework, and 10% were making only limited use (p.7). This suggests that there is the opportunity for the Te Whāriki framework to accommodate a wide range of EC practices.

A large number of pre-schoolers attend some form of early childhood education in New Zealand. The Education MOE (2016a) website analyses the New Zealand EC data, and shows that of the five-year-olds starting school in December 2015, 96.4% of children had attended an early childhood centre, and of those children, 91.3% had attended an early childhood centre for between fifteen and forty hours per week.

The Progress in International Reading Literacy Study (PIRLS) compares the reading achievement and behaviours of children in their fifth year of formal schooling across fifty-three education systems. Within the New Zealand context, the PIRLS report findings based on the 2011 data, show that 92% of New Zealand children attend an early childhood centre for more than a year before starting school. The PIRLS data also indicated that students at Year Five had higher reading achievement if they had been engaged in early literacy activities, such as being read to, before starting school. Additionally, those Year Five students who had not attended an early childhood centre had, on average, lower reading achievement compared to the other Year Five students who had attended an early childhood facility. These data suggest that the emergent literacy experiences children receive at early childhood centres are important in shaping their literacy development. Many EC centres focused their self-reviews on “improving literacy, numeracy, and science teaching and learning” (ERO.,

2013). Optimising the role of the early childhood teacher in facilitating such experiences is, therefore, important to understanding differences in later literacy achievement. One of the common literacy activities in early childhood is storybook reading with individual, small and large groups of children.

1.4 Emergent literacy within storybook reading

There have been many studies investigating early childhood teachers' styles of engaging children in storybook reading. Dickinson and Smith (1994) identified three naturally occurring storybook reading styles in their group of twenty-five teachers: (a) a co-constructive approach, where teachers and children engaged in high amounts of talk about the story and pictures, with high level clarifications to extend discussions; (b) a didactic-interactional approach, where there was limited talk outside of reading the text, with the discussion often at a low cognitive level interaction; and (c) a performance-orientated approach, where teachers primarily talked prior to reading and after reading the storybook and used high cognitive demand interactions. At follow-up one year later, Dickinson and Smith (1994) found that the children whose teachers used a performance-orientated approach had greater gains in their vocabulary development compared to the children whose teachers used the other two approaches. Their hypothesis for this approach's greater gains was that this approach had the child involved in analytical talk.

Moschovaki and Meadows (2005) found in their study of twenty Greek teachers reading two information books and two storybooks to groups of children aged 3.5 - 5.5 years, that most teachers used an interactive style of reading when reading storybooks, wherein they read a page and then discussed it with the children. Moreover, when reading storybooks compared to information books, these teachers used more low cognitive demand talk. This low cognitive demand talk may not

engage children in the analytical talk which the Dickinson and Smith (1994) study suggested was important.

Differences in types of storybook reading styles have also been examined from the perspective of the teacher's level of education (Gerde & Powell, 2009). This research highlighted that teachers with Bachelor level qualifications in early childhood education used more book-related comments (such as defining vocabulary, and expanding on information related to the book) than those with a high school qualification or a degree in another field. They suggested that while the level of teacher education may not explain all the differences in preschool classroom quality, there are differences in child-outcomes (especially in vocabulary growth) and outcomes that may be related to the quality of book-focused teacher talk. They also highlighted the large variability of teachers' extra-textual comments, with some teachers having very little talk other than reading the text and other teachers have long discussions with the children.

1.5 Early childhood programs and educational outcomes

Longitudinal studies show links between the quality of early childhood programs and later educational outcomes (Catts et al., 2015). The quality of the program is dependent on several factors. In the *Initial Teacher Education Policy and Practice Report*, Kane (2005) argued that in New Zealand, the quality of an early childhood program is dependent on what a teacher knows (their knowledge), shows (including attitudes) and does (skills) or, as Shulman (1986) stated, subject content knowledge and subject pedagogical knowledge. Kane and colleagues (2005) suggested that a child's early childhood educational foundation is vital for setting the basis for all future development.

Within the early childhood context, teachers work collaboratively rather than

independently with small groups of children, therefore, the quality of the program is also influenced by the relationship between teachers (Smith et al., 2000; Dalli et al., 2011). It has been well documented that there are measurable cognitive gains, particularly for “at-risk” children, such as early literacy and numeracy (Cascio & Schanzenbach, 2013; Gormley, Gayer, Phillips, & Dawson, 2005; Weiland & H., 2013) for children participating in quality early childhood programs.

1.5.1 Quality teaching in early childhood

There is considerable debate about the definition of “quality” in teaching. There is New Zealand and international research that demonstrates the impact of teachers on the quality of the teaching and learning (Alton-Lee, 2003; Cochran-Smith, 2003; Farquar, 2003; Hattie, 2009). However, there is considerable debate about the actual definition of “quality”, with discussion on its multiple dimensions, such as in terms of student outcomes (Hanushek, 2011), teachers’ command of subject and pedagogical knowledge (Hopkins & Stern, 1996) and/or teacher qualifications (Cochran-Smith, 2003; Darling-Hammond, 2000a, 2000b, 2012). It has been documented that having children with high quality early childhood teachers has a lasting effect on student achievement in the early years of formal education (Swain, Springer, & Hofer, 2015). The debate has centred on the importance of teachers’ subject knowledge with researchers such as Binks-Cantrell, Washburn, Joshi, and Hougen (2012) suggesting the “Peter Effect”, which is based on the Bible story of Peter not being able to give what he didn’t have. In the teaching fraternity, the “Peter Effect” would translate to 'how do we teach what we don’t know?'

1.6 Assessing teacher knowledge - test format implications

In terms of phonological awareness research (Carroll et al., 2012; Cheesman, McGuire, Shankweiler, & Coyne, 2009; Crim et al., 2008; Cunningham & O'Donnell,

2015; Greaney & Arrow, 2012; Hammond, 2015; Hindman & Wasik, 2011; Lonigan & Shanahan, 2010; McCutchen et al., 2002; Moats, 2009a; Moats & Foorman, 2003; Piasta & Wagner, 2010; Snow et al., 2005; Spencer, Schuele, Guillot, & Lee, 2008; Stainthorp, 2004), all discuss the importance of a strong subject knowledge base and highlight the variability of teacher knowledge of phonological awareness. However, there is debate on the type of tests given and the level of the teachers' ability to analyse and apply knowledge to the same level as assessments that are more authentic. In the most frequently used format for teacher tests used within PA research, all or part of the tests are multiple choice questions (Binks-Cantrell, Joshi, & Washburn, 2012; Cheesman et al., 2009; Cunningham, Perry, Stanovich, & Stanovich, 2004; Fielding-Barnsley, 2010; Mahar & Richdale, 2008; Meehan & Hammond, 2006; Moats & Foorman, 2003; Schachter, 2015; Spencer et al., 2008).

1.6.2 Convergent / divergent assessment

The debate of test format has led to different test formats being considered. Multiple choice tests have many advantages, such as being time efficient, being good for use with large groups, and providing quick feedback (Roberts, 2006). However, as summarised by Roberts (2006), multiple choice tests also have disadvantages, such as taking time to construct, not testing creativity, and only analysing and encouraging a *surface level* of thinking. In the PA test, the multiple choice test format would be termed a *convergent assessment* by Torrance and Pryor (2001). Convergent assessments, as defined by Torrance and Pryor (2001), are those that “aim to discover *if* the learner knows, understands or can do a predetermined thing” (p. 617). Therefore the PA multiple choice tests are a type of convergent assessment that focuses on contrasting errors with the correct answer, rather than an assessment that guides further learning and evaluating knowledge at a point or over time. This type of

assessment fits into a behaviour list view of learning. As the participants have the answers in front of them, it is argued that these types of tests do not evaluate teachers' true ability (Darling-Hammond, 2000b).

In contrast, Torrance and Pryor (2001) suggest using *divergent assessment*, that is assessment that aims “to discover *what* the learner knows, understands or can do” (p. 617). The participant can use more open forms of recording answers, such as noting how many sounds are in a word, or what the second sound is. By using the more open form of recording, a greater participant insight can be encouraged with the focus on insights into the participants' own current understandings and which may prompt metacognitive reflection (Torrance & Pryor, 2001), particularly if there is appropriate feedback given between the learner and the instructor (Hattie, 2009; Sadler, 1989). This view of assessment aligns more with contemporary theories of learning.

1.7 Theories of reading development

Reading is considered to be a highly complex linguistic and cognitively challenging process in effortless, fluent, independent reading (Invernizzi & Hayes, 2011; Kamhi & Catts, 2012). A *Simple View of Reading* (SVR) was proposed by Gough and Tunmer (1986), where reading (R) was the product of decoding (D) and comprehension (C) which are of equal value (Hoover & Gough, 1990), in that neither decoding or comprehension is sufficient on their own for successful reading. In later research, Tunmer and Chapman (2012) suggest that the original two-component structure should remain, but the demarcation between the D (decoding) and C (comprehension) be relaxed, to account for the fact that C influences R (reading) directly, as well as indirectly through D. Therefore, this Simple View of Reading

accounts for the language linkages between oral vocabulary knowledge, phonological processing skills and word recognition (Tunmer & Chapman, 2012).

The SVR provides a construct of the process of achieving reading. However, it does not evaluate the underlying theoretical standpoints underpinning this process, which teachers must understand in order to facilitate and implement effective instructional strategies within the classroom.

In the research, three theoretical stand-points are considered (1) top-down approaches (the focus is on whole language, that is, the processing of the text begins with meaning driven processes, then word level, down to individual sounds and letters), (2) bottom-up, with the focus on individual sounds comprising “many strands that are woven” together, and (3) interactionist, where there are both bottom-up and top-down skills employed by the reader. By understanding different word recognition models, teachers can implement effective instructional practices.

1.7.1 Dual-route model and modified dual-route model of word recognition

The dual-route model of word recognition suggests that the individual accesses the meaning of the printed word by either selecting and following one of two routes – the phonological or the visual route (Coltheart, 1978, 2005). The phonological route requires the individual to select the printed word and then segment the word into letters or groups of letters (as governed by the orthographic rules of the language) that are then linked to the appropriate phonemes (i.e., letter to sound mapping). These phonemes are then phonologically recoded (i.e., blended together) to allow the reader to access the meaning of the word. To use the phonological route it is assumed that the individual understands that letters (i.e., graphemes) have a sound (i.e., phoneme) representation and that the individual has the ability to segment and

blend graphemes and phonemes accurately to construct accurate phonological representations.

Invernizzi and Hayes (2011), suggested that phonics-based programs or approaches for reading instruction that prioritise letter-sound relationship, support the phonological route for word recognition. Recent reading research has highlighted the importance of PA to support children's learning how to blend and segment phonemes and then how to apply the phoneme-grapheme correspondences (phonics) in the word reading process (Johnson & Watson, 2005; Rose, 2006).

Within this phonological route within the dual-route model, there is no allowance for the irregular spellings of English words that do not configure to a simple phoneme-grapheme match. Therefore, the visual route of the dual-route theory proposes that the individual uses an alternative to the phonological route by making a connection between the word's orthographic representation and visual shape to access the word's meaning. This visual route access is dependent on the individual's previous experiences with seeing the word rather than on the individual's PA and phoneme-grapheme knowledge. It is assumed that within this dual-route model, the individual reader uses either route interchangeably as the word demands (Invernizzi & Hayes, 2011). That is, for low frequency, unfamiliar or unknown words the phonological route is accessed and for familiar words the visual route is used. This initial preference for the phonological route for unknown or unfamiliar words highlights the importance of phonological information being taught to children to enable decoding (and recoding) of words to establish a strong and efficient foundation for later reading acquisition.

A proposed modification to the dual-route model was made by Ehri (1991) to recognise that when individuals use the visual route to recognise irregular words, they

also use the phonological route to decode regular aspects of the word and thus activate a visual-phonological route. For example, in the word *ghost*, the *ost* is a regular rime unit and the *h* in the *gh* is silent, so if the individual activates the phonological route for the *gh*, then both sounds will be produced. If the individual recognises the *gh* as being an irregularly spelt ‘g’ sound, then the visual route is activated. Thus, both the visual and phonological routes are activated within the same word to provide information to decode the word’s meaning and this reduces the memory demands. Therefore, the individual first reads a word through the phonological route, using the grapheme-phoneme links and PA. Then, with increased exposure, the individual begins to visually and phonologically recognise the word. Within this model for both regular and irregular words, the importance of utilising phonological information is highlighted.

There has been some discussion about possible limitations of this model. First, the series of studies carried out by Invernizzi and Hayes (2011) was conducted on adults with sudden brain injuries that resulted in acquired reading disabilities, rather than emerging from developmental studies of young people who were struggling readers. The second limitation stems from studies where the individual has trouble with both the phonological and orthographic routes rather than the either/or framework of this model (Stanovich, Siegel, & Gottardo, 1997). Zbell and Everatt (2002) showed that adults did not differ in phonological processing tasks if they had identified primary phonological or orthographic difficulties.

Researchers argue that the phonological and orthographic routes cannot be viewed as totally separate pathways (Vellutino, Scanlon, & Chen, 1995), but instead, have a number of connections between the two on the route to skilled word recognition. Cockcroft, Broom, Greenop, and Fridjohn (1999) suggest, that children

may acquire concepts such as syllable manipulation onset and rime detection more naturally than the acquisition of phoneme level skills. It is the manipulation of phonemic level units that is linked to the acquisition of literacy (Nancollis, Lawrie, & Dodd, 2005; Nation & Hulme, 1997; Ukrainetz, Nuspl, Wilkerson, & Beddes, 2011).

1.7.2 Connectionist model of word recognition.

The connectionist (also known as parallel-distributed processing) model is one where the individual is said to integrate orthographic, semantic and phonological knowledge to access word meaning (Invernizzi & Hayes, 2011; Plaut, 2007; Seidenberg, 2005, 2007). Using computer modelling, researchers have modelled the roles of the semantic, orthographic and phonological knowledge in reading development. By inhibiting or facilitating effects on each of these language areas, this model suggests that phonological knowledge is necessary for beginning readers to decode new words while competent readers require the integration of semantic, phonological and orthographic information (Harm & Seidenberg, 1999, 2004).

The connectionist model considers the interplay between skills in learning to read the printed word, which is in contrast to the dual-route model of separate processing routes (Seidenberg, 2007). For teachers, it is critical to understand the differing strata of semantic, phonological and orthographic knowledge that underpin skilled reading in order to identify and implement effective teaching strategies within the developmental models of word recognition in the classroom environment.

1.7.3 Developmental models of word recognition.

The above are theoretical frameworks of reading printed words from a skilled reader's perspective. It has been hypothesised that children go through delineated stages to acquire efficient and fluent word recognition skills with different cognitive skills and strategies (Ehri, 1991; Frith, 1985; Treiman & Bourassa, 2000). To enable

teachers to facilitate children's transition through these stages, a thorough knowledge base is essential. The models proposed by Ehri (1991) and Frith (1985) involve three key stages: logographic, alphabetic and orthographic.

The logographic phase (Ehri, 1991; Frith, 1985) sees children recognise words based on their shape and contextual clues – similar to the way they recognise pictures. There is no phonological or phoneme-grapheme knowledge used. During the alphabetic stage, there is evidence that the children begin to use PA knowledge and letter-sound correspondences to decode the written word (Ehri, 1991; Frith, 1985). From Ehri's perspective, children need to learn and then apply increasingly sophisticated strategies to recognise words. These include the acquisition of alphabetic knowledge, grapheme-phoneme correspondence, and the connection between the written and spoken form of the language to form systematic connections. The orthographic stage allows children, through exposure to and experience of print, to recognise morphological units (for example, "ing") within the printed word. As these units are recognised as a whole, without specific decoding letter by letter, this enables reading that is more rapid.

As part of the alphabetic stage, Share (1995) suggests that there is the development of self-teaching which leads to an increasing independence in the learning to read process. Share's (1995) self-teaching hypothesis suggests that previous exposure to phonological recoding (that is, converting letters to sounds) facilitates learners to begin to self-teach other letter-sound correspondences in an analytic and systematic fashion. This self-teaching increases the learner's orthographic lexicon, reading fluency and proficiency.

This has implications within the classroom environment. What are the models of sound-letter correspondences being demonstrated for children by teachers and

those who work within the classroom, and what are the reading instruction practices, particularly for those children with poor ability, to construct accurate phonological representations and to translate letters into sounds? (Algozzine et al., 2011; Carroll et al., 2012; Cunningham & O'Donnell, 2015; Moats, 2008b; Moats & Foorman, 2003; Spencer et al., 2008).

The Stage model, as above, highlights how children progress towards becoming a competent word reader. In particular, the PA and the phoneme-grapheme correspondence within the alphabetic stage are of critical importance. The purpose of reading, however, is not to read words in isolation, but to recognise words within connected text. Thus, theories of connected text reading are of interest. With connected text, the context of the words allows the reader to access additional support. For example, the additional information may include the semantic relationships of the words within a sentence or paragraph that indicate the intended meaning of a multi-meaning word, and the sentence and structure of the narrative (Kim & Goetz, 1994; Stanovich & Cunningham, 1993).

1.8 The phonological awareness skills of education professionals

Previous research suggests that educational professionals present with relatively low levels of phonological awareness that may consequently inhibit their ability to provide explicit instruction in phonological decoding and encoding strategies. For example, Moats and Foorman (2003) conducted a longitudinal study that examined American teachers' ($n = 103$) knowledge of key language and literacy concepts and their ability to apply that knowledge within the classroom context. Testing showed that the teachers had difficulty differentiating between letters and sounds and detecting sounds within words, particularly when the spelling of words was not transparent. Classroom observations confirmed that these difficulties were

affecting classroom instruction. Teachers tended to blend words letter-by-letter rather than sound-by-sound. Crim et al. (2008) reported similar results in their examination of the linguistic knowledge (including phonological awareness) of sixty-four early childhood educators. This group demonstrated variable knowledge in identifying syllables, poor morpheme knowledge, and inaccurate phoneme identification. The researchers noted that the early childhood teachers appeared to count letters in the words rather than think about letter combinations that could represent a single sound (Crim et al., 2008).

1.8.1 Oral presentation of phonological awareness assessments

The limited awareness demonstrated by educational professionals on more complex phonological awareness tasks is not necessarily easily overcome. Spencer et al. (2008) compared the phonemic awareness skills of kindergarten teachers ($n = 109$), first grade teachers ($n = 112$), reading teachers ($n = 100$), special education teachers ($n = 60$), and speech-language pathologists ($n = 160$). Performance across these groups was comparable, except for speech-language therapists, who presented with comparatively strong phonemic awareness. The similar performance across classroom, special education teachers, and reading teachers was unexpected, given that the latter groups had participated in additional professional development and specialised training to support their work with struggling readers. Orthographic knowledge influenced the performance of most participants. For example, the participants were more accurate when analysing transparent words with direct sound-letter correspondence. Fielding-Barnsley (2010) showed that pre-service teachers had a rudimentary knowledge of phonemic awareness that included the ability to define “phoneme” but were unable to transfer this knowledge to identifying the number of phonemes within a word. Stainthorp (2004) reported that British teacher trainees ($n =$

38) improved their phonemic awareness skills after completing a literacy course that included one phonological awareness lecture and multiple lectures focused on children's literacy development. However, despite this professional learning, the trainees continued to present with weak phonemic awareness skills overall that would be likely to inhibit their ability to provide explicit instruction in using the alphabetic principle in reading and spelling.

Although a large body of literature, including those studies highlighted above (Al-Hazza et al., 2008; Brady et al., 2009 ; Carlisle et al., 2009; McCutchen, Green, Abbott, & Sanders, 2009; Tibi, 2005), has elucidated the phonological awareness skills of literacy educators, the results are limited by administering the test in a written rather than oral format. Within New Zealand, classroom instructional methods require children to focus on the sound structure of words, for example, “what is the first sound in . . .?” before applying the orthographic rules of recording the sound. It is, important therefore, to evaluate educators' performance in a verbally administered task, as this format necessitates that participants focus on the sound structure of the words, without immediate orthographic cues or distractions. This is particularly important given studies showing that educators rely heavily on orthographic knowledge (e.g., number of letters, orthographic rules) rather than on the sounds of speech when asked to identify sounds in words (McCutchen et al., 2009; Moats & Foorman, 2003; MOE., 2007a).

One preliminary study that has used a predominantly orally presented task to examine the phonological awareness skills of professionals involved in literacy education was conducted by Carroll (2006). The study compared the performance of New Zealand classroom teachers ($n = 15$), teacher aides ($n = 15$), specialist literacy professionals (Resource Teachers of Literacy (RTLit, $n = 16$), Resource Teachers of

Learning and Behaviour (RTLB, $n = 12$), and teacher trainees ($n = 100$) who were about to graduate from a three-year teaching degree. The results indicated that all groups had some difficulty with the phonemic level items within the task. Participants performed better on orthographically transparent items, despite the verbal administration of the task. In contrast with the Spencer et al. (2008) study, those New Zealand participants with specialist literacy training (i.e., RTLits and RTLBs) scored significantly higher than the classroom teachers. The teacher aides, who had no formal training, scored lower than the final year teacher trainees. The final year teacher trainees scored lower than the classroom teachers. These results suggest that specialist training has a significant impact on the phonological awareness skills of education professionals within the New Zealand context. It is important, however, that these results are replicated on a larger sample that also includes early childhood educators and teacher trainees at the beginning of their initial teacher education qualification, to further understand the influence of professional development on educators' linguistic knowledge and to allow further analysis of results obtained with an orally presented phonological awareness test.

1.9. Early Childhood teachers' phonological awareness knowledge.

Although many variables contribute to the complex process of acquiring written language and reading ability, children's phonological awareness (PA) knowledge, that is, an individual's awareness of the sound structure of a spoken word (Gillon, 2004), at school entry is one of the major predictors of early literacy achievement. For example, children's PA scores at school entry can predict reading achievement one year later with ninety-two per cent accuracy (Carson, Gillon, & Boustead, 2013). Further, children who have been immersed in a literacy-rich early childhood environment that includes exposure to the links between sounds and letters,

have a more positive response to formal literacy instruction (Ball, 1997; McLachlan et al., 2006).

Children's PA development starts before formal literacy instruction at school (Allor & McCathren, 2003; Cabell et al., 2011; Crim et al., 2008; Young, 2009). It is critical, therefore, that early childhood (EC) teachers understand the importance of PA and can help facilitate young children's early PA development. In EC centres, this occurs within the context of developing their wider emergent literacy knowledge. In order to explicitly teach PA, teachers need to be consciously aware of the sound structure of the spoken language of instruction (Crim et al., 2008; Cunningham, Zibulsky, & Callahan, 2009; Moats, 2009b; Stanovich & Cunningham, 1993). Teachers' personal PA knowledge and skills, however, cannot necessarily be assumed. Carroll et al. (2012) compared the PA skills of EC teachers, primary school teachers, student teachers, teacher aides, speech-language therapists and reading specialists. EC teachers' ability to segment complex single syllable words into individual sounds varied from 0 - 100 per cent correct with a mean of only twenty per cent correct, suggesting that professional development (PD) may be useful to enhance their PA in order to facilitate their ability to draw children's attention to sounds within words in the preschool environment. There is limited direction regarding the optimal PD model focused on phonological awareness (particularly in the EC setting) that will produce the greatest gains in teacher knowledge, teacher practice and children's learning.

1.9.1 Storybook reading and phonological awareness

Storybook reading conversations can be analysed to provide information on the type of talk used by teachers. When reading storybooks together, adults and children predominantly talk about the content of the story and the illustrations, to help

children make meaning of the story (Bus, van Ijzendoorn, & Pellegrini, 1995; Hindman, Connor, Jewkes, & Morrison, 2008; Phillips & McNaughton, 1990; Sénéchal et al., 1996). This language-based meaning-making has significant benefits for children's comprehension and vocabulary development, particularly when teachers engage children with high cognitive demand comments and questions, compared to teachers who use lower cognitively demanding talk (Dickinson & Smith, 1994; Pentimonti & Justice, 2010; Pollard-Durodola, Gonzalez, & Simmons, 2014; Price, Bradley, & Smith, 2012).

Studies that have evaluated the effectiveness of enhancing children's emergent literacy knowledge (e.g., PA, picture naming, and print and letter knowledge) within the EC centre environment have shown positive literacy outcomes for children identified as having speech-language impairment or at risk of literacy difficulties (Bailet et al., 2008; Gillon, 2005a; Shanahan, 2008; Yeh & Connell, 2008). The NELP (2008) meta-analysis summary highlights the importance of age appropriate activities. Some studies use the same activities for differing age levels to provide comparison data. There are questions as to whether these highly structured activities are developmentally appropriate at the preschool level to assess and support the development of PA skills.

1.9.2 The use of small group phonological awareness interventions

The Gillon (2005a) PA intervention study using developmentally appropriate phoneme awareness level tasks with twelve three- and four-year-old preschool children identified as having moderate to severe speech impairments, demonstrated that PA can be effectively stimulated. However, this intervention was implemented with small groups outside the EC centres by speech-language pathologists, and may not be generalisable to the EC centre setting. A study by Yeh and Connell (2008)

investigated PA intervention within the EC centre and compared the effectiveness of three emergent literacy interventions (rhyme awareness, vocabulary development, phoneme awareness) that utilised pre-planned structured small group curriculum activities. The post-test measures of rhyme showed no differences in performance between the three different groups. Children who participated in the phoneme development intervention out-performed the other two groups in phoneme segmentation and blending assessments. Given that there is a stronger connection between reading success and phoneme awareness than syllable or rhyme awareness, children who received the PA instruction were more likely to respond favourably to early literacy instruction.

Although the Yeh et al. (2008) study is notable for showing that preschool children's phoneme level knowledge could be facilitated within the EC educational environment, the generalisability of the results to other early childhood settings may be limited by the use of an intensive, heavily structured and systematic instructional approach. The use of scripted lessons may have inhibited teachers' ability to respond dynamically to individual children's needs. Expert teachers can be identified by their more effective use of 'just in time' and effective responses to children's learning needs (Timperly, Wilson, Barrar, & Fung, 2007). Further, the use of intervention activities by researchers that are not typically used within the EC setting raises questions about their environmental validity (NELP, 2008). Research is thus required to investigate how teachers can incorporate PA activities within the natural play and learning environment within EC education settings.

1.9.3 Effectiveness of promoting early childhood teachers' phonological awareness knowledge

There appears to be little guiding evidence about the type and/or intensity of PD that is most effective in changing teaching practices and whether any change in

teacher behaviour has a resulting impact on children's PA skills. PD for teachers appears to be more effective when it is sustained over a period of time, rather than a one-off event (Algozzine et al., 2011), particularly when the participants have opportunities to practice within the training setting and then receive ongoing feedback on their performance in the classroom (Sheridan, Edwards, Marvin, & Knoche, 2009). Most studies that have evaluated the effects of PD focused on developing EC teachers' PA have been implemented alongside researcher-prescribed teaching sessions.

Studies that have evaluated the effectiveness of various PD models in promoting EC teachers' PA awareness and outcomes for children have had mixed findings. Cusumano, Armstrong, Cohen, and Todd (2006) trialled a three tier PD approach over 15 weeks with a group of forty-one EC teachers. Twelve of the teachers received PD and coaching, ten teachers received PD and no coaching, and a control group of nineteen teachers received no PD or coaching. Following the intervention, there was a small but significant increase in the PA of children who were taught by the teachers who participated in the PD only and the PD plus coaching conditions. Contrary to previous studies, coaching did not significantly contribute to the children's PA skill over and above the PD only condition. This unexpected finding is likely due to the structure of the intervention, where coaching was only implemented in the last third of the intervention. Further research is required to examine the effectiveness of providing coaching throughout the entire intervention phase.

In contrast, O'Connor, Arnott, McIntosh, and Dodd (2009) compared the effectiveness of a collaboratively created whole class PA and language intervention program for four-year-old children from low socioeconomic backgrounds with a

control class. Children who were taught by teachers who implemented a collaboratively created program had higher literacy outcomes at the end of the implementation and at follow-up five months later than those in the control group. Follow-up data collected two years later showed that only a small sub-group had maintained their accelerated literacy development in comparison to the other groups and the entire group scores indicated that they were still considered to be below the level that was expected of their peers. A greater level of individualisation of the intervention approach may be needed to ensure stronger long-term effects of such interventions.

In a more recent study Algozzine et al. (2011) examined the effectiveness of intensive PD and coaching designed to support the use of evidenced-based early literacy instruction for teachers and teachers' assistants teaching at-risk four-year-olds across thirty-six classrooms. Teachers who participated in the intervention (n=25) were consistently rated higher in observations of their use of important literacy practices than the control group (Algozzine et al., 2011). There was no analysis, however, of the impact the PD had on children's literacy skills.

The reviewed studies have demonstrated that promoting EC teachers' personal PA knowledge can have an impact on children's emergent literacy development within the EC education setting. The use of scripted teaching methods and/or researcher-prescribed activities, however, may hinder the dynamic and immediate nature of effective teaching (e.g., providing effective feedback and individualised task adjustment according to children's need) and may not fit with the teaching and learning philosophy of many preschools. Studies that have examined the effectiveness of coaching approaches to PD have shown mixed results and many have not documented the impact on children's PA development.

1.10 Early school years literacy instruction in New Zealand

The teaching of reading and writing in New Zealand has been shaped by a National Curriculum that has been in existence for approximately 30 years. The Ministry of Education has provided free resources to all state schools and these have influenced the provision of literacy instruction within the whole language/constructionism framework of literacy instruction. Publications, such as the instructional reading series *Ready to Read* (RTR), have been developed as a levelled reading series with the texts “gradually increasing in vocabulary, text length, complexity of text structure, students’ familiarity with the context, and how explicitly the context is stated” (<http://literacyonline.tki.org.nz/Literacy-Online/Teacher-needs/Instructional-Series/Ready-to-Read/Guided-reading-texts>). This reflects the MOE’s social constructivism/whole language Vygotskian theoretical viewpoint, that is, a student learns within their zone of proximal development, building on what they can do independently and what they can do with someone else’s guidance or in collaboration with others (Vygotsky, 1978). The MOE has also provided teachers in all state schools with copies of instructional guidelines, such as the *Learner as a Reader* (MOE., 1996a), and *Effective Literacy Practice* (MOE., 2003), all of which are underpinned by the constructionist approach. With the publication of The Literacy Learning Progressions (draft and final form) (MOE., 2007a, 2007b), there were graded recommendations for children’s phonological awareness achievement, expressed explicitly for teachers, indicating a shift towards PA and phonics inclusion. In 2010, the Ministry of Education implemented *National Standards* (MOE., 2009b) with clear expectations of student achievement at various time points in the domains of literacy and numeracy. In New Zealand, the National Standards are not a nationally administered assessment but a standards-referenced assessment of what a child is expected to achieve against a set of exemplars, and are moderated with teacher

judgement (MOE, 2015a). These teacher judgements assume in-depth teacher knowledge of all the components of effective reading instruction.

1.10.1 Whole language approach.

Whole language is based on a constructionist approach and was the predominant approach to literacy instruction for instruction during the 1980s and 1990s (Moats, 2000; Pressley, 2006), where the instruction focuses on the meaning of written text, based on the assumption that children will learn to read independently and naturally with little explicit or direct instruction. This is much like a child learns to talk (Pressley, 2006; Tunmer, Chapman, & Prochnow, 2006), where they naturally progress from single words to long sentences.

There are a number of key features for the whole language approach, such as, an emphasis on immersing individuals in real literacy experiences, child-centred instruction, focus on meaning, the connection of the reading and writing processes, and deducing meaning through the use of content (including syntactic and semantic meaning cues). Whole language is considered to be a top-down approach, where children are encouraged to use strategies (these include reading to the end of the sentence, using text structure, and drawing on prior knowledge, to extract meaning (Moats, 2000; Pressley, 2006).

Within the whole language approach, the attention is drawn to the relationship between letters and sounds as required within connected text, (use of embedded phonics) (Pressley, 2006; Walker, 2008b) and teachers were encouraged not to over-emphasise the sub-word level cues, as this would detract from the text meaning (Clay, 1998). There is no explicit or systematic teaching of phonics (i.e. letter-sound relationships) or PA.

There has been much debate and criticism of the whole language approach due to the lack of focus on word-level and sub-word-level skills. As an example, Pressley (2006) highlighted that the two cores on which this approach are founded lack validation. These cores are 1) sentence context cues as the main strategy for decoding unfamiliar words and 2) reading as a skill that will develop ‘naturally’. Other large studies (for example, *Commission on Preventing Reading Difficulties in Young Children* (National Research, 1998) and the *National Reading Panel* (Ehri et al., 2001)) showed that no phonics or embedded phonics instruction was linked to lower reading rates and that explicit PA and phonics teaching contributed positively to being able to read words in isolation. It could be argued that for children who enter formal literacy instruction with strong PA skills, whole language may work well. However, for those children who have difficulties or have not been exposed to the foundational word level skills, the whole language approach could be detrimental to their literacy learning (Tunmer et al., 2006).

1.10.2 Phonics instruction

Phonics, in contrast to whole language, can be viewed as a bottom-up/word-level approach, as the focus is on teaching the relationship between letters and sounds and how this knowledge is applied to decoding the printed word (Walker, 2008a). In the literature, there are several different phonics teaching approaches: synthetic phonics, where each letter-sound is understood in a word then blended together to form the word; analytic phonics, where letter-sound links are taught without the link to decoding or encoding printed words; and analogy phonics, where the children are taught riming units (phonograms e.g. ‘ot’) and use these units to read and spell.

Phonics differs from PA, as the focus with phonics is on teaching letter-sound patterns, while PA refers to an awareness of the sound structure of spoken words,

with no reference to letters. However, the teaching of PA, paired with letter knowledge/phonics to bridge speech to print, involves teaching children how to identify, blend, segment, delete and manipulate syllables, rhymes, and individual phonemes in words (Gillon, 2004) has been shown to be effective.

Several countries, such as Australia (Australian Government, 2005) and the United Kingdom (Rose, 2006), support the inclusion of synthetic phonics instruction, however, despite the reference to PA instruction within the recommendations of these reports, synthetic phonics instruction is prioritised over PA instruction.

1.10.4 The place of phonological awareness in New Zealand education

There is only one inferred reference to phonological awareness within the Te Whāriki early childhood curriculum document, that children experience an environment where:

- they develop non-verbal communication skills for a range of purposes;
 - they develop verbal communication skills for a range of purposes;
 - they experience the stories and symbols of their own and other cultures;
 - they discover and develop different ways to be creative and expressive.”
- (p.72)

There is no explicit description of the importance of PA, nor is it explicitly included in Kei Tua o te Pae: Oral, Visual, and Written Literacy (Book 17) (MOE., 2009a), which has been produced by the MOE as a set of exemplars for early childhood teachers.

The New Zealand Ministry of Education has recently signalled a shift by incorporating an emphasis on phonological awareness and phoneme-grapheme relationships in early literacy instruction into English Curriculum support materials,

such as “Sound and Words” (<http://literacyonline.tki.org.nz/Literacy-Online/Teacher-needs/Sounds-and-words>). However, the effective use of such teaching strategies is dependent upon educators’ ability to provide explicit instruction and deliberate acts of teaching in these word-level reading and spelling skills.

A large body of research indicates that phonological awareness, the ability to reflect upon and manipulate the sound structure (syllables, rhymes, phonemes) of words, is a critical factor in early reading and spelling success (Catts et al., 2012; Gillon, 2004; Hatcher, Hulme, & Snowling, 2004; Lane, Pullen, Eisele, & Jordan, 2002; Strickland, 1990) It is a reliable predictor of early literacy development and explicit teaching in phonological awareness and letter knowledge improves the outcomes of children who progress slowly in early reading (Gillon, 2004).

1.11 Thesis Synopsis

Summary and thesis aims.

Ensuring that children are using all their skills on their formal literacy journey is a critical issue for New Zealand educational success. When learning to read, early problems are difficult to remediate, and research shows that once a reader is “behind”, it is very difficult for them to catch up with their peers, which in turn impacts on their personal, academic and ultimately economic lives (UNESCO., 2009). How to resolve these literacy difficulties is a complex puzzle. The inequalities between “good” and “poor” readers and the prevalence of literacy difficulties continues to raise alarm internationally (NAEP, 2009; Nicholson, 2009; UNICEF, 2010) and resolution will require collaboration between teachers, educators, researchers and policy-makers to make sustainable long-term evidence-based improvements in literacy education and outcomes for all children.

A key part of the literacy learning process which is supported by a large body of evidence is phonological awareness, which should be taught and measured within the early childhood or primary classroom (Arrow & Greaney, 2012; Catts, Wilcox, Wood-Jackson, Larrivee, & Scott, 1997; Ehri et al., 2001; Gillon, 2004; McLachlan & Arrow, 2010; Treutlein, Zöllner, Roos, & Schöler, 2008). Research studies that have been carefully controlled show that when there is effective PA assessment and instruction, literacy difficulties can be prevented or reduced (Gillon, 2004, 2005a, 2005b). However, there is still the issue of effective classroom instruction for mixed abilities and ages, with some research, such as that by Shapiro and Solity (2008), using a twelve-minute session (repeated three times during the day) that had some elements of differentiated teaching showing positive results.

Practical issues, such as time available for explicit PA exposure/instruction during the early childhood years and primary years, and the teacher's ability to provide effective differentiated instruction, must be considered when attempting to bring research into the children's literacy journey. There is some emerging research suggesting that the successful integration of learning and teaching strategies between early childhood and formal schooling may be an effective strategy to align learning strategies and success for children (Jacobson, 2014). Within the New Zealand context, the Education Review Office (ERO) report (ERO. (2015), *Continuity of learning: transitions from early childhood services to schools*, stated that one factor which facilitates a more successful transition to school is when "leaders and teachers in early childhood services and schools understood the links between Te Whāriki and *The New Zealand Curriculum*" (p .1).

In summary, there has been a large amount of research examining the role of PA, but this has largely been in controlled settings outside of the classroom (Bradley

& Bryant, 1983; Bryne et al., 2000; Ehri et al., 2001; Gillon, 2005b; McNeill et al., 2009b). Research into classroom teachers and other educational professionals' use of PA, is suggesting that phonological awareness may be an educational term that is unfamiliar to many teachers and educators, and may be often confused with phonics. Phonological awareness is an important underpinning for children's literacy learning and can be developed before formal literacy instruction begins. With international studies and reports detailing initiatives that are implementing PA into the classroom environment, identifying the PA knowledge of adults working with children is of critical importance.

New Zealand provides a unique environment to assess the current PA knowledge of education professionals and to trial innovative professional development approaches that encourage the inclusion of PA within the classroom environment, considering the Te Whāriki early childhood curriculum and whole language literacy teaching practices that have been in place over the last twenty-plus years. Towards these goals, the experiments reported in this thesis address the following hypotheses:

1. New Zealand teachers have largely taught from a whole language theoretical stance, and the use of and validation of a PA test for adults will predict the level of current PA knowledge to inform professional development needs.
2. Early childhood teachers use a variety of types of questions and comments with small groups of children, and these comments and questions can be an effective approach to facilitate emergent literacy development, in particular, phonological awareness, whilst reading storybooks in an authentic EC activity.
3. Professional development to enable teacher-implemented classroom-wide phonological awareness will enhance the PA skills of children and raise

literacy outcomes.

The first hypothesis is addressed through research reported in Chapter 2. It discusses the execution of a PA test for adults, designed to assess both the PA skills and knowledge of teachers across professional groups and throughout New Zealand. Hypothesis 2 is addressed in Chapters 3 and 4. The types of questions and comments that early childhood teachers make during storybook reading with small groups of four-year-old children is evaluated. In Chapter 4, the effect of the type of presentation of adult PA test is explored, and the effect on children's PA development of a short intensive period of teacher-implemented PA instruction through storybook reading comments and questioning by teachers, is tracked. Chapter 5 presents the use of different presentations of a PA test with primary school teachers, and Chapter 6 tracks the effect of the implementation of professional development and a set of PA resources on five-year-old children's PA skills. Chapter 7 aggregates the reported research findings of this thesis in a general discussion and suggests possible future research directions and initiatives to raise the use of PA within New Zealand educational settings.

Chapter 2: Explicit Phonological Knowledge of Educational Professionals

2.1 The New Zealand context

Within the New Zealand educational context, the teaching of reading has predominantly fallen within the *whole language* theoretical stance. The whole language model is a top-down model that encourages the use of text-level processing, and as such, does not include explicit systematic teaching of phonological awareness or phonics (letter-sound relationships). This approach assumes that children will learn to read within a “natural” context (Pressley, 2006; Tunmer et al., 2006). Therefore, the emphasis is on drawing links between letters and sounds only in the context of connected text, or embedded phonics (Moats, 2000; Pressley, 2006; Walker, 2008a).

Scientific evidence to support the notion that learning to read and write is not a natural process has grown, and thus instruction in PA is an important component of the literacy journey. Research has started to investigate the PA knowledge of the adults teaching children.

2.2 The phonological awareness skills of education professionals

International research has highlighted differences in the PA knowledge among adults using written assessments and questionnaires (e.g. (Al-Hazza et al., 2008; Alghazo & Al-Hilawani, 2010; Cheesman et al., 2009; Cunningham & O'Donnell, 2015; Fielding-Barnsley, 2010; Fisher, Bruce, & Greive, 2007; McCutchen et al., 2002; Moats, 2014; Stainthorp, 2004).

Although a large body of literature, including those studies highlighted above (Al-Hazza et al., 2008; Brady et al., 2009 ; Carlisle et al., 2009; McCutchen et al.,

2009; Tibi, 2005), has elucidated the phonological awareness skills of literacy educators, the results are limited by researchers choosing to administer the test in a written rather than oral format.

Within New Zealand, classroom instructional methods require children to focus on the sound structure of words, for example, “what is the first sound in . . .?”, before applying the orthographic rules of recording the sound. It is, important, therefore, to evaluate educators’ performance in a verbally administered task, as this format necessitates that participant’s focus on the sound structure of the words without immediate orthographic cues or distractions. This is particularly important given studies showing that educators rely heavily on orthographic knowledge (e.g., number of letters, orthographic rules) rather than on the sounds of speech when asked to identify the sounds in words (McCutchen et al., 2009; Moats & Foorman, 2003).

One preliminary study that has used a predominantly oral task to examine the phonological awareness skills of professionals involved in literacy education was conducted by Carroll (2006). The study compared the performance of New Zealand classroom teachers ($n = 15$), teacher aides ($n = 15$), specialist literacy professionals (Resource Teachers of Literacy, RTLit, $n = 16$), Resource Teachers of Learning and Behaviour (RTLb, $n = 12$), and teacher trainees ($n = 100$) who were about to graduate from a three-year teaching degree. The results indicated that all groups had some difficulty with the phonemic level items within the task. Participants performed better on orthographically transparent items, despite the verbal administration of the task. In contrast with the Spencer et al. (2008) study, those New Zealand participants with specialist literacy training (i.e., RTLits and RTLbs) scored significantly higher than the classroom teachers. The teacher aides, who had no formal training, scored lower than the final-year teacher trainees. The final year teacher trainees scored lower than

the classroom teachers. These results suggest that specialist training has a significant impact on the phonological awareness skills of educational professionals within the New Zealand context. It is important, however, that these results are replicated on a larger sample that also includes early childhood educators and teacher trainees at the beginning of their initial teacher education qualification, in order to further understand the influence of professional development on educators' linguistic knowledge and to allow further analysis of results obtained with an oral phonological awareness test.

2.3 The current study

This study examined the phonological awareness skills of a range of New Zealand educators to gain insight into their potential ability to provide explicit phonemic awareness instruction within a classroom literacy program.

The following hypotheses were tested:

1) that a predominantly oral phonological awareness test reflects the construct of phonological awareness - that is, does the test have construct reliability?;

2) that speech-language therapists have stronger phonological awareness than all other groups of educational professionals and teacher trainees within the New Zealand context, as a result of their training and work in phonology and phonological disorders;

3) that educators with specialist literacy training (i.e., RTLits and RTLBs) have stronger phonological awareness than classroom teachers (primary and early childhood educators), teacher trainees, and teacher aides;

4) that early childhood teachers would have comparable phonological awareness skills to classroom teachers;

5) that teacher trainees who are about to graduate have stronger phonological

awareness than teacher trainees at the outset of their qualification; and 6) that teacher aides have comparable phonological awareness skills to beginning teacher trainees, due to the more limited formal literacy training experienced by these groups.

2.4 Method

Participants

As shown in Table 1, the 699 participants were classified into eight groups according to their professional qualifications. The first six in-service professional groups were initially recruited through their participation in professional development offered as part of a larger Ministry of Education funded research project, “Hei Awhiawhi Tamariki ki te Panui Pukapuka, encouraging children to embrace a love of literacy”, (for more information see (Carroll & Carroll). The workshops focused on oral language and literacy knowledge for those working with children in early childhood education facilities and the early school years. Later workshops were offered through a national professional development provider and the participants either self-opted in or attended at the suggestion of their manager or school principal. The data were gathered at a number of workshops over a period of six years that were facilitated by the first author (qualified primary teacher and speech-language therapist). The research protocols were reviewed and approved by the Auckland College of Education Ethics Committee.

The student teachers included final year students ($n = 98$) (i.e., about to graduate from University with a three-year Bachelor of Teaching and Learning Degree), who were attending their last lecture on literacy teaching, and first year students ($n = 153$), who were attending their first literacy lecture within their Bachelor of Teaching and Learning program. The first year students had not attended any previous lectures on phonological awareness.

Table 2.1
Description of participant groups

Participant	Number	Description
Speech-Language Therapists	$n = 34$	All held a tertiary qualification in speech-language therapy that is recognised in New Zealand.
Resource Teachers of Literacy	$n = 80$	Trained teachers with, or working toward, a Post Graduate Diploma in Literacy Education.
Resource Teachers of Learning and Behaviour	$n = 26$	Trained teachers who held a Post Graduate Diploma in Special Needs Resource Teaching
Classroom teachers	$n = 208$	All held a tertiary qualification in primary teaching.
Early Childhood Educators	$n = 51$	All held a tertiary qualification in early childhood teaching.
Teacher Aides	$n = 49$	Most had no formal teachers' aide qualification and they "learned skills as they worked."
Final Year Students	$n = 98$	About to graduate with a Bachelor of Teaching and Learning.
First Year Students	$n = 153$	In the first of a three-year Bachelor of Teaching and Learning degree.

2.5 Procedure

The phonological awareness test used in this study was the Teachers' Test of Phonological Awareness (Love & Reilly, 1995), adapted with the authors' permission to allow for the vowel variation between Australian and New Zealand English. This task was administered at a group level. The test was given at the beginning of the workshops or lectures for the in-service participants to evaluate their personal phonological awareness knowledge and subsequently used as the basis for the professional development or lecture. The test was given at the start of the lecture to allow the student teachers to reflect on their own knowledge. Both the in-service professionals and the student groups were invited to hand in their score sheets to be included in this research project.

The participants who chose to submit their score sheets were asked to identify their occupational group (i.e., if they were an RTLit, RTLB, teacher, teacher aide, early childhood educator, or SLT) or if they were a first or third year student teacher. This was the only demographic information collected.

The test was administered by a speech-language therapist under test conditions and the following verbal instructions were given:

“This is a test. No talking is allowed. Please do not write the words down. Do the tasks in your head. Counting on fingers or the use of tally marks is allowed. It is how *I* say each of the words.”

The Teachers' Test of Phonological Awareness is an informal test that has forty-one items which are reduced to forty in the final scoring, split into six subtests, evaluating various aspects of phonological awareness and has been used by the test authors as a pencil and paper test in Australia and as a formal pencil and paper test by Stainthorp (2004). There has been no construct validity conducted.

For this research, the first four subtests were administered orally, with the participants noting their answers on the score sheet provided. This allowed the collection of descriptive data alongside the collection of scores. The last two subtests required the participants to silently read a set of words and match as instructed. No definitions of any terms (e.g., “sound,” “syllable”) were given. At the beginning of each subtest, participants were reminded to base their answers on the tester’s pronunciation. The six subtests are described in detail below and the full version of the test may be viewed in Appendix A:

1. Syllable identification: This subtest required the participants to record the number of syllables in ten spoken words, ranging from two (e.g., caution “cau-tion”) to five syllables (e.g., inconceivable “in-con-ceiv-a-ble”).
2. Phoneme identification: This subtest required the participants to record the number of sounds in ten spoken words ranging from three to ten phonemes in length. The words varied, with some having direct transparent phoneme-grapheme mapping (e.g., flag □f-l-a-g”), and others having more complex mapping (e.g., thought “th-ough-t”).
3. Second sound identification: This subtest required the identification of the second sound in six spoken words and recording the letter and/or combination of letters that could *plausibly* represent the phoneme *in that word*. The target words varied from identifying consonants within simple and complex clusters (e.g., bride, scream) and vowels (e.g., bought). See Appendix A for a list of accepted correct responses for each item in this subtest.
4. Final sound identification: This subtest required the identification and recording of the last sound of six spoken words using a letter or combination of letters that could *plausibly* represent the target sound *in that word*. The

stimuli included both consonants and vowels as the final sound. For example, the last sound in the words “laugh” and “though.” See Appendix A for a list of accepted correct responses for each item in this subtest.

5. Rhyme matching: This subtest required the participants to read ten words silently to themselves and match the four pairs of rhyming words. The rhyming pairs differed in spelling so this was an auditory rather than a visual task. For example, the words “some” and “numb” were paired together, with “zipper” and “zither” as the non-rhyming words.
6. Alliteration awareness: This subtest required the participants to silently read nine words and match those that started with the same sound but differing grapheme representation. For example, the words “gentle” and “joke” were paired together. There were three pairs and one set of three to match.

2.5.1 Scoring system

Prior to the answers being provided by the first author, the participants were reminded that the test was being used to help them reflect on their own phonological awareness knowledge and that they would not be asked to share their own scores within the workshop. They were asked not to change any of their incorrect answers and the score sheets were self-marked as either correct or incorrect by the participants as part of the workshop discussion. The participants were verbally given the plausible answers and if a participant suggested an alternative answer, it was discussed as to its plausibility. Each item was marked as correct or incorrect and then totalled for a subtest total. For the rhyme subtest, participants were asked to take a point off if they had paired the non-rhyming words, so the subtest was marked out of a total possible score of four.

2.5.2 Inter-rater reliability of scoring

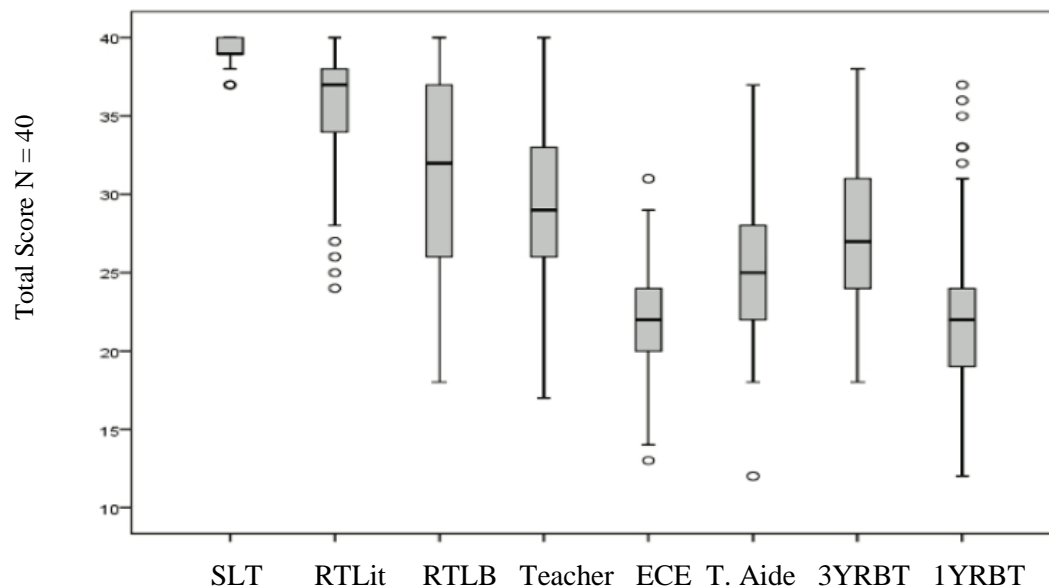
All of the score sheets were rechecked for marking accuracy, as teachers were observed to mark incorrect answers correct if they considered their answer to be plausible. Two hundred randomly selected papers were blind marked at the individual answer level and subtest score level by two speech-language therapists, using a prepared marking master sheet for plausible and implausible responses. Where there were multiple answers recorded, the first answer was scored. There was ninety-nine per cent agreement between the scores of the two markers. Difficult to decipher responses were discussed and response agreed on by the speech-language therapists.

The test scores were analysed by group at the total score, subtest and individual item levels to determine the participant's phonological awareness ability. The test consisted of forty-one items, including a score for non-rhyming items where if the participant matched the non-rhyming pair of words in the rhyme section, a point was deducted.

In order to establish whether the questions in this test were internally consistent, a Cronbach's alpha was run: the test of forty-one items including a score for non-rhyming item ($\alpha = .883$); the syllable subtest consisted of ten items ($\alpha = .633$); the phoneme identification consisted of ten items ($\alpha = .893$); the identification of the second phoneme subtest consisted of six items ($\alpha = .775$); the identification of the last sound subtest consisted of six items ($\alpha = .598$); the rhyming identification subtest consisted of five items ($\alpha = .226$); and the alliteration subtest had four items ($\alpha = .648$). The subtests that were presented orally (syllable identification, how many phonemes, second sound and last sound identification) consisted of thirty-two items ($\alpha = .884$), and the written presentation (rhyming and alliteration) consisted of nine items ($\alpha = .547$).

2.6 Results

The test scores were analysed by group at the total score, subtest and individual item levels to determine the participant's phonological awareness knowledge. The participants' subtest scores were combined to give a total raw score out of forty (Figure 1).



Abbreviations: SLT is Speech-Language Therapist, RTLit is Resource Teacher of Literacy, RTLB is Resource Teacher of Learning and Behaviour, ECE is Early Childhood Educator, T. Aide is Teacher Aide, 3YRBT is final year teaching students, and 1YRBT is first year teaching students. o= outlying participant score.

Figure 2.1: Total scores for participant groups on the teacher's phonological awareness test

Analysis using ANOVA showed that there was a statistically significant group effect [$F(7, 691) = 112.331, p < .0001$] with a large effect size ($\eta^2 = .532$). Post hoc testing using Tamhane correction showed there was a difference between the group mean scores of the speech-language therapists and RTLits ($p < .017$) and significant

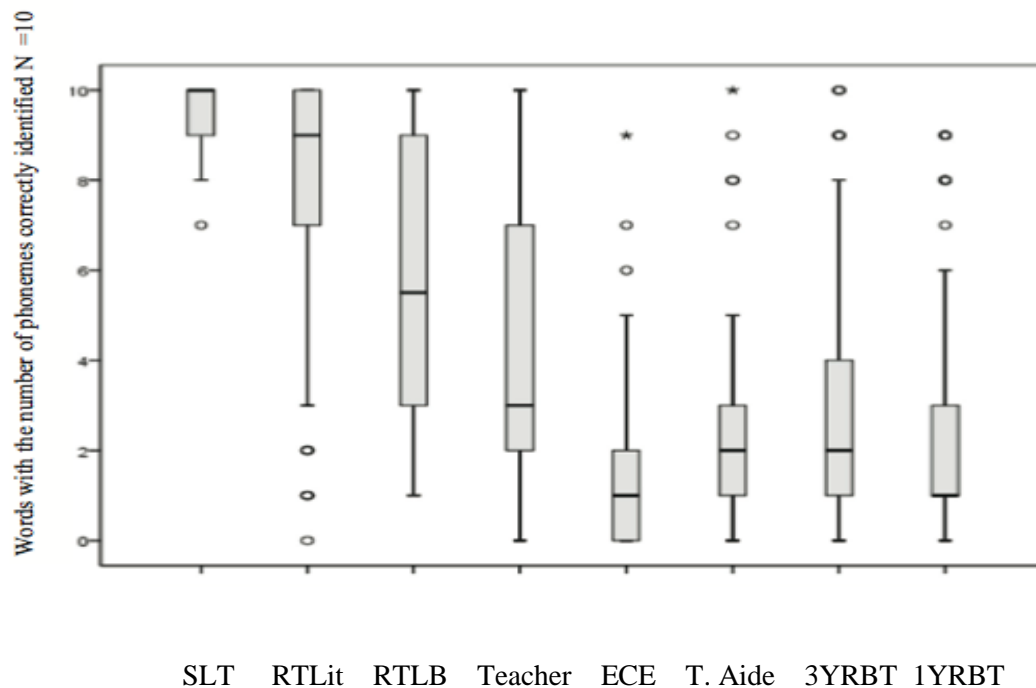
differences between SLTs and all other groups ($p < .0001$). The performance of each group within the six different subtests was also analysed to gauge differences in performance in the groups across different types of phonological awareness tasks. The scores of the groups in each subtest are summarised in Table 2. Analysis of performance in the syllable awareness task using ANOVA indicated a main group effect [$F(7.691, = 7.156, p < .0001)$], with a moderate effect size ($\eta^2 = .067$). Post hoc testing with Tamhane correction showed that there was no significant difference in group performance between the SLTs, RTLits, and RTLBs ($p < .368$). SLTs performed better than teachers ($p < .019, d = .39$), ECEs ($p < .002, d = .83$), teacher aides ($p < .002, d = .82$), 3YRBT students ($p < .081, d = .34$), and 1YRBT students ($p < .001, d = .38$).

Table 2.2*Performance of All Groups on the Subtests of the Teachers' Phonological Awareness Test*

	SLT		RTLit		RTLb		Teachers		ECE		T.Aides		3YRBT		1YRBT	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Syllable Subtest (max = 10)	10	0	9.90	0.34	9.31	1.54	9.74	0.72	9.27	1.15	9.12	1.41	9.78	0.75	9.71	0.84
Phoneme Counting Subtest (max = 10)	9.47	0.83	7.71	2.77	5.46	3.33	4.35	3.09	1.47	1.85	2.46	2.37	3.22	2.65	2.03	2.08
Second Phoneme Subtest (max = 6)	5.94	.24	5.10	1.03	4.04	1.81	3.21	1.72	1.33	1.37	2.31	1.62	2.56	1.69	1.33	1.33
Final Phoneme Subtest (max = 6)	5.94	0.24	5.59	0.77	5.15	1.26	5.06	1.19	4.06	1.75	5.02	1.25	4.61	1.37	3.67	1.59
Rhyme Subtest (max = 4)	3.94	0.24	3.50	0.53	3.58	0.50	3.54	0.56	3.61	0.49	3.41	0.64	3.57	0.52	3.26	0.89
Alliteration Subtest (max = 4)	3.91	0.29	3.69	0.54	3.69	0.47	3.53	0.67	2.73	1.23	3.16	0.94	3.50	0.78	2.10	1.32

Abbreviations: SLP is Speech-Language Therapist, RTLit is Resource Teacher of Literacy, RTLb is Resource Teacher of Learning and Behaviour, ECE is Early Childhood Educator, T. Aide is Teacher Aide, 3YRBT is final -year teaching students and 1YRBT is first-year teaching students

Analysis of performance in the phoneme identification subtest using ANOVA indicated a main group effect [$F(7, 691) = 69.769, p < .0001$] with effect size $\eta^2 = .414$. Post hoc testing with Tamhane correction indicated that the SLTs performed significantly ($p < .0001$) better than the RTLits ($p < .05, d = .75$), and the RTLBs ($p < .001, d = 1.79$); and teachers ($d = 1.78$), early childhood educators ($d = 5.30$), teacher aides ($d = 4.15$), 3YRBT students ($d = 2.31$), and 1YRBT students ($d = 3.90$). Informal discussion with the participants suggested that variations in their responses were due to consonant clusters being counted as one sound and grouping sounds into meaningful units (e.g., rime units such as “ot”). The variability across groups in responses to this subtest is represented in Figure 2.



Abbreviations: SLT Speech-Language Therapist, RTLit is Resource Teacher of Literacy, RTLB is Resource Teacher of Learning and Behaviour, ECE is Early Childhood Educator, T. Aide is Teacher Aide, 3YRBT is final-year teaching students and 1YRBT is first-year teaching students. o = outlying participant score, * = extreme outlying participant score.

Figure 2.2 Words with the number of phonemes correctly counted.

Analysis of performance in the second sound identification subtest using ANOVA indicated a main group effect of [$F(7, 689) = 82.070, p < .0001$] with an effect size of $\eta^2 = .455$. Post hoc testing with Tamhane correction indicated that there was no difference in

performance between the SLTs, RTLits, and RTLBs and these groups performed significantly better than all the other groups ($p < .0001$).

Descriptive analysis of participants' responses to the second sound identification subtest revealed wide variation in performance. Variability was particularly evident in the word "queen" where the second sound /w/ was least likely to be identified, with 21.6 per cent (151 out of 699) of participants correctly identifying /w/. The most common incorrect response written across all groups was "ee", indicating that participants were not breaking the "kw" consonant cluster into individual sounds.

The responses to the item 'scream' within the second sound identification subtest demonstrated the wide variation in the concept of what the participants considered to be a sound. Although all SLTs demonstrated that they knew the second sound was "k"; only forty-four per cent of teachers, seven per cent of ECEs, twenty-four per cent of teacher aides, eighty-five per cent of RTLits, sixteen per cent of RTLBs, thirty-nine per cent of the 3YRBT students, and eight per cent of the 1YRBT students could correctly identify and record the letter representing the second sound in this item. Analysis showed that the majority of answers that were incorrect kept the triconsonant cluster intact or split it in to /cr/, or recorded the vowel, or "eam" rime unit as a response. For example of the 208 classroom teachers, 44.7per cent correctly identified /k/ as the second sound in the word *scream*, 16.8 per cent recorded the second sound as /kr/ or /r/, 29.3 per cent identified the vowel, a further 9.2 per cent recorded the "eam" rime unit, and the remainder recorded a consonant plus vowel or the last sound /m/.

Analysis of performance in the last sound identification subtest using ANOVA indicated a main group effect of $[F(7, 690 = 28.106, p < .0001)]$, with an effect size of $\eta^2 = .222$. Post hoc testing with Tamhane correction indicated that there was no difference in performance between the SLTs and RTLits and these two groups performed significantly

better than the other groups ($p < .0001$). Analysis of participants' responses to the last sound identification subtest showed no significant difference between the SLTs, RTLits ($p < .147$, $d = .54$), and RTLBs ($p < .109$, $d = .95$). There was a significant difference between the SLTs, RTLits, and RTLBs, and the other groups ($p < .0001$). Descriptive analysis of responses showed that rime units (e.g., "isp") or consonant clusters (e.g., "sp") were likely to be listed as the last sound.

Analysis of performance in the rhyme identification subtest using ANOVA indicated a main group effect of [$F(7, 690) = 6.102$, $p < .001$] with effect size $\eta^2 = .058$. Post hoc testing with Tamhane correction indicated that there was no difference in performance between the SLTs and RTLits, and these two groups performed significantly better than the other groups ($p < .0001$).

Analysis of performance in the alliteration awareness subtest showed no difference between the SLTs, RTLits, and RTLBs. SLTs scored significantly higher than the teachers ($p < .001$), ECEs ($p < .0001$), teacher aides ($p < .0001$), 3YRBT students ($p < .004$), and 1YRBT students ($p < .0001$). Informal discussion indicated that there were some individuals who were not able to read the words.

2.7 Discussion

This study evaluated 699 New Zealand educators' explicit phonological knowledge on the Teachers' Phonological Awareness Test using a predominately oral presentation. The first hypothesis tested showed that the items in the Phonological Awareness test were internally consistent.

The second hypothesis tested was that speech-language therapists would present with a more in-depth understanding of phonological awareness than other groups of educational professionals working in New Zealand primary schools. The data supported this hypothesis, with the SLTs outperforming other participant groups in the majority of subtests and

particularly the three phonemic level awareness subtests. The rhyme awareness subtest appears to have been influenced by the inclusion of a non-rhyming pair of words for all groups. Subtests that showed little difference between group scores (i.e., syllable and alliteration awareness) are likely explained by their being relatively easy phonological awareness tasks and thus influenced by ceiling effects. RTLits and RTLBs at times matched the SLTs' knowledge in some of the subtest sections as a group, but as individuals, there was a large variance in their scores. All other groups had significantly poorer performance compared to SLTs.

These findings are consistent with previous research and confirm that there is a wide variability in education professionals' and paraprofessionals' performance on subtests that require demonstration of their own awareness of the sound structure of spoken words give in an oral presentation (Carroll, 2006) or in a written format (Crim et al., 2008; Cunningham et al., 2004; Fielding-Barnsley & Purdie, 2005; McCutchen et al., 2009; Moats, 2009a; Stainthorp, 2004; Tetley & Jones, 2014).

The third hypothesis tested was that the educators with specialist literacy training (i.e., RTLits and RTLBs) would have stronger phonological awareness than classroom teachers and teacher trainees. This hypothesis was only partially supported by the data. The RTLits consistently outperformed the teachers in phoneme identification and also outperformed the teacher trainees in phoneme identification, and second sound and last sound identification. The RTLBs outperformed the teachers in phoneme identification and teacher trainees in the phoneme identification and the second sound identification. These results are supported by Fielding-Barnsley and Purdie (2005) Australian study, where the phonemic metalinguistic knowledge of the teachers was positively influenced by specialist training. These results are not consistent with Spencer et al. (2008), where the specialist reading teachers did not demonstrate significantly different knowledge compared to the classroom teachers.

The contrast in results across these studies may be due to differences in the training of literacy specialists in the American and New Zealand contexts and/or the use of an orally presented phonological awareness task in the current investigation. A descriptive comparison of classroom teachers' performance in the current study with that reported in Spencer et al. (2008) indicates further differences in findings and suggests that New Zealand teachers may present with stronger phonological awareness knowledge than their American colleagues when the words are more orthographically complex. For example, fifty-five per cent of American teachers were able to correctly identify the number of sounds in an orthographically transparent word (i.e., stop), compared with fifty-eight per cent of New Zealand classroom teachers, who identified "flag" as having four sounds. By contrast, with non-transparent items, New Zealand teachers showed superior phoneme identification accuracy (e.g., 6% of American teachers were able to identify that "start" had four sounds compared with 32% of New Zealand teachers accurately identifying that "scone" had four sounds). Further research comparing the spoken and written administration of the same phonological awareness task is needed to more systematically explore the impact of test modality on participants' scores.

The fourth hypothesis, that early childhood teachers would have comparable phonological awareness to the primary teachers, was not proven. The ECEs did not achieve significantly lower scores than the teachers in the syllable subtest, but all other subtests showed that the teachers significantly outperformed the ECEs. The ECEs demonstrated significantly poorer total scores than the teachers ($d = 1.43$). Descriptive analysis of the ECEs' score sheets and discussion with the ECEs indicated that they did not count letters, as described in the Crim et al. (2008) study, or sounds, but segmented words at the onset and rime level, and considered consonant blends to be one sound.

The fifth hypothesis, that teacher trainees who were about to graduate would have stronger phonological awareness than teacher trainees at the outset of their qualification, was

supported. The third-year students demonstrated a more consistent knowledge than the first year students, suggesting that the students gained an understanding of the phonological structure of words as part of their University program, with a large effect size on total scores (Cohen's $d = 1.12$). When comparing the skills of the third year students and the teacher aides working within the classroom, the third year students showed a higher level of proficiency; however, the effect size is small ($d = .39$). It is likely that the teacher aides acquire some metalinguistic knowledge within their working environment that would explain the teacher aides' higher mean scores than students in their initial year of teacher training.

There appears to be a relationship between specialist training (i.e., the SLTs, RTLit, and RTLBs) and a more in-depth knowledge of the sound structure of spoken words, with the mean of the total scores higher than the other groups. However, there was variability within the RTLit and RTLB groups, implying that this in-depth knowledge is inconsistent. McCutchen et al. (2002) reported that teachers with strong explicit phonological awareness skills spend greater instructional time teaching sound/word activities than those with weaker personal phonological awareness skills. It could be assumed that an educator with strong phonological awareness knowledge, and in particular phonemic awareness knowledge, could provide more focused and accurate feedback to children within their classroom program. Based on the results of this study, a child who needs explicit phonological awareness instruction to assist reading and spelling development may have a classroom teacher or teacher aide who will not be sufficiently knowledgeable to provide the necessary support the child may need in understanding the phonological structure of words at the phoneme level or to accurately map sounds to letters when more complex phoneme-grapheme relationships exist in words.

The diversity in phonological awareness skills across the groups can be conceptualised through Snow et al. (2005) levels of internalised professional knowledge, which are

conceptualised as points on a pedagogical continuum. The points on this knowledge continuum include: the declarative level (i.e., still acquiring relevant disciplinary knowledge); the “situated can-do procedural” level (i.e., able to support children in a highly structured situation but not able to consistently provide individualised feedback to a child); “stable procedural knowledge” (i.e., being able to provide phonological awareness instruction for the majority of children); and finally, the “expert adaptive knowledge” level (i.e., where the teacher can demonstrate the ability to address the full range of phonological awareness challenges within the classroom).

Overall, the results of this study indicate that although the participants’ demonstrated consistent and more explicit knowledge at syllable, rhyme, and alliteration levels, many of our educators are at the lowest levels of Snow et al.’s (2005) knowledge continuum (i.e., at the declarative knowledge level and situated, can-do procedural knowledge) in their understanding of phonological awareness at the phoneme level.

Many educators in this study reported during their discussions that they had learned to read with relative ease. As their reading became more proficient, their phonological awareness knowledge probably went from explicit knowledge to implicit knowledge very quickly, consequently making it difficult to draw upon these skills in linguistic awareness tasks as a teacher (Stainthorp, 2004)

SLTs in this study showed a high level of explicit knowledge, commensurate with Snow et al.’s (2005) reflective level of knowledge. The SLPs performance reflects their training that typically involves intensive instruction and practice in phonetic transcription (i.e., the ability to hear and record sounds). Professional development for educators can have a significant impact on classroom practices, but the model of isolated professional development courses rarely makes a significant change to classroom teaching practices (Timperly et al., 2007). Snow et al. (2005) argued that student teachers cannot learn all that is required to

implement successful reading programs in pre-service education. The results of this study show that there are differences in the phonological awareness knowledge of the students beginning their teacher training and those about to graduate. There are also significant differences between educators working with children prior to the formal teaching of literacy and those educators working in classrooms where literacy is formally taught. Many are advocating sustained in-depth professional development rather than one-off, short courses (Al-Hazza et al., 2008; Cunningham et al., 2004; Girolametto, Weitzman, Lefebvre, & Greenberg, 2007; McCutchen et al., 2009; Snow et al., 2005; Spear-Swerling & Brucker, 2003; Tibi, 2005).

Differing models of professional development for teachers are starting to emerge in the research. In New Zealand, the “Teacher inquiry and knowledge-building cycle to promote valued student outcomes” (Timperley et al., 2007) is one such model of professional development that asks the teachers, among other questions, “what do we already know (and) what do we need to learn?” (p. xliii), thus promoting “evidence -informed pedagogy” (p. x). The current data have suggested the value of such approaches to professional development for literacy educators.

2.8 Study conclusion

This New Zealand study confirms and extends the results of the initial investigation published by Carroll (2006). New Zealand educators, like their overseas colleagues, have wide and varying metalinguistic knowledge, understanding and use of phonological awareness in their work with children. The level of this knowledge varies significantly with the participants’ level of specialist training; and also within subgroups of educators. The SLTs were the group with the least variance and consistently demonstrated the highest achievement. However, their direct input into classroom literacy instruction in New Zealand schools is limited and more typically associated with literacy development in children with severe and

complex communication needs.

Phonological awareness instruction is a critical component of classroom literacy instruction, both prior to and during the formal teaching of literacy. Professional development strategies that enable teachers to develop greater pedagogical content knowledge in phonological awareness are required so they can provide appropriately individualised learning experiences and quality feedback to their students. Continued research into professional development that is effective in promoting educators' in-depth phonological knowledge is warranted, as teachers who have more in-depth knowledge of the alphabetic principle and phonology may be more likely to provide effective literacy instruction within the classroom environment.

Chapter 3: New Zealand early childhood teachers' storybook reading practices.

3.1 Introduction

Reading storybooks with young children is an activity many parents undertake on a regular basis. Storybook reading holds an important place in children's language and literacy development (Van Kleeck, 2008; Wasik, Bond, & Hindman, 2006; Whitehurst & Lonigan, 1998). Children's vocabulary development can be fostered by adults and children talking together about new words, concepts and embarking on discussions about ideas (for example, Sénéchal et al. (2008)). Adults can also draw children's attention to the print aspects of storybooks, that is, the written words, letters, the sounds letters make and other concepts around print (Davis, Evans, & Reynolds, 2010; Ezell & Justice, 2000).

At school entry, language measures, such as phonological awareness, expressive vocabulary and story recall, and literacy measures, such as letter knowledge and print concept knowledge, are all good predictors of literacy success (see McCardle, Scarborough, and Catts (2001) for a review of the literature). The PIRLS report suggests that New Zealand children who were engaged in literacy activities (including being read to regularly by their parents) as pre-schoolers, achieved significantly higher reading literacy scores compared to children who only sometimes were engaged in early literacy activities (see Chamberlain & Caygill, 2012).

There has been international research focusing on various aspects of storybook reading and impact on children's learning and later literacy competency, through the analysis of the interaction between adults' comments and questions related to the storybook text, when both early childhood teachers and parents read with children (Callaghan & Madelaine, 2012; Evans, Reynolds, Shaw, & Pursoo, 2011; Ezell & Justice, 2000; Fletcher & Reese, 2005; Hindman et al., 2008; Massey, 2013; G. Phillips & McNaughton, 1990).

The purpose of this study of ten New Zealand early childhood teachers was to investigate the types of questions and comments that early childhood teachers used while reading storybooks with small groups of four-year-old children and how these may be facilitating emergent literacy development and in particular, phonological awareness.

3.2 Reading styles

There have been many studies investigating early childhood teachers' reading styles. Dickinson and Smith (1994) identified three naturally occurring storybook reading styles in their group of twenty-five teachers: (a) a co-constructive approach, where teachers and children engaged in high amounts of talk with high level clarifications to extend discussions; (b) a didactic-interactional approach, where there was limited talk which was often at a low cognitive level interaction; and (c) a performance-orientated approach, where teachers primarily talked prior to reading and after reading the storybook and used high cognitive demand interactions. At follow-up one year later, Dickinson and Smith (1994) found that the children whose teachers used a performance-orientated approach had greater gains in their vocabulary development compared to the children whose teachers used the other two approaches.

Moschovaki and Meadows (2005) found in their study of twenty Greek teachers reading two information books and two storybooks to groups of children aged 3.5 - 5.5 years, that most teachers used an interactive style of reading when reading storybooks, wherein they read a page and then discussed it with the children. Moreover, when reading storybooks compared to information books, these teachers used more low cognitive demand talk.

Differences in types of storybook reading styles have also been examined from the perspective of the teacher's level of education by Gerde and Powell (2009). They found teachers with Bachelor level qualifications in early childhood education used more book-

related comments than those with a high school qualification or a degree in another field.

They suggested that while the level of teacher education may not explain all the differences in preschool classroom quality, there are differences in child outcomes that may be related to the quality of teacher talk.

3.2.1 Content talk and print-related talk

Storybook reading conversations can be analysed to provide information on the type of talk used by teachers. When reading storybooks together, adults and children predominantly talk about the content of the story and the illustrations to help children make meaning of the story (Hindman et al., 2008). This language-based meaning-making has significant benefits for children's comprehension and vocabulary development, particularly when teachers engage children with high cognitive demand comments and questions, compared to teachers who used lower cognitively demanding talk (Dickinson & Smith, 1994).

Kaderavek and Justice (2002) suggested that storybook reading provides additional opportunities to foster later literacy success. In particular, they suggested that while the research shows that during storybook reading teachers tend to focus more on the content of the story than on print or book conventions, drawing attention to these print and book conventions allows for teachable moments to promote children's emergent literacy skill development.

3.3 This study

The present study was designed to investigate the typical comments made and questions asked by early childhood teachers during storybook reading. The research questions asked were: (1) What are the levels of cognitive demand prompted by teachers' questions and comments?; (2) What are the foci of the questions and comments made during story reading?

3.4 Method

3.4.1 Participating early childhood centres and teachers.

Ten teachers were randomly chosen from a group of forty-three early childhood teachers from nine urban early childhood centres who were participating in a larger shared book reading intervention study investigating PA knowledge. The early childhood centres were from one city in New Zealand and consisted of seven kindergartens and two early childhood facilities, with a total of forty-three teachers. The early childhood centres were in areas of mid to low socioeconomic status, with the exception of one kindergarten, which was located in a mid to high socioeconomic area. The head teachers identified children attending the facilities as predominantly of New Zealand European descent (90%), New Zealand Māori (5%), Pacific Island (1%), Asian (2%) and other (2%). The majority of the forty-three EC teachers were female (42 female and 1 male). All teachers had a tertiary early childhood qualification, which ranged from a one-year teaching diploma to a four-year teaching degree, and a range of teaching experience. The ten teachers randomly selected for this project were all female teachers who worked full time, whose teaching experience ranged from newly qualified to over twenty-years' experience.

3.4.2 Video and coding procedures of the early childhood teachers reading storybooks

The ten teachers were video recorded reading two storybooks of their choice to a small group of four-year-old children. The teachers were requested to read the book as they would normally and the video camera was placed behind the teacher and focused onto the book, so pointing at the book could be recorded. To offset reactivity (such as being uncomfortable being recorded, feeling self-conscious), that may be present in the initial reading, only the second story was transcribed and coded for analysis.

3.4.3 Coding.

Each video was transcribed by a trained transcriber. Utterances said outside of the reading of the storybook's text (extra-textual utterances) were coded initially for cognitive demand using the four levels of cognitive demand coding scheme. Levels 1 and 2 are the more concrete levels, and levels 3 and 4 are more cognitively demanding and abstract, as developed by Price et al. (2012). A full description of the coding scheme is provided in Table 3.1.

The transcripts were then recoded to capture the numbers of extra-textual utterances that were made relating to content (i.e., comments or questions that related to vocabulary, background knowledge that the child has, prediction of events etc.) compared to those related to early literacy skills (i.e., comments or questions related to text features, letters, letter/sounds, rhyme etc.) and behaviour management (i.e. comments used to re-orientate the children to the book, e.g. sit on your bottom so everyone can see, or are you listening?) using adaptations of coding schemes used by Zucker et al. (2009) and Piasta, Justice, McGinty, and Kaderavek (2012). (See Appendix C for coding scheme).

The initial training of the independent transcriber/coder involved coding practice videos and discussing each utterance's code. Feedback was given and further examples included in the coding scheme for the coders to refer to before the research videos were coded.

Inter-rater reliability was calculated between the two transcript coders for thirty per cent of the videos (i.e., 3 videos) to evaluate the consistency of agreement of the coding. Coding was completed independently and Cohen's Kappa was used to calculate agreement. For the coding of the cognitive levels, Kappa was calculated to be between 0.85 and 0.94, which is within the reliable range and almost perfect agreement (Hallgren, 2012). For the

content/literacy coding, Kappa was calculated to be between 0.71 and 0.76, which is within the reliable range and showed substantial agreement.

Table 3.1:

Coding categories for teachers' extra-textual cognitive demand levels comments and questions

Level		Examples
Level 1	Matching Perception	Label objects or characters. Direct attention to a pictured object or character. Imitation.
Level 2	Selective Analysis/ integration of perception	Describe characteristics e.g. size, shape, colour, quantity. Perception of the visual picture
Level 3	Reorder / infer about	Make inferences including judgments. Text to child's life comparisons
Level 4	Reasoning about perception	Make predictions Provide factual knowledge or definitions and explanations.

Note: Coding system adapted from Price et al. (2012)

3.5 Results.

Data.

The storybooks were chosen by the participants. Each storybook page was counted if it contained text. The cover was included if the teacher commented on the cover or read the title of the book. The ten teachers read 204 pages of text and made 559 extra-textual comments (see Table 2). Further research is required to examine if there is a relationship between the number of pages and the number of comments made. For example, the two teachers who read the longest books (both 29 pages) made eighteen and twenty-nine extra-textual comments, while the teacher who read the shortest book (14 pages) made fifty-five comments.

The raw codes were counted and converted to a per page rate to provide a more equivalent metric across storybooks. The codes were transferred into SPSS Statistic (version

20) for data transformation and statistical analysis. As the occurrences of some extra-textual codes were very low (i.e. literacy at the within word level, letter/sound codes), these codes were aggregated conceptually for statistical analyses.

As shown in Table 3.3, the early childhood teachers predominately used Level 1, 2 or 3 cognitive level extra-textual comments and questions. There were comparatively few level 4 extra-textual comments. Teachers used praise significantly more often than negative comments, and the children appeared to be engaged in the activity, with few behaviour management comments recorded.

Table 3.2:
Raw Descriptive data

	Total	Mean	SD	Range
Number of book pages	204	20.40	5.54	14 - 19
Number of extra-textual comments	559	55.9	22.75	18 - 88

Table 3.3:
Descriptive per page ratio data of the of the storybook cognitive level extra-textual coding

	Mean	Range
Codes per page ratio		
Cognitive		
Level 1	1.15	.21 -2.41
Level 2	.60	.10 – 1.58
Level 3	.63	.03 – 1.31
Level 4	.11	0 - .32
Affirmations	.48	0.8 – 1.1
Negations	.03	0 - .03
Behaviour Management	.05	0- .16

The content versus literacy based extra-textual comments were again converted to a per page ratio as shown in Table 3.4. Teachers were more likely to use content comments compared to literacy-coded comments. No teachers made comments referring to letters or sounds, with the majority of the literacy codes derived from pointing to text, commenting on text features, or referring to environmental literacy (e.g., discussing reading books at the library) rather than commenting on within-word features.

Table 3.4.

Descriptive ratio data of the storybook extra-textual coding for 10 teachers – content versus literacy comments.

	Mean	Range
Content Codes		
Comment or question	.90	.41 – 1.86
Background	0.16	0 - .36
Other	0.60	0 - .59
Total Content Codes	1.66	
Literacy Codes		
Point to text	.06	0 - .16
Text comment or question	0.12	0 - .47
Letter / sound	0	0 - 0
Environmental	.09	0 - .59
Other	0	0 - 0
Total Literacy Codes	.27	

3.6 Discussion

This study investigated the extra-textual comments made by early childhood educators during storybook reading with small groups of four-year-old children. The transcriptions of the teachers' comments and discussion as they shared the storybooks with the children were coded to describe the comments made by teachers and the emergent literacy skills that were

the foci of these comments. The results showed that the early childhood teachers predominantly focused on the story content and meaning of the story, with statistically significantly fewer comments focused on drawing children's attention to the print on the page or toward developing early phonological awareness skills important to word reading

The analysis of the extra-textual talk made by teachers showed there was a wide variation between teachers in the types of comments and questions made by the teachers. Overall, the few behaviour management comments suggested that the children were engaged in the storybooks, regardless of the length of the book. The coding showed that the teachers focused on the content and vocabulary of the storybook rather than on the phonological awareness, print-based literacy aspects. This research suggests that aspects such as phonological sensitivity and letter knowledge are not highlighted by early childhood teachers during storybook reading in the New Zealand context. This is consistent with the previous research in American preschool settings (Ezell & Justice, 2000; Hindman et al., 2008; Zucker et al., 2009).

This weighting of comments and questions towards content and vocabulary may affect the children's literate cultural capital (the reading-related variables at school entry that support early literacy development that are linked to early childhood activities that include phonological sensitivity, grammatical sensitivity, receptive vocabulary, and letter knowledge), as defined by Tunmer et al. (2006). From this sample of teachers' extra-textual comments, it is evident that teachers did support children's receptive vocabulary. When teachers repeated back children's comments that were grammatically incorrect, there were examples of teachers modelling correct grammatical structures. There were few examples of teachers' extra-textual comments supporting children's letter sound knowledge or phonological sensitivity. It has been recommended that children who have been identified as at-risk for reading difficulties should have access to quality early childhood environments that promote language and

literacy growth and address reading factors in a rich, meaningful, and integrated way (Snow et al., 1998). The current results suggest that there is good opportunity to increase the amount of print-based learning within a routine activity in New Zealand's early childhood curriculum.

This leads to a new question, what is the theoretical base for teachers' storybook reading with four-year-old children in early childhood settings? Many of the studies in this area have focused on the vocabulary aspect of children's learning rather than on the more encompassing literate cultural capital notion espoused by Tunmer et al. For the compulsory school sector, one theory of reading is that reading is considered to be the product of decoding and comprehension ($R = D \times C$) (Gough & Tunmer, 1986). That is, a child has to understand the content and vocabulary of the words as well as being able to decode the letters of the words. Given this, perhaps an adaptation for early childhood teachers to theoretically frame their storybook extra-textual reading practices could be:

Balanced Emergent Literacy Practices (ELS) =

Contextual (C) talk X Phonological Awareness/Print Referencing (P) talk

where,

Contextual (C) talk = teachers' and children's talk that encourages comprehension of the story, vocabulary extension, and linking the story to children's prior experiences

and

Phonological Awareness / Print Referencing (P) talk = teachers' explicitly talking about phonological awareness including syllables, rhyme, and sounds, letter names, pointing to text etc.

Together, these balanced extra-textual comments could foster the development of the complex skill sets that provide the foundation for successful reading acquisition.

The results of this pilot study must be interpreted carefully. This is only a small sample of ten teachers, with variation in the amount and types of extra-textual talk used during storybook reading. It was evident from the transcripts that some teachers promoted discussion throughout the book, while others kept the discussion to the end of the book. Further, differences in the books selected by the teachers to read may have added to the variation in the amount and type of extra-textual used across participants.

There also appears to be differences in the cognitive level of extra-textual talk between teachers. While the children engaged in the shared book reading activity in this study were four-year-olds, the cognitive levels of the talk were predominantly levels 1 to 3 (see Table 3.1), with research suggesting that the children's vocabulary and comprehension are increased if level 4 talk is used (e.g. Dickinson and Smith, 1994).

A second consideration is that while the teachers all have an early childhood qualification, there was no data collected on their knowledge and beliefs about storybook reading and children's language development. Thus, there is no data available on how their personal beliefs and perceptions of extra-textual talk during storybook reading may have influenced their storybook reading style.

The third consideration is the relatively low number of literacy skill focused comments by teachers and the potential impact of this on children's learning. Research has shown that early childhood teacher's phonological awareness is less advanced than primary trained teachers which may make it less likely for them to include print based extra-textual comments (Carroll et al., 2012). Research, such as that of Justice, Kaderavek, Xitao, Sofka, and Hunt (2009), has shown that increasing print referencing and phonological awareness

during storybook reading in the context of a very scripted intervention can increase these skills for preschool children. This is an aspect that requires further research within the New Zealand context to establish if increasing print referencing and phonological awareness during storybook reading will enhance these skills for children. In addition, if so, how can this be achieved effectively given teacher knowledge and within the current curriculum. The next study/chapters investigates the EC teachers' PA in-depth and possible explicit teaching practices that may enhance children's PA development.

Chapter 4: Explicit Phonological Knowledge of Early Childhood Teachers and the Effect of Two Different Professional Development Models

4.1 Teacher knowledge

There is a growing body of evidence supporting the importance of teacher knowledge as a contributing factor in children's learning and achievement. For effective teaching, Shulman (1986) suggested that teachers require both *Subject Content Knowledge* (SCK), that is, the facts and concepts within a subject; and *Pedagogical Content Knowledge* (PCK), defined as how we teach a subject to make it comprehensible to others. For instance, in PA a teacher may have the SCK of how many sounds are in a word, but not the PCK of how to effectively teach this understanding to a child within the classroom context.

As outlined in Chapter 1, several studies have examined EC teachers' SCK in the area of PA along with the wider literacy fundamentals, such as morphological and orthographical knowledge (Crim et al., 2008; Cunningham, Zibulsky, & Callahan, 2009; Fielding-Barnsley, 2010; McCutchen et al., 2002; McLachlan, 2010; McLachlan & Arrow, 2010; Neuman & Wright, 2010). In general, these studies have found that SCK is widely variable, with teachers' often overestimating their knowledge.

Tasks used to measure teachers' PA knowledge have typically been written assessments (i.e., the word is presented on a page and teachers are required to perform the phonological awareness task, such as identifying the number of sounds in the word or multi-choice format). Written PA tasks may be more heavily influenced by orthographic factors (i.e., the way the word is spelled) than verbal tasks. The teacher's phonological awareness test used in Carroll et al. study (2012) (see Chapter 2) had the majority of the test items presented

orally and the results, consistent with written assessments, showed that teachers performed less linguistically complex tasks (e.g., syllable segmentation) more accurately than phoneme awareness tasks. Examination of teachers' PA has also been limited to isolated assessments (e.g., assessment at pre- and post-intervention), which assumes that teacher knowledge is stable over time. This assumption may be invalid, given the large variability in performance across items tapping the same underlying skill (e.g., how many sounds in "flag" and "thought"; Carroll et al., 2012). This current study aimed to explore this variability through establishing a baseline PA performance across four assessment points (in alternate test items matched for phonological structure administered in written and spoken formats) prior to the implementation of the research intervention, to allow a more robust examination of any change to teacher knowledge.

4.2 Effectiveness of promoting early childhood teachers' phonological awareness knowledge

There appears to be little guiding evidence about the type and/or intensity of PD that is most effective in changing teaching practices and whether any change in teacher behaviour has a resulting impact on children's PA skills. PD for teachers appears to be more effective when it is sustained over a period of time rather than a one-off event (Algozzine et al., 2011), particularly when the participants have opportunities to practice within the training setting and then receive on-going feedback such as coaching or mentoring on their performance in the classroom (Neuman & Wright, 2010; Sheridan et al., 2009). Most studies that have evaluated the effects of PD on developing EC teachers' PA have been implemented alongside researcher-prescribed teaching sessions, which may not be within the optimal level of children's development. Further, the use of scripted teaching sessions does not align with the New Zealand early childhood curriculum. This study explored the effectiveness of professional development on early childhood teachers' subject content knowledge and for a small group subject pedagogical knowledge within naturally occurring conversations.

It is hypothesised that:

1. Teachers will demonstrate variability in their professional reading and favour a more whole language than structured approach to literacy instruction on the Teachers' Beliefs About Literacy Questionnaire.
2. Teachers will show variability in their personal knowledge of PA and will be more accurate in a verbal context without the distraction of the orthography to influence their responses.
3. A professional learning and coaching model will be more effective than a traditional PD model in enhancing EC educational personal PA abilities.
4. Children's phonological awareness will increase when the EC teachers are coached to provide PA experiences within storybook reading.

The study will be reported in two parts. Part 1 will report the adults' results and Part 2 will report the children's PA skills.

4.3 Method Part 1.

4.3.1 Participants

Participants in this study were teachers and children in New Zealand early childhood centres. In New Zealand, the term Early Childhood Centre (ECC) is used to describe licensed and regulated early childhood services. This includes not-for-profit kindergartens, community-based centres, as well as privately owned early childhood centres. All ECCs use the early childhood curriculum, Te Whāriki (1996b). As described in Chapter 1, this document comes from a sociocultural perspective, of principles that encompass the notion of children learning within a partnership with others. It does not require subject teaching and learning in any particular curriculum areas or for teachers to have specialised content or subject knowledge. Typically, children attend ECE up to five years of age and then begin formal schooling on their fifth birthday.

4.3.2 Participating early childhood centres.

Nine urban early childhood centres (with 43 EC teachers) from the one city in New Zealand participated in the study. Five kindergartens and two early childhood facilities opted into the PD program, following a presentation of the proposed research (32 teachers). The remaining two kindergartens (13 teachers) opted for a delayed start in the PD due to staff changes and, therefore, acted as a control group.

The early childhood centres were in areas of mid to low socioeconomic status, with the exception of one kindergarten which was located in a mid to high socioeconomic area. The head teachers identified children attending the facilities as predominantly of New Zealand European descent (90%), New Zealand Māori (5%), Pacific Island (1%), Asian (2%) and other (2%). The majority of the forty-three EC teachers were female (42 female and 1 male). All teachers had a tertiary early childhood qualification, which ranged from a one-year teaching diploma to a four-year teaching degree, and a range of teaching experience, as shown in Table 4.1.

Table 4.1
Reported teaching experience of participants.

	Number of years teaching					No Answer
	0 to 5	6 to 10	11 to 15	16 to 20	Over 20	
Number of teachers	8	6	8	10	8	3

4.4 Procedure

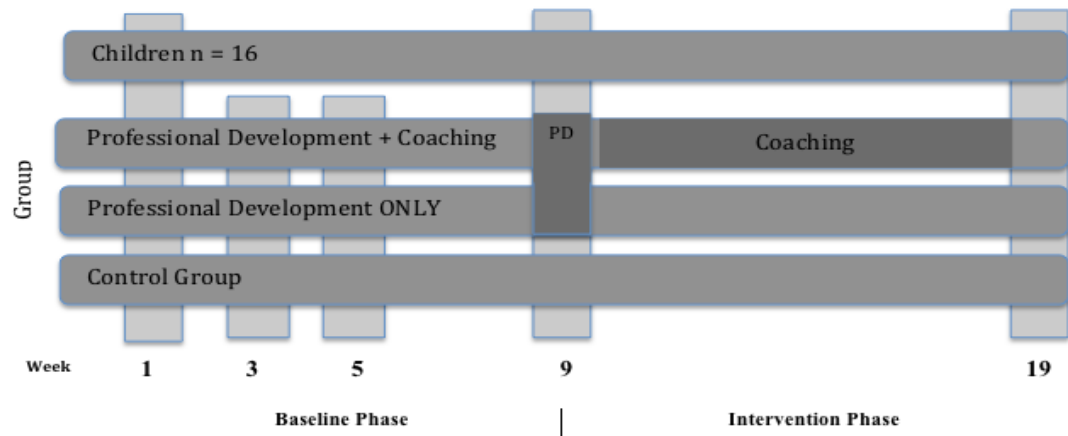
There was a larger group than expected that opted into the research, and due resource constraint only some groups were videoed and children only followed for one experimental group. The seven early childhood centres in the experimental group were randomly assigned to two PD Conditions. The professional development plus coaching group (PD+C, n = 19)

participated in professional development and ongoing coaching whereas the professional development only group (PDOnly, n = 11) participated in professional development alone. The two centres in the control group, (Control, n = 13) did not participate in any form of professional development or coaching during the research period. All participants completed a questionnaire (see Appendix B) that collected information on their teaching experience, teaching qualification, professional reading and development practices linked to emergent literacy, and their personal definitions of PA compared to phonics.

4.4.1 Baseline Phase One1 (9 weeks)

At the beginning of Phase One, the teachers were requested to fill out a questionnaire that detailed demographic information and some beliefs about literacy development and subject knowledge.

During Phase One, the teachers' PA knowledge was tested four times over a nine-week period, (see Figure 3.1) with a minimum interval of two weeks between tests; using two different forms. Version A was an adapted version (with the authors' permission) of the "Teachers Phonological Awareness Test" (Love & Reilly, 1995) to allow for the vowel variation between Australia and New Zealand. This was the same Test as that used in the teacher (Carroll et al., 2012) and reported in Chapter 2 of this thesis. The second form of the test (Version B) was developed to parallel version A and allow for multiple testing over time (see Appendix A and D for both test versions). The participants were given both test A, and the alternative form B as a written presentation and as a verbal presentation. The presentation of the tests was in the following order, so there were no presentations of the same test back to back.



Note: The bars at weeks 1, 3, 5, and 9 represent assessment points with the following assessments:
 Week 1: Children - PIPA, PA Probes, CELF-Pre Teachers – Questionnaire, PA test – Verbal form A
 Week 3: Teachers – PA test – Written form B
 Week 5: Teachers – PA test – Written form A
 Week 9: Children - PA Probes Teachers – PA test – Verbal form B
 Week 19: Children – PA Probes Teachers – PA test – retest verbal form A

Figure 4.1 Study Format

-Time One – Verbal PA test A. This was the test format used in chapter 2 of the thesis (Carroll, 2006; Carroll et al., 2012) and by administering first allowed the results to be compared with previous research participants.

-Time Two – Written PA test B.

-Time Three – Written PA Test A.

-Time Four – Verbal Test B. This allowed the use of the verbal presentation responses to be used for the professional development session.

No feedback was given to the teachers for the first three presentations. The fourth presentation formed the beginning of the PD for the teachers in the experimental groups (PD+C and PDOnly) where feedback was provided. This feedback provided is described in more detail in the section below. The control group did not receive any feedback from the

fourth presentation. Due to illness, three teachers did not complete all four of the baseline PA tests.

PA Test description

Both test forms have forty items split into six subsections evaluating various aspects of phonological awareness. The foci of the six subtests are described below:

1. Syllable segmentation: This subtest required the participants to count the number of syllables in ten words (ranging from two to five syllables).

2. Phoneme segmentation: This subtest required the participants to count the number of sounds or phonemes, not letters, they heard or read in each of the ten target words. The words were three to ten phonemes in length. The words varied in their internal structures with some having direct phoneme-grapheme mapping (for example *flag* → f-l-a-g) and others having more complex mapping (for example *thought* → th-ough-t).

3. Second sound identification: This subtest required the identification of the second sound or phoneme in six separate words and the participants recording the letter/letters for the target phoneme. The words varied from identifying consonants within simple and complex blends (for example *bride* and *scream*); and vowels (for example *bought*). All plausible letter or letter combinations were accepted as a correct response. See Appendix A for a list of accepted correct responses.

4. Final sound identification: This subtest required the identification and recording the last sound of six spoken words. Answers included both consonants and vowels - for example, the last sound in the words “laugh” and “though”. All plausible letter or letter combinations were accepted as a correct response. See Appendix A for a list of acceptable correct responses.

For the written presentation of the first four subtests, the participants read each of the words and noted the number of syllables or phonemes beside the word. For the verbal presentations, a speech-language pathologist read out the words and the participant noted the answer on a blank test answer sheet.

5. Rhyme matching: This subtest required the participants to read ten words silently to themselves and match the four pairs of rhyming words. The rhyming pairs differed in spelling, so this was an auditory rather than a visual task, for example “some / numb”.

6. Alliteration awareness: This subtest required the participants to silently read nine words and match those that started with the same sound but differing grapheme representation, for example “gentle / joke”. There were three pairs and one set of three to match.

Video Coding Description

All teachers in the PD+C and PDOnly groups were video recorded reading two storybooks of their choice to a small group of children in week one, with only the second video being used to account for first video nervousness, and again prior to the PD session in week nine. The videos were coded in order to categorize the extra-textual utterances made outside of the storybook text being read to the children. The teachers were requested to read the book as they would normally. Ten teachers were chosen at random (5 from PD+C and 5 from PDOnly) to have their videos coded.

4.4.2 Coding.

A coding scheme was used to categorise the extra-textual utterances (utterances made outside of the text of the storybook) teachers incorporated into their storybook reading. The coding scheme, shown in Table 4.2, was adapted from those used by Piasta, Justice, McGinty

and Kadervek, (2012); Price, Bradley, and Smith, (2012); and Zucker, Ward and Justice (2009). This coding scheme was specifically developed to capture the number of content and literacy skill related extra-textual comments teachers used. Content-related utterances referred to the story (e.g. “*The ducks are there.*” “*Do you like ducks?*”), whereas literacy-related utterances referred to the text, letter/word sounds in storybooks (e.g. “*That word says ...*”; “*Those two words start with the same sound .. jiggle, giant*”).

PD Intervention (PD+C and PDOnly groups)

Following the baseline phase of assessments (week 9) PD+C and PDOnly groups participated in a ninety-minute professional development event. Each EC centre received their professional development at their own centre. The professional development covered three areas: 1. Phonological awareness knowledge using the teachers’ responses to the test as stimuli for discussion; 2. Grapheme-phoneme connections and correct articulation of phonemes; and 3. Incorporating phoneme awareness into storybook reading activities. Details are provided in Table 4.2.

Table 4.2
Extra-textual comment codes made by EC teachers during storybook reading.

	Code	Description
Content	C/Q	Comment/Question: Teacher makes a comment or asks a question relating to the book content
	B	Background: The teacher makes a comment or asks a question that links the story to some prior event or knowledge of the child
	O	Other: Gesture to enhance vocabulary understanding e.g. points to the picture or picks up an object relating to the story
	A/N	Agrees / Disagrees affirms or disagrees with the child without expanding e.g. “you’re right.” “I don’t think so”
Literacy	P	Point to text: Teacher points to the words as they read.
	T	Literacy text: Teacher comments or asks a question about the words/text
	S	Letter/ Sound: Teacher says something relating to the letter name or letter sound
	E	Environmental: Teacher comments on book language or literacy activity
Behaviour	BM	e.g. asking children to be quiet, sit still.

4.4.3 Phonological awareness knowledge

For the first forty-five minutes of the PD event, the verbal phonological awareness test form B was administered and then marked with open discussion of the participants' answers. The discussion and teaching involved the following:

A discussion about the syllable level of words (section 1) which focused on gaining agreement on the definition of “syllable”, how words have rhythm, intonation, and stress patterns. There was also discussion on the assumed skills required to complete the task and these included the ability to “hear” the syllables, one-to-one matching and counting of the syllables, and the ability to hold information in short-term memory.

The phoneme level tasks discussion (subsections 1, 2, and 3) included discussion on a definition of “phoneme” and the use of Lonigan’s (Phillips, Clancy-Menchetti, & Lonigan, 2008) model to discuss the participants’ segmentation level, according to the continuum of phonological awareness and linguistic complexity.

Participants were encouraged to reflect on their answers and their own theoretical understandings of language development, language structure, and children’s early literacy development. Other terminology, for example “onset and rime” was introduced and discussed. For subsections 5 and 6, the discussion focused on comparing the written and verbal forms of words and how word origin impacts on the pronunciation. The teachers were asked to think about the verbal and written presentations of the tests and to comment on which form of the test they felt more confident completing.

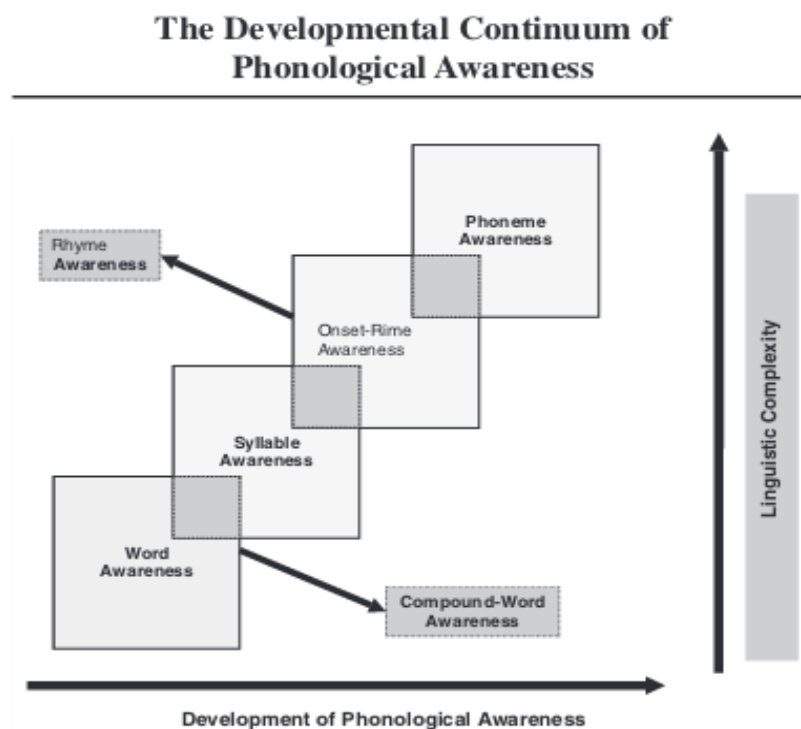


Figure 4.2 Development of Phonological Awareness Model

(Phillips, Clancy-Menchetti, & Lonigan, 2008). Copyright Guilford Press. Reprinted with permission of The Guilford Press

Grapheme-phoneme knowledge: The next fifteen minutes of the PD event focused on how each consonant sound is produced and correctly pronounced. Particular focus on voiced

and unvoiced pairs of consonants, sound development for New Zealand children, and children's typical sound substitutions were examined.

Integrating phonological awareness into storybook reading: The last thirty minutes of the PD session focused on strategies for incorporating explicit phonological awareness activities within ECC storybook reading times. The teachers had examples of phonological awareness activities demonstrated to them by the first author. Examples included commenting on words that rhyme, pointing to text and commenting on sounds that words start with, and playing segmenting games with the teachers, segmenting the names of items in the illustrations and for the children to point to. The teachers were given the opportunity to practice these activities with a partner for ten to fifteen minutes. Feedback was provided by the researcher and peer feedback times were actively built into this part of the session.

All PD sessions were audiotaped. An independent coder using the PD Session Plan checked for consistency of topics covered across sessions, and time spent on each topic section. The independent coder verified that all topics were covered in all sessions in a very similar way, with some variation of the examples used. Time allocations for each section varied by up to five minutes, with the greatest time variation being for the administration and discussion of the participants' test results. The latter was between forty-four minutes and forty-nine minutes duration.

Individual Coaching (PD+C group only)

Following the PD, only the teachers in PD+C group received coaching. This involved four individualised coaching sessions for each of the nineteen teachers in this group. The four sessions were implemented over a ten week period. The teachers were both observed and video recorded reading a storybook of their choice with a small group of children. Each session was approximately twenty to thirty minutes duration, and followed a format of the researcher and teacher looking at the book and the teacher giving the researcher information

on what aspect of PA she was looking for feedback on. Feedback included demonstrating different phonological awareness activities, facilitation of reflective discussion and the use of the video to scaffold feedback. The teacher and researcher then discussed further book reading sessions and set agreed goals for the teacher to work on, for example, as a game at the end of the storybook to segment simple words that had been read within the story for the children to blend back into the word. PDOnly did not receive any further PD or coaching during the ten week period when PD+C received the coaching.

4.4.4 Reassessment

At week nineteen, all three groups were reassessed using the verbal phonological awareness test A. Following the completion of this stage of the study, the Control group then received the same professional development event as PD+C and PDOnly groups, but these results are not reported. The EC teachers in PD+C and PDOnly were video recorded again with a small group of children reading a storybook of their choice.

4.5 Results

4.5.1 Teachers' questionnaire results

The questionnaire results were collated. In response to how frequently they read professional materials directly related to reading and writing development, teachers indicated a variety of amounts of time, from one teacher who indicated that they read once or twice, with the majority indicating that they read professional materials once a month or less.

Table 4.3

How frequently do you read professional materials directly related to reading and writing development in preschool children?

Number of teachers	Frequency of reading
1	once or twice a week
3	once a fortnight
11	at least once a month
14	once or twice a year
13	rarely
1	no answer

Some participants noted that they read a variety of materials from research in peer-reviewed published journals, such as *Early Childhood Folio*, while the majority indicated that they mainly read material published by the Ministry of Education (e.g. the *Gazette*).

For Teachers' Beliefs About Literacy Questionnaire (Westwood et al., 1997), the TBLAQ Part II was used. This part of the survey contains twenty-four descriptors of literacy beliefs, coded to a five-point rating scale from 1 (high agreement) to 5 (low agreement). For this research, only the scale of level of agreement was used regarding each descriptor for literacy acquisition. The items were identified as having either a top-down child-focused or a bottom-up theoretical stance, and were then clustered into groups accordingly. It was assumed that if a teacher identified agreement with a given theoretical model, they would adopt instructional methods from that theoretical stance. If there were teachers that chose practices from both the top-down and bottom-up questions, then it was assumed that they would adopt a mixed or interactive theoretical stance.

Table 4.4 shows the mean, median and standard deviations score for the cluster of eight items for the top-down, child-focused model. A low average score of three meant that

the participants were in agreement with top-down literacy-related practices. Respondents' scores across the eight items averaged 3.12, which indicated agreement on the 5-point scale.

Table 4.4

Descriptive statistics from top-down items on the TBALQ of early childhood teachers

Item descriptor	Sum	mean	range	sd
#1 difference in skills	141	3.28	2 - 5	1.05
#2 spell naturally	131	3.05	1 - 5	1.05
#3 word study undesirable	128	2.98	1 - 4	.801
#5 learning to read	138	3.21	2 - 5	.999
#9 no direct phonics	146	3.40	1 - 5	.821
#11 proficient reader	129	3.00	1 - 4	.926
#19 spelling learned	101	2.35	1 - 5	.813
#22 visual spelling	161	3.74	2 - 5	.539

The bottom-up descriptors are the practices most associated with teacher control and direct instruction. The total scores, mean, range, and standard deviation scores for the cluster of items associated with bottom-up literacy approaches are shown in Table 4.5. For these sixteen items, the mean score was 2.71, placing them in the low agreement range. The last item (#25) asked teachers to rate on a 1-7 scale where they believe their own position would be concerning how the first stages of reading and writing should be organised for young children. The scale is from child-centred (unstructured - immerse the child in stimulating reading/writing environment) to teacher-directed (highly structured - directly instruct the child in component skills for reading/writing). The ratings are shown in Table 4.6 which also shows the overall mean of 5.16, indicating that this group of early childhood teachers indicated that they thought beginning literacy should be taught in a more formal and structured way than unstructured.

Table 4.5

Descriptive statistics from bottom-up items on the TBALQ of early childhood teachers

Item descriptor	Sum	mean	range	sd
#4 teachers select books	135	3.14	2-5	1.05
#5 attending to print	138	2.31	2 - 5	.989
# 6 flashcards for drills	140	3.26	2 - 5	1.01
#7 Teach phonics early	92	2.14	1 - 5	.804
#8 controlled vocabulary	126	2.93	2 - 4	.704
#10 isolation of sight vocab.	120	2.79	2 - 4	.742
#12 specific skills	99	2.30	1 - 5	.860
#14 teacher choose the spelling list	150	3.49	2 - 5	.798
#15 test spelling regularly	110	2.56	1 - 4	.881
#16 use of spelling lists	127	2.95	1 - 5	.844
#17 invented spelling	144	3.35	2 - 5	.973
#18 transfer of list spelling	112	2.60	1 - 5	.955
#20 sounds in spelling	89	2.07	1 - 4	.884
#21 PA predicts spelling	100	2.33	1 - 4	.778
#23 specific spelling time	115	2.67	1 - 5	.892
#24 direct spelling instruction	112	2.60	1 - 5	1.07

Table 4.6

Continuum ratings for top-down and bottom-up teaching of early childhood teachers (%)

1	2	3	4	5	6	7	mean
(un- structured)						(highly structured)	
0 (0)	0 (0)	2 (3.3)	10 (16.7)	14 (23.3)	13 (21.7)	4 (6.7)	5.16

Six teachers indicated that they assessed literacy through observation and recorded this in the children's "Learning Stories". Four teachers indicated that they informally assessed the PA skills of the children.

When asked to write about what they understood the terms 'phonological awareness' and 'phonics' to mean, there was a large variation in answers. These were coded on a 0 to 3 scale against set definitions by two independent coders and checked for coding reliability (Kappa was calculated to .86 for PA coding and .89 for phonic definition coding). The codes were as indicated in Table 4.7, with 0 being judged as an incorrect answer and 3 being a correct answer. As shown in table 4.7, more teachers were able to articulate the definition of phonics compared to a definition of PA.

Table 4.7

Percentage of teachers' answers to what does the term PA and phonics mean on a scale of 0 to 3

Definition		Phonological Awareness	Phonics
Percentage of teachers correct			
incorrect	0	17	14
	1	48	3
	2	28	14
correct	3	3	38

4.5.2 Teachers' phonological awareness knowledge during baseline phase.

The results were analysed to examine the teachers' phonological awareness performance on written and verbal presentations on the phonological awareness tasks prior to

PD. There were no significant correlations between any of the questionnaire answers and the teacher's scores on the first PA test.

Bivariate correlations were computed among the four baseline PA tests, using the teachers' PA scores. The results suggested there were strong positive correlations between all four tests that were greater or equal to $r = .75, p < .001$. The magnitude of the correlation between written test A and B and between verbal test A and B was not statistically significant ($Z = 1.19, p = .23$).

Table 4.8
Pre-professional development mean performance on phonological awareness tests (with Standard Deviations in Parentheses)

	Verbal A	Written B	Written A	Verbal B
PD + Coaching	23.11 (3.91)	21.74 (4.07)	21.37 (3.95)	23.84 (4.18)
PD Only	22.00 (4.86)	22.73 (5.39)	21.82 (5.02)	22.73 (3.88)
Control	22.42 (5.27)	21.58 (4.60)	21.42 (5.60)	22.64 (5.70)
Total Group	22.62 (4.49)	21.95 (4.60)	21.50 (4.63)	23.22 (4.48)

Raw scores out of 40.

A series of one way ANOVA (SPSS version 20) showed no significant difference between the three groups on the verbal test A, $F(2,39) = 4.599, p = .804$; written test B $F(2,39) = .208, p = .813$ written test A $F(2,39) = .763, p = .967$; and the verbal test B $F(2,38) = .332, p = .700$.

As there were no significant differences between the groups, a multivariate test was performed to evaluate the two different test forms. There were significant differences between the test versions A and B ($\Lambda(1, 40) = 15.73, p = .001$), but there were no significant differences by time ($\Lambda(1, 40) = .104, p = .749$). However, the interaction of test version and time was approaching statistical significance ($\Lambda(1, 40) = .3.69, p = .062$).

Paired t-tests showed that there were no significant differences between the test versions A and B when both were presented verbally, $t(40) = 1.478, p = .147$. A paired t-test showed there were no significant differences between the test versions A and B when presented in the written form $t(41) = 1.146, p = .259$. In contrast, the paired t-tests showed a significant difference in the mean scores between the test A verbal presentation and the written presentation of test A $t(40) = 2.685, p = .011$. There was also a significant difference between the verbal presentation of test B and the written presentation $t(40) = 3.291, p = .002$. The data indicated that the teachers found the verbal version of both A and B easier than the written version of A and B. During informal discussion during the PD session, most teachers indicated that they thought they would have performed more highly on the written test versions as they thought the written words were helpful.

While the total test scores were shown to be consistent, further investigation of the data showed that the teachers were inconsistent with their answers. For example when the answers for “What is the second sound in ...” were examined and coded as to the rule demonstrated by the response i.e. for “what is the second sound in *bride / broke*”, if a participant wrote ‘r’ it was coded as correct; ‘ri’ / ‘ro’ coded as incorrect consonant vowel; ‘ride’ / ‘roke’ coded as incorrect rime unit, etc. The participants' codes were then examined for consistency of rule use and then correct rule use over the four baseline test presentations, as shown in Table 4.9.

Table 4.9

Consistency of rule use over the four baseline test presentations of the Subtest “What is the second sound in...?”

Word	Number of respondents	No Consistent rule used	Consistent rule use	Consistent correct rule use
bride / broke	40	24	15	1
whim / white	41	24	10	7
scream / scrub	40	27	10	3
bought / bought	41	19	13	9
queen / quack	40	27	13	0
thrive / throne	40	27	10	3

4.5.3 PD Intervention Phase.

The data were analysed to explore the effects of the professional development on the participants’ performance on the PA tasks. The results of the total group on the verbal presentations over time, (week 1, week 9 (pre-intervention) and week 19 (post intervention)) were examined. Repeated measures ANOVA showed that there was a significant group effect over time ($\Lambda(6, 66) = 4.35, p = .001, \text{power} = .973$) but this was not a linear change.

Wilks Lambda post hoc analysis showed that there was a within-subject change over time $F(4, 66) = 4.350, p = .001$, but this was not a linear change and Levene’s Test was again not significant. Post hoc analysis showed no significant difference between the three groups at time one $F(2, 39) = .220, p = .804$, nor at time two $F(2, 38) = .332, p = .720$. However, at time three post-PD, there was a significant difference between the three groups $F(2, 35) = 7.775, p = .002$, as shown in Figure 4.3

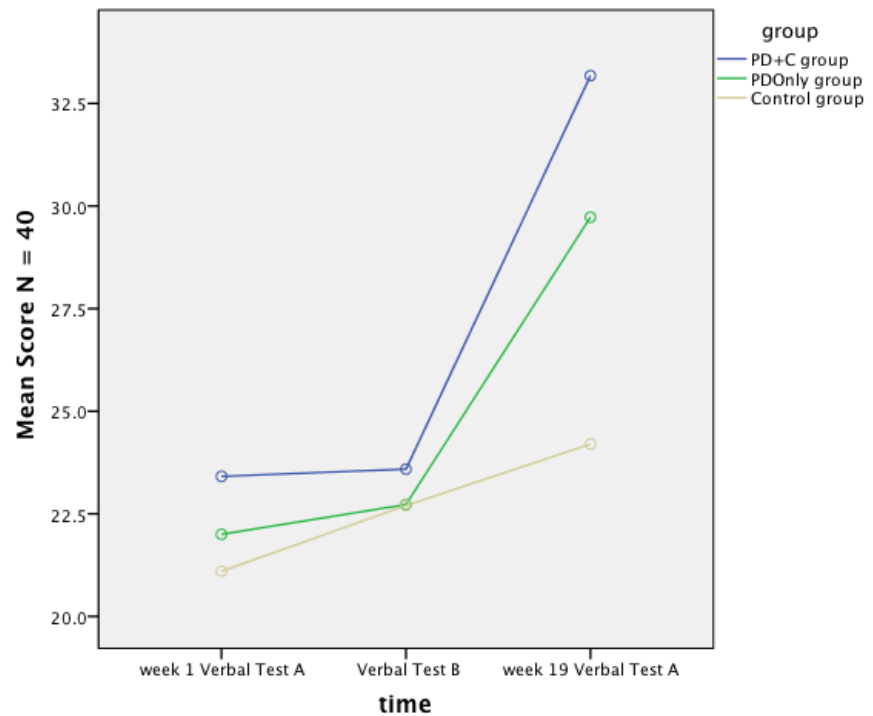


Figure 4.3. Comparison of the mean scores of the PA test across three time points.

Post hoc analysis using Bonferroni showed a significant difference between PD+C group and the Control groups $F(2, 35) = 7.775, p = .001$. However, there were no significant differences between PD+C and PDOnly groups $F(2, 35) = 7.775, p = .383$, or PDOnly and Control groups $F(2, 35) = 7.775, p = .1$.

4.5.4 Effect of professional development on storybook reading

Five teachers were randomly selected from each of the PD+C and the control groups. Their storybook reading videos filmed at weeks one, nine and nineteen were analysed using the predetermined coding scheme. Inter-rater reliability (IRR) was calculated for twenty-three per cent of the videos to evaluate the consistency of agreement of codes between two coders. Coding was completed independently. Cohen's Kappa was used to assess IRR for the categorical codes. Kappa ranged from 0.71 to 0.79 which, according to Lance and Koch (1977, cited in Hallgren, 2012) how substantial and reliable agreement. Disagreement

occurred with tag questions such as “It’s a dog, isn’t it?” when the speaker did not wait for a reply or spoke the question without a rising intonation pattern. As the storybooks used in the current study were chosen by the participants and differed in numbers of pages of text, the raw codes from the content/literacy-related skills coding scheme were transformed into a per page rate to provide an equivalent rate across all storybooks and teachers, as shown in Table 4.10.

Table 4.10

Five PC+C group and five control group teachers extra-textual content and literacy comments coded as comment to page ratio (with Standard Deviations in Parentheses)

	Baseline 1		Baseline 2		Post intervention	
	Week 1		Week 9		Week 19	
	Content	Literacy	Content	Literacy	Content	Literacy
Control	3.06 (1.23)	0 (0)	3.80 (1.29)	.02 (.04)	4.17 (1.98)	.01 (.03)
PD+C	2.07 (1.32)	.28 (.28)	2.19 (1.42)	.65 (.65)	2.74 (1.87)	1.99 (.08)

For the content extra-textual comments, the Mann-Whitney analyses showed no statistical differences between the PD+C and Control groups at baseline 1 ($U = 17, p = .421$) and 2 ($U = 20, p = .151$) or at post testing ($U = 17, p = .421$). For the literacy extra-textual comments, the Mann-Whitney analyses showed no statistical differences between the PD+C and Control groups at baseline 1 ($U = 12.5, p = 1$) and 2 ($U = 10, p = .690$), but a significant difference between the groups at post-intervention ($U = 0, p = .008$) with the intervention group using significantly more literacy comments following intervention.

4.5.5 Summary of results both PA knowledge and integrating storybook reading.

The teachers found the verbal test easier than the written test and PD+C and PDOnly groups who received PD improved their knowledge compared to the control group although the difference was only significant between the PD+C and control group. The teachers who received additional coaching had higher scores, this did not reach significance, suggesting the PD alone was equally effective in improving performance, as measured by the test. For the storybook reading, the teachers did not differ across time with the exception of the PD+C group whom increased their literacy comments, but did not decrease the number of content comments compared to the Control group.

Study Part 2

The second part of the study examined whether PD plus coaching was associated with any improvement in children's PA skills. The teachers in group 1 approached the caregivers of children in their centres aged between four years and four years six months with information regarding the study, and invited the caregivers to allow their children's speech-language and PA skills to be monitored over the 19-week period. Given that there were no comparison groups multiple measures of the children's PA skill in the baseline phase was implemented to allow for detection of an intervention effect. Eighteen children aged between four years two months and four years six months had completed consent forms, with two children not being included in the study due to poor attendance during the assessment phase. All children scored within one standard deviation of the mean on the Clinical Evaluation of Language Fundamentals (CELF-Pre) (Wigg, Secord, & Semel, 2006) and two were judged to have significantly delayed speech sound development on the New Zealand Articulation Test (Moyle, 2005).

The sixteen children from the teachers in professional development plus coaching group were assessed on the following PA tasks:

(1) The Preschool and Primary Inventory of Phonological Awareness (PIPA) (Dodd, Crosbie, McIntosh, Teitzel, & Ozanne, 2000), which has six subtests (syllable segmentation, rhyme awareness, alliteration awareness, phoneme isolation, phoneme segmentation, and letter knowledge) to assess children's phonological awareness between the ages of three years to six years eleven months. The PIPA was administered at weeks one and nineteen (see Table 4.11).

(2) The informal-structured Phonological Awareness probes (Gillon, 2000b), which are designed for monitoring children's PA progress over short time points. There are two subtests, each with ten items. The first subtest is a rhyme oddity task with the child identifying which word does not rhyme from three. The second subtest is an initial sound matching task. Test-retest reliability estimates and internal consistency reliability coefficients are >0.70 (Carson et al., 2013).

The teachers were asked to read a storybook using PA (for example talking about sounds, rhyme, syllables within the story context) to the identified children within their centres, at least four times a week as part of the intervention with the teachers completing a log of which children they read to.

4.6 Results – children

The data were analysed to examine the children's changing performance in phonological awareness and to ascertain whether there was any significant change in their performance in association with the period of time the teachers received professional development in PA instruction. Data collected by the teachers to verify that each child in the study was read a storybook at least four times per week showed that all children had received the required storybook reading experiences. The children's raw scores were used in the analyses. Non-parametric statistical tests were used to analyse the children's PIPA scores due

to the skewed distribution. The Wilcoxon Signed-ranks test of each PIPA subtest scores showed statistically significant differences pre- and post-test, as shown in Table 4.11 below.

Table 4.11

Children's subtest scores on the PIPA pre- and post-test

	Week 1 Pre test M (SD)	Week 19 Post test M (SD)	Z	d
Syllable segmentation	1.50 (1.37)	5.56 (1.79)	.001	2.63
Rhyme awareness	2.38 (1.59)	6.62 (2.25)	.001	2.25
Alliteration awareness	2.50 (1.51)	5.38 (2.58)	.003	1.41
Phoneme isolation	1.19 (2.81)	5.00 (3.86)	.001	1.17
Phoneme segmentation	.00 (.000)	1.06 (1.34)	.016	1.16
Letter knowledge	.88 (0.96)	5.69 (6.09)	.001	.84

M= mean; (SD)=Standard deviation; Z= statistical effect size; d = Cohen's effect size.

As shown in Table 4.11, the effect size for each of the PIPA subtests was found to exceed Cohen's (1988) convention for a large effect.

Table 4.12 shows the repeated multivariate analysis of the probes administered to the group of children, at weeks one, nine and nineteen. There was no significant difference between weeks one and nine for the rhyme oddity task, the phoneme matching, and total scores. There was a large significant difference between weeks nine and nineteen (i.e., the intervention period for teachers) for both the rhyme oddity and phoneme matching tasks. There were no significant differences when analysed for gender differences.

Table 4.12
Means and Standard Deviations of children's probe scores n=16
(with Standard Deviations in Parentheses)

	Week 1	Week 9	Difference between weeks 1 and 9	Week 19	Difference between weeks 9 and 19	<i>d</i> Difference between weeks 9 and 19
Rhyme	2.25 (.56)	2.63 (.47)	.564	6.13 (.57)	.001	7.88
Oddity						
Phoneme	3.0 (2.19)	2.94(1.17)	1.00	6.56 (2.34)	.001	1.65
Matching						

4.6 Summary of results

The children's raw scores on the probes did not differ significantly from weeks one to nine during the baseline phase, that is, before the teachers received PD and coaching. The children's probe scores were significantly higher at week 19 (that is, post teacher PD and coaching) compared to weeks one and nine, with large effect sizes evident. The children's PIPA scores were also significantly higher at week 19, compared to week one and again all subtests showed large effect sizes.

4.7 Discussion

This study was designed to investigate EC teachers' PA knowledge and the effects of two different PD models on the EC teachers PA subject content knowledge, and their ability to draw children's attention to sounds in words and print concepts during storybook reading. In addition a small group of children's PA development was monitored during the period in which the teachers' PA development was examined. Storybook reading with small groups of children is a common activity with both adults and children selecting storybooks. In this research all the books were selected by the teacher and research suggests that parents are more

interactive during reading sessions with a narrative book compared to reading an expository book (Robertson & Reese, 2015).

The first hypothesis examined was that EC teachers will show variability in their personal knowledge of PA and will be more accurate in a verbal context, without the distraction of the orthography to influence their responses. This was partially supported by the data. When tested, EC teachers' PA appeared to be relatively stable over the baseline period, based on their total test scores, however, the individual subtest responses suggest that there is a wide variation of responses within each subtest item, supporting hypothesis one. During the initial baseline testing, many EC teachers voiced that they did not know the answer, became perturbed that they could not remember how they had answered last time, and some questioned how to segment what a sound was. This perceived lack of knowledge has been documented by other researchers at the early childhood level (Crim et al., 2008; Cunningham, Zibulsky, & Callahan, 2009; J. Wilson & Colmar, 2008) but using only a single time point and written assessments of the teachers' knowledge.

For this study, there was no significant difference over time but a significant difference between written and verbal presentations of the same test. This finding was consistent with Moats (2009a) suggestion that teachers report feeling unprepared and voiced their lack of understanding of the reading process. It could be argued that the EC teachers' difference in written and verbal presentation scores may be based on the EC teachers' confusion of grapheme–phoneme correspondence/mapping, as shown in the Spencer et al. (2008) study. Alternatively, it may be the English orthography and teacher knowledge of spelling rules that overrode the sound structure for these teachers within the written test format. This would be consistent with research suggesting that the more transparent the orthography, the greater the accuracy in identification of phonemes (Spencer et al., 2008). However even with direct grapheme-phoneme matching, the EC teachers demonstrated

inconsistency between test presentations (for example, when asked how many sounds in the word “flag” or the alternate “flop” one participant wrote three sounds in test 1, one sound in test 2 and 3 and 2 two sounds in test 4 across the baseline phase).

Binks-Cantrell, Washburn, et al. (2012) suggested that a possible explanation for teachers’ variable performance on basic language constructs is that the teachers themselves lack the knowledge due to the “Peter Effect”, that is how can we teach what we don’t know. Although the term “Peter Effect” is a relatively recent one, the literature concerning the lack of teacher knowledge in the language and literacy domain has been growing over the last decade for teachers in the compulsory education sector (Cunningham et al., 2004; Fielding-Barnsley & Purdie, 2005; Lyon & Weiser, 2009; McCutchen et al., 2009; Moats & Foorman, 2003; Stanovich & Cunningham, 1993), and more recently for those in the early childhood sector (Crim et al., 2008; Cunningham, Zibulsky, & Callahan, 2009; Lonigan & Shanahan, 2010; McLachlan, 2010; McLachlan & Arrow, 2010). The teachers’ inability to articulate the definitions of PA reinforced the lack of knowledge.

The second hypothesis, that the professional learning and coaching model will be more effective than a traditional PD model in enhancing EC educational personal PA abilities, was also partially supported. The Best Evidence Synthesis Iteration: Teacher Professional Learning and Development (BES) (Timperly et al., 2007) posits that, in the main, single PD sessions or workshops are not as effective for student learning outcomes as PD with on-going learning opportunities. Single PD sessions often involved external expertise, such as a researcher, and the BES (2007) suggested that there was little evidence that these sessions have a positive effect on teaching practices or impact on student outcomes. The exception to the less effective single PD session outcomes was where the single PD session focused on a narrow goal or goals, often subject content knowledge that was linked to the participant’s teaching. In this study, the focus on improving the teachers’ PA was a narrow subject content

goal for both the PD+C and PDOnly groups. The wider goal of implementing an increased number of extra-textual literacy based comments was only tracked for the PD+C and control groups therefore, further research will be required to evaluate the PDOnly implications for pedagogical and content knowledge change.

Atkin (2008) suggested that there are four stages that teachers journey through to become reflective teachers. At the tacit level is the prior knowledge of practices teachers think may be effective, which are then built upon in the explicit knowledge strategy stage. In this stage, teachers often look for the ‘simple solution where someone else has the answer’, so teaching is by a plan, following the pre-determined steps. At this stage, if a teacher is challenged, that is when a teacher questions their own knowledge and theoretical understanding - this is what Atkin terms an “ouch moment”. Atkin posits that for effective PD, there has to be an ‘ouch’ moment, (moments to challenge participants' current practice or level of understanding), to allow the teacher to reflect on their practice at a deeper level and bring about change as part of the final two levels of reflective practice. Within this study, the PA tests and PD provided the challenging material to stimulate new learning and practice, with many of the teachers voicing their lack of understanding of PA and commenting on how little they perceived that they knew about PA and emergent literacy.

The coded videos of the EC teachers’ storybook reading investigated the use of literacy/content extra-textual comments and some judgments about the number of extra-textual literacy comments were made. There was a significant increase in print referencing and literacy-based comments and questions in the PD+C group, compared to the Control group. The longitudinal study conducted by Piasta et al. (2012) indicated that increasing print references (both verbal and non-verbal) had measurable positive effects on children’s early literacy skills. Teachers in the PD+C group commented in post-assessment discussions that the PD and coaching had encouraged them to implement PA and print referencing in wider

activities outside of storybook reading. However, those teachers in the PDOnly group commented that, on reflection, they had initially attempted to increase textual-based comments but they had not maintained their commenting. One of the difficulties experienced by the transcribers was the level of background noise in the recordings. This ambient noise level was high, with the noise of other children, music playing etc., and this meant that on a number of occasions the recordings had to be listened to many times to decipher what either the adult or child was saying.

The Control group's PA did not improve significantly over time and their storybook reading style differed from the PD+C groups' style, with the PD+C teachers implementing more literacy-focused extra-textual comments post-PD and coaching and the children's PA scores improved. This supports Carlisle et al. (2009) research, which found a lack of significant association between teachers' knowledge and students' improvement in reading. They suggest that investigating both subject content knowledge and also the subject pedagogical knowledge, as well as observation of actual teaching practices, aligns with student achievement.

The third hypothesis tested in this study was that improved early childhood teachers' PA will be associated with improvement in children's PA skills. This hypothesis was supported for the PD+C group with the children's PA development, as measured by the assessment probes, increasing significantly over the teachers' intervention period, compared to stable performance during the baseline phase. Further investigation of both subject content knowledge alone and the subject pedagogical knowledge, with observation of actual teaching practices and how they align student achievement, is warranted. Several teachers commented during their coaching sessions that there were some study children that rarely came to storybook reading sessions and that they had to take the storybooks to where the children were playing, (e.g. outside), to meet the required number of book reading sessions.

The results of this study also align with Guo, Justice, Kaderavek, and McGinty (2012) investigation of the literacy environment, which further reinforces the notion of high quality language and literacy interactions within the environment that help foster children's learning. In their study, even within a literacy-rich preschool environment, there was a lower rate of literacy growth for children if there was low quality instructional support.

By video recording and coding the small sample of EC teachers, we were able to investigate the use of literacy/content extra-textual comments and make some judgments about the number of extra-textual literacy comments being made. PD was successful in improving teachers PA knowledge and the PD+C group did, on average, score higher than the PDOnly group, but this was not statistically significant. The Control group's PA did not improve significantly over time and their storybook reading style differed from the PD+C groups' style, with the PD+C implementing more literacy-focused extra-textual comments post-PD and coaching.

4.8 Conclusion

This research explored EC teachers' PA content knowledge and found that it was highly variable and influenced by the type of test format used. Teachers performed better on phonological awareness assessment tasks when the tasks were verbally administered. Both single PD sessions and PD plus coaching are effective in significantly improving teachers' personal phonological awareness knowledge. PD plus Coaching may be a useful method to support teachers transferring their improved PA skills to natural teaching situations, which in turn may lead to improved performance in young children's phonological awareness development. Continued research is necessary, utilising a larger number of participants and directly comparing differing PD models on children's phonological awareness development, to provide further evidence of effective practices in early childhood educational settings.

Considering the results of this research the next chapter investigates the knowledge and PA skills of teachers in the early years of formal literacy instruction.

Chapter 5: Classroom teachers' phonological awareness.

5.1 Introduction

There is strong agreement and recognition among researchers that explicit instruction in how word recognition occurs, and how to apply phonological awareness and letter-sound correspondence, are crucial underpinnings to literacy teaching (Al Otaiba, Puranik, Ziolkowski, & Montgomery, 2009; Justice, 2006; J. M. Pentimonti, 2011; Wagner & Torgesen, 1978). In the previous chapter of this thesis it was established that early childhood teachers had varying PA knowledge and this knowledge was not stable over time within written and verbal presentations of the same PA test. The research in this chapter is the study of forty-four New Zealand primary teachers' PA over time, comparing their knowledge to demographic and questionnaire responses to gauge their knowledge of PA, and their use of PA within the typical classroom setting. Investigating the baseline knowledge of New Zealand teachers will help provide a platform to inform professional development needs.

5.1.2 Teacher knowledge of phonological awareness and classroom phonological awareness practices

As described in Chapter 2, New Zealand classroom teachers have wide and varying knowledge of PA. There has long been a whole language top-down focus on reading instruction, as evidenced by the Ministry of Education's literacy resources supplied to all primary schools and online (Tunmer, Greaney, & Prochnow, 2015). Research suggests that instruction in small phonological units (e.g., phoneme level) improves the awareness of larger units, such as syllables and rhymes (Yeh, 2003). However, it is important that a teacher has sufficient knowledge to be able to successfully scaffold a teachable moment outside of the PA program's allotted time (Al Otaiba et al., 2008), to allow for children to be aware of the

interconnectedness of the literacy instruction across the curriculum, which will increase the awareness of words and metalinguistic abilities (Ehri, 1991).

5.1.3 Professional development compared to use of structured programs

Research conducted outside of the classroom has proven the effectiveness of a structured PA program for children at risk of literacy difficulties (McNeill et al., 2009a). More recently, a structured program modified for the classroom showed the effectiveness of four intensive thirty minute blocks per week, to a total of twenty hours of whole-class PA instruction (Carson et al., 2013). Considering the variability of New Zealand teachers' PA, it is not known if providing PA professional development without the structured program would prove to be beneficial for children starting formal literacy instruction.

It is hypothesised that:

1. Primary teachers will demonstrate variability in their professional reading and favour a more whole language than structured approach to literacy instruction on the Teachers' Beliefs About Literacy Questionnaire.
2. Teachers will show variability in their personal knowledge of PA and will be more accurate in a verbal context without the distraction of the orthography to influence their responses.

5.2 Methodology

5.2.1 Participants

Sample data was obtained from forty-four teachers based in eight schools in either one medium-sized city or one larger city in the South Island of New Zealand. The teachers were requested to fill out a questionnaire that detailed demographic information and some beliefs about literacy development and subject knowledge (the TBALQ), their knowledge of PA / phonics and classroom practices, in week one alongside the verbally presented PA test A

There was a spread of decile ratings that ranged from low to high and a range of participating teachers across the decile ratings as shown in table 5.1.

Table 5.1
Number of teachers participating by school decile rating.

	School decile rating				
	2	3	5	7	10
Number of schools	1	1	2	1	3
Number of teachers	6	9	8	2	19

All forty-four teachers (40 female and 4 male) completed the demographic data that showed that forty-two participants taught in the junior part of the school (that is, with children aged 5-to-7-years) and the other two teachers taught children aged between seven and eleven years of age at one participating small school that wanted the whole staff to participate in the professional development. There was a mix of part-time classroom teachers (27%), who indicated they did specialist teaching, teacher release, or job-share, and full-time teachers (73%). Many teachers (45%) noted that they had “special responsibilities”, such as coordinating transition to school, and team/syndicate leadership.

Of the forty-four teachers, forty-three indicated their total years of teaching service, as described in Table 5.2, with the majority having more than five years of teaching experience. Forty-one of the teachers were fully registered teachers, while three were provisionally registered. All questionnaire data was double entered to ensure accuracy of data entry.

Table 5.2
Teaching experience.

	Years of experience				
	0 - 5 years	6 -10 years	11–15 years	16-20 years	21+ years
number of teachers	5	9	11	9	10

The teachers were asked if they spoke more than one language fluently and three indicated that they did, with languages such as Māori or Samoan being their fluent language in addition to English. Some teachers had post-graduate qualifications (16%) and thirty per cent of the participating teachers were trained in Reading Recovery. When asked how frequently they read literacy-related professional materials, twenty-eight per cent indicated that they would read such material at least once a fortnight or more, with seventy-two per cent indicating that they would read monthly or less. The teachers stated that they read Ministry of Education curriculum support materials and accessed information on *TKI/Te Kete Ipurangi* (the bilingual portal for NZ teachers which provides educational material) more than material from other sources (for example, research articles).

5.3 Measures

All the teachers, with the exception of one who was called away, completed Part II of the *Teachers' Beliefs About Literacy Questionnaire (TBALQ)*, (Westwood et al., 1997), See Chapter 4 for a full description of this questionnaire as well as questions relating to definitions of PA and phonics and the teachers classroom practices. The format then followed that portrayed in Figure 5.1 with written test formats and the last session in week nine then had the verbal test B and a professional development session the same as that outlined in chapter 4 of this thesis.

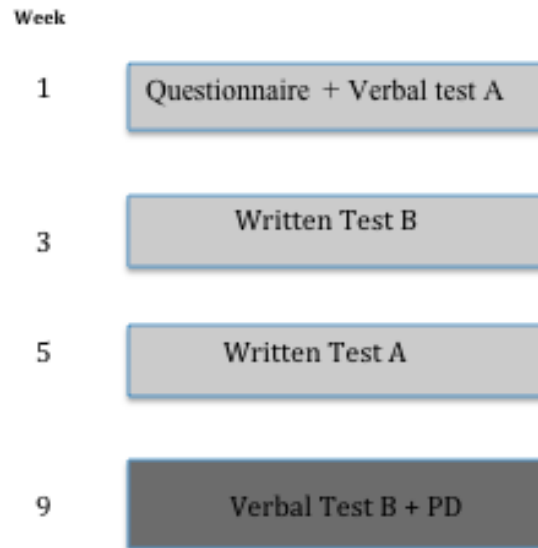


Figure 5.1 The format of the study's assessments over nine weeks

The PA test Version A was an adapted version (with the authors' permission) of the "Teachers Phonological Awareness Test" (Love & Reilly, 1995) to allow for the vowel variation between Australia and New Zealand. This was the same Test as that used in the teacher (Carroll et al., 2012) and reported in Chapter 2 and 4 of this thesis. The second form of the test (Version B) was developed by the first author to parallel version A and allow for multiple testing over time (see Appendix A and D for both test versions). The participants were given both test A, and the alternative form B as a written presentation and as a verbal presentation.

The presentation of the tests was in the above order, so there were no presentations of the same test back to back. All forms were checked and double entered into a spread-sheet for analysis. Forty-percent of the PA tests were randomly selected and checked by an independent rater who had 100% agreement with the first marker. The questionnaire data was also double checked (100% agreement) and double entered for accuracy

5.4 Results

5.4.1 Data analysis

Data related to the PA tests and Teacher Beliefs About Literacy Questionnaire were analysed using a combination of descriptive and inferential techniques. Statistical analyses were accomplished using IBM, version 22 Statistical Packages for the Social Science (SPSS). All answers were checked by a second person and there was 100% agreement.

5.4.2 Results of the Teachers' Beliefs About Literacy Questionnaire (TBALQ).

The TBALQ items were then sorted into questions that reflected top-down beliefs (i.e. more whole language based instruction) and bottom-up beliefs (i.e. more structured skill based instruction).

Table 5.3 shows the mean, median and modal scores for the cluster of eight items for the top-down, child-focused model. A low average score of less than three meant that the participants were in agreement with top-down literacy-related practices.

Respondents' scores across the eight items averaged 3.34, which indicated a slight skew towards low agreement on the 5-point scale. Two of the items were in the agreement range (item #5: *Learning to read should involve attending closely to the print on the page* and item #19: *Spelling is best learned incidentally*) with modes of 2 that indicated an agreement with top-down approaches. The other items: #1 (*There is very little difference in the skills needed by beginning and proficient readers*); # 2 (*Children learn to spell in the same natural way they acquire oral language skill*); #3 (*Devoting specific time to word study in isolation is undesirable*); #11(*Proficient readers pay very little attention to details of print when reading*); and # 22(*Learning to spell depends almost entirely on vision*) all had modes of 4, indicating disagreement with the statements and a skew towards teaching with bottom-up approaches.

Table 5.3
Descriptive statistics from top-down items on the TBALQ of 43 teachers

Item descriptor	Sum	mean	range	sd	mode
#1 difference in skills	145	3.37	1-5	1.196	4
#2 spell naturally	133	3.09	1 - 5	.996	4
# 3 word study undesirable	138	3.21	1 - 5	1.10	4
#5 learning to read	99	2.30	1 - 5	1.08	2
#9 no direct phonics	180	4.19	2 - 5	.664	4
#11 proficient reader	141	3.28	1 - 5	1.09	4
#19 spelling learned	116	2.70	1 - 4	.964	2
#22 visual spelling	164	3.81	2-5	.699	4

The bottom-up descriptors are the practices most associated with teacher control and direct instruction. The total scores (sum) of all the participants, mean, range, standard deviation and modal scores for the cluster of items associated with bottom-up literacy approaches are shown in Table 5.4. For these sixteen items, the mean score was 2.61, placing them in the moderate to high agreement range. Two of the four items that addressed the spelling instructional practices of using lists (#16: *The use of spelling lists is essential for learning how to spell*; #18: *Words learnt in spelling lists are generally transferred successfully to children's writing*) placed on the low agreement side, with modal scores of 4, with # 17 (*Children's use of invented spelling reinforces bad habits*), a reverse polarity item for which agreement indicated that the use of invented spelling supported bad habits. The last spelling instruction item (#15: *Teachers should regularly test spelling*) had a mean of 3.05, but a mode of 2. Looking at the data, this item was almost bi-modal with 2 indicated by seventeen teachers and 4 indicated by fifteen teachers

Table 5.4
Descriptive statistics from bottom-up items on the TBALQ of 43 teachers

Item descriptor	Sum	mean	range	sd	mode
#4 teachers select books	104	2.42	1-5	1.118	2
#5 attending to print	99	2.30	1 - 5	1.081	2
# 6 flashcards for drills	117	2.72	1 - 4	.908	2
#7 Teach phonics early	79	1.84	1 - 4	.652	2
#8 controlled vocabulary	104	2.42	1 - 5	.957	2
#10 isolation of sight vocab.	115	2.67	1 - 5	1.017	2
#12 specific skills	94	2.19	1 - 5	.932	2
#14 teacher choose the spelling list	115	2.67	1 - 4	.993	2
#15 test spelling regularly	131	3.05	2 - 5	.975	2 (4)
#16 use of spelling lists	140	3.26	2 - 5	.928	4
#17 invented spelling	143	3.33	2 - 5	.944	4
#18 transfer of list spelling	146	3.40	2 - 5	.929	4
#20 sounds in spelling	95	2.21	1 - 5	1.081	2
#21 PA predicts spelling	96	2.23	1 - 4	.812	2
#23 specific spelling time	110	2.56	1 - 4	.881	2
#24 direct spelling instruction	104	2.42	1 - 4	.957	2

The mean score ($m = 1.84$) showing the strongest agreement was for #7 (*Beginning readers should be taught phonics skills*), with the smallest standard deviation (.652). Strong agreement was also found on items #12 (*Study of separate skills such as comprehension, word recognition and phonics*); #20 (*Spelling involves careful listening to sounds within words*);

#21 (*Young children’s phonemic awareness skills predict their ability to learn to spell in the early years*) and #5 (*Learning to read should involve attending closely to the print on the page*). These items are all considered to be part of direct bottom-up literacy instruction.

The last item (#25) asked teachers to rate on a 1-7 scale where they believe their own position would be concerning how the first stages of reading and writing should be organised for young children. The scale is from child-centred (unstructured - immerse the child in stimulating reading/writing environment) to teacher-directed (highly structured - directly instruct the child in component skills for reading/writing). The ratings are shown in Table 5.5, which also shows the overall mean of 3.37.

Table 5.5
Continuum ratings for top-down and bottom-up teaching of 43 teachers (%)

1	2	3	4	5	6	7	mean
(un-structured)						(highly structured)	
2	6	15	15	4	1	0	3.37
(4.5)	(13.6)	(34.1)	(34.1)	(9.1)	(2.3)		

Overall the results of the TBLQ on the teachers’ beliefs suggest that these forty-three teachers do believe in a bottom-up instructional programme for literacy, but within a less structured, balanced teaching approach, rather than a highly structured program, which is strong in PA and phonics instruction. These results differ to some degree from the whole language top-down instructional approach that has been espoused by the New Zealand Ministry of Education.

5.4.3 Primary teachers’ phonological awareness knowledge.

The results were analysed to examine the primary teachers’ PA performance on written and verbal presentations on the PA tasks prior to PD. There were no significant

correlations between any of the questionnaire answers and the teachers' scores on the first verbally presented PA test.

Bivariate correlations were computed among the four baseline PA tests, using the teachers' PA scores. The results suggested there were strong positive correlations between all four tests that were greater than, or equal to, $r = .86$, $p < .001$. The magnitude of the correlation between written tests A and B and between verbal tests A and B was not statistically significant and Wilks Lambda post hoc analysis showed that there was no within-subject change over time $F(3, 40) = 1.950$, $p = .137$.

Table 5.6

Baseline mean, standard deviation and range of performance on phonological awareness tests

	Verbal A n = 44	Written B n = 43	Written A n = 43	Verbal B n = 43
Mean	29.18	29.14	29.98	29.02
SD	6.165	6.639	6.085	6.022
Range	17 – 39	16 – 39	18 - 38	16 - 38

Raw scores out of 40.

A paired-samples t-test was conducted to compare the different test forms. As shown in Table 5.6, there were no differences in the scores for test A when presented verbally or in the written presentation $t(42) = -1.854$, $p = 0.71$. There was no difference in the scores for test B between the verbal and written forms $t(42) = -.227$, $p = .821$. There was no difference between test A and B when both were presented verbally, $t(42) = .223$, $p = .824$, or in the written format $t(42) = 1.835$, $p = .074$. A multivariate test showed no statistical significance between the interaction of test version and time $F(4, 40) = 1.950$, $p = .137$; Wilks' $\Lambda = .872$. At baseline there was a non-significant correlation of $.057$ ($p = .718$) between the teachers' scores on verbal test A and TBQA question 25 on structured or direct teaching scale.

Descriptive analysis of the *what is the second sound in...?* subtest answer sheets for the teachers showed that over fifty per cent of the teachers were consistent over time with the rule they used for identifying the second sound in the six words presented.

5.4.4 Definitions of phonics and phonological awareness and classroom assessment.

For the questions *What do you understand the term phonological awareness to mean?* and *What do you understand the term phonics to mean?*, the teachers' answers were coded as 0 = incorrect answer, 1 = some aspects, 2 = several aspects, 3 = correct definition. The answers were independently coded by two trained coders. Calculation of kappa was performed, with kappa .82 for PA definition (in the "very good" range) and .76 for the phonics definition (in the "good" agreement range). Weighted kappa was also calculated to account for how far apart the rater-variability was and this was .87 for PA and .84 for phonics, placing both in the "very good" range of agreement. As shown in Table 5.7, the teachers were able to define *phonics* with greater accuracy than *phonological awareness*. There was a non-significant correlation of .160 ($p = .306$) between the teachers' scores on verbal test A and their phonological awareness definition, and a non-significant correlation of .031 ($p = .842$) between the teachers' scores on verbal test A and their phonics definition. When asked if they assessed PA, sixty-three per cent of the teachers said that they did, twenty-one per cent indicated that they did not, and sixteen per cent did not indicate either way. Of those teachers who indicated that they did assess PA, the majority assessed this using letter/sound relationship assessments or a commercially produced "Phonic Program" assessment.

Table 5.7
Percentage of teachers able to define phonological awareness and phonics

		Phonological Awareness	Phonics
0	no answer / incorrect	14	4.7
1	some aspects	30.2	4.7
2	most aspects	39.5	23.3
3	correct definition	16.3	67.4

In terms of activities that teachers used to support children's phonological awareness development, the most commonly described were songs, rhymes, modelling, sounding out, interactive computer games, shared writing, using alphabet cards to find the letters corresponding to the sounds, use of Jolly Phonics, and use of letter of the week.

5.5 Discussion

There have been several studies in the literature regarding the lack of teacher knowledge in the language and literacy domain (Cunningham et al., 2004; Fielding-Barnsley & Purdie, 2005; Lyon & Weiser, 2009; McCutchen et al., 2009; Moats & Foorman, 2003; Stanovich & Cunningham, 1993). The teachers' ability to more accurately define phonics, than phonological awareness also reinforces the lack of knowledge and confusion between these two different concepts.

The results of the TBALQ were surprising considering the whole language literacy instruction stance advocated by the MOE within New Zealand. It appears that there is a disconnect between the beliefs of teachers to have informal, natural spontaneous learning environments and their beliefs of the component teaching of literacy being important. This may be indicating that within this group of teachers a more balanced view of literacy

instruction is emerging with direct explicit attention to specific word-level skills as part of the reading for meaning instructional approach. There is a need for balance and for teachers to be able to explicitly connect these component skills into real authentic learning situations.

For this group of teachers, there were no differences between the PA total test scores tests over the four-administrations despite the different written and verbal formats. There was a non-significant trend of teachers scoring slightly higher on the written test, which is in contrast to the early childhood teachers' results where they scored significantly higher on the verbal presentation (see Chapter 4). This may possibly be due to the primary teachers' literacy teaching knowledge impacting on the written format, for instance, the use of spelling patterns or *word families* to decode. There were inconsistencies noted in segmentation of consonant blends with teachers more likely to keep the blend as one unit at the beginning of a word than if the blend was at the end of the word.

If there is confusion and inconsistencies within teachers, what is therefore being practiced in the classroom setting? Within New Zealand there is a move towards the use of *innovative learning environments* where teachers work collaboratively and often with several classes (MOE, 2016b). With collaborative teaching and the accompanying practices, this can either confirm current knowledge or provide the opportunity to learn from, and with others. The use of their PA test in the professional development session gave the teachers the opportunity to discuss and debate PA, their ideas, thoughts and practices and how others perceived the PA understandings. For several schools it was the opportunity for their learning community to collaborate on the next step of reflecting on their PA instruction within the school.

5.6 Conclusion

This research explored forty-four primary teachers' knowledge and beliefs about literacy and PA content knowledge. It was found that teachers' beliefs did reflect the use of

PA and phonics within the literacy learning environment but their knowledge was highly variable. For the PA tests, the teachers were not influenced by the type of test format used (i.e. verbal or written presentation) but did show variability on their answers. Continued research is necessary, utilising a larger number of participants to provide further evidence of effective practices.

What was not shown in this study was the teachers' use of PA in the classroom setting and if like their answers on the PA tests this varied across time and situation which will be explored with one teacher in the next chapter.

Chapter 6: Implementation of classroom-based phonological awareness.

Teaching phonological awareness (PA) coupled with letter-sound correspondence and how the two components are applied to word recognition, are critical to children's early literacy learning success (Al Otaiba et al., 2012; Arrow & McLachlan, 2014; Justice, 2006; Wagner & Torgesen, 1978). The research described in this chapter explores the effect of professional development on teacher phonological awareness and the use of explicit phonological awareness instruction and PA resources within a classroom programme.

Specifically, this chapter reports the results of the researcher working within the junior classroom of a small, low socioeconomic primary school with the new entrant/year one level teacher, within the spirit of *Ako*. The concept of *Ako* is described in Ka Hikatia (MOE, 2013) as a "teaching and learning relationship where the educator is also learning from the student and where educators' practices are informed by the latest research and are both deliberate and reflective" (p. 20). In this research, it was expected that the researcher would learn from the teacher and the teacher would learn from the researcher, and both would be influenced by the children's learning.

6.1.1 Classroom based phonological awareness

Previous classroom-based research on intensive PA and phoneme-grapheme instruction, such as that by Shapiro and Solity (2008), has shown significant and long-term literacy benefits. Shapiro and Solity (2008) study demonstrated a twenty per cent reduction in the prevalence of reading difficulties after two years of intensive PA instruction. Other studies have implemented shorter periods of PA instruction (that is, less than one year), such as those conducted by Fuchs et al. (2001); Justice et al. (2010); McIntosh, Crosbie, Holm, Dodd, and

Thomas (2007), but while there can be an immediate benefit for literacy post-intervention, the effects have not always been sustained in the long term.

New entrant classrooms are busy and in New Zealand they have new children joining the class (usually) on their fifth birthday throughout the year. Ensuring that children have the PA and alphabetic knowledge to support beginning-reading instruction is important (Kamhi & Catts, 2012) and by implementing PA (particularly at the phoneme level) within the classroom instructional program, may reduce the risk of literacy disabilities (Carson et al., 2013) and in turn lead to long-term benefits. Within education, *Response to Intervention* (RTI) is a framework that aims to reduce/prevent literacy failure, initially through effective first-teaching as a basic premise (Fuchs & Fuchs, 2006; Graner, Faggella-Luby, & Fritschmann, 2005). It is also based on teachers implementing evidence-based practices as a first strategy (Johnston, 2011; Justice, 2006), where children are monitored and at-risk children are identified and supported with supplementary teaching in a timely manner.

6.1.2 Teacher knowledge of phonological awareness and classroom practices

As described in Chapter 2, New Zealand classroom teachers have wide and varying knowledge of PA. There has long been a whole language top-down focus on reading instruction, as evidenced by the Ministry of Education's literacy resources supplied to all primary schools and online (See TKI website). Research suggests that instruction in small phonological units (e.g., phoneme level) improves the awareness of larger units, such as syllables and rhymes (Yeh, 2003). Therefore, it is important that a teacher has sufficient knowledge to be able to successfully scaffold a teachable moment outside of the PA program's allotted time (Al Otaiba et al., 2008), which will increase the awareness of words and metalinguistic abilities (Ehri, 1991).

6.1.3 Professional development compared to use of structured programs

There has been research outside the classroom that has shown the effectiveness of structured PA programmes for children with significant oral and written literacy difficulties (McNeill et al., 2009a). However, there has been debate in some education sectors about the use of narrow, experimental research paradigms, and whether these help classroom practices (Smith, 2000). Smith (2000) suggests that research paradigms do not match the classroom environment and are unable to be implemented and sustained over time to improve classroom practices. Recently, a structured programme, that was modified for the classroom, showed the effectiveness of an intensive program of four thirty-minute blocks per week, to a total of twenty hours of whole class PA instruction (Carson et al., 2013). Considering the variability of New Zealand teachers' PA, it is not known if providing PA professional development without the structured program would prove beneficial for children starting school. For example, in a study by Hadley, Simmerman, Long, and Luna (2000) of two classrooms where an speech-language therapist (SLT) worked within the classroom along with the regular teacher for half of the week embedding PA and vocabulary into instruction resulted in improved PA and vocabulary results for the children after the six month intervention compared to two control classes. An alternative perspective is whether teachers require resources to help their implementation of explicit PA instruction into the literacy program, rather than the use of incidental activities or structured programmes.

In New Zealand, Hughes (2013) in her Masters research involving forty-two primary schools in Dunedin, found that sixty-two percent of these primary schools were using a commercially produced package, with the predominant use being for phonics teaching. The use of commercially produced phonics programmes was linked, by the principals interviewed, to factors such as addressing the public debate on phonics teaching, reducing teacher workload, ensuring school-wide consistency of practice, increasing teacher pedagogical

content knowledge, response to the implementation of National Standards to New Zealand schools, debate on the whole language/phonics perspective of literacy teaching (Hughes, 2013), and school autonomy from MOE-produced literacy resources. This indicates that schools appear to be looking to address the difficulties of implementing PA / phonics into the classroom programme through the use of programmes rather than teacher knowledge.

A major difference between New Zealand and other countries is that in New Zealand there is no mandated literacy PA/phonics curriculum. There are statements encouraging the embedding of PA and phonics into the classroom programme, such as “deliberate and focused instruction” (p. 32), *Effective Literacy Practice in Years 1-4* (MOE., 2003) and in the *Sound Sense, Teacher Support Material* (MOE., 2001), but no advocacy of a systematic approach. It appears that some schools are turning to commercially produced packages to address the pedagogical subject knowledge for teachers, but this does not necessarily address the teachers’ subject content knowledge.

There are generic guidelines and a flowchart on *TKI* for New Zealand teachers (MOE., 2010), with suggestions on monitoring the use of commercial programmes with data collection. While the MOE model does have some suggestions for reflection about whether the programme meets student needs, recognising the teacher as the implementer and the possible need for PD for teachers is only a very minor component of the implementation of resources. Instead, teacher PD is seen as outside of the implementation of commercial resource packages.

6.1.4 Classroom resources

If teachers are not consistent with their oral segmentation of words, then they cannot be fully supportive of the Literacy Learning Progressions (MOE., 2007b) statement which states that in the first year of school, children “are constantly refining their ability to aurally distinguish sounds in spoken words” (p. 10). With no systematic PA programme from the

MOE, teachers often search online for material from websites such as <http://pbskids.org>, <http://www.readingresource.net/phonemicawarenessactivities>, <http://www.bbc.co.uk/schools/laac/menu.shtml> and <http://www.starfall.com/>. There are concerns that these sites are American or British, with corresponding accents (to a New Zealand ear), and that in some cases, the phonemes are said with a pronounced ‘schwa’ vowel, which can be confusing for children in New Zealand.

Some teachers are seeking commercially produced programmes, which they see as time efficient. However a key factor in the use of these commercially produced resources is the teachers’ ability to evaluate the effectiveness of the programme for the New Zealand classroom (if it is an overseas programme) or the research behind the programme if it is New Zealand-based.

There are several New Zealand-based PA/Phonics programmes, such as *Sounds Alive (Lloyd)* which is a very descriptive programme with set lessons and a whole school PD package, but no independent research that can be readily accessed. *Spelling Under Scrutiny* (Allcock, 2000) has a number of PA resources and some published research on its effectiveness, plus a number of testimonial statements from teachers on the website. Allcock is available to undertake training with teachers and also has video clips accessible from the website. *Phonics* (Soryl, 2013) has a programme with set lesson structures for different levels. This programme was developed in London before the author returned to New Zealand, where she has adapted the resources for the local market. They are advertised on the website as “tried and tested in the classroom”, but no independent research can be readily accessed.

While these three programmes are New Zealand developed or adapted for New Zealand use, only *Spelling Under Scrutiny* has published research on its effectiveness and how it can be integrated into the classroom literacy programme, rather than being taught as a

standalone lesson. All have the ability to have teacher PD as part of the programme; with *Sounds Alive*, PD is part of the implementation.

6.1.5 Adapting and extending the Gillon Phonological Awareness Training Programme (PAT) for whole class instruction.

The Phonological Awareness Training Programme (Gillon, 2000b) is a short and highly intensive programme that is implemented in one-to-one or small group sessions with twenty hours of instruction over a ten-week period. The PAT focuses primarily at the phoneme-level, using systematic and explicit teaching. For this study, the PAT resources were used as a base idea and then expanded to activities that would be more appropriate for whole class sessions, linked to the classroom literacy programme. For instance, the segmenting and blending of animal names for “Old MacDonald’s farm” was extended to include New Zealand animals (e.g. *kiwi*, *skink*) and machinery (e.g. *tractor* and *ute*), and the animal and machinery noises (see Appendix G).

The children in this study received nineteen hours in term three and fourteen hours in term four of explicit PA instruction, paired with the typical phonics instruction (letter-sound knowledge) that was part of the classroom instruction. Phonics refers to a method of teaching that draws attention to letters or letter patterns and the sounds they represent (Tunmer, Chapman, & Prochnow, 2006). In contrast, PA specifically targets the sound structure of words. PA instruction is best put together with letter knowledge to highlight the link between speech and print (Gillon, 2004). The ‘usual’ New Zealand classroom literacy curriculum, does not include a specific focus on teaching PA skills.

In this chapter the following hypotheses are addressed:

- 1) That PA professional development alone for a teacher will improve the phonological awareness abilities of five-year-old children over a ten-week period

- 2) That PA resources, alongside PA professional development for the teacher linked to the classroom literacy programme, will improve the PA skills to a higher level than PD alone, of five-year-old children.

6.2 Method

6.2.1 School selection and participants

The lead researcher was approached by the School Principal of a small (three teacher) urban, Government-funded Primary school, based in a low socioeconomic suburb of a small South Island city. The school had a school decile rating of 2b (socioeconomic rating based on census information of the area the school catchment area and a 2b indicates a very low socioeconomic area). The principal expressed concern that there was a large number of children not reaching National Standards levels in reading and writing after one year at school. For reading, the National Standard expected level is for the child to be reading at level twelve. The MOE provided some funding for Reading Recovery (RR), and the school also contributed, resulting in the allocation of two funded RR places. The RR teacher reported that children entered RR at level two or three and were discontinued at about level seventeen on the Ready to Read Series. The RR Tutor also worked in the school to provide additional RR places.

The participating school distributed consent forms to parents of all children in the new entrant class at the beginning of the school year, and during the year, as required, for children entering the class as the child turned five or children participating in school visits. The majority of parents gave full permission and three parents granted partial permission (this was that the children would participate in class and be videoed as part of the class, but would not be assessed). Twenty children aged between five-years-and-zero-months and five-years-eleven-months from one classroom and one teacher participated fully in this research. The class selected was the junior class and there was a high percentage of children identifying as

Māori and/or of Pasifika descent, compared to New Zealand European. Table 6.1 shows the demographic composition of the class compared to the demographic data of all year one children in the Otago region. All the children's parents identified that standard New Zealand English was their first language.

Table 6.1
Demographic composition of Class A – participating children

	Gender		Ethnic Grouping			
	Girls	Boys	NZ European	Māori	Pacific Islander	Asian / Other
Class A	8	12	8	6	5	2
(n = 20)	40%	60%	40%	30%	25%	5%
*Otago						
Data	48%	52%	73%	14%	5%	8

Note. Percentages represent the entire sample; * Otago demographic data taken from Education Counts (2015) July 1st funding roll numbers for year 0 / 1 children.

The teacher (teacher A) was multi-lingual (Samoan, English and Te Reo Māori) with a postgraduate qualification in Māori and theology. Teacher A had taught full-time for seven years, with the majority of his experience being in the junior part of the school. Teacher A had attended phonics training and reported using some *Jolly Phonics* in the classroom programme, as well as reading professional literacy-focused materials at least once a fortnight. The teacher's scores on the PA verbal and written tests were in the mid-thirty's range (on average 35 out of 40 which is above the teacher group average of 29). Teacher A did not score well on the PA/phonics definition task with both definitions judged to be only containing a partially correct answer. In the Teacher Beliefs about Literacy Questionnaire (TBALQ), teacher A *strongly agreed* with the use of flash card drills for sight vocabulary and *agreed* that there should be phonics and component skills taught and also that PA influences spelling ability. In

terms of the TBALQ, teacher A was in the middle of the unstructured / structured range so in the “balanced reading approach” range.

6.3 Procedure

The research was designed to take place over one school year, which in New Zealand is from February to December, with four terms of approximately ten weeks; each term is separated by a two-week holiday break. In the year 2011, the school year was comprised of term one for ten weeks, term two for eleven weeks, term three for ten weeks and term four for nine weeks, with the holidays between terms three and four being slightly longer than usual to accommodate the Rugby World Cup. The research was as follows:

Term One - Baseline data collection of teacher knowledge and classroom practices and child data. Classroom literacy programme as usual.

Term Two - PA professional development implemented into the classroom programme and Children’s PA monitored.

Term Three - PA classroom resources introduced and developed.

Classroom coaching and children’s PA monitored.

Term Four - Continued trialling of resources. No classroom coaching.

Prior to the PD, teacher A was observed during guided reading lessons, shared reading and writing sessions, and instructional writing. The purpose of the observations was to learn more about the amount, content and implementation of literacy instruction. The observational instruments used for the study were open-ended supporting notes, as the teacher voiced concerns about his practice being filmed.

6.3.1 Phonological awareness professional development

This small urban school opted, at the Principal's request, for all the teachers to participate in the PA professional development so that all the teachers would have the same information and could all benefit from the PD. Teacher A participated alongside his colleagues. The last test (verbal B) was used as a basis for discussion for the first forty-five minutes of the PD event, with the test marked with open discussion of the participants' answers. The discussion and teaching involved the following:

- A discussion about the syllable level of words (section 1) which focused on gaining agreement on the definition of "syllable", and how words have rhythm, intonation, and stress patterns. There was also discussion on the assumed skills required to complete the task and these included the ability to "hear" the syllables, one-to-one matching and counting of the syllables, and the ability to hold information in short-term memory.
- The phoneme level tasks discussion (subsections 1, 2, and 3) included discussion on the definition of "phoneme" and the use of Lonigan's model (Phillips et al., 2008) to discuss the participants' segmentation level according to the continuum of phonological awareness and linguistic complexity.

Participants were encouraged to reflect on their answers and their own theoretical understandings of language development, language structure, and children's early literacy development. Other terminology, for example, "onset and rime", was introduced and discussed. For subsections five and six, the discussion focused on comparing the written and verbal forms of words and how word origin impacts on the pronunciation. The teachers were asked to think about the verbal and written presentations of the tests and to comment on which form of the test they felt more confident completing.

Grapheme-phoneme knowledge: The next fifteen minutes of the PD event focused on how each consonant sound is produced and correctly pronounced. Particular focus was given

to voiced and unvoiced pairs of consonants, sound development for New Zealand children, and children's typical sound substitutions.

Integrating phonological awareness into the classroom program: the last thirty minutes of the PD session focused on strategies for incorporating explicit phonological awareness into the classroom literacy programme and included consistent use of phoneme level instruction. The teachers discussed examples of phonological awareness activities that they were currently implementing and brainstormed other ideas. Feedback was provided by the primary researcher and teacher A's peers in this part of the session.

6.3.1 Assessment phases and measures

All child participants received a comprehension assessment of their language and PA skills, as well as monitoring of their PA skills, at the end of each school term. The teacher continued to monitor students' literacy skills against National Standards, as usual.

6.3.2 Formal assessments

The following formal assessment was administered at school (at the beginning of term one for those children already at school in teacher A's class and within a week of the other children starting school during the year).

Language: The *Clinical Evaluations of Language Fundamentals Preschool—Second Edition* (Australian and New Zealand Edition) (CELF-P2; Wiig, Secord & Semel, 2006) was administered to obtain a profile of receptive and expressive spoken language skills. This profile gives normative data for children aged three-years-and-zero-months to six-years-and-eleven-months. The CELF-P2 is comprised of six core subtests (three receptive language ability assessments and three expressive language ability assessments). The receptive language subtests evaluate children's understanding of sentence structure, concepts and following directions, and basic concepts. The expressive language subtests measure word structure, expressive vocabulary and recall of sentences. The six subtests are organised into

different groupings to construct the following: a core language score (e.g., sentence structure, word structure and expressive vocabulary); a receptive language index (e.g., sentence structure, concepts and following directions, and basic concepts); an expressive language index (e.g., word structure, expressive vocabulary and recall of sentences); a language content index (e.g., expressive vocabulary, concepts and following directions, and basic concepts); and a language structure index (e.g., sentence structure, word structure and recall of sentences). Additional subtests such as a PA task, pre-literacy scale and pragmatic profile are also provided. **Reliability and validity:** Test-retest reliability for the CELF-P2 is satisfactory, with correlation coefficients for the six core subtests ranging from excellent (0.90) to adequate (0.78) across all ages. Measures of internal consistency are acceptable, ranging from 0.80 to 0.96 across the subtests. Correlations between the CELF-P2 and its Australian equivalent, the CELF-4, revealed moderate to high coefficients ranging from 0.61 to 0.86 between subtests. The six core subtests of the CELF-P2 were individually administered to the twenty children in this study and all children were included.

Speech sound development: The *New Zealand Articulation Test* (NZAT; Moyle, 2005) was administered to measure children's speech sound development. The NZAT is appropriate for children aged five -years-and-zero-months to eight-years-and-eleven-months. The NZAT consists of five subtests: single consonant sounds, initial consonant blends, vowels, multi-syllabic words and a conversational speech sample. The single consonant sounds subtest and the initial consonant blends subtest require children to articulate consonants in a single word by naming a picture presented by an examiner. These are the only subtests that are normed. **Reliability and validity of NZAT:** Reliability of the NZAT single consonant subtest and initial consonant blends subtest is provided, using inter-rater reliability, test-retest reliability and internal reliability. Inter-rater reliability between two individuals experienced in phonetic transcription was ninety-eight per cent for single consonants in the

initial, medial and final position of single words and ninety-two per cent for initial consonant blends. Measures of internal consistency produced reliability coefficients ranging from 0.84 to 0.95. All children were accepted into the study, regardless of their NZAT score. For this study, the NZAT was administered individually to each child and the number of consonants and consonant blends correctly articulated was counted to give a raw score out of eighty-two. The names of fifty-nine pictures for the twenty-three consonant sounds in the initial, medial and/or final position of words, and the twenty-three picture stimuli to evaluate the production of twenty-three initial consonant blends were used to elicit responses.

PA: The *Preschool and Primary Inventory of Phonological Awareness (PIPA;* Dodd et al., 2000) was used to obtain a standardised profile of PA ability for the children starting school in the year the research ran. This test is suitable for children aged three-years-and-zero-months to six-years-and-eleven-months. The PIPA has six subtests: syllable segmentation, rhyme awareness, alliteration awareness, phoneme isolation, phoneme segmentation and letter-knowledge ability, and provides normative data for Australian and British children.

Reliability and validity: Reliability measures of internal consistency, test-retest reliability and inter-rater reliability are provided. Internal consistency reliability coefficients are acceptable and range from 0.70 for phoneme segmentation to 0.98 for letter-knowledge. Test-retest reliability using Pearson product-moment correlation coefficients are reported to be statistically significant for all six subtests ranging from 0.33 for phoneme segmentation to 0.98 for letter-knowledge.

Vocabulary: The *Peabody Picture Vocabulary Test—Fourth Edition (PPVT-4;* Dunn & Dunn, 2007) was administered to determine receptive vocabulary ability. This test is suitable for people aged two-years-and-six-months through to ninety years of age. The PPVT-4 comprises 228 test items, with twelve test items per subset. Test items are presented with four pictures on a page, from which children are required to point to the item that represents

the word spoken by the examiner. There are two parallel forms of the test: A and B.

Reliability and validity: Reliability of the PPVT-4 is sufficient, with split-half reliability coefficients from 0.94 for Form A to 0.95 for Form B. Internal consistency alpha coefficients ranged from 0.97 for Form A to 0.96 for Form B and the average test-retest correlation coefficient was 0.93. A number of measures of validity are documented, for example, concurrent validity with satisfactory correlations between the PPVT-4 and the *Expressive Vocabulary Test* (0.82), the *Comprehensive Assessment of Spoken Language* (0.58), the *Clinical Evaluations of Language Fundamentals-4* (0.74) and the PPVT-III (0.84).

Baseline assessments showed that there were a range of abilities in teacher A's class, as shown in Table 6.2. Some of the children had marked articulation delays and one had a nasal snort on s blends. This can negatively affect the acquisition of good word-recognition skills (Al Otaiba et al., 2012; Catts et al., 1999). No children in this study were seeing, or had been seen by, a speech-language therapist. The two lowest scoring children had significant lateralisation of s, z, ch, and g. All NZAT samples were transcribed by the lead researcher with no vowel distortions noted. An independent speech-language therapist transcribed ten randomly selected samples. Inter-rater reliability was 100 per cent on consonants and the independent SLT noted no vowel distortions. The independent SLT reviewed videos of the test sessions of ten randomly selected children and the inter-rater reliability across all assessments was 99.9 per cent agreement. There were some difficulties with one of the children obscuring the video camera, which was set to record their pointing behaviour.

Table 6.2

Baseline verbal and non-verbal language measures. N = 20

	Age (months)	PPVT-4	CELF-P2: RLI	CELF-P2 CLI	NZAT
	61.80	93.10	97.37	97.63	56.70
<i>SD</i>	0.41	33.26	12.22	11.56	12.48
Range	4;10–5;10	87–120	76–115	80–118	25–72

Note. PPVT-4 = Peabody Picture Vocabulary Test—Fourth Edition standard scores ($M = 100$, $SD \pm 15$) (Dunn & Dunn, 2007); CELF-P2 RLI = Clinical Evaluations of Language Fundamentals Preschool–2 Receptive Language Index ($M = 100$, $SD \pm 15$), CELF-P2 RLI = Clinical Evaluations of Language Fundamentals Preschool–2 Core Language Index ($M = 100$, $SD \pm 15$) (Wiig et al., 2006); NZAT = Number of Consonants Correct score from the NZAT (Moyle, 2004)

The children were then grouped into those who had started school the year before the research started, $N = 5$, (and thus were over five years four months in age), and those who had started school in the research year, $N = 15$. An one-way analysis of variance (ANOVA) did not show a statistically significant between the groups on formal baseline measures of receptive language ($F(1, 17) = .005$, $p = .945$), core language index ($F(1, 17) = .008$, $p = .928$), receptive vocabulary score ($F(1, 18) = .012$, $p = .915$).

For the fifteen children who started school in the year of the research, the PIPA was administered as close to the child's starting date as possible (within the first week). As shown in Table 6.3, the children's raw scores were low across all subtests with syllable identification being the highest average and all children scored in zero for the phoneme segmentation task.

Table 6.3
PIPA raw scores for the younger children at school entry, n = 15

	PIPA				
	SS	RA	AA	IPI	PS
<i>M</i>	2.67	2.00	1.93	.87	0
<i>SD</i>	1.88	1.25	1.67	1.55	0
Range	1 - 7	1 - 4	0 - 6	0 - 5	0

PIPA = Preschool and Primary Inventory of PA raw scores ($N=12$ per subtest) (Dodd et al, 2000); SS = Syllable Segmentation, RA = Rhyme Awareness, AA = Alliteration Awareness, IPI = Initial Phoneme Identity, PS = Phoneme Segmentation

6.3.3 Informal assessment measures of PA development

The Phonological Awareness Probes for Pre-schoolers was administered to all children at the beginning of their school year. The probes were developed by Gillon (2000a, 2002), based on earlier work by Bradley and Bryant (1983), and assess rhyme oddity and initial phoneme identity, with the child required to point to one of three pictures (that is, no verbal response is given by the child).

The other PA assessment was the Phoneme Awareness Assessment Probes for five-to-seven-year-old children (Gillon et al., 2007), which was administered at the beginning of the child's school year and at the end of each school term. The probes have six subtests (initial sound phoneme isolation, final sound phoneme isolation, phoneme blending, phoneme deletion with 2 subtests, and phoneme segmentation). The subtests are administered by the researcher to each child individually and require the child to respond verbally.

6.3.4 Assessment reliability and scoring reliability.

All assessments were administered individually to each child in a quiet room near their classroom, by the primary researcher or a qualified speech-language therapist trained in the appropriate test administration procedures. Data was recorded using a small video camera and at least fifty per cent of all measures were scored twice to assess inter-rater reliability. Inter-rater reliability scoring was performed by an independent SLT who reviewed the videos of the

test sessions of ten randomly selected children. There were some difficulties with one of the children obscuring the video camera, but reliability across all formal and informal assessments was 99.95 per cent agreement, with the obscured responses coded as disagreements.

6.3.5. Classroom phonological awareness

Teacher A's personal phonological awareness scores were consistently in the mid-thirties (out of a possible forty) across the baseline phase. During observations of various literacy instructional sessions, it was noted that teacher A was

- inconsistent with what constituted a sound. For example, when playing *I spy something beginning with s*, teacher A told a child that spider started with sp so was not correct; segmented words at onset rime level but told the children he was saying the individual sounds; when writing words on the board for the letter of the week, discounted words that didn't fit with the sound, (for example, the letter was G and teacher A accepted goat but not giant); tended to ask for letters rather than sounds (for example, tell me the letters in sun).
- during "phonics" said the consonants with a pronounced 'schwa' vowel.
- during shared and guided reading, very rarely drew attention to sounds, with the emphasis being on the letters and reading for meaning and using the illustrations for cues. For example, "what can you see in the picture that starts with the letter b? A bag. Well done."

During discussion with teacher A, after the PD session, teacher A stated that he was not a strong teacher of reading and writing, and was much better at settling children into school, establishing routines, and music, dance, vocabulary/oral language teaching. Teacher A suggested that although he would segment words into onset and rime and sounds for the

children, he would very rarely blend words explicitly and model the whole process for the class.

As part of the *Ako* arrangement, it was mutually agreed that teacher A would try speaking sounds correctly and be more explicit with PA in shared writing and guided reading. After the first week of term two, teacher A approached the researcher and requested guidance, and a “Help Sheet” was devised (see Appendix F). This sheet was laminated and placed beside teacher A’s chair so that he could reference it. The levels of PA were discussed and further guidance in incorporating sounds rather than letters was further discussed. Later that term, it became apparent from discussion that teacher A required resources to help him implement PA in the classroom.

6.3.6 Classroom phonological awareness resources

The PAT (Gillon, 2000b) was used as a basis for designing a series of classroom-based resources. During discussion with teacher A, it was agreed that there would be a range of resources, from syllable through to sound segmentation and blending, that would be linked to the classroom inquiry theme or the literacy programme (in particular the printing programme), so explicit links could be made across the curriculum (see Appendix G for examples of the activities at various PA levels).

Originally, the PAT was administered over two one-hour sessions per week, until twenty hours of instructional time had been completed. During term three, which was eleven weeks long, four twenty-five-minute sessions per week were negotiated with teacher A to be part of the Literacy Programme, with the majority of these sessions targeting phoneme level skills, and some other more informal sessions, targeting syllables and onset and rime. This ensured that the children were exposed to a range of PA tasks across the week and across curriculum areas. For example, teacher A played the transport syllable clapping game as part of numeracy, with children either clapping or counting. The one-syllable cards were then used

as a blending/segmenting task for the *I came to school by...* PA game. The lead researcher visited once each week to jointly teach a PA session, problem solve and discuss further resources required by teacher A.

6.3.4 Programme fidelity

Teacher A was asked to complete a PA diary for each week of PA instruction, recording the time spent on explicit phoneme level activities and lower level PA. The lead researcher visited twice each week: once to liaise with teacher A, observe and discuss the activities, discuss changes that teacher A thought would be helpful, and model lessons etc.; and the second time to video the PA session. These videos were viewed by a trained independent speech-language therapist to ensure that teacher A targeted phoneme-level skills, was scaffolding the children's PA attempts appropriately, and linked activities to print, where appropriate, after week two. The viewed sessions were judged as accurately illustrating the instructional PA content. Nineteen hours of PA instructional time were logged during term three. During term four, the classroom visits by the researcher were reduced to once every fortnight and ten hours of PA instruction logged. This reduction was due to the school going through merger preparation, reducing the available instruction time, as children visited the new school site and undertook joint activities.

6.4 Results

This study followed the phonological awareness progress of twenty children in a small urban school with one teacher. The focus was on teacher A's explicit and consistent teaching of PA, initially through professional development, to see if there was a significant increase in the children's PA, and then through introducing developed classroom resources that explicitly linked PA to the children's literacy learning, as well as coaching through an *Ako* concept.

In term one, teacher A taught the usual literacy program. There was some phonics teaching through the use of *Jolly Phonics*, however the classroom observations showed that

teacher A was inconsistent when demonstrating what constitutes a sound, talked about letters rather than sounds, added the ‘schwa’ vowel to consonants and consonant blends, and implicitly taught PA. After a PD session during term two, teacher A was observed to become consistent in the pronunciation of consonants, and more explicit in defining “sound” and using individual sounds, rather than keeping consonant blends together. Although teacher A became more conscious of his subject content knowledge, the amount of explicit PA teaching did not appear to increase, and teacher A voiced on many occasions that he knew what he wanted to teach, but did not know how to do it. The children’s PA, as measured on the Gillon (2007) PA probes, showed a small increase in PA learning as shown by the increase in slope in Figure 6.1, compared to term one.

During term three, classroom resources were introduced, along with coaching. Some of teacher A’s sessions were videoed and used as a discussion point with teacher A, and sometimes teacher A would video the lead researcher demonstrating a lesson, in order to critique the researcher and observe the children. Teacher A was instrumental in further developing the ideas for the PA resources from the lead researcher’s ideas and the original PAT resources. These included the use of some familiar Māori words for animals on Old MacDonald’s farm, the use of the transport syllable game within the numeracy context, and the vocabulary for the initial and final word sorting games (see Appendix G). This collaboration was important for both the lead researcher and teacher A. As teacher A, and the lead researcher were talking about ways to improve a game, one child asked, “Are you teaching (teacher A’s name) or is he teaching you?” illustrating that the children were seeing adults modelling problem-solving and learning. Within the classroom situation, teacher A was flexible and willing to trial extensions of the PA games. For example, Old MacDonald’s farm was extended to the children taking a white board and pen and writing the name of the animal they had segmented and blended the name of. Once completed, the children returned to

teacher A. He read the name aloud and then the child showed teacher A the picture, to confirm he had read the word correctly. Children who could not write independently went to an adult helper.

The results of the Gillon Probes (2007) showed a steeper incline of PA learning over this term. The teacher reported that the children now saw themselves as readers and writers, took less time to settle at literacy time, and wrote more often (they wrote more words and used wider vocabulary). During guided reading, teacher A was observed to use a wider range of prompts than in terms one and two. These prompts, which occurred when a child stopped reading, included:

Teacher A “I’ll sound the word out and you blend the sounds back together b..a..g...”

Child “Bag!”

Teacher A “bag, great now let’s look at the word and check....”

During shared writing, teacher A used “think alouds” to explicitly model PA and letter knowledge and involved the children in segmenting words while others wrote the word on the whiteboard. A favourite game to settle the children after morning-tea break was “*I spy something beginning with (sound)*” and when the older children became very attuned to initial sounds teachers changed the game to “*I spy something that ends with a (sound)*”. There were also occasions where children were observed modelling and scaffolding PA for newer children.

In term four there was a reduction in the lead researcher’s time in the classroom. This also coincided with the school being officially merged with a neighbouring school. The amount of explicit teaching time was reduced, but the children continued to make PA progress and those starting in term four appeared to have a greater PA probe score trajectory than previously observed.

In Figure 6.1 the trajectories of the children's scores on the Gillon Probes are shown. The five children on the right of the graph are the five older children who have been at school for the most number of weeks. As shown by their plots, the first being the end of term one, there was little or no increase on score at the end of the second term score. Two children's scores decreased which may be due to the teacher's change in modelling confusing them. There is a significant slope change to the end of term three (third probe assessment) and for three of the five children continued change. The two children (one showed no change and the other a decrease in score) both changed teacher for the last term.

The younger children depicted on the left side of the graph, show steeper slopes of learning compared to the older children, suggesting that the younger children reached the same scores as the other five children in fewer weeks. For example the older child 10 in 64 weeks at school, reached a similar total score to that of child 01 who was at school for 39 weeks, in the same class regardless of language and articulation levels. Child 01 had the lowest Core Language Index score and Receptive Language Score in the study. It also appears that there may be a trend of the children who participated in school visits before they turned five-years may have been benefiting for the explicit PA teaching and resources as they were scoring some items correct on the Gillon (2007) probes at school entry.

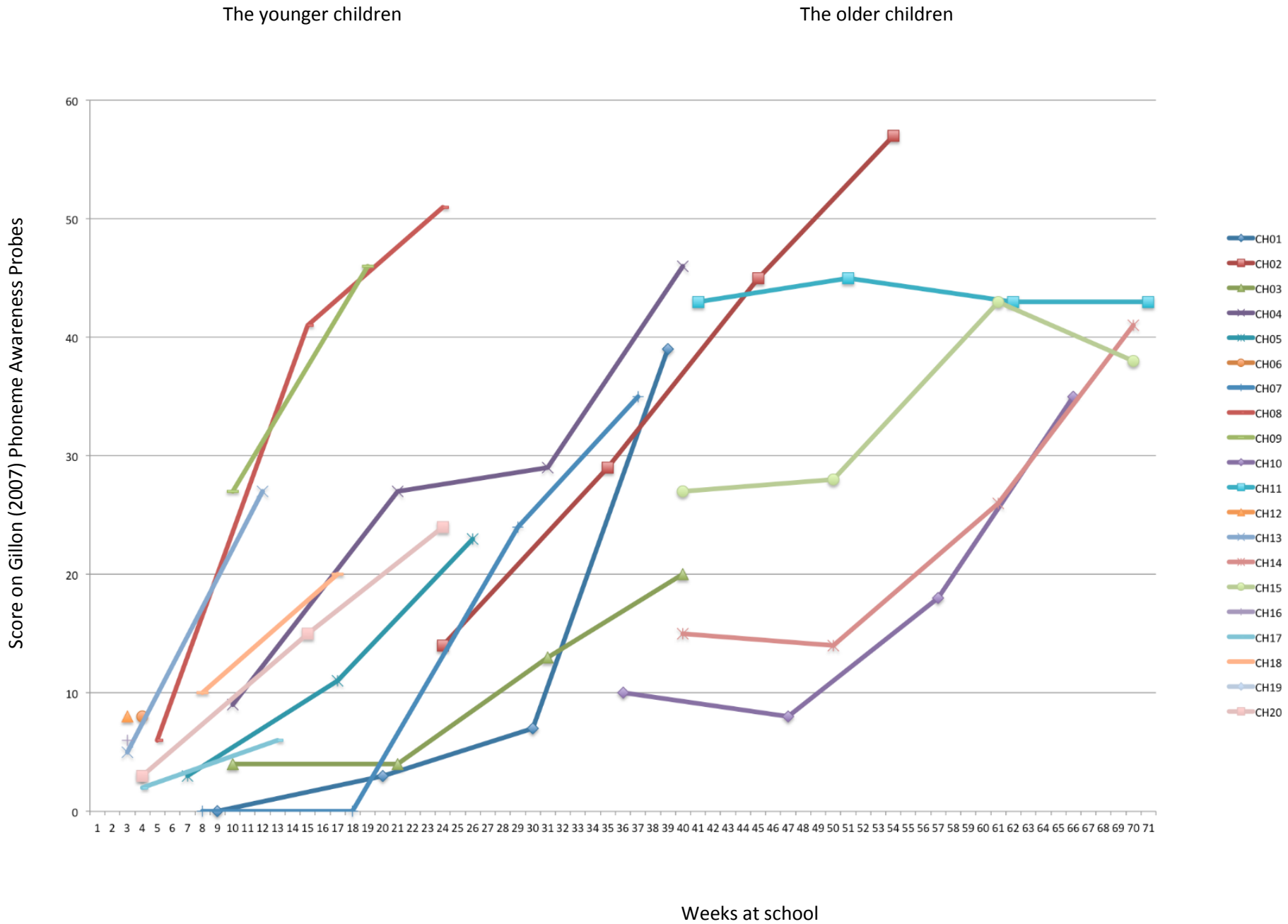


Figure 6.1. Plots of Gillon (2007) phonemic awareness probes total scores at end of term assessment points by weeks at school

When contacted the next year, the RR teacher reported that although there were still children not reaching the literacy National Standard level at the end of their first year at school (three out of the twenty), the number had reduced significantly for the research cohort. Those eligible for RR were now entering the program at a minimum of level six, spending less time on RR and exiting at level eighteen to nineteen.

6.5 Discussion

This small classroom-based research study extends the scope of the existing literature by illustrating that professional development in phonological awareness increased one teachers' subject content knowledge, but was not sufficient to impact on subject pedagogical knowledge and accelerate children's PA learning. The use of *Ako*, allowed the researcher, teacher and the children to develop resources that supported the teacher's subject pedagogical knowledge, significantly impacted on the children's literacy learning as shown by the PA probe scores, teacher report and specialist teacher information. The lead researcher was able to learn about the classroom-routines, classroom expectations and curriculum in an authentic setting.

6.5.1 Professional development

The first hypothesis, that professional development in phonological awareness for a teacher would improve the phonological awareness abilities of five-year-old children over a ten-week period was partly supported. Specially, teacher A become more consistent with his PA subject content knowledge and using that knowledge within his usual teaching practice. For some children, it appears that this concise and consistent modelling of sounds was sufficient for their PA to improve. However, in this class, with a number of children having delayed speech and/or language development, the change in teaching knowledge was not enough. This finding is consistent with other research results that demonstrate that PD alone is not sufficient to change classroom practices (Timperley, 2007; Timperley, Kaser, & Halbert, 2014). For some of the older children,

the change in teacher practices appears to have coincided with a drop in their PA probe scores from the end of term one to the end of term two. This may be due to the change in teacher practices confusing the children.

6.5.2 Classroom programme development

The second hypothesis, that the use of resources linked to the classroom programme would improve the PA skills of children, was supported. The use of resources enabled teacher A to have a pedagogical framework for specific phoneme-level skills and the PD enabled teacher A to scaffold success for children's PA attempts. In this study, the emphasis was on phoneme-level skills, with existing research suggesting that increased targeting of smaller sound units is likely to increase the awareness of larger sound units, such as onset and rime, and syllables (Yeh, 2003). However, teacher A also integrated syllable and rime tasks into literacy (and numeracy) lessons, as it was important to him to be 'holistic' in his teaching practice. The transport game (syllable level) was then converted into a phoneme level game, with the children blending and segmenting the one-syllable words. This also highlights the importance of vocabulary. With the transport game, there was a lot of discussion about vehicles with which the children were unfamiliar. When the game was used again, the children were encouraged to discuss their newly-acquired knowledge with the new children in the class. With Old MacDonald, none of the children knew the sound made by a goose, so a range of animals and noises were discussed, and the noises agreed on before being included in Old MacDonald.

During the debrief session with teacher A, there were some interesting insights into the classroom intervention. Teacher A reported that the children were "better listeners" and not just at PA time. When questioned as to why teacher A thought that he replied that "Doing the PA has made them tune-in. One of the best things was introducing *thinking time* so the children stopped calling out over each other, but could

still show me that they had an answer by putting their finger on their chin”. Thinking time had been introduced by the researcher as a strategy to encourage all children to think. When children had an answer they put their finger on their chin, rather than shouting out the answer or waving their arm up in the air and disturbing others. Initially this cohort of children found this very difficult, but over a few weeks were able to think, wait for others, and allow the teacher to ask them for the answer. Teacher A reported that sometimes having the thinking time allowed him to “think aloud” to model the process. Teacher A also commented that he now saw the children as readers and writers from the day they started school and had higher expectations of them.

6.5.3 National implications for New Zealand literacy

This study demonstrated that professional development aimed at increasing a teacher’s phonological awareness content knowledge within a whole language approach classroom, was insufficient to prompt a significant change in children’s phonological awareness, especially for those at high risk of literacy difficulties. The whole language approach has the assumption that children will link speech and print (phonemes-graphemes) naturally, through implicit instruction (Moats, 2000; Pressley, 2006). In this study, the children were exposed over a ten-week term to a total of nineteen hours of explicit phoneme-level instruction through activities linked to the literacy curriculum. Initially, teacher A reported that it was difficult to integrate the activities due to time pressures, but stated that the children had to be “really quiet to hear”, which increased their focus. This had the additional effect that the children appeared to move on to other literacy activities more easily, and settled more quickly.

This supports the RR teacher’s report the following year that the children were entering the RR programme at a higher level than in previous years, and with greater sound-letter knowledge and skills, suggesting that the PA classroom instruction may provide children with better underlying literacy acquisition skills than the traditional

whole language literacy approach. This supports previous research that the inclusion of letter-sound knowledge, paired with the PA instruction, has a greater influence, than PA instruction alone, on reading and spelling development (Ehri et al., 2001). Although this study had a large proportion of children whose parents identified their ethnicity as Māori or Pasifika, their results were not analysed separately, however they appeared to benefit equally well as the NZ European children, which provides support for raising Māori and Pasifika achievement, which are both identified in the Ministry of Education strategies through *Ka Hikitia - Managing for Success: The Māori Education Strategy 2008 – 2012* (MOE, 2013) and the *Pasifika Education Plan 2013-2017*

This study does not answer the question of the optimal timing and duration of classroom-based PA instruction for children starting formal schooling. Although this study showed promising results for five-year-old children, particularly those just beginning school, it is not clear if this explicit instruction would be more beneficial earlier, before formal literacy instruction. For teachers to integrate PA into new entrant classes, they would need to be strong in both their content and pedagogical knowledge, to ensure optimal teaching, and also be able to recognise those children who still remain at risk of literacy difficulties.

One of the main limitations of this study was that the researchers assessed the PA skills and development of the children, so teacher A had no investment in the data gathering, other than his usual literacy assessments. While he reported changes (for example, children progressing up reading levels more quickly during the PA intervention stage, more writing etc.) it was difficult for teacher A to see where individual children required further scaffolding to enhance their learning. Another limitation was the lack of a control comparison group. However in comparing the results of the younger children to those of the older children, the younger children reached a similar point to the older children in about half the number of weeks at school.

A future direction would be to trial the resources and assessments with teachers in other lower decile and higher decile schools, to attempt to duplicate the results. Although the level of support required to facilitate changes in teacher practice is high and expensive, the impact on this group of children's PA development and literacy learning appears to have been cost effective.

7. Discussion

7.1 Introduction

The research reported in this thesis, investigated teachers' knowledge of phonological awareness (PA) and practices that teachers use to integrate PA into authentic classroom activities. In the literacy-learning journey for children, PA is widely recognised as an important foundational skill and as predictive of literacy success. (Bradley & Bryant, 1983; Ehri et al., 2001; Gillon, 2005a, 2005b; McNeill et al., 2009b). It is critical therefore to examine the knowledge teachers bring to their reading instructional practices including their phonological awareness knowledge, and to understand how teachers use this knowledge in authentic activities within the early childhood settings and during the early school years.

Specifically, the experiments reported in this thesis investigated 1) Early Childhood (EC) teachers' PA knowledge; 2) the implementation of professional development for teachers to encourage their use of PA activities within a storybook setting; 3) the impact of professional development for teachers on children's PA development; 4) primary school teachers' knowledge of PA; and 5) the effect of professional development for primary school teachers on children's literacy learning within junior school classroom context.

This research was underpinned by the following observations and hypotheses:

1. New Zealand teachers have largely taught from a whole language theoretical stance, and the use of and validation of a PA test for adults will predict the level of current PA knowledge to inform professional development needs.
2. Early childhood teachers use a variety of types of questions and comments with small groups of children, and these comments and questions can be an effective approach to facilitate emergent literacy development, in particular, phonological awareness, whilst reading storybooks in an authentic EC activity.

3. Professional development to enable teacher-implemented classroom-wide phonological awareness will enhance the PA skills of children and raise literacy outcomes.

There follows a brief review of each research chapter reported in this thesis and then a general discussion on how the research reported addresses the aforementioned hypotheses.

7.2 Summary of thesis research

7.2.1 Research Chapter 2- Explicit phonological awareness knowledge of educational professionals

The first part of this study investigated the PA knowledge of 699 educational professionals and paraprofessionals, using a structured, informal, predominantly oral presentation of a modified Australian test. Results showed that the test had construct validity and the participants had widely varying knowledge, with significant differences between the groups and within the groups. The SLTs, who had the most specialised training, had the greatest in-depth knowledge, and conversely, those just beginning their teacher training and those with the least specialised training had the lowest scores. Individuals had the greatest difficulties at the most linguistically complex level of PA. Having established that New Zealand educational professionals and paraprofessionals have varying degrees of knowledge, the next step was to establish what types of language EC teachers used during storybook-reading-supported emergent literacy (and in particular PA), whether teachers had similar scores on written compared to oral presentations of PA, and if the teachers' PA knowledge was consistent over time.

7.2.2 Research Chapter 3: New Zealand early childhood teachers' storybook reading practices

The purpose of the second study of ten New Zealand EC teachers was to investigate the types of questions and comments that EC teachers use while reading

storybooks with small groups of four-year-old children and how these may facilitate emergent literacy development, and in particular, PA. The results showed that, regardless of the type of storybook being read, the teachers' cognitive levels of talk were predominantly more concrete than abstract, which may affect the children's exposure to vocabulary and inhibit comprehension. There were few references to print or PA in the extra-textual comments which may be related to the teachers' PA knowledge and the curriculum context. This led to the formulation of *Balanced Emergent Literacy Practices (ELS)*:

ELS = Contextual (C) talk X Phonological Awareness/Print Referencing (P) talk

where,

Contextual (C) talk = teachers' and children's talk that encourages comprehension of the story, vocabulary extension, and linking the story to children's prior experiences

and

Phonological Awareness / Print Referencing (P) talk = teachers explicitly talking about PA, including syllables, rhyme, sounds, letter names, pointing to text, etc.

Together, these balanced extra-textual comments could foster the development of the complex skill sets that provide the foundation for successful reading acquisition.

However, this formulation of ELS is dependent on teacher knowledge of PA, both subject and pedagogical knowledge, to effectively foster emergent literacy.

Having established the variability of teacher knowledge (Chapter 2) and the types of extra-textual comments made by EC teachers in storybook reading sessions, the next step was to evaluate EC teachers' PA knowledge in a more in-depth manner over time. This information was crucial to be able to develop PD initiatives to build teacher knowledge in this area and to be able to confidently detect change in teacher knowledge following PD.

7.2.3 Research Chapter 4: Explicit phonological awareness knowledge of early childhood teachers and the effect of two different professional development models

The research study in Chapter 4 explored the PA of forty-three EC teachers, divided into three groups across a baseline phase (9 weeks) and with written and oral presentations of two PA tests. This was followed by professional development for two groups, with the third group receiving no professional development. In the second ten-week phase, one of the two groups that received professional development also received coaching sessions and the PA development of sixteen children was evaluated. Results showed that the EC teachers' PA was higher as a total score, on average, than the other professional groups. The teachers' scores were statistically higher on the both the oral presentations than the written presentations of both versions of the PA test. Over the nine weeks of phase one, the analysis showed that many of the teachers were inconsistent with their segmentation skills, with different answers recorded for each of the different tests for the same item.

Videos recorded, over time, of the teachers in the professional development and coaching group showed changes in the extra-textual comments made that reinforced emergent literacy concept development, such as PA. The sixteen children's PA results on standardised and non-standardised assessments showed little change in the first nine-week baseline phase and significant change in the second ten-week phase indicating that the PD and coaching model to support teachers' storybook reading practices, had a positive impact on the children's PA development compared to the teachers' typical literacy practices.

7.2.4 Research Chapter 5: Primary teachers' phonological awareness knowledge.

This chapter reported the results of primary teachers' PA knowledge over time. In Chapter 1, the first research report investigated the PA knowledge of 699 educational professionals and paraprofessionals, using a structured, informal, primarily oral

presentation of a modified Australian PA test. Having established that New Zealand educational professionals and paraprofessionals have varying degrees of knowledge, the next steps were to establish if primary teachers had similar scores on written compared to oral presentations of PA, whether the teachers' PA knowledge was consistent over time, and if the teachers preferred a top-down or bottom-up literacy instructional approach through the use of the Teachers' Beliefs About Literacy Questionnaire (TBALQ). Analysis showed that the teachers' PA did not differ over time or by test format, which is unlike the EC teachers' results. The primary teachers on the TBALQ showed a move towards skills-based literacy instruction i.e. a bottom-up model, but also indicated overall that they did not favour highly structured lessons. The majority of the teachers were able to define the term 'phonics' but not 'PA'. Many of the teachers named phonics-based instructional techniques and resources when asked what they use in the classroom to help children's PA development.

7.2.5 Research Chapter 6: Implementation of classroom-based phonological awareness.

This chapter reported the results of a small classroom based intervention with a teacher of five-year-old children where the teacher participated in PA professional development and then trialled some PA resources that were linked to the literacy programme in his classroom. While for some children, it appears that this concise and consistent modelling of sounds was sufficient for their PA to improve, this change in teaching was not enough, particularly for the most at-risk children. This finding is consistent with other research results that demonstrate that PD alone is not sufficient to change classroom practices (Timperley, 2007; Timperley et al., 2014). For some of the older children, the change in teacher practices appears to have confused them as their scores have dropped from the end of term one to the end of term two.

The second part of this classroom-based intervention was, that the use of resources linked to the classroom programme would improve the PA skills of children.

The use of resources enabled teacher A to have a pedagogical framework for specific phoneme-level skills and the PD enabled teacher A to scaffold success for children's PA attempts. Teacher A was observed to integrate PA tasks into literacy (and numeracy) lessons and the children's PA appeared to develop at an increased rate.

Other insights were also gained with teacher A reporting that the children were "better listeners". By introducing *thinking time*, the children could show that they had an answer by putting their finger on their chin rather than calling out. Teacher A also reported that the thinking time allowed him to "think aloud" to model the process more explicitly. Teacher A also commented that he now saw the children as readers and writers from the day they started school and had higher expectations of them.

7.3 Adult knowledge of phonological awareness

In this thesis, the first research hypothesis was that New Zealand teachers have largely taught from a whole language theoretical stance, and debate centres on the importance of subject content knowledge. The use of and validation of a PA test for adults will reflect the level of current PA knowledge to inform professional development needs. The experiment reported in this thesis in Chapter 2 supports the hypothesis that New Zealand teachers have a wide and varying personal knowledge of PA when participating in a primarily orally presented PA test. Chapter 3 reported evidence that EC teachers' use of extra-textual comments during storybook reading focused mainly on extending and broadening children's vocabulary and the understanding of concepts related to comprehension of the story. Chapter 4 and Chapter 5 provided evidence that teacher knowledge varies over time, and thus is not "stable", which impacts on teachers' classroom practices.

7.3.1 The impact of teacher knowledge of phonological awareness

Leading experts have raised concern about the gap in teachers' linguistic knowledge with respect to their theoretical understanding of the reading and writing

processes. In particular, their limited knowledge of language structure and phonological awareness has been criticised (Al-Hazza et al., 2008; Crim et al., 2008; Cunningham et al., 2004; McCutchen et al., 2009; Moats, 1994, 2009b, 2014; Spear-Swerling, Brucker, & Alfano, 2005; Spencer et al., 2008; Stainthorp, 2004; Stanovich & Cunningham, 1993). Research on teacher subject knowledge in the area of PA has typically presented tests in a written format (e.g. multiple-choice) with a single assessment point. It can be argued that this does not fully assess teacher knowledge, with this test format only assessing surface knowledge, not analytical, deep knowledge (Darling-Hammond, 2000b; Roberts, 2006; Torrance & Pryor, 2001). Cochran-Smith and Lytle (1999) contested the assumption that teachers who know more, teach better, and suggest that teachers require knowledge-for-practice (that is, theory); knowledge-in-practice (pedagogical knowledge); but also knowledge-of-practice (knowledge that teachers learn by using the knowledge of others to generate their own theories by collaborating with others), which takes time to construct (Cochran-Smith, 2003; Cochran-Smith & Lytle, 1999).

The theoretical knowledge of New Zealand educators was examined in Chapter 2, and it was found that there were wide and varying differences within and between the groups. This is in line with international research (Spencer et al., 2008; Stainthorp, 2004; Washburn, Binks Cantrell, Joshi, Martin-Chang, & Arrow, 2015). However, it was established that the more specialised the preparation for New Zealand educators, the higher the group mean total score on the test, and the lower the variance within the group. This is contrary to other research that found that there was no difference with specialisation (Spencer et al., 2008). The New Zealand pre-service teachers in the Washburn et al. (2015) study were at the end of their respective professional preparation programmes of study and scored relatively highly, on phonological awareness measure when compared to the other basic language constructs assessed. In this thesis, there was a significant difference between scores at the beginning of student teachers' 3-year degree programme of study and the end of their degree for pre-service primary teaching students

PA scores. For this group of students lectures were provided to the students in explicit PA knowledge during their degree programme. What has not been established with many research studies is the ability of the in-service and pre-service teachers to use their PA knowledge in the classroom environment. McKinsey (2007) stated that “the quality of outcomes for any school system is essentially the sum of the quality of the instruction that its teachers deliver” (p. 26). Wilcox-Herzog (2002) showed that teachers with a strong understanding of child-development and knowledge of teaching theoretical frameworks had greater consistency between their beliefs and their actions.

In the scope of this thesis, further research was undertaken to investigate classroom PA instructional practices and teacher knowledge for preschool and junior primary school teachers.

In Chapter 3 it was established that New Zealand EC teachers focused more on vocabulary and comprehension than on PA or print referencing when using extra-textual comments while reading storybooks with small groups of four-year-old children. This is consistent with other international research (Cabell, Justice, McGinty, DeCoster, & Forston, 2015; Dickinson & Smith, 1994; Hindman & Wasik, 2012; Massey, 2004; Price et al., 2012; Wasik & Hindman, 2011). This finding is also consistent with the Te Whāriki curriculum document that emphasises the learning environment rather than learned language, with little or no emphasis on underlying key literacy skills (Blaiklock, 2013a, 2013b; Nuttal, 2005). Although, in his research Blaiklock (2008) stated that the word “alphabet” does not appear in Te Whāriki, but the word “number” is reported to appear multiple times, with the argument that Te Whāriki was written at a time when there was no emphasis put on children learning pre-literacy or emergent literacy skills (McLachlan & Arrow, 2015). However, Te Whāriki is a curriculum that is sufficiently flexible that teachers who have a strong emergent literacy subject and pedagogical knowledge can make judgments about how and when to weave concepts such as PA into

authentic and meaningful activities, such as storybook reading. Teachers with little and/or poor knowledge of emergent literacy practices, however, may not utilise opportunities to develop these critical skills for literacy development into their learning experiences which may limit children's preparation for more formal literacy instruction once they commence school. *Kei Tua o te Pae* states that "the focus throughout *Kei Tua o te Pae* is on assessment as a powerful force for learning" (Ministry of Education, 2004, p.2) however as suggested by the Peter Effect (Binks-Cantrell, Washburn, et al., 2012) how can teachers assess children's PA if they have difficulties themselves. PA develops over time and it may be difficult to assess children's PA development to be able to scaffold the child's learning (for example, in the "what's next?" section of a child's learning story if focusing on PA) if the teacher's own phonological awareness knowledge is not consistent or is not sufficiently deep. In examples of "good literacy practice" as part of the Literacy in Early Childhood Services Report (Education Review Office, 2011), there is no mention of PA and the use of sounds and rhyme are mentioned only fleetingly. The focus of "good practice" appears to be the use of narrative, vocabulary development, spatial awareness, and relationships: a global, whole language focus. Despite increased focus on the role of PA in emergent literacy, there continues to be gaps in our knowledge about the amount and types of PA exposure in early childhood that will accelerate children's PA learning.

7.3.2 Early childhood teacher knowledge of phonological awareness over time and different test modalities

As discussed in Chapter 4, it was established that EC teachers PA proficiency differed over test format, and although their total scores were consistent over time, their answers differed. There were no correlations between their total score on the first orally presented PA test and the type or length of training, the reported literacy-focused professional development received, or amount of professional reading the participants' reported. International research, such as that by Hindman and Wasik (2011), has linked

more knowledge with more education and professional development, whereas other research, such as that by Hammond (2015), has found that knowledge and classroom practices are inconsistent.

Engaging children in emergent literacy practices requires a specialised knowledge base that is not necessarily a consequence of adult literacy (Spear-Swerling & Brucker, 2004), as adult readers have implicit strategies which they may struggle to make explicit for children. Teachers' ability to break down emergent literacy instruction to its components, particularly PA, and then to structure a sequence that scaffolds a child's learning pathway, is essential for foundational literacy instruction. The research in this thesis reports that, based on their four baseline PA test results, many EC teachers would be unable to scaffold PA activities in a consistent and explicit manner and were unclear about the difference between phonics and PA.

7.3.2.1 Implementation of phonological awareness into storybook reading.

Within the Te Whāriki framework, there is little scope to implement a formal "PA programme", due to Te Whāriki's top-down, whole language approach. International studies that have integrated PA into preschool classrooms have been (Lefebvre, Trudeau, & Sutton, 2011) with classroom-based studies such as that by Connor, Morrison, and Slominski (2006) have shown that time spent in code-focused activities was associated with increases in code recognition growth whereas time spent on meaning-focused activities was associated with vocabulary. While the Connor et. al (2006) study did not explicitly code for PA activities, it can be assumed that time spent on PA activities and explicit instruction would be related to increased PA. Storybook reading to small groups of children is a common activity in early childhood centres and, considering the amount of time New Zealand children spend in early childhood facilities, EC teachers are in a prime position to encourage children to engage in literacy-promoting activities.

In Chapter 4, two groups of EC teachers received professional development on emergent literacy development, and in particular PA, based on the hypothesis that professional development would raise the subject content knowledge of the teachers. There are a number of studies and iterations of studies (Avalos, 2011; Carlisle & Berebitsky, 2011; Earley & Porritt, 2013; Timperley, 2007) that have indicated that professional development as a one-off occurrence does not translate into changes in classroom/teaching practice. Schachter (2015) reviewed the design of EC professional development and recommended that professional development as a lever for improving teacher practices required innovative formats.

The professional development in this thesis was linked to one of the verbal tests, so that the EC teachers could use their own knowledge as the basis for discussion and reflection on the “what do we know” and “how does this impact on learners” so that teacher learning is connected to the needs of the learner. This type of professional development is advocated as being part of the *spiral of inquiry* (Timperley et al., 2014), a commonly used framework for transforming learning within the New Zealand educational community.

One of the two groups that received professional development also received individualised coaching sessions. Coaching and mentoring is well documented as being a means to bring about changes in teacher practice that may be sustained over time (DeBaryshe & Gorecki, 2007; Powell, Diamond, Burchinal, & Koehler, 2010; Wasik et al., 2006). Within the discussion of this research, conversations with EC teachers that further linked PA into everyday activities has not been highlighted. For example, one teacher talked about playing animal lotto and encouraging children to say the sound of the first letter of the animal’s name (e.g. /k/ for cat, /m/ for mouse) and how she explicitly linked first sounds, e.g. “cat and kitten both start with /k/, listen **cat** **kitten**”, and thus used pedagogies to link theory and practice. Professional conversations about impact

on the children's' learning were also voiced by the teachers as being important, which links with Ingvarson, Meiers, and Beavis (2005) findings that teachers who understood the links between professional development and children's learning reported the greatest impact efficacy. The question is how we encourage teachers to use pedagogies to link theory and practice in the current teaching environment (Darling-Hammond, 2006) in an explicit and systematic way that enhances children's learning. Teacher knowledge could be an important pathway through which education and training affect teacher practice. Teachers with more knowledge had more education, as did teachers who received language and literacy professional development. Teachers with greater knowledge also demonstrated higher quality practices.

7.4 Primary teacher knowledge of phonological awareness over time and different test modalities and TBALQ

The primary teachers' inconsistent and poor PA results are consistent with international research findings (Al-Hazza et al., 2008; Hindman & Wasik, 2011; Moats, 2014; Moats & Foorman, 2003; Spencer et al., 2008). From this research, it has been shown that New Zealand and overseas teacher knowledge, within the compulsory educational sector, in different test formats can be compared, as there were no statistical differences between the written and verbal test formats. There were no correlations between total scores on the first orally presented PA test and with the type or length of training, the reported literacy-focused professional development received, or professional reading the participants reported. Whereas international research links greater knowledge with more education and professional development (Hindman & Wasik, 2011), it also shows that knowledge and classroom practices are inconsistent (Hammond, 2015).

Teachers' ability to scaffold and structure literacy instruction to its core components, particularly PA, is essential for foundational literacy instruction. As adult readers, the implicit strategies can be difficult to make explicit for children. The research

in this thesis suggests that, based on their four baseline PA test results, many teachers would find it difficult to scaffold PA activities in an explicit manner. Like the EC teachers, the primary teachers were unclear about the difference between phonics and PA, and this confusion is consistent with the findings of Cheesman et al. (2009) in their study of 223 first-year teachers who also confuse PA with phonics.

Within the New Zealand whole language, top-down literacy context, the results of the TBALQ for this group of teachers indicated a shift in beliefs to a more bottom-up, core-component teaching model. This raises interesting questions regarding the acquisition of the subject content knowledge and the subject pedagogical knowledge. The definitions of PA/phonics and the teachers' reports of strategies and resources used suggest that there is a place for professional development and learning in this area for New Zealand teachers, including those that implement commercially produced packages, to ensure strong underpinnings of scientifically proven theory.

7.5 Implementation of phonological awareness professional development and impact on the learners

Ensuring that classroom teacher instructional methods support the Response to Intervention (RTI) mantra of good first teaching before more specialised teaching is implemented for those still at risk of literacy difficulties, is paramount. International studies suggest that up to one in three children will experience difficulties in acquiring the foundations of literacy learning (NAEP, 2009; Nicholson, 2009). These difficulties are often ongoing and can be lifelong (Catts et al., 2015; Gillon, 2004).

It became apparent that the teacher in this research project required more than PA professional development and in-classroom support to be able to implement PA in an explicit manner within the classroom program. The teacher needed to be meta-cognitive with the explicit teaching. Vygotsky (1978) termed this “defossilizing”, with the teachers breaking down successful (in this case) PA into its components so that the learner becomes aware of each of the components and how they combine. This is not always

easy. In this study, teachers appeared to understand what constitutes a sound, but when they investigated their knowledge, many had the realisation that they did not have specific, consistent knowledge and that they may not use their knowledge in the classroom consistently. This notion is supported by researchers such as Hammond (2015), who has also found that knowledge and classroom practices are inconsistent, and Bos, Mather, Dickson, Podhajski, and Chard (2001) suggest that inconsistency can make classroom instruction less effective and more confusing for students. One of the underpinnings of Collaborative Inquiry is the need to know why something is better, so that we change the way we teach in a consistent way (Timperley et al., 2014).

7.5.1 Implementation of classroom-based instructional materials.

This study involved the further development of the PAT materials and the development and creation of the new classroom resources, and the impact on children's PA learning was tracked using the Gillon (2007) probes. This resource development was done in a collaborative manner, *Ako*, so the best possible resource was developed that met the requirements of the PA research, as well as the classroom teacher and children. The small cohort of children that was followed in teacher A's class all exhibited growth in their PA skills, with the children ($n = 15$) who started school in the research year, gaining PA scores comparable to their older peers in a shorter timeframe. This suggests that the inclusion of classroom-based PA instructional resources along with professional development on teacher subject content and pedagogical knowledge can have a positive impact on raising PA development for a cohort of children in a low decile school. Importantly, teacher A and the RR teacher reports both indicated that the children in this cohort were reading at higher levels, writing more and a greater number reached the National Standard level in Literacy at the end of their first year at school, than was expected. It was also reported that the children's rate of achieving the Numeracy National Standard remained at the typical level of previous years.

7.6 Theoretical Implications

Understanding how adults teach literacy and how children learn to read and write is critical for effective implementation of literacy instruction within authentic classroom practices. The research reported in this thesis progresses current thinking about theories of learning to read.

7.6.1 Modified dual-route model

The modified dual route model of word recognition (Ehri, 1991) discussed in Chapter 1 suggests that individuals use one of two routes, either a phonological or visual-phonological to recognise individual words in print. For most children they use the phonological route when first learning to read. To activate the phonological route, the reader must have a sufficient understanding of the grapheme-phoneme link as well as the PA ability to blend and segment at the phoneme level to be able to construct accurate phonological representations. As the reader becomes more practiced they begin to activate the visual-phonological route within which the irregular parts of words are recognised by their visual information. With practice and exposure to the written word, children begin to recognise printed words more rapidly and combine the visual and phonological information.

Research findings reported in this thesis highlight the importance of phonological skills for both adults and children. For adults that are teaching children PA skills, it is important that they have a deep understanding of PA and how this knowledge applies within various classroom situations to enrich the quality of explicit and consistency of teaching practices. This was achieved by demonstrating that both early childhood and primary teachers had varying PA knowledge that differed over time which affected their ability to teach children the underlying phonological mechanics of words. By increasing the teachers' knowledge they were able to be more consistent which allowed the children enriched access to the phonological route which in turn may allow greater access to successful decoding.

7.6.2 Connectionist model of word recognition.

The connectionist (also known as parallel-distributed processing) model is one where the individual is said to integrate orthographic, semantic and phonological knowledge to access word meaning (Invernizzi & Hayes, 2011; Plaut, 2007; Seidenberg, 2005, 2007). The connectionist model considers the interplay between skills in learning to read the printed word, which is in contrast to the dual-route model of separate processing routes (Seidenberg, 2007). For teachers, it is critical to understand the differing strata of semantic, phonological and orthographic knowledge that underpin skilled reading in order to identify and implement effective teaching strategies within the developmental models of word recognition in the classroom environment. Within this thesis the early childhood teachers' PA test scores significantly differed between verbal and written test presentations suggesting that within the connectionist model they were less likely to be able to identify and implement effective teaching strategies within the constraints of the Te Whāriki curriculum.

7.2.3 Developmental models of word recognition.

Theoretical frameworks of reading printed words are often from a skilled reader's perspective. It has been postulated that children go through described stages to acquire efficient and fluent word recognition skills with different cognitive skills and strategies (Ehri, 1991; Frith, 1985; Treiman & Bourassa, 2000). To enable teachers to facilitate children's transition through these stages, a thorough knowledge base is essential. The models proposed by Ehri (1991) and Frith (1985) involve three key stages: logographic, alphabetic and orthographic.

There is evidence that during the alphabetic stage children begin to use PA knowledge and letter-sound correspondences to decode the written word (Ehri, 1991; Frith, 1985), and children learn and apply increasingly sophisticated strategies to recognise words, and these include the acquisition of alphabetic knowledge, grapheme-

phoneme correspondence, and the connection between the written and spoken form of the language to form systematic connections.

The research reported in this thesis demonstrates the importance of teacher knowledge and their ability to model PA explicitly within the classroom environment. The models of sound-letter correspondences being explicitly and consistently demonstrated for children by teachers are particularly important for those children with poor ability to construct accurate phonological representations and to translate letters into sounds. The intention of reading is to recognise words within connected text. With connected text, the context of the words allows the reader to access additional support. By providing the PA within the of storybook reading (early childhood setting) or the literacy programme (early school years setting) additional information such as the semantic relationships of the words within a sentence or paragraph that indicate the intended meaning of a multi-meaning word, and the sentence and structure of the narrative (Kim & Goetz, 1994; Stanovich & Cunningham, 1993) could be explored alongside the PA in an authentic activity.

7.7 Practical Implications

The research reported in this thesis has implications for both early childhood and early school years teaching of emergent literacy skills. There are practical implications for the PA knowledge of teachers. Currently, there is some inclusion in some pre-service teacher training courses for both early childhood teacher trainees and primary teacher trainees (Washburn et al., 2015), however these trainees may not see this theoretical information translated into practice within the classroom while on practicum placement due to the wide and varying PA knowledge reported in this study of currently practicing teachers. This also suggests that the teachers may not be placing explicit emphasis on phoneme level skills within the literacy programmes of early childhood or early school year classrooms. How do these in-service teachers access PA professional development

that changes classroom practices in a timely cost effective manner. There is no New Zealand classroom based research on when is the optimal period to be explicitly exposing children to PA – is it during early childhood years or once the child starts formal literacy instruction or a combination of both so that we shift from “Reading Recovery” a age six-years, to a proactive prevention of literacy difficulties model of instruction. The results of the TBALQ showed that both early childhood and primary teachers favour some skills based instruction e.g. phonics instruction, but within a less structured programme.

The research reported in this thesis holds potential for raising achievement for young Māori children under the *‘Ka Hikitia - Accelerating Success: The Māori Education Strategy 2013 – 2017’* (MOE, 2013) and young Pasifika children under the *Pasifika Education Plan 2013-2017*. These strategies are designed to improve the New Zealand education system to meet the learning needs of two at-risk populations. A focus area of these strategies is *‘foundation years’* where attaining a strong platform for future learning during the early childhood and schooling years is highlighted. This thesis adds to this focus area by demonstrating that implementing PA instruction and resources in a classroom environment that is multi-cultural and includes a cohort of young Māori and Pasifika children appeared to accelerate the children’s PA.

7.8 Limitations and Directions for Future Research

The results reported throughout this thesis must be considered within the context of the study’s limitations. With the exception of the first large PA study, there is the overarching limitation of small sample size and for more robust results each study will need to be duplicated on a larger scale. The limitations and future directions are further discussed within each study.

For the first study of the different educational professionals, the only data collected was the PA test results. Having access to demographic and other information (for example, on whether the professionals had received Reading Recovery training)

would have given a greater depth to the results, and allowed a more detailed exploration of why some teachers scored highly. This limitation could be overcome by replicating the research with the addition of a questionnaire.

The use of extra-textual comments within the storybook reading of EC teachers with small groups of four-year-old children provided a small snap-shot of the types of language used and emergent literacy engagement. This was a small sample that could be replicated in the future with a larger sample size to provide greater certainty that the results can be generalised. The use of a small video camera with a lapel microphone for the teacher may also improve the audio quality of recordings, as some of the audio was very difficult to decipher due to background noise. Taking the children and teacher into a small, quiet room may alter the types of language heard during the storybook sessions, as this is not a usual occurrence within the early childhood centres.

The third and fourth studies both examined teacher PA knowledge over time and two different test formats (verbal compared to written). This showed differences between the EC teacher group, who performed statistically higher on the verbal presentations of the test, and the primary teachers, who performed very similarly on both forms of the test but showed a trend towards performing better on the written assessments. Both groups were relatively small, so replication on a bigger scale, with teachers who have trained outside New Zealand, may produce different results. For the questionnaire, the inclusion of more detailed questions to examine the beliefs of teachers in both sectors could provide a platform for collaboration between the sectors. In the Report of the Early Learning Advisory group (MOE, 2015b), two recommendations were that there should be “a programme of sustained professional development in early years settings (birth to eight years) “ and “schools consider establishing reception classes for five-year-olds, with curriculum planning, assessment and evaluation based on Te Whāriki” (p.6). Considering the differences between the EC and primary teachers’ literacy views and PA

knowledge, research into the practical implementation of these two goals within the PA/emergent literacy foci could provide interesting insights.

Within the professional development session, many EC and primary teachers queried why they had not previously been introduced to PA. Orchard and Winch (2015) argue that the best teachers “need a conceptual framework within which to think about education, as well as practical professional knowledge and skills” (p.7), which implies implementing PA in both pre- and post-service professional development. This would allow for trainee teachers to have the framework, but also to see the craft of implementation.

One such professional development model was used for the third study. Storybook reading, a typically occurring activity for teachers, was used for explicit PA exploration with the children, with the lead researcher providing coaching. Although this did encourage the teachers to use their centre’s resources, the use of books was difficult for some teachers. It did prompt teachers to think about book choice for a purpose, and there were discussions about book choices, and ‘knowing the book’, rather than picking up an unknown book. In future research, it may be appropriate to provide the teachers with resources to enable them to practice PA within a controlled game but not heavily scripted such as the programme used in the Yeh et al (2008) research so teachers can respond appropriately to the children’s PA needs. However, this carries a risk of teachers thinking that there is a downward push of teaching expectations (MOE, 2015b) from the primary sector.

With regard to the implementation of classroom PA at both EC and primary school levels, it was hard to change teacher practices. Cunningham, Zibulsky, Stanovich, and Stanovich (2009) suggest that this is due to the fact that an individual’s personal ideologies and belief structures resist change. One limitation of the school-based research was that the school principal invited the lead researcher to work with the teacher, rather

than the teacher opting into the research. It took time for the researcher and teacher A to build a working relationship. However, the concept of *Ako*, learning with each other, put the relationship onto a more even platform. The introduction of the concept of *Ako* was very positive and could provide a future research model in the early childhood setting. The children in the early childhood class were not formally followed into school as part of this research. One question for further investigation is whether, despite the early childhood PA instruction, there would be a similar effect of PA sensitivity declining, similar to the possible effect of moving primary school classrooms, shown in the drop of one child's PA score, if the primary school teacher's PA instructional practices do not match that of the EC teachers.

In the United States of America there is an increasing number of scripted curriculum materials available (Ede, 2006), and New Zealand uses some semi-scripted programs (for example, *Sounds Alive*, Lloyd, *n.d.*). In this study, there were no scripts and the games were referred to as resources, not programmes. The reason for this was that resources can be adapted by the teachers for their specific classrooms, scaffolding the children's PA development in a more naturalistic manner, and catering for the diverse learners in their classrooms (individualised and differentiated teaching), which are all in direct conflict with the use of scripted lessons (Ede, 2006). Within the school study, there were a number of children that entered school during the year on their fifth birthday. Having an intensive, class-based ten-week PA programme, while effective (Carson et al., 2013), would not allow for children coming in throughout the year, or transient children that are known to be at risk of literacy difficulties. Research to build on the study outlined in Chapter 5 of this thesis could further investigate classroom-based flexible resource implementation and teacher practices, and appropriate PA assessment and monitoring tools, with what does the child already know and what are they ready to learn as an underlying premise.

7.7 Conclusion

Investigating teacher subject content knowledge and pedagogical practices to ensure the best first teaching practice possible is of vital importance in New Zealand. The research reported in this thesis provides important data of teacher PA knowledge, teaching practices, and teachers' beliefs in both the early childhood and the early school years settings. Through a series of studies, the data from this thesis highlight the diversity of educators' knowledge and practices in relation to phonological awareness. The data is also able to provide valuable insights into different professional development models that may enhance classroom teachers' instructional practices to raise PA achievement in young children as to build strong foundational knowledge for their literacy success.

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Appendix A: Teacher Screening Test for Phonological Awareness Test (New Zealand Adaption)¹

(1) How many **syllables** in each of the following words?

- | | | |
|--------------------|-----------------------|--------------------|
| (a) animal (3) | (b) caution (2) | (c) hastily (3) |
| (d) catalyst (3) | (e) revolution (4) | (f) crustacean (3) |
| (g) invincible (4) | (h) inconceivable (5) | (i) stealthily (3) |
| (j) fortunate (3) | | |

(2) How many **sounds** (not letters) in each of the following words?

- | | | |
|---------------------|----------------|------------------|
| (a) flag (4) | (b) scone (4) | (c) rust (4) |
| (d) clump (5) | (e) change (4) | (f) straight (5) |
| (g) chemist (6) | (h) hiccup (5) | (i) thought (3) |
| (j) instrument (10) | | |

(3) What is the **second sound** (not letter) in each of the following words?

- | | | |
|-----------------|---------------|----------------|
| (a) bride (r) | (b) whim (i) | (c) scream (k) |
| (d) bought (or) | (e) queen (w) | (f) thrive (r) |

(4) what is the **last sound** (not letter) in the following words?

- | | | |
|----------------|----------------|-----------------|
| (a) laugh (f) | (b) though (o) | (c) giraffe (f) |
| (d) ginger (a) | (e) crisp (p) | (f) arrange (g) |

(5) Join the **4 rhyming pairs** of words

- | | | |
|-----------------|-----------------|----------------|
| (a) stuff + (f) | (b) basin + (d) | (c) read + (g) |
| (d) hasten | (e) some + (i) | (f) enough |
| (g) bed | (h) zipper | (i) numb |
| (j) zither | | |

(6) Join the words together that **begin with the same sound**

- | | | |
|-------------------|----------------------------|------------------|
| (a) cholera + (f) | (b) knave + (d) | (c) gentle + (h) |
| (d) pneumonia | (e) chauvinist + (g) & (i) | (f) quiet |
| (g) shoal | (h) joke | (i) chef |

¹ Adapted with permission from Love & Reilly (1995). Answers are in brackets.

Marking Key for Teachers' Phonological Awareness Test – subtests three and four

Acceptable Reponses for the second sound in the word:

bride – “r”

whim – “i”

scream – “c” or “k”

bought - “ou,” “ough,” “or” Queen – “w” or “u”

thrive – “r

Acceptable Reponses for the last sound in the word:

Laugh – “f,” “gh,” or “ph”

Though – “ough,” “ou,” “ow,” or “o”

Giraffe – “f,” “ph” or “gh”

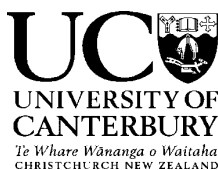
Ginger – “a”

Crisp – “p”

Arrange – “g,” “j,” or “dg”

¹ Adapted with permission from Love & Reilly (1995). Answers are in brackets.

Appendix B: Early Childhood Invitation and Questionnaire



UNIVERSITY OF CANTERBURY
COLLEGE OF EDUCATION

EARLY CHILDHOOD EDUCATOR QUESTIONNAIRE

Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices.

Please read the following before completing this questionnaire:

Your Early Childhood Centre has registered to participate in a PhD study entitled “Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices”. One aim of this study is to determine the current pedagogical and teaching practices of phonological awareness of New Zealand Educators in early childhood facilities and primary schools:

Research shows that a child’s phonological awareness skills in the early school years is a powerful predictor of how well that child will learn how to read and write. The aim of this questionnaire is to understand teachers’ knowledge of phonological awareness and their phonological awareness skills, and to determine if development and training in the use of phonological awareness activities would be of benefit to educators working in New Zealand classrooms and early childhood facilities.

This questionnaire is divided into six sections where you will be asked to provide information on your teaching background and professional learning, your classroom, current assessment practices and your perceived beliefs about literacy development and instruction,

The information you provide is strictly confidential. You may withdraw your participation, including withdrawal of any information you have provided, up until the point where the questionnaire has been added to the other data. As your information is anonymous, please be assured it cannot be identified. Individual participants and facilities will not be identified in any documents arising from this questionnaire. A summary of the results will be emailed to participants if requested.

This questionnaire forms part of a PhD research project carried out by myself, Jane Carroll, under the supervision of Professor Gail Gillon and Dr Brigid McNeill at the College of Education, University of Canterbury. If you have any questions or concerns about participating in this project please contact Jane on 03 364 2987 extn: 7082 (University of Canterbury) or on my cell phone (027 411 7394) or email at jane.carroll@pg.canterbury.ac.nz or jcarroll@clear.net.nz

By signing the top page of the questionnaire and completing this questionnaire it will be understood that you have consented to participate in the project, and that you consent to publication of the results of the project with the understanding that anonymity will be preserved.

Yours sincerely,

Jane Carroll

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QUESTIONNAIRE

Code

Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices.

Early Childhood Educator Questionnaire

Please tick (✓) as many boxes required to answer each question unless otherwise stated.

Please leave the boxes blank if they do not apply to you.

Before you begin please write your name, the name of your school in the space below so that we are able to keep track of questionnaires that have been distributed and returned. This top sheet will be removed and your data will be recorded against the unique code in the top right corner.

Participant Name: _____

Name of Early Childhood Facility: _____

Signature:

Date completed:

SECTION A: Participant InformationCode

What year level do you currently teach? Under 2 year olds ₁ Over 2 year olds ₂

1. Do you teach full time? Yes ₁ No ₂ If 'No' how many hours a week do you teach? _____

2. What is your role? Teacher ₁ Senior Teacher ₂ Other _____

Special Responsibilities (please describe):

3. How many years teaching experience do you have

- a. with children under 2 years old 0-5 ₁ 6-10 ₂ 11-15 ₃ 16-20 ₄ 20+ ₅
 b. with children over 2 years old? 0-5 ₁ 6-10 ₂ 11-15 ₃ 16-20 ₄ 20+ ₅
 c. in total? 0-5 ₁ 6-10 ₂ 11-15 ₃ 16-20 ₄ 20+ ₅

4. What is your registration status?

Full ₁ Subject to Confirmation ₂ Provisional ₃

Unregistered, n/a or other ₄ (please give details)

6. What is your gender? Female ₁ Male ₂

7. Did you complete your Teacher Training in New Zealand? Yes ₁ No ₂
which training institution? _____

8. How many years (full time equivalent) was your undergraduate teaching/professional qualification?

1 ₁ 2 ₂ 3 ₃ 4 ₄

9. Do you have postgraduate qualifications? No ₁ Yes ₂
If yes please give details

10. Have you participated in training for any of the following

If yes, please note down beside the tick who facilitated the training.

- a. Jolly Phonics
 c. Sounds Alive
 d. Phonographics
 e. Phonics Training
 f. First Steps
 g. H.P.P
 h. Letterland
 i. Other (please give details)

11. How frequently do you read professional materials directly related to reading and writing development in preschool children?

Once or twice a week ₁ Once a fortnight ₂ At least once a month ₃ Once or twice a year ₄ Rarely ₅

12. What professional materials do you read? Please give details

Research e.g. Forum, etc

MOE curriculum support materials

Other providers of curriculum support materials

Please specify:

Online resources – TKI, NZ Curriculum

Other online resouces

Please specify:

Code

SECTION B: Facility Information

1. How many children are currently in your early childhood centre? _____

2. Provide an estimated percentage of the ethnic composition of your early childhood centre :

Pakeha/New Zealander _____ 1 Māori _____ 2 Pacific Island
 _____ 3
 Asian _____ 4 Other (specify) _____ 5

3. Does your centre run a special programme for the children who are 4 years old?

Yes ₁ No ₂

If yes please give details e.g.

- a. age when children start going to the group?
- b. group size,
- c. time in the 'special programme' – how many hours per week
- d. when it is run – morning / afternoon?
- e. do all children participate or do parents opt to have their child included?
- f. What do you do in this time that is different to the rest of the programme?

4. How do you assess and monitor the children's oral language development?

5. How many 4 year old children in your centre do you feel have speech and/or language difficulties?

None ₁ 1-2 ₂ 3-6 ₃ 7-10 ₄ 10+ ₅

6. How many children are receiving specialist support (e.g., special education, CCS,)?

None ₁ 1-2 ₂ 3-6 ₃ 7-10 ₄ 10+ ₅ ₆ Not

sure

7. Please list the type of specialist support currently being accessed by children in your facility.

On the next page is a set of questions about beliefs that underpin literacy development. Although it has been designed for teachers in primary schools, part of this study is investigating the beliefs of early childhood educators compared to primary teachers

Code

Section C: Teacher's beliefs about Literacy Questionnaire (TBALQ)

Westwood, P; Knight, B., & Redden, E. (1997) Assessing teachers' beliefs about literacy acquisition: The development of the Teachers' Beliefs About Literacy Questionnaire (TBALQ) *Journal of Research in Reading*, 20, 3, pp. 224-235

For each of the statements 1-24 below please indicate the description which indicates the extent to which you agree or disagree with statement.

		<i>strongly agree</i>	<i>agree</i>	<i>uncertain</i>	<i>disagree</i>	<i>strongly disagree</i>
1	There is very little difference between the skills needed by the beginner reader and those used by proficient readers.					
2	Children learn to read in the same natural way that they acquire oral and aural language skills.					
3	Devoting specific time to word study in isolation is undesirable since this practice de-contextualises a component skill of language.					
4	Teachers should select books for children to read based on the difficulty level of the text.					
5	Learning to read should involve attending closely to the print on the page.					
6	Flashcard drill should be used to build up children's sight vocabularies.					
7	Beginning readers should be taught phonics skills.					
8	Graded reading schemes using controlled vocabulary should be used in classrooms.					
9	Direct teaching of phonics is not necessary as children can learn all they need to know about the alphabet code by being helped with their daily reading and writing activities and by observing others.					
10	Sight vocabulary learnt in isolation does transfer to text reading.					
11	Proficient readers pay very little attention to the details of print when reading.					
12	For effective learning, literacy programmes should be organised to allow for the specific study of separate skills such as comprehension, word recognition and phonics.					

Part 2.

		<i>strongly agree</i>	<i>agree</i>	<i>uncertain</i>	<i>disagree</i>	<i>strongly disagree</i>
13	Children learn to spell in the same natural way that they acquire oral language skills					
14	Teachers should choose the words children need to learn to spell					
15	Teachers should regularly test spelling.					
16	The use of spelling lists is essential for learning how to spell.					
17	Children's use of invented spelling reinforces bad habits.					
18	Words learnt in spelling lists are generally transferred successfully to children's writing.					
19	Spelling is best learnt incidentally through regular reading and writing activities.					
20	Spelling involves careful listening to sounds within words.					
21	Young children's phonemic awareness skills predict their ability to learn to spell in the early years.					
22	Learning to spell depends almost entirely upon vision (e.g. look-cover-write-check) rather than attending to the sounds within words.					
23	Specific time each week should be devoted to the explicit teaching of spelling					
24	There is an important place for direct instruction in spelling in the early school years.					

25 On the scale from 1 to 7 below please circle the number to indicate what you believe to be your own position concerning how the first stages of reading and writing should be organised for young children, from child-centered and unstructured (7) to teacher-directed and highly structured (1).

Least Structure

Most Structure

7

6

5

4

3

2

1

Immerse child in

Directly instruct

Stimulating reading/

child in component

Writing environment

skills for

No direct teaching

reading/writing.

SECTION D: Literacy Assessments

1. Do you use literacy assessments? Yes ₁ No ₂

If yes please give details

2. What do you understand the term “Phonological Awareness” to mean?

3. What do you understand the term “Phonics” to mean?

SECTION E: Phonological Awareness Assessment

1. Do you formally assess the phonological awareness skills of the children?
Yes ₁ No ₂

2. If yes what types of phonological awareness assessments do you use? E.g. informal assessments / formal assessments and when do you assess the children?

SECTION F: *Literacy Development*

1. Briefly describe the types of activities that are included in your programme that help children's phonological awareness development.

2. Please give examples of the activities that are provided in your facility to encourage literacy development.

3. Do you use any commercially available phonics / phonological programmes?

Yes ₁

No ₂

If yes, please give details

Appendix C: Video Code Scheme

Vocabulary	VC	Comment: The teacher / child makes a comment about something relating to the book	e.g.: "I like ducks" "The End" (without words on the page) e.g. "Do you like ducks?"
	VQ	Question: The teacher / Child asks a question about something relating to the book	e.g. "I know that you have a cat at home."
	VB	Background: The child / teachers makes a comment or asks a question that links the story to some prior event or knowledge of the child	e.g. - knocks on the table to replicate knocking at the door.
	VO	Other: Gesture to enhance vocabulary understanding Points to the picture in response to the text Picks up an object that relates to the text	e.g. – child points to each animal as the adult reads out the animal's name. e.g. Picks up a real patty pan case while reading about making cupcakes.
Affirmation Negation	A	Adult agrees or repeats back what the child says	
	N	Adult disagrees with the child	
Literacy	LPT	Point to text: Teacher / child points to the words as they are read.	
	LTC	Text Concepts: Comments on text concept	e.g. "Let's read" "That word is ..."
	LTQ	Text Concepts: Questions / text concepts	e.g. "Shall we read on?" "What word is that?"
	LSC / LSQ	Letter / Sound: The teacher or child says or asks a question something relating to the letter name or sound	e.g. - "that's the letter 'j' and it makes a 'j' sound" e.g "b... bump" – gives initial sound before the word e.g. "s – lash" e.g. prompts child by giving first sound eg "n n ...?"
	LEC	Environmental: comments on text or book language or literacy activity including requests to read the book again, turn the page.	e.g. the teacher or child comments on a change in text e.g. "those words are big so we can say them in a loud voice"
	LEQ	Environmental: Question	e.g. discussion re a literacy activity e.g. library cards book language e.g. talking about the author e.g. says "The end" with words
	LO	Other: Phonological awareness - syllable awareness - comments about words that rhyme. - repeating the words that rhyme from the text	e.g. "it rhymes with gong and says bong" "Can you think of a word that rhymes with flute?" e.g. "spl – ash"
Behaviour manage- ment		e.g. asking children to be quiet, sit still etc.	

Appendix D: Teacher Screening Test for Phonological Awareness Test – Test Form B

Answers are in brackets

(1) How many **syllables** in each of the following words?

banana (3) rubbish (2) rapidly (3) analyst (3) believable (4)
 magazine (3) competitive (4) technological (5) referee (3) lunatic (3)

(2) How many **sounds** (not letters) in each of the following words?

flop (4) scope (4) last (4) clamp (5) change (4)
 straight (5) charisma (7) haggis (5) thought (3) substitutes
 (10)

(3) What is the **second sound** (not letter) in each of the following words?

(a) broke (r) (b) white (i) (c) scrub (k, c)
 (d) bought (or, ou, ough) (e) quack (w,u) (f) throne (r)

(4) What is the **last sound** (not letter) in the following words?

(a) graph (f, gh, ph) (b) know (o, ough, ou, ow) (c) giraffe (f, gh, ph)
 (d) paper (a) (e) clasp (p) (f) arrange (g, j, dg)

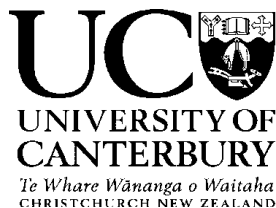
(5) Join the **4 rhyming pairs** of words

(a) basin + (c) (b) stew + (f) (c) hasten (d) dough + (e) enough +
 (h) (j)
 (f) two (g) zipper (h) sew (i) zither (j) stuff

(6) Join the words together that **begin with the same sound**

a) sugar +(c)+ (b) chemist + (e) (c) ship (d) cent + (i) (e) quiche
 (h)
 (f) gnome +(g) (g) pneumonia (h) chef (i) psychic

Appendix E: Primary Teacher Questionnaire



UNIVERSITY OF CANTERBURY
COLLEGE OF EDUCATION
School of Literacies and Arts

PRIMARY TEACHER QUESTIONNAIRE

Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices.

Please read the following before completing this questionnaire:

Your school has agreed to participate in a PhD study entitled “Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices”. One aim of this study is to determine the current pedagogical and teaching practices of phonological awareness of New Zealand Educators in early childhood facilities and primary schools:

Research shows that a child’s phonological awareness skills in the early school years is a powerful predictor of how well that child will learn how to read and write. The aim of this questionnaire is to understand teachers’ knowledge of phonological awareness, their phonological awareness skills, and to determine if training in, and development of classroom phonological awareness activities would be of benefit to teachers working in New Zealand classrooms and early childhood facilities.

This questionnaire is divided into five sections where you will be asked to provide information on your teaching background and professional learning, your classroom, current literacy assessment practices and your perceived beliefs about literacy development and instruction,

The information you provide is strictly confidential. You may withdraw your participation, including withdrawal of any information you have provided, up until the point where the questionnaire has been added to the other data. As your information is anonymous, please be assured it cannot be identified. Individual participants and schools will not be identified in any documents arising from this questionnaire. A summary of the results will be emailed to participating schools if requested.

This questionnaire forms part of a PhD research project carried out by myself, Jane Carroll, under the supervision of Professor Gail Gillon and Dr Brigid McNeill at the College of Education, University of Canterbury. If you have any questions or concerns about participating in this project please contact Jane on 03 364 2987 extn: 7082 (University of Canterbury) or on my cell phone (027 411 7394) or email at jane.carroll@pg.canterbury.ac.nz or jcarroll@clear.net.nz

By signing the top page of the questionnaire and completing this questionnaire it will be understood that you have consented to participate in the project, and that you consent to publication of the results of the project with the understanding that anonymity will be preserved.

Yours sincerely,

Jane Carroll

Jane Carroll

Doctoral Student &

Speech Language Therapist

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QUESTIONNAIRE

Phonological awareness development in early childhood and the early school years: The influence of New Zealand educational practices.

Primary Teacher Questionnaire

Please tick (✓) as many boxes required to answer each question unless otherwise stated.

Please leave the boxes blank if they do not apply to you.

Before you begin please write your name, the name of your school in the space below so that we are able to keep track of questionnaires that have been distributed and returned. This top sheet will be removed and your data will be recorded against the unique code in the top right corner.

Participant Name: _____

Name of school: _____

School Decile: _____

Signature:

Date completed:

SECTION 1: Participant InformationCode **1. What year level do you currently teach?**Year 0/1 ₁ Year 1 ₂ Year 1/2 ₃ Year 0/1/2 ₄**Do you teach full time?** Yes ₁ No ₂**If 'No' how many hours a week do you teach?****5. What is your role?** Teacher ₁ Senior Teacher ₂ Syndicate Leader ₃ AP ₄ DP ₅
Other _____Special Responsibilities (please describe):
_____**6. How many years teaching experience do you have**

a. with children between year 0/1 and 2 of schooling?

0-5 ₁ 6-10 ₂ 11-15 ₃ 16-20 ₄ 21+ ₅b. in total? 0-5 ₁ 6-10 ₂ 11-15 ₃ 16-20 ₄ 21+ ₅**7. What is your registration status?** Full ₁ Subject to Confirmation ₂ Provisional ₃**6. What is your gender?** Female ₁ Male ₂**7. Do you speak more than one language fluently?** Yes ₁ No ₂

If Yes what other language / languages do you speak? _____

8. Did you complete your Teacher Training in New Zealand? Yes ₁ No ₂
Which training institution? _____**9. How many years (full time equivalent) was your undergraduate teaching/professional qualification?** 1 ₁ 2 ₂ 3 ₃ 4 ₄**10. Do you have postgraduate qualifications?** No ₁ Yes ₂
If yes please give details**11. Have you participated in training for any of the following?****If ticked please note who facilitated the training beside the tick**

- a. Reading Recovery
- b. Jolly Phonics
- c. Sounds Alive
- d. Phonographics
- e. Phonics Training
- f. First Steps
- g. H.P.P
- h. Letterland
- i. Other (please give details)

14. How frequently do you read professional materials directly related to literacy development in school-aged children?Once or twice a week ₁ Once a fortnight ₂ At least once a month ₃ Once or twice a year ₄ Rarely ₅**15. What professional materials do you read? Please give details**Research e.g. set, ASCD, etc. MOE curriculum support materials Other providers of curriculum support materials

Please specify:

Online resources – TKI, NZ Curriculum Other online resources

Please specify:

SECTION 2: Class InformationCode

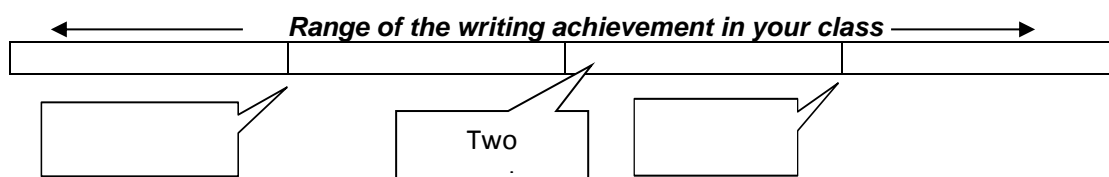
1. How many children are currently in your class? _____
2. What reading level would you expect the children in your class to be at after 6 months at school? Please indicate level:
Colour wheel level ____ (or) Reading Recovery level ____ (or) Ready to Read level _____
3. What reading level would you expect the children in your class to be at after 12 months at school? Please indicate level:
Colour wheel level ____ (or) Reading Recovery level ____ (or) Ready to Read level _____
4. Does your school offer Reading Recovery? Yes ₁ No ₂
If yes: How many places are funded by the Ministry of Education? _____
Funded by your school? _____

Please indicate at what reading level are children at your school generally going into Reading Recovery? _____

Graduating from Reading Recovery? _____

How many children in your class have been or are currently are in Reading Recovery? _____

5. Please attach 4 writing samples of children in your class who have been at school for 12 months or more at the following points for the assessment in your classroom:



Please (if possible) colour photocopy the children's work in colour so the teacher's input is clearly shown

6. Do you assess the oral language of the children in your class? Yes ₁ No ₂
If yes what assessments do you use?

7. How children in your class have received an assessment and / or ongoing support from some source (e.g., speech language therapist, teacher, RTLB etc)?

None ₁ 1-2 ₂ 3-6 ₃ 7-10 ₄ 10+ ₅ ₆ Not sure

8. Are there children in your class that you feel have speech and / or language difficulties?
Yes ₁ No ₂

If yes how many?

Briefly describe some of the difficulties:-

Section 3: Teacher's beliefs about Literacy Questionnaire (TBALQ)

Westwood, P; Knight, B., & Redden, E. (1997) Assessing teachers' beliefs about literacy acquisition: The development of the Teachers' Beliefs About Literacy Questionnaire (TBALQ) *Journal of Research in Reading*. 20, 3, pp. 224-235

For each of the statements 1-24 below please indicate the description which indicates the extent to which you agree or disagree with statement.

		<i>strongly agree</i>	<i>agree</i>	<i>uncertain</i>	<i>disagree</i>	<i>strongly disagree</i>
1	There is very little difference between the skills needed by the beginner reader and those used by proficient readers.					
2	Children learn to read in the same natural way that they acquire oral and aural language skills .					
3	Devoting specific time to word study in isolation is undesirable since this practice de-contextualises a component skill of language.					
4	Teachers should select books for children to read based on the difficulty level of the text.					
5	Learning to read should involve attending closely to the print on the page.					
6	Flashcard drill should be used to build up children's sight vocabularies.					
7	Beginning readers should be taught phonics skills.					
8	Graded reading schemes using controlled vocabulary should be used in classrooms.					
9	Direct teaching of phonics is not necessary as children can learn all the need to know about the alphabet code by being helped with their daily reading and writing activities and by observing others.					
10	Sight vocabulary learnt in isolation does transfer to text reading.					
11	Proficient readers pay very little attention to the details of print when reading.					
12	For effective learning, literacy programmes should be organised to allow for the specific study of separate skills such as comprehension, word recognition and phonics.					

		<i>strongly agree</i>	<i>agree</i>	<i>uncertain</i>	<i>disagree</i>	<i>strongly disagree</i>
13	Children learn to spell in the same natural way that they acquire oral language skills					
14	Teachers should choose the words children need to learn to spell					
15	Teachers should regularly test spelling.					
16	The use of spelling lists is essential for learning how to spell.					
17	Children's use of invented spelling reinforces bad habits.					
18	Words learnt in spelling lists are generally transferred successfully to children's writing.					
19	Spelling is best learnt incidentally through regular reading and writing activities.					
20	Spelling involves careful listening to sounds within words.					
21	Young children's phonemic awareness skills predict their ability to learn to spell in the early years.					
22	Learning to spell depends almost entirely upon vision (e.g. look-cover-write-check) rather than attending to the sounds within words.					
23	Specific time each week should be devoted to the explicit teaching of spelling					
24	There is an important place for direct instruction in spelling in the early school years.					

25 On the scale from 1 to 7 below please circle the number to indicate what you believe to be your own position concerning how the first stages of reading and writing should be organised for young children, from child-centres and unstructured (7) to teacher-directed and highly structured (1).

Least Structure

Most Structure

7 6 5 4 3 2 1

Immerse child in
Stimulating reading/
Writing environment
No direct teaching

Directly instruct
child in component
skills for
reading/writing.

SECTION 4: General Classroom Literacy Assessments

1. **What types of assessments do you use?** (you may tick more than one)

Commercially Developed Assessments

- a. School Entry Assessment (SEA)
 Which subtests to you use? Oral Language ₁ Numeracy ₂ Literacy ₃
- b. Six Year Observational Survey (6 Year Net)
- c. Neale Analysis of Reading Ability
- d. Burt Word Reading Test (NZ version)
- e. Assessment Resource Banks (ARBs)
- f. Reading Prose Inventory
- g. Other (please list): _____


School or Teacher Developed Assessments

- h. Checklists, rating scales and / or matrixes
- i. Running Records
- j. Exemplars
- k. Teacher made observation checklists
- l. Portfolio or work samples e.g. sample folders
- m. School or syndicate developed tests
- n. Teacher made tests used with your class only
- o. Other (please specify): _____
-

SECTION 5: Classroom Phonological Awareness Assessment

1. **What do you understand the term “Phonological Awareness” to mean?**
2. **What do you understand the term “Phonics” to mean?**
3. **Do you assess the phonological awareness skills of children in your classroom?**
 Yes (if yes please go to question 4) No (If no please go to question 5)
4. **Briefly describe when and how you formally / informally assess phonological awareness and the types of phonological awareness assessments you use.**
 (please include how you record children’s progress, the types of tasks that you use, group / individual assessment etc)
5. **Why do you not assess phonological awareness skills?**
6. **What types of activities do you use in your classroom to facilitate phonological awareness?**

Appendix F: Prompts for Phonological awareness

PA Stage	Child's level	Instruction	Answer sounds like...
easier  harder	Syllable	Let's break the word teapot into syllables	tea - pot
	Onset / rime	we can break a word into bits – p – ot (p is the onset and ot is the rime) (Spot would be sp-ot)	p-ot, pot
	first sound	What is the first sound in pot?	p
	last sound	What is the last sound in pot?	t
	blending	What word am I saying p – o – t	pot
	segmenting	Tell me all the sounds in pot	p – o - t
	manipulation (with letter tiles or on the white board)	If this says pot , show me hot	hot

Appendix G: Phonological Awareness Resources

Teacher A requested a number of activities that could be used at the syllable, onset-rime and phoneme level. The resources detailed are examples of the activities and resources developed. The Activity Chart (Appendix F) was used by the teacher.

Classroom PA Activity: *Syllable level*

There had been a classroom focus on *how we come to school*, a set of small (10cm x 10) cards with a picture of a mode of transport were developed. An additional set of cards with the numeracy counting patterns were also made.

Transport pictures

1 syllable	2 Syllables	3 Syllables	4 Syllables
sled	spaceship	roller-skates	helicopter
car	rocket	motorbike	hot-air -balloon
truck	kayak	hang-glider	station-wagon
bus	tanker	caravan	people-mover
raft	dingy	steamroller	roller coaster
bike	jetboat	windsurfer	
trike	wagon	aeroplane	
train	seaplane	submarine	
boat	canoe	fire-engine	
ship	jetski	sailing-boat	
yacht	glider	minibus	
jet	surfboard	ambulance	
van	wheelchair	parachute	
plane	scooter	gondola	
tram	rickshaw	bulldozer	
pram	go-cart	police-car	
tank	tandem	unicycle	
skis	digger	chariot	
	skateboard		



The teacher had the laminated syllable sheet beside him.

Procedure-

Teacher picks a car names the transport and everyone claps the syllables – targeting segmenting or teacher segments the syllables for the children to blend (blending)

Variations:

- child picks a card, names and claps while other children count

- children point to blocks as they say the word

- children put the card on a the numeracy sheet

- sound isolation – say the word and then the first sound of that word e.g. sled /s/. Also last sound e.g. bus /s/.

Teacher A used this game after morning tea to ‘tune’ in listening.

Games with food items, clothes and toys were also developed

Onset-Rime level

			<p>Pictures: Knee, bee, three, pea, tree, key Block, clock, rock, sock, Den, hen, ten, pen Map, cap, tap, snap, Nail, sail, ball, snail, mail, hail Cat, pat, bat, rat, Flip, ship, rip, zip Wait, smell, fat, sell, bell, sell Mop, pop, chop, stop</p>

Children named the item on the card then matched the card with a rhyme, targeting onset and rime segmenting and blending.



























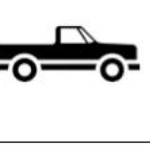

Variations:

-Teacher A used a big book then the children matched the rime with the rime written on the board (matching to print) so bell, smell, shell went under the “ell”. Some children were encourage to write the onset of the word to match their card making the phoneme-grapheme link.

- The teacher (or child) picked a card and segmented the word (at onset-rime or phoneme level) for the others to blend and “guess which picture they had”.

Phoneme level

This was often linked to the letter the children were writing or to the Big Book or to a theme / topic. One of the favourite games was “Old MacDonald’s farm”

																																																																																																																													
																																																																																																																													
																																																																																																																													
				<table border="1"> <thead> <tr> <th>Animal</th> <th>No Sounds</th> <th>Noise</th> <th>No of Sounds</th> </tr> </thead> <tbody> <tr><td>Duck</td><td>3</td><td>Quack</td><td>4</td></tr> <tr><td>Hen</td><td>3</td><td>Cluck</td><td>4</td></tr> <tr><td>Cow</td><td>2</td><td>Moo</td><td>2</td></tr> <tr><td>Pig</td><td>3</td><td>Oink</td><td>3</td></tr> <tr><td>Sheep</td><td>3</td><td>Baa</td><td>2</td></tr> <tr><td>Chick</td><td>3</td><td>Chirp</td><td>3</td></tr> <tr><td>Dog</td><td>3</td><td>Woof</td><td>4</td></tr> <tr><td>Cat</td><td>3</td><td>Purr</td><td>2</td></tr> <tr><td>Deer</td><td>2</td><td>munch</td><td>4</td></tr> <tr><td>Mouse</td><td>3</td><td>Squeak</td><td>5</td></tr> <tr><td>Frog</td><td>4</td><td>Croak</td><td>4</td></tr> <tr><td>Goose</td><td>3</td><td>Honk</td><td>4</td></tr> <tr><td>Goat</td><td>3</td><td>Bleat</td><td>4</td></tr> <tr><td>Bee</td><td>2</td><td>Buzz</td><td>3</td></tr> <tr><td>Horse</td><td>3</td><td>Neigh</td><td>2</td></tr> <tr><td>Lamb</td><td>3</td><td>Baa</td><td>2</td></tr> <tr><td>Call</td><td>4</td><td>Moo</td><td>2</td></tr> <tr><td>Kiwi</td><td>4</td><td>Kiwi</td><td>3</td></tr> <tr><td>Skink</td><td>5</td><td>cherp</td><td>4</td></tr> <tr><td>Donkey</td><td>5</td><td>Hee haw</td><td>4</td></tr> <tr><td>Turkey</td><td>4</td><td>gobble</td><td>4</td></tr> <tr><td>Fish</td><td>3</td><td>Pop</td><td>3</td></tr> <tr><td>Truck</td><td>4</td><td>brumm</td><td>4</td></tr> <tr><td>Ule</td><td>2</td><td>Put put</td><td>6</td></tr> <tr><td>Peacock</td><td>5</td><td>cry</td><td>3</td></tr> <tr><td>Fly</td><td>3</td><td>Bizz</td><td>3</td></tr> <tr><td>rabbit</td><td>5</td><td></td><td></td></tr> <tr><td>Emu</td><td>3</td><td>Drum</td><td>4</td></tr> <tr><td>rat</td><td>3</td><td></td><td></td></tr> </tbody> </table>		Animal	No Sounds	Noise	No of Sounds	Duck	3	Quack	4	Hen	3	Cluck	4	Cow	2	Moo	2	Pig	3	Oink	3	Sheep	3	Baa	2	Chick	3	Chirp	3	Dog	3	Woof	4	Cat	3	Purr	2	Deer	2	munch	4	Mouse	3	Squeak	5	Frog	4	Croak	4	Goose	3	Honk	4	Goat	3	Bleat	4	Bee	2	Buzz	3	Horse	3	Neigh	2	Lamb	3	Baa	2	Call	4	Moo	2	Kiwi	4	Kiwi	3	Skink	5	cherp	4	Donkey	5	Hee haw	4	Turkey	4	gobble	4	Fish	3	Pop	3	Truck	4	brumm	4	Ule	2	Put put	6	Peacock	5	cry	3	Fly	3	Bizz	3	rabbit	5			Emu	3	Drum	4	rat	3		
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The class sang Old MacDonald had a farm and on the farm..... child / teacher picks a card

And on that farm he had achild / teacher segments the animal name and then blends the sound to the word or other children blend the sounds and say the animal name.

Variations: The song changes to “Old MacDonald had a farm and on the farm..... child / teacher picks a card...And he had animal that said segment the animal noise.

- the children went and wrote the animal name after saying and segmenting.

Phoneme Level Continued....

First and last sound sorting games with the grapheme



Variations: included blending sounds to guess which picture the child / teacher had picked, playing “I see a” Sounding out the picture

The activities with the first and last sounds can easily be adapted to meet a range of PA abilities including sound letter manipulation. Children with more advanced skills can also be encouraged to provide a sound change to the existing sequence using the phrase, 'If this says ____, show me _____' using letter tiles or writing on the whiteboard.



Appendix H: Permission

From: GP Permissions <Permissions@guilford.com>
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To: Jane Carroll jane.carroll@otago.ac.nz

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