School years, summer holidays and the reading achievement gap

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Abstract

The present study examined the impact of children's socioeconomic backgrounds on the development of their reading and reading-related skills, over two school years and two summer breaks. The 136 children in the study were from six Auckland primary schools and represented a cross-section of different socioeconomic backgrounds. The study tested three theories of differential school year gains and summer losses in language and literacy: literate cultural capital theory, Matthew effects theory, and faucet theory.

All children were assessed at five test points. The first test point was at school entry, in Year 0. Children were assessed on alphabet and vocabulary knowledge, phonemic awareness, high-frequency word reading, and graded word reading. The four subsequent test points were at the end of Year 0, the beginning and end of Year 1 and the start of Year 2.

The results showed that the high-decile groups started school with greater levels of reading-related skills and high-frequency word reading skills than the low-decile groups. Generally, the gap in reading-related skills persisted and widened over the duration of the study.

In terms of graded word reading ability, a disparity became apparent in the second school year. By the end of the study, the highest decile group were reading at a reading age of about two years above their lowest decile counterparts. During the two school years, all decile groups made gains. However, these gains between groups were uneven at points, contributing to the reading disparity. Over the summer breaks, while some decile groups made gains in reading, others lost ground, by as much as 50% over one summer compared to what they had gained the previous school year.

The findings of the study supported all three theories to varying degrees and at different test points. The literate cultural capital theory was supported in that pre-reading skills at school entry determined reading progress. Faucet theory was supported in graded word reading ability in the first school year and over both summers. Matthew

effects were noted in word reading trajectories over the second school year and in reading-related skills over the period of the study.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Context

The fact that there exists a reading disparity among children in New Zealand is well-established, as identified by studies within New Zealand and internationally (Kirsch et al., 2003; Marshall, Caygill, & May, 2008; Mullis, Martin, Foy & Drucker, 2012; Mullis, Martin, Gonzalez, & Kennedy, 2003; OECD, 2007). The fact that this gap in reading is stratified along socioeconomic lines is also acknowledged (Hoff, 2013; Nicholson, 1997, 2003; Perry & McConney, 2010; Potter & Roksa, 2013; Telford, 2013; Wright & Neuman, 2013).

While the immediate effects of this reading gap are apparent in that progress in reading is delayed for some children, the lasting consequences are typically less evident. The impact of this disparity is far reaching in that it affects not only academic achievement of the children in the beginning years of school, but also this disadvantage can impact educational attainment in later school years (Lonigan, Burgess, & Anthony, 2000). In fact, these effects have been found to influence high school attendance and college placement (Alexander, Entwisle & Olson, 2007a).

Although the existence of the gap and its implications have been identified, what is less known is when the gap begins and how it widens. Some research points to the reserve of pre-reading skills that children have at school entry that determines how well they learn to read after starting school (Nicholson, 1997, 2006; Tunmer & Chapman, 2003; Tunmer, Chapman, & Prochnow, 2006). A deficit in these pre-reading skills has consequences for reading achievement in children as they go through school. The degree of pre-reading skills that is possessed by children has been shown to be dependent on family income background. Other research points to the summer vacation as contributing to the widening of the reading gap among children of different social classes (Alexander, Entwisle, & Olson, 2001; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Entwisle, Alexander, & Olson, 2001).

The present longitudinal study tracks the reading development of children representative of a cross-section of socioeconomic status (SES) backgrounds. Using a

seasonal comparison research approach, it attempts to chart their reading development over two school years and two summer breaks. This study is situated in New Zealand classrooms. It begins as the participant pool of New Zealand children turn 5 years old and begin primary school. It tracks their progress in reading and reading-related skills over the next 2 years of schooling and summer vacations.

The Problem

In New Zealand, measures to address the reading disparity have so far failed to close this gap despite the variety of remediation and prevention programs implemented nationally or within schools. Part of the reason could be that the scope of research so far does not provide comprehensive data showing the details of how children's pre-reading skills and reading ability at school entry influence reading progress. Also, a clear picture is lacking in terms of the trends in reading development trajectories over the summer vacation and how it compares with school year progress in children across different SES backgrounds.

More specifically, there are various gaps in the literature, particularly in the local context. Firstly, there is insufficient longitudinal data on children's reading-related skills and reading progress from school entry through to the first few years of school. Additionally, not much of this progress is presented in the research along SES lines. Furthermore, from the time that different SES children start school, it is unclear when the disparity is first noted. Lastly, no longitudinal research has provided insight into development of reading-related skills and reading ability over the summer break among children here.

Aims and Contribution

The purpose of this study is to provide stakeholders with a better understanding of the reading gap between different income background children at the start of formal schooling. It tracks not only reading progress but also the development of the skills that contribute to reading progress. This study attempts to provide a broader view of New Zealand children's reading progress, by SES background, to pinpoint where exactly the reading gap begins and the development trajectories of the reading-related skills that

support reading progress. The study explores these in the context of the school year and summer break separately as developmental paths of these may differ when children are in and out of school.

This study contributes to the body of research in that it is the only New Zealand study that tracks children's development of pre-reading skills and reading ability separately over school years and during the summer breaks. It provides insight into how the summer break affects children's reading progress.

Theoretical Framework

In predicting the trajectories of different SES children's reading and reading-related skills progress, three reading theories are deemed to frame this longitudinal study. The first is the literate cultural capital theory which relates to reading-related skills that children start school with. This theory contends that the amount of literate cultural capital children begin school with influences how well children learn to read in school (Nicholson, 1997, 2006; Tunmer & Chapman, 2003; Tunmer et al., 2006). Studies have shown that there are considerable differences in the degree of pre-reading skills, which include alphabet knowledge, phonemic awareness and vocabulary knowledge, that children begin school with. Literate cultural capital theory is linked to social class differences with children from low-SES backgrounds possessing lower levels of pre-reading skills compared to high-SES children.

The remaining two theories, Matthew effects theory and faucet theory, relate to children's progress in reading ability. Matthew effects theory expounds that children who are good readers, typically from high-income backgrounds, learn to read better and display greater rates of reading growth compared to poor readers, the majority of whom are from lower income backgrounds (Stanovich, 2008). Matthew effects theory is represented by the reading gap displaying a fan effect in reading trajectories where the 'rich get richer and the poor get poorer'.

Finally, faucet theory points to the summer vacation as the culprit of the reading gap. It is also linked to social class differences (Alexander et al., 2001; Entwisle et al., 2001). This theory contends that during the school year, equal opportunities are

available to all children and they learn to read at an even pace, regardless of social class. Over summer, the reading disparity widens substantially as the school resource faucet is turned off. During this time, inequalities in educational opportunities result in some social classes of children gaining ground while others may experience a ‘summer slide’ in reading.

A common thread among the three theoretical interpretations is that disparities in reading-related skills and reading ability may be exacerbated by differing levels of motivation to read (Chapman & Tunmer, 2003; Marinak & Gambrell, 2013). Hence, motivation is also considered in the design of this study.

Outline of Chapters

Chapter 2 is the literature review. It will examine the theories that frame the scope of this research study. Chapter 3 describes the methodology detailing the research design used in the study. Chapter 4 states the results of the study, while Chapter 5 discusses the results in the context of the surrounding literature. This chapter also lists limitations and implications for future research and ends with a conclusion.

Chapter 2: Literature Review

Introduction and Theoretical Underpinnings

There is a reading disparity among children in New Zealand. The gap between good and poor readers is one of the largest among OECD countries. There are three possible explanations for this gap.

The first factor that may contribute to the reading gap is the amount of literate cultural capital that children enter school with. Literate cultural capital is a set of pre-reading skills and knowledge that children possess prior to starting school. It is a reflection of what children bring from their preschool experiences and home environment. The SES background of the children may influence how much literate cultural capital they possess. Literate cultural capital theory (Tunmer et al., 2006) suggests that the degree of pre-reading skills and abilities that children possess determines how well they learn to read later on.

The second explanation for the reading gap might be attributed to Matthew effects theory (Stanovich, 2008). As children progress through schools, those with greater pre-reading skills learn to read faster and become good readers. During the time that children attend school, factors that influence their reading go beyond the home environment and may include factors such as peer effects and school decile ratings. With increased practice, good readers tend to read more and thereby become even better readers. Better readers then surge ahead leaving their less proficient counterparts behind, thus creating or contributing to the reading gap. This is analogous to the trend of 'the rich getting richer' otherwise known as Matthew effects theory (Stanovich, 2000, 2008) of reading development. It is characterised by a fan spread of better readers showing increased gains in reading while poorer readers may show slower gains or even losses over time.

A third potential explanation for the reading gap may be summer slide theory, also known as faucet theory (Alexander et al., 2001; Entwisle at al., 2001). This theory suggests that during the school year there exists a steady flow of opportunity to learn for all children. With the resource faucet turned on for all children, low-SES children gain

equally compared to their high-SES counterparts. However, during the long summer vacation, this school resource faucet is turned off or diminishes for low-income children. While all children are out of school during the summer break, learning opportunities are not available equally to all children and once again, their home background, socioeconomic factors and intrinsic motivation to read have greater impact on their reading progress than school effects. This results in some children gaining ground in reading and others sliding. Learning may continue for high-income children through enriching out-of-school experiences. However, lower SES children may not have similar learning opportunities, leading to unequal progress among children of different SES backgrounds. The result is that lower SES children may lose more ground in reading over the summer break than their higher SES counterparts. Downey, von Hippel and Broh (2004) support the faucet theory of Alexander et al. (2001) through their research that reveals low-SES children lose skills during the summer, while high-SES children gain, contributing to the skills gap. Downey et al. (2004) note, however, that when school is in session, all children gain skills at a higher rate than over the summer and the gap between low- and high-SES children's reading narrows. This suggests that school has a compensatory effect of reducing learning inequality that develops in part over the summer break.

This literature review firstly looks at studies that indicate the presence of a reading gap among children in New Zealand schools. A summary of reading development and theories of reading acquisition follows. This review will then examine how children learn to read and the pre-reading skills that may be required. It attempts to build a profile of good readers and poor readers and the factors that may affect this. Following this, reading development among children in their preschool and first few years in a New Zealand classroom will be examined. For the former, the literature on literate cultural capital and reading predictors that point to how children develop as readers before they begin school will be outlined. Reading development after children start school will be discussed in the context of Matthew effects theory and how this may contribute to the reading gap. Next, the impact of the long summer vacation on children's reading will be examined. A common thread among the explanations of reading progress is the SES backgrounds of the children. Hence, this literature review will also focus on this in the context of the three explanations mentioned. Another factor that influences many aspects of children's reading progress is the degree of

motivation to read. Thus, the final part of this review will explore literature on the relationship between reading progress and children's motivation to read.

The Reading Disparity

There is a reading disparity in New Zealand. This is evidenced by studies conducted internationally and is acknowledged by the Ministry of Education (MOE) in New Zealand. The following sections outline some of the findings of these studies.

A key study, the Program for International Student Assessment (PISA), has been conducted by the Organisation for Economic Co-operation and Development (OECD) every 3 years since 2000. It measures performance in reading, mathematics and science among 15-year-old students in various OECD member and non-member nations. New Zealand has participated in the study from the outset.

In terms of reading literacy, participants were assessed on their ability to retrieve specific information, capacity to understand and interpret information from reading texts. Text types included narrative, descriptive texts and transactional texts, such as tables, charts and forms. From these assessments, a composite score was then derived.

The first round of the study, in 2000, involved participants from 32 countries, while subsequent rounds in 2003, 2006, 2009 and 2012 involved students from 41, 57, 63 and 65 participating countries respectively. New Zealand participants were 15 years old at the time of the study and numbers for the reading component of the five studies were 3,667, 4,511, 4,824, 4,653, and 4,291 respectively.

Results of the PISA 2000 study showed that New Zealand ranked 3rd in reading literacy out of the 32 countries that participated. The mean reading score of participants in New Zealand was 529, which was significantly higher than the international average of 500. However, the range of scores among the New Zealand sample was bigger compared to most of the other participant countries. The difference between the 5th and 95th percentile was 355. This gap was the second largest among all participating countries. The report on this study suggested that SES may influence reading

achievement in New Zealand because students from higher income households performed better than students from lower income households (Kirsch et al., 2003).

Furthermore, the report highlights that the gap was ethnically linked, with European/Pakeha and Asian students having significantly higher reading achievement scores than Maori and Pasifika students. The lowest levels of reading achievement in New Zealand appear to be predominantly among lower SES children of Maori or Pasifika descent. This finding was noted previously in an international study conducted by the International Association for the Evaluation of Educational Achievement, New Zealand, called PIRL (Wagemaker, 1992).

The next PISA study in 2003 saw New Zealand's mean reading literacy score drop marginally to 522 although this was not a significant difference to the 2000 score of 529. In that year, New Zealand ranked 5th out of a total of 41 participating countries. The distribution of scores between the 5th and 95th percentile was 344, making it one of the largest ranges in that year. A report by the MOE in New Zealand (MOE, 2009) suggested that while New Zealand's good readers led their counterparts in the other participating countries, there was a group of weaker readers that were falling behind. Similar to their response to the PISA 2000 study, the MOE report highlights SES as a factor affecting achievement in reading literacy, as well as ethnicity, with Pakeha/European students performing better than their Maori and Pasifika peers.

The 2006 PISA study (OECD, 2007) found that the average mean reading score of New Zealand children, was 521, which was once again significantly higher than the OECD average of 492. There was no statistical difference between mean scores on the 2006 PISA study and similar scores for reading literacy in previous studies. New Zealand ranked 3rd in that year, out of the 57 participating countries. The distribution of scores between the 5th and 95th percentile was the same as in PISA 2003, at 344. In their summary of findings, the New Zealand MOE (Marshall et al., 2008), acknowledged this wide spread of scores and recognised the need to improve achievement of low-achieving students. The New Zealand MOE also reported that larger proportions of Pakeha/European children performed better and larger proportions of Maori and Pasifika students were in the lower levels of performance. Reading literacy also improved with increased SES.

The 2009 PISA study had similar trends. The mean reading literacy score for New Zealand students was 521, which was not significantly different from previous studies. New Zealand ranked 7th out of 65 participating countries. This score was significantly higher than the average, but as in previous studies, the distribution of scores showed a larger disparity between good and poor readers with the range between the 5th and 95th percentile being 335 (Telford & May, 2010). A further report once again, suggested that SES background, among other factors, influenced reading performance (Telford, 2013).

The most recent follow-up of PISA in 2012 saw New Zealand participants achieving a mean reading score of 512 and a decline in rankings from 7th to 13th out of 65 participating countries (OECD, 2012). However, the mean score was above the OECD average of 498. Since PISA 2000, the proportion of students with poor reading skills (at Level 2 or below) had increased while the proportion of good readers (Level 5 or above) had dropped, as recognised by the MOE (May, Cowles, & Lamy, 2013).

In sum, results of each PISA study have displayed similar trends. New Zealand children, on average, are reading better than most of their counterparts in the countries that participated in the studies. However, the gap between good and poor readers has existed since the beginning of the study and does not seem to be closing, despite the efforts of the New Zealand MOE. A further common thread among all the PISA studies is that the gap appears to be SES and ethnicity linked.

The PISA studies have been used by the New Zealand MOE to guide them in seeking to attain educational achievement for all students. Following the PISA 2000 results, the MOE acknowledged this reading disparity among children in the study. In its Statement of Intent (MOE, 2005), the aim of reducing the gap over the following 5 years was declared. Results of the 2009 PISA study, however, indicated an unusually large disparity compared to other participating countries. The MOE 2009 annual report acknowledged this reading gap. It listed various initiatives to address it. One was better access to Early Childhood Education for all children. Another was the implementation of National Standards for schools to identify students with literacy difficulties. A third was professional development for teachers. While these initiatives are underway and being evaluated, results indicate that “The difference in achievement levels between

high and medium decile schools is reducing but the difference in achievement levels between high and low decile schools remains unchanged." (MOE Annual Report, 2009, p.16).

The PISA studies are a measure of the knowledge and competencies of 15-year-old students in various participating countries. The sample of the PISA studies is age-based and is concerned with students' key competencies in the transitioning from compulsory education to post-compulsory education or work life. Another set of international studies, the Progress in International Reading Literacy Study (PIRLS), on the other, hand focuses on children in the fourth grade of primary school (children who have had 4 or 5 years of schooling) and examines children's achievement in reading skills that are required to transition from learning to read to reading to learn. The most recent PIRLS studies were conducted in 2001, 2006 and 2011. These studies also illustrate a reading gap among New Zealand children. The following sections report the main findings of each study.

PIRLS 2001 saw 2,500 New Zealand children in Year 5 participate in a series of reading literacy assessments focusing on purposes of reading and reading comprehension ability, along with children from 34 other countries. The mean reading scores for the New Zealand cohort was 529, which was higher than the international average at 500. However, similar to the PISA trends, in New Zealand, the range of scores between the good and poor readers was wider when compared with most other better-performing countries, at a range of 308, being the difference between the 5^{th} and 95^{th} percentile (Mullis et al., 2003).

The next PIRLS study conducted in 2005/2006 showed similar results. A total of 6,256 Year 5 students participated in the study. Their reading score averaged 532, which was once again above the international average of 500. However, there was no significant change in the New Zealand mean from the 2001 PIRLS study to the 2005/2006 study. The variation in scores was again wider than in most countries, with the 5^{th} and 95^{th} percentile range being 290.

The subsequent PIRLS study in 2010/2011 revealed results following a similar trend. The number of participants in New Zealand was 5,600 Year 5 students in this

cycle. The mean score was 531, again above the international mean. Nevertheless, this was not significantly different from New Zealand's PIRLS mean scores in the PIRLS 2001 and 2005/2006 studies. Additionally, New Zealand also stood out as having one of the largest differences in mean scores between the 5th and 95th percentile groups, at 293, a slight increase from the 2005/2006 result (Mullis et al., 2012).

In summary, international studies over the last 14 years have documented that mean average reading scores place some New Zealand students amongst better-performing countries in the OECD. However, a recurring theme is the large reading gap between high- and low-SES students in New Zealand. It is well-established that this disparity between good and poor readers is more pronounced in New Zealand than for many other countries where literacy levels have been researched. These international studies have also shown that this gap is not limited to a particular age group of students but seems to be maintained as children progress from their early years to almost the end of their compulsory schooling years. This disparity in literacy is an acknowledged cause for concern to the MOE in New Zealand.

Reading and Theories of Reading Acquisition

Gough and Tunmer's (1986) simple view of reading defines reading comprehension as a function of decoding and language comprehension. Hence, the goal of reading education is to help children acquire the skills necessary to construct meaning from a text and thereby facilitate comprehension.

Two main theories on reading acquisition have dominated reading research since the 1960s. Nicholson and Tunmer (2011) provide a summary of these theories. The first, the top-down theory, is a constructivist learning theory that sees the reader carrying out information processing by using pre-existing ideas and interacting with the words in a text to create meaning. The authors cite Goodman's (1981) view that as the reader can only process a limited amount of information at any one time, reading effectiveness is enhanced as processing demands drop. In order to drop processing demands, readers predict information prior to actually reading it. The next strategy of the reader is to process as little printed information as possible. This is possible as the

reader makes sense of sentences by prediction based on word spellings, grammatical sequence and sentence context.

The assumptions of top-down reading theory, therefore, are that readers do not read every word and instead make use of contextual clues to predict meaning and mainly check print to confirm predictions. Nicholson and Tunmer (2011) contend that while context can make text familiarity easier, prediction based on context-driven cues is limited and that there must be additional skills at work during the reading process. An additional problem they mention is the fact that context-rich texts are not typical. In a study by Nicholson (1993), good readers were found to have well-developed word recognition skills and were able to read well without predicting information based on context. Poor readers, on the other hand, relied on context clues to facilitate word recognition.

The second theory of reading is Gough's (1972) bottom-up theory. This theory sees the reader taking a snapshot of groups of words at one point in time. In 1 second, perhaps four or five words are identified. Alphabetic print is converted into phonological form and meaning extrapolated from memory. Meaning is then deposited in long-term memory. Building on this theory, Nicholson and Tunmer (2011) suggest that good readers identify every word in a text. Following this, two pathways of processing are highlighted in their summary. The first involves each word being processed phonologically and meaning then interpreted using the mental lexicon. The second suggests that new words may be processed phonologically, but as familiarity with the word increases, skilled readers process these words as sight words. Sight words, as explained by Ehri (2014), are words that have been read before and are read from memory. They are not decoded but are recognised from sight with meaning and pronunciation activated by this process. While more high-frequency or irregularly spelt words tend to be regarded as sight words, Ehri (2014) explains that all words when familiar are read from memory by sight.

Top-down theory is considered by many to underpin the whole language approach to reading and the bottom-up theory has practical applications found in the phonics approach to teaching reading (Helland, Tjus, Hovden, Ofte, & Heimann, 2011; Nicholson & Tunmer, 2011). Reading experts have historically had debates about each

of the approaches being mutually exclusive. However, within the last 20 years, this polarised dichotomy has eased up, with both sides now calling for a more balanced approach (Nicholson & Tunmer, 2011; Pearson, 2004). The top-down or whole language movement dominated the pedagogical approach to teaching reading in the 1960s, although throughout its time, it never gained unanimous acceptance. According to Pearson (2004), the reign of the whole language movement ended for several reasons, two of which were the "unintended curricular casualties of the whole language" approach and the "growth of balanced literacy as a mediating force in the debate" (p.220). Now, there is recognition that all children may not learn the same way and that varying combinations of these approaches may be necessary for different children depending on the skills that they possess. Children with a greater degree of pre-reading skills may benefit more from the whole language or top-down approach, which may be more meaning-focused. In contrast, children with relative deficiencies in these skills may benefit more from the phonics or bottom–up approach, which pays particular attention to developing these skills that then provide a foundation for successful beginning reading experiences (Arrow & McLachlan, 2011).

Emergent Literacy and Literate Cultural Capital

Reading acquisition does not begin at the commencement of school. Rather, it happens as a developmental continuum, starting early in children's lives (Whitehurst & Lonigan, 1998). This concept is termed emergent literacy. Whitehurst and Lonigan (1998) explain that this is a necessary part of learning to read whereby the development of reading, writing and oral language skills occur interdependently as children have and draw on home and preschool experiences. Emergent literacy skills are therefore the skills and processes that contribute in the development of reading and writing skills prior to the commencement of schooling. The development of these skills is influenced by children's knowledge, attitude and environments. Whitehurst and Lonigan (1998) explain the model of emergent literacy skills in detail by categorising two interdependent sub-sets of skills and processes, the inside-out and outside-in sets. The former includes metalinguistic features, including knowledge of alphabet (knowledge about letter names and sounds which directly relate to conventional reading acquisition), decoding ability, phonological awareness that is necessary in order to convert print into units of sound, knowledge of punctuation, and syntactic awareness.

Outside-in processes comprise skills that children require to comprehend what they read. This involves understanding the framework of texts which they read. These skills include knowledge about conventions of print, (which is knowledge of standard front to back orientation and left-to-right print format), syntax, and the discourse structure of a narrative.

Research shows that emergent or pre-literacy skills that preschool children possess prior to beginning formal schooling have an impact on later reading development (Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013; Whitehurst & Lonigan, 1998). Some of these skills were identified by the National Early Literacy Panel in their meta-analysis of 300 studies (Lonigan, Schatschneider, & Westberg, 2008). The studies involved measuring one or more pre-literacy skills possessed by children at or slightly older than kindergarten age and investigating the relationship between these skills and the development of conventional literacy competencies. These competencies are the skills that are used in actual reading, including recognition of high-frequency words, understanding of text structure, predicting text, and monitoring of own reading performance. Findings were that alphabet knowledge was a moderate to strong predictor of all conventional literacy competencies, while phonological awareness had a moderate correlation with the same literacy skills.

Emergent literacy may develop mainly in the home setting as well as preschool and day care environments. In the home, shared book reading has been found to provide a rich context for children to be exposed to print and promote vocabulary development. Other aspects of home literacy include the number of books in a home, visits to the library, and adult-child verbal interactions that contribute to children's emergent literacy skills (Anderson, Purcell-Gates, Lenters, & McTavish, 2012; Sénéchal, 2012). Semi-formal preschool settings, such as kindergarten, may also develop children's emergent literacy skills of alphabet knowledge, concepts of print, vocabulary and phonological awareness (Connor, Morrison, & Slominski, 2006; Shanahan & Lonigan, 2010). Therefore, the home and early childhood education environments are key influences on the development of preschoolers' emergent literacy skills.

Importantly, Whitehurst and Lonigan (2001) explain that emergent literacy skills vary greatly among children and suggest that the degree of these skills of children is often linked to family income. The SES background of children has been found to be one of the strongest predictors of performance differences in children at the start of formal schooling in first grade in the United States (Blachman, 2000; Lonigan & Whitehurst, 1998; Nicholson, 2003). The performance differences are found in reading achievement as well as in various emergent literacy skills. They suggest that the SES link may be due to the differences in shared reading experiences at home. A study by Ninio (as cited in Whitehurst & Lonigan, 2001) explains this finding, suggesting that mothers of lower SES groups have smaller productive vocabulary bases and engage in fewer teaching behaviours while carrying out shared book reading, compared to their higher SES peers. Other studies by Adams (as cited in Whitehurst & Lonigan, 2001) found less book ownership and less frequency of shared reading experiences among low-SES families compared to higher SES families.

Similar to Whitehurst and Lonigan's (1998) theory and model of emergent literacy, in New Zealand, Tunmer et al. (2006) have found that skills that children possess prior to starting school are a strong predictor of later reading success and are SES dependent. They coined the term literate cultural capital to refer to these reading literacy-related skills. A key study was conducted by Tunmer et al. (2006) to examine how strong literate cultural capital was as a predictor of later reading achievement. In this longitudinal study, the researchers used phonological awareness, grammatical sensitivity, receptive vocabulary knowledge and letter knowledge as measures of literate cultural capital. Seventy-six new entrant children from different SES backgrounds were assessed in these measures when they entered school for the first time and a composite score of these variables was generated to represent literate cultural capital. Then, at the end of Year 7 of school, their reading achievement was measured.

Results of this study showed that the literate cultural capital scores of higher SES background children at school-entry were significantly greater than those of lower income family children. Furthermore, literate cultural capital accounted for almost 50% of the variance in reading achievement 7 years on. At Year 7, children in the study were about 12 years old and the average reading age of the cohort of children in the study was 11 years and 5 months. However, the children in the bottom quartile of literate

cultural capital scores at school entry had an average reading age of 9 years 1 month, which was a deficit of 2 years and 4 months compared to the overall mean. On the other hand, the highest quartile had an average reading age of 13 years and 4 months. Hence, children in this quartile were 2 years and 1 month above their expected reading age. Tunmer et al. (2006) explain that children with insufficient literate cultural capital at school entry may be forced to depend on ineffective strategies to identify words in a beginning reading classroom. They claim if remedial support is not provided in the form of enhancing the literate cultural capital skills in their study, Matthew effects in reading achievement occurs, as evidenced by their result 7 years on. Their study showed that low-SES children starting with lower levels of literate cultural capital did not benefit as much from reading instruction in a whole language classroom, which seems to favour children with more literate cultural capital. This will be discussed in greater detail in a later section.

As early reading skills influence later reading success, the following sections examine in greater detail the individual skills that contribute to the literate cultural capital or emergent literacy skills of children. The skills focused on are alphabet letter and sound knowledge, phonemic awareness and receptive vocabulary, as these are the components most relevant to the study.

Alphabet knowledge.

This refers to children's awareness of the name, form and sound of the letters of the alphabet. Research indicates that alphabet knowledge is a crucial emergent literacy skill and some research identifies it as the best predictor of future reading ability. The National Institute of Literacy is a federal government agency of the United States that was convened in 2002 to summarise scientific research findings on children's early literacy development. It has consistently found that alphabet knowledge is one of six key components that influences later reading success. They conclude that it is an early precursor literacy skill that has medium to large predictive relationships to future reading achievement (National Early Literacy Panel, 2008). A great many researchers share a consensus that alphabet knowledge is a vital part of early literacy development, with children lagging behind in this area more likely to have difficulties when learning to read later on (Duncan et al., 2007; Foulin, 2005; Hammill, 2004; Lonigan et al.,

2000; Lonigan et al., 2008; McBride-Chang, 1998; National Early Literacy Panel, 2008; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004; Stanovich, 2008; Torgesen, 2002; Torgesen & Hudson, 2006; Tunmer & Nicholson, 2011).

Much research points to alphabet knowledge as a step towards word recognition and emergent reading (Ehri, 1987, 1998, 2014; Gough & Hillinger, 1980; Roberts, 2003; Treiman & Rodriguez, 1999). It has been suggested that knowledge of alphabet names allows children greater familiarity and enhanced ability to identify them in text. This in turn allows for more rapid and efficient processing during the reading process (Ehri, 2014; Foulin, 2005; Logan, Schatschneider, & Wagner, 2011; McBride-Chang, 1999; Schatschneider et al., 2004; Walsh, Price, & Gillingham, 1988).

Additionally, knowledge of alphabet names allows the reader to retrieve sounds more easily and to develop both a phonological concept of print and phonologically-based strategies for decoding print (Foulin, 2005). This is due to the fact that many letter names contain, in their initial or final position, the phoneme associated with that letter. In fact, it is likely that letter name knowledge supports letter sound learning in that letter knowledge provides a platform upon which children can link names and sounds. This reinforces learning of the alphabetic principle (Adams, 2011; Adams, Treiman, & Pressley, 1998; Foulin, 2005; Share, 2004). Developing knowledge of the alphabetic principle requires that children make connections between graphemes, which are the units of letters in print that represent individual phonemes, and the phonemes themselves (Ehri, 2014). Children who have well-developed knowledge of the alphabetic principle and are able to successfully relate graphemes to their corresponding phonemes can then use this knowledge to decode unfamiliar words (Ehri, 2014; Turnbull, Bowles, Skibbe, Justice, & Wiggins, 2010), as well as build a bank of words they can recognize by sight (Ehri, 2014).

Due to the evidence that alphabet knowledge is crucial in emergent literacy, and is a strong predictor of later reading success, many researchers and organisations are in agreement that alphabet knowledge should be an essential component of early school instruction. This is evidenced in the standards set by educational authorities in the United States. Piasta, Petscher and Justice (2012), in their review of alphabet knowledge benchmarks set by the various states, have found that the majority of states

include standards for alphabet learning at the start of the first year of formal school in the first grade. However, this number varies from state to state. The highest benchmark, in Texas, requires children at the end of preschool to be able to name at least 20 uppercase and 20 lowercase letters. Most states in the review set the benchmark at least 10 or more letters. The authors highlight that the benchmarks set by almost all states indicate the recognition of early alphabet knowledge as important in later literacy achievement, but agree that there is little consensus as to a suitable number being the appropriate benchmark. In this regard, the authors investigated the relationship between letter-name knowledge of preschool children and its predictive power or impact on literacy achievement 2 years on.

The study by Piasta et al. (2012) comprised 371 participants, the majority of whom came from low-income backgrounds. Children were assessed on letter name knowledge at the end of their time at preschool. Two years later, the same children were assessed in word reading, spelling and reading comprehension skills. Using state and federal standards as a guide, the researchers generated benchmarks of 10, 13, 16, 18 19 and 26 letter names and examined the negative predictive power of the results. Negative predictive power, according to the authors, signified the proportion of children not at-risk on first grade literacy outcomes, which were word reading, spelling and passage comprehension. In other words, the rationale was that children achieving particular benchmarks should not be at risk of literacy difficulties. They found that preschool children who were able to identify 10 or more letters were most likely to be not at risk in terms of first grade literacy outcomes. To elaborate, for lowercase alphabet, negative predictive power was .89 or greater on risk of first grade spelling difficulty. This means that 89% of children in the study who knew at least 10 letters were not at risk for spelling difficulties at first grade. Unsurprisingly, as the benchmark for alphabet knowledge increased to 13, 16, 18, 19 and 26, the negative predictive power also increased up to .97 for letter knowledge for all 26 letters of the alphabet. A similar trend was noted for knowledge of 10 or more letters of the alphabet and passage reading with negative predictive power ranging from .74 to .85. Hence, knowledge of 10 letters of the alphabet at school entry was recognised as an acceptable benchmark for greater likelihood of later literacy competency.

Alphabet knowledge of 10 letters was also identified in a review by Bracken and Crawford (2010) in the United States. They conducted a review of basic concepts listed in early childhood education standards across 50 states. They contend that children require the foundations of language to be able to explore and manipulate topical concepts in a variety of content areas and experience later academic success. In their review, Bracken and Crawford (2010) found that although not uniform, all 50 states require 5-year-olds at the end of their time at pre-kindergarten to recognise and name some of the letters of the alphabet. Not all states specify the number of letters in their standards. However, recognition of 10 letters appears to be the most common requirement in state standards. The researchers call for greater standardisation between the various states as a next step in the right direction.

In the New Zealand context, there are no similar standards of alphabet knowledge benchmarks specified by the MOE. In fact, the New Zealand early childhood education (ECE) curriculum allows for wide interpretation in terms of early literacy development in ECEs and does not prescribe what teachers must do to promote literacy development, thereby leaving teachers to make decisions about developing children's emergent literacy skills. Correspondingly, there is no requirement for children's emergent literacy skills, including alphabet knowledge, to be formally measured at school entry (Foote, Smith, & Ellis, 2004; Patel, 2012).

Considering the wealth of research that has shown the key role of alphabet knowledge in literacy development, surprisingly, a meta-analysis of 63 studies on letter knowledge learning and instruction by Piasta and Wagner (2010) did not show evidence of much transfer to the development of other early literacy skills. Following alphabet instruction, small positive effects were found immediately in reading skills, but no effects were found for phonological awareness or spelling skills. It should be noted that over 50% of the studies gave their control groups a degree of phonological training or some form of alphabet instruction supposed to be less effective than the experimental treatment (Piasta & Wagner, 2010). Therefore, possible gains made by the control groups as a result of such instruction could well have reduced the measured effect sizes of the experimental treatments. Only four of the 63 studies analysed conducted follow-up assessments, but none of these found any significant impact of alphabet knowledge instruction on reading outcomes. While the studies used in the meta-analysis had their

limitations, particularly in terms of the variation in instructional techniques and experimental design, the authors call for further research examining the role that alphabet knowledge plays in reading development.

In terms of alphabet knowledge and SES, lower SES has been found to correlate with lower levels of alphabet knowledge. Bowey (1995) investigated the emergent literacy skills of two groups of 5-year-old preschoolers in Brisbane. One group of 23 children came from high-SES families, while the low-SES group comprised 25 children. The high-SES children were found to have significantly higher levels of letter name knowledge than those from the low-SES group (Bowey, 1995). The high-SES children could name an average of 11.09 letters, whereas for the children from low-SES households this dropped to an average of 5.72 letter names.

Similarly, Nicholson (2003) found that some New Zealand children from lower SES backgrounds started school with significantly lower levels of alphabet knowledge than their counterparts from higher SES backgrounds. Nicholson used the Clay (1985) assessment of alphabet knowledge, which measures children's knowledge of the uppercase and lowercase letters, with a resulting score out of 52. There were 113 children who were tested around the time that they started school. The mean age for low-SES children and high-SES children was 5.27 years and 5.26 years respectively, with no significant differences between the two groups. Although scores in each SES group ranged widely, the average alphabet knowledge score for the low-SES children was 20 out of 52, while the high-SES group scored an average of 41 out of 52. Nicholson also found that school-entry alphabet knowledge was the best predictor of children's reading ability at the end of their first school year but that phonemic awareness scores best predicted their reading ability at the end of their second year at school (Nicholson, 2003).

To summarise, alphabet knowledge is a necessary part of developing literacy because of its critical connection to understanding the alphabetic principle. As such it has been found to be a strong predictor of literacy in the early years of schooling. As children develop increased familiarity with letters, they are able to recognise letters in print more easily. Furthermore, letter-name knowledge helps children to develop letter-sound knowledge due to the phonemic clues within letter names thereby helping

children begin to understand the alphabetic principle. This development of grapheme to phoneme correspondences allows children to use phonologically based strategies to decode printed text. Finally, low-SES has been found to correlate with low levels of alphabet knowledge in preschoolers and new entrants in formal schooling.

Phonological awareness.

While knowledge of the alphabet is vital for future reading success, another element that is essential for reading development is phonological awareness. This has been defined by the National Research Council in the United States as knowledge about speech units including syllables, onset-rime and phonemes and the possession of the skills necessary to identify such units and to manipulate these by blending or segmenting to change meaning (National Research Council, 1998). The critical connection between children's levels of early phonological awareness and their subsequent achievement in attaining literacy has been well-established in the fields of cognitive and developmental psychology over decades of research (Burgess, 2002; Bus & van Ijzendoorn, 1999; Castle, Riach, & Nicholson, 1994; Ehri, 2014; Kim, Petscher, Foorman, & Zhou, 2010; Lonigan et al., 2000; Lundberg, Larsman, & Strid, 2012; Nicholson, 2003; Raz & Bryant, 1990; Tunmer, Chapman, Greaney, Prochnow, & Arrow, 2013).

One important concept of phonological awareness is that it develops in children in the order of larger to smaller segments of sound. This means that children first identify whole words and then syllables before onsets and rimes and finally individual phonemes (Anthony & Francis, 2005; Anthony, Lonigan, & Schatschneider, 2003; Ziegler & Goswami, 2005). Another point to note regarding phonological awareness is whether it acts as a unified construct that develops as increasingly more complex skills or if it is a multidimensional construct, with discrete phonological awareness abilities. Several robust studies have found that children's performances on a range of phonological awareness tasks are usually well accounted for by a single underlying ability. This supports a unified phonological awareness construct. (Anthony & Lonigan, 2004; Anthony et al., 2003; Schatschneider, Francis, Foorman, Fletcher, & Mehta, 1999; Stanovich, Cunningham, & Cramer, 1984).

One study that demonstrates this unified construct is that by Lonigan et al. (2000) who examined the degree to which the components of phonological awareness, such as rhyme and phonemic awareness, could be identified as separate factors from an overall concept of phonological awareness with respect to early reading skills. They conducted a longitudinal study of 193 children largely from middle- and high-income families. Approximately half of the children were initially assessed in the early preschool period and given follow-up assessment 18 months later, while the remainder were recruited into the study and followed for around a year from late preschool to kindergarten or first grade. The children were given 4 different measures of phonological sensitivity, which were rhyme and alliteration oddity detection tasks, a blending task and an elision task. Results showed that the global concept of phonological awareness is a unitary construct, and also that the participants' rankings for phonological awareness remained constant across the two assessment points. That is, a 5-year-old with relatively low or high levels of phonological awareness compared to their peer group had similar phonological awareness levels in comparison with the same peer group at the age of 6 (Lonigan et al., 2000).

Phonological awareness and phonemic awareness are terms that are sometimes substituted for each other (Walsh, 2009). However, it is important to note that phonemic awareness is actually a skill that is a subset of phonological awareness. It involves the understanding that words can be divided into a sequences of individual sounds known as phonemes and the skill is evidenced by segmenting, blending, or substituting phonemes inside words to make new words. Phonemic awareness is considered to be the most sophisticated and latest-developing level of phonological awareness (National Research Council, 2010).

Some research has shown that phonemic awareness is a strong predictor of future reading success (Morrow, 2009; Nicholson, 2003, 2005, 2006; Nicholson & Ng, 2006), and other research shows phonological awareness to be crucial for early literacy development (Tunmer et al., 2006). Hence, in this review, phonological awareness is used to represent everything from the most basic levels of phonological awareness through to finely-grained phonemic awareness. When studies relate exclusively to phonemic awareness they will be detailed as such.

After accounting for other factors such as social class, receptive vocabulary, IQ and memory skills, children with higher levels of phonological awareness have been found to develop literacy faster than those with lower levels, and vice versa (Lonigan et al., 2000; Raz, & Bryant, 1990; Torgesen, 2002). The following sections review the literature on how phonological awareness may enhance reading development.

Firstly, phonological awareness may contribute to the development of knowledge about grapheme-phoneme correspondence, that is, the alphabetic principle. Unlocking the key to the alphabetic principle requires that children have the necessary phonological awareness to recognise the individual phoneme segments from the flow of speech. Once these phonemes have been segmented and identified, they can be related to corresponding letters of the alphabet in print and the child can begin to develop reading and spelling ability (Kim et al., 2010; Lundberg et al., 2012; Shankweiler & Fowler, 2004). Hence, phonological awareness and interaction with reading printed text allow children to develop cipher knowledge, which is English letter-sound knowledge (Nicholson, 2003), and this cipher knowledge is a vital step towards understanding the alphabetic principle.

Secondly, as most English alphabet letter names contain the phoneme which is represented by the letter name, it has been hypothesised that phonological awareness helps children to abstract the sounds of letters from those clues in their names (Kim et al., 2010). Phonological sensitivity has been found to be associated with higher levels of letter-sound knowledge in children. A study by Kim et al. (2010) investigated the correlation between children's level of phonological awareness and their knowledge of letter sounds with known and unknown letter names. Children with low levels of phonological awareness were shown to have a 40% likelihood of knowing the letter sounds of known letter names. However, for children with highly developed phonological awareness, this likelihood rose to 82%. Where the letter name was unknown, the less phonologically skilled children had a 3% chance of knowing the corresponding letter sound, whereas this increased to 11% for children with high levels of phonological awareness. These findings support the hypothesis that higher levels of phonological awareness assist children in working out letter sounds from the phoneme clues in the letter names.

Further support for the importance of phonological awareness to literacy development comes from the results of intervention programs. Many experimental studies have shown that preschoolers who were given training in phonological awareness went on to develop significantly higher levels of literacy development in early schooling than children from control groups who did not receive this training (Bus & van Ijzendoorn, 1999; Castle et al., 1994; Lundberg et al., 2012; Nicholson, 2003; Torgesen, 2002).

However, in their review of longitudinal intervention studies of the effect of phonological awareness training on subsequent literacy development, Castles and Coltheart (2004) contend that only phonological awareness training that is explicitly linked to graphemes and letter-sound correspondence can be convincingly shown to benefit literacy development. Supporting this link, Hatcher et al. (2006) evaluated the impact of two literacy support programs with a strong focus on phonological awareness integrated with letter-sound correspondence. They reported a significant positive effect on literacy outcomes for participants.

In terms of phonemic awareness, studies have shown that interventions including this skill can improve reading skills. In New Zealand, one study by Ryder, Tunmer and Greaney (2008) investigated the effectiveness of phonemic awareness training integrated with letter-sound correspondence on literacy development. The study involved 24 children between 6 and 7 years old in a primary school in a low- to middle-income area. The participants were all children with identified reading delay. A control group and intervention group were formed from the participant pool. The measures used in the pretests and posttests included a context-free word recognition test, a pseudoword decoding task and a test of reading comprehension. Immediately following the 24-week intervention period, the intervention group significantly outperformed the control group in the posttest measures of pseudoword decoding and context-free word recognition. No significant differences were noted between groups in reading comprehension skills. However, 2 years later, the intervention group children were found to perform significantly better in the same two measures of literacy skills than the control group. By this time, the difference between mean reading ages for the groups had grown to 9 months for context–free word recognition and 14 months for in-text word recognition. The researchers suggest that the gains made by the intervention group had compounded

in the interim period due to positive Matthew effects in literacy development (Stanovich, 2008). Another study by Nicholson and Ng (2006) on 24 children in Singapore found similar results for preschool children who were given phonemic awareness training. The intervention program resulted in significantly higher scores for phonemic awareness and word reading in lists and passages.

While phonological awareness and phonemic awareness are identified as causal factors in acquiring literacy, there is likely to be a reciprocal effect in that learning to read may have the effect of further facilitating development in these areas. This is because developing familiarity with printed text and its corresponding phonemes gives children practice that raises their phonological awareness (Shankweiler & Fowler, 2004).

Turning to the influence of SES on phonological ability of beginning readers, many studies have examined this relationship and clear differences linked to SES. High-SES has been found to correlate strongly with well-developed phonological awareness, while children from low-SES families have been shown to start kindergarten or school with comparatively much less knowledge in this area (Lonigan et al., 2013; Lundberg et al., 2012; McCoach, O'Connell, Reis, & Levitt, 2006; Nicholson, 2003; O'Connor, Arnott, McIntosh, & Dodd, 2009).

McIntosh, Crosbie, Holm, Dodd and Thomas (2007) investigated the phonological awareness of 169 children attending preschools in low-SES areas of Queensland, Australia. They used the two sub-tests of the Primary and Preschool Inventory of Phonological Awareness assessment. These sub-tests were the rhyme awareness tasks and phoneme isolation tasks. Results of this study were that in the rhyme awareness task, the average standard score of low-SES children was 4, while the expected standard score for children at that age was 10. In the phoneme isolation task, the low-SES group had an average standard score of 7, compared to an expected norm of 10. Hence, the low-SES preschoolers showed levels of phonological awareness that were far below normative expectations for their age group and the researchers concluded that these children would be seriously disadvantaged at school entry in terms of literacy development.

In a more local context, Nicholson (2003) investigated the early literacy skills of children from different SES groups at school entry in New Zealand. His study used the GKR phonemic awareness assessment tool (Roper, 1984), which gives a score out of 42. This study measured the early literacy skills of 113 children from decile 1 and decile 10 schools, representing children from low- and high-SES backgrounds respectively. While some children from the low-SES group performed better than others in the high-SES category and vice-versa, on average clear differences were found. The children from low-SES families had an average score of 3, whereas high-SES children scored an average of 9. In follow-up testing, these school-entry phonemic awareness scores were shown to be the best predictor of the children's word-reading skills at the end of their second year at school.

A previous study that examined the link between phonemic awareness and future reading ability was done by Juel (1988). She had similar findings among new entrant children, which was that phonemic awareness at school entry predicted reading ability 4 years on. In her study on literacy development of 54 low-SES children in Austin, Texas, she tracked phonemic awareness and reading ability from first through fourth grades. The measure of phonemic awareness was the GKR phonemic awareness assessment (Roper, 1984). Her findings were that children who became poor readers at fourth grade had started school with low levels of phonemic awareness. Their mean raw score on the phonemic awareness measure was 4.2, with the most common score being 0. On the other hand, school entry phonemic awareness raw scores of children who became good readers in fourth grade was considerably higher at 21.7. Good readers approached the ceiling for this measure by the end of the first grade, while the poor readers only approached the ceiling at the end of third grade. She explained that the lack of phonemic awareness contributed to the learning of spelling-sound correspondences more slowly.

In summary, phonological awareness, including phonemic awareness, is a necessary condition for developing literacy because it is an essential step to understanding the alphabetic principle. It may facilitate letter-sound knowledge by helping children access phonemic clues within letter names, while the process of reading text is likely to also develop phonological awareness in a reciprocal relationship. Additionally, intervention programs where phoneme training was paired

with reading the corresponding text were found to improve subjects' subsequent literacy development. Finally, low-SES correlates strongly with low levels of phonological awareness for preschool and beginning-school children.

Receptive vocabulary development.

Receptive vocabulary refers to the vocabulary knowledge that children use to interpret language that they read or hear (Pearson, Hiebert, & Kamil, 2007). Between the preschool years and the early school years, children's vocabulary growth takes place in three differing, but overlapping contexts (Sinatra, Zygouris-Coe, & Dasinger, 2012). Firstly, it occurs through interactive talk in the home and in the local community, where children have the opportunity to experience and understand language in the context of activities they are involved in. Secondly, when children start schooling, either in ECE settings or in the initial years of primary school, an additional layer of oral interactions with teachers and classmates contribute to vocabulary acquisition (Connor et al., 2006). The third context for vocabulary development is in interaction with books, through activities such as shared reading and looking at picture books, which may occur in the home or school context (Connor et al., 2006; Dollins, 2008; Sinatra et al., 2012).

It should be noted that even when children start their formal school experiences, only a small fraction of their time is actually spent at school, with the vast majority of their language experience still happening at home or in their local community (Berliner, 2006). Furthermore, the majority of vocabulary acquisition occurs through scaffolded language exposure and interactions with family, community and teachers as opposed to through direct instruction (Cunningham & Stanovich, 1998). Children are estimated to learn between 2,000 and 3,600 words in each year of early schooling (Penno, Wilkinson, & Moore, 2002) and in one measure of reading proficiency, it is predicted that they need to receptively understand at least 10,000 vocabulary items by the age of 6 to be proficient at reading (Byrnes & Wasik, 2009 in Jalongo & Sobolak, 2011). Beck, McKeown and Kucan (2013) explain that in general, before children start school, their vocabulary knowledge can develop very rapidly with their vocabulary base increasing by approximately 50 to 70 words each week. By the time children start school, they typically have around 14,000 words. However, after children start school, vocabulary

knowledge is extended not as much by conversations, which are generally understood, but rather through reading and explicit teaching.

The relationship between vocabulary knowledge and reading comprehension has been well-researched (Cunningham & Stanovich, 1997; Hairrell, Rupley, & Simmons, 2011; Sénéchal, Ouellette, & Rodney, 2006; Stahl & Nagy, 2006). Comprehension depends on successful word reading with skill differences in the latter impacting on skill differences in the former (Perfetti, 2007). Preschool vocabulary knowledge has been found to be a strong predictor of concurrent reading comprehension (Lonigan et al., 2008; Nelson, Vadasy, & Sanders, 2011; Pearson et al., 2007; Stahl & Fairbanks, 1986; Storch & Whitehurst, 2002). Stahl and Fairbanks (1986) carried out a meta-analysis of 41 controlled experimental studies of the effect of vocabulary instruction on reading comprehension. They found a mean effect size of .97, which is considered to be a large effect. More recently, in their 2007 summary of theories and concepts in vocabulary assessment, Pearson et al. note that numerous studies have shown a positive correlation of .6 to .8 for vocabulary knowledge as a predictor of reading comprehension.

Additionally, children's degree of receptive vocabulary knowledge can impact reading success later on. A study by Cromley and Azevedo (2007) found that vocabulary was one of the largest contributors to reading comprehension success among children in the ninth grade. Similar findings were made by Ouellette and Beers (2010) among 156 children, who were either in Grades 1 or 6, from three schools in eastern Canada. The authors found that vocabulary knowledge played an increasingly significant role in the prediction of reading comprehension among children in Grade 6 but not in Grade 1. Additionally, receptive vocabulary did not predict decoding knowledge in Grade 1 but it was a significant predictor in Grade 6.

As explained by Jalongo and Sobolak (2011), new entrant children who begin school with a greater bank of vocabulary words tend to have greater comprehension of the texts that they read, which in turn expands their vocabulary knowledge. Children with a larger bank of receptive vocabulary can leverage this knowledge to learn a higher number of new words at a faster rate than their counterparts with lower levels of vocabulary knowledge (Beck & McKeown, 2007; Sinatra et al., 2012). On the other

hand, children who begin school with limited vocabulary may have problems with constructing meaning from text because of their inability to identify and allocate meaning to printed words that they do not know (Tunmer & Chapman, 2012; Tunmer & Greaney, 2010).

This lack of reading comprehension would then further constrain those children's vocabulary growth. This is because children need to possess both background subject-matter knowledge and a receptive vocabulary bank that includes a minimum of 95% of the vocabulary items in a text to have the ability to both comprehend the overall text and to guess the meaning of any unfamiliar vocabulary in it (Ehri, 1998; Mol & Bus, 2011). As a result, children with lower levels of receptive vocabulary are less able to successfully guess the meanings of new words in text and so less able to expand their bank of receptive vocabulary.

Hence, unsurprisingly, vocabulary interventions have been shown to increase students' ability to comprehend text in one meta-analysis of 37 studies among children from pre-K to Grade12 by Elleman, Lindo, Morphy and Compton (2009). In this review, children who underwent some form of vocabulary instruction benefited 3 times as much in reading comprehension ability as those who did not.

Apart from resulting in lower reading comprehension, a restricted range of receptive vocabulary also hampers other aspects of early literacy development. This is because it affects the development of children's phonological decoding skills in two ways. One way is that these children miss out on additional opportunities to map spelling-sound relationships (Tunmer & Chapman, 2012). The other way that lack of receptive vocabulary hinders growth in phonological awareness is explained by the lexical restructuring model (Walley & Flege, 1999; Walley, Metsala, & Garlock, 2003).

According to the lexical restructuring model, growth in vocabulary knowledge forces each child to develop ever more sophisticated phonemic representations of words to manifest the increasingly subtle pronunciation differences between the child's growing bank of lexical items, so growth in vocabulary knowledge leads to a more fine-grained phonological awareness (Roberts, 2005; Walley & Flege, 1999; Walley et al., 2003). As a result, children with poorly developed receptive vocabulary knowledge are

less likely to show higher levels of phonemic awareness than children of the same age group who have a larger resource of receptive vocabulary items (Walley et al., 2003). Therefore, lower levels of receptive vocabulary result in not only reduced reading comprehension, but also in less development of phonological awareness, which has been shown to be a crucial early literacy skill.

Similar to its effects on alphabet knowledge and on phonological awareness, the impact of SES should not be underestimated in vocabulary growth. The SES background of children has been found to be significantly associated with receptive vocabulary development (Hart & Risley, 1995; Hoff, 2013; Nicholson, 2003; Qi, Kaiser, Milan, & Hancock, 2006; Roberts, Jurgens, & Burchinal, 2005; Storch & Whitehurst, 2002; Vaden-Kiernen et al., 2010). A number of studies have found that low-SES children start school with both significantly lower scores on receptive vocabulary measures than high-SES children, and lower scores than expected norms.

Looking at school entry receptive vocabulary knowledge, a study by Qi et al. (2006) assessed this knowledge among over 500 low-SES preschoolers in the United States. They measured children's receptive vocabulary knowledge with the Peabody Picture Vocabulary Test – Third Edition (PPVT-III) (Dunn & Dunn, 1997). This is a norm-referenced measure through which standard scores can be generated. A standard score of 100 in this measure represents the average. This study found average standard scores of 77.88 for a sample of African American children and 81.90 for a group of European American children. The difference between the scores for these two ethnic groups was not significant and overall, the children's mean vocabulary score was about 1.5 *SD* below the national average norm, showing about a quarter of them lagging behind the normal language development profile.

A more recent study in the United States (Froiland, Powell, Diamond, & Son, 2013) evaluated the receptive vocabulary knowledge of 551 children from low-SES neighbourhoods just before beginning school. They found average standard scores of 85.86 on the PPVT-III, which is about 1 *SD* below the expected national norm for the children's age.

In New Zealand, Nicholson (2003) used the Peabody Picture Vocabulary Test - Revised (PPVT-R) (Dunn & Dunn, 1981) to measure the receptive vocabulary knowledge of 113 low- and high-SES children when beginning school and at the end of their first year in school. The study found significant differences between the two groups. The children from low-SES families began school with an average standard score of 75.75 on the receptive vocabulary measure, compared to 105.30 for the high-SES children. By the end of the first year in school, the difference had decreased slightly, but remained significant, with low-SES children scoring an average standard score of 82.90 on the same vocabulary measure against 105.32 for the children from high-SES backgrounds.

In accounting for this gap between different SES groups, researchers have identified a number of factors. The first is the level of language interaction between family members of children in different SES classifications. A study by Hart and Risley (1995) in the United States found significant differences in vocabulary size among 3-year-olds from 42 families from different SES backgrounds. Children of professional parents were engaged with 3 times more by their parents than children of parents on welfare. This resulted in the active vocabulary bank of the first group of children being 1,000 words by the time they were 3 years old, compared with only 500 words in the latter group. The researchers found the differences widening as children become older and estimate that when they start kindergarten, children from more economically privileged families have heard about 30 million more words than their economically disadvantaged counterparts. The reasons for these differences, as stated by Hart and Risley (1995), are that the high-SES children received 3 times more general and language interaction with family compared with low-SES children. Low-SES parents were found to not engage in oral interaction with their children much beyond what was necessary to control their behaviour. However, in high-SES families conversation went beyond this level and was considered to give high-SES children rich exposure to a wider range of vocabulary, positive reinforcement and more complex ideas. Due to this, the quality of speech was rated as lower in low-SES families than in high-SES families (Hart & Risley, 1995). Both these factors contribute to expanded vocabulary banks in children from high-SES families.

To support this finding, intervention studies show that enhanced quality and quantity of oral interaction can benefit children's vocabulary development. One such intervention investigated how to best improve poor levels of vocabulary development in low-SES children. Peterson, Jesso and McCabe (1999) conducted a study over the course of 12 months with 20 children and their mothers from low-income Canadian families. Half the children and their mothers were assigned to a control group and half to an intervention group. The researchers trained the intervention group mothers in both increasing the frequency and length of conversational interactions with their children and in eliciting more contextualised and narrative-style speech from their children. Compared with children from the control group, the intervention group children were found to have significant improvement in their vocabulary development at the end of the intervention period.

Other researchers have shown that SES is a key factor in important areas such as the number and quality of books in the home, and in how often shared book reading happens. The comparative lack of literacy experiences in low-income households means that these children are likely to have less developed oral language skills, including vocabulary knowledge, and to begin school with lower levels of vocabulary knowledge than their middle- and high-income counterparts (Froiland et al., 2013; Hoff, 2013; Qi et al., 2006; Rowe & Goldin-Meadow, 2009; Storch & Whitehurst, 2002; Vaden-Kiernen et al., 2010).

To highlight the importance of shared book reading, an intervention program run by Sharif, Ozuah, Dinkevich and Mulvihill (2003) in South Bronx, New York provides a further possible model for mitigating the impact of SES on children's vocabulary knowledge. Forty-nine low-income parents participated in short workshops that focussed on the what and how of shared storybook reading with their preschool children. Follow-up testing 7½ months later revealed that the intervention program led to significant improvements in children's levels of receptive vocabulary knowledge.

The previously mentioned study by Qi et al. (2006) identified three SES risk factors in their study of the connection between SES and receptive vocabulary knowledge. Within the overall below-average result of low-SES children being 1.5 *SD* below the norm, maternal education level, marital status and the number of children in

the family were factors found to have additive negative effects on low-SES children's vocabulary knowledge. It is theorized that mothers with less education read and speak with their children less and with a smaller range of vocabulary, resulting in correspondingly lower levels of vocabulary knowledge in their children. Additionally, it is believed that in both single parent families and in those with more than three children, time pressures on the parents mean that the children are likely to have less interaction with their parents. These families are also more likely to have fewer financial and material resources to go round, again resulting in fewer of the parent-child interactions that benefit language development such as reading storybooks (Qi et al., 2006).

Reciprocal relationships.

While previous sections have detailed some of the reciprocal relationships between the development of alphabetic knowledge, phonological awareness and receptive vocabulary, it is perhaps worth reviewing these connections in view of the concept of literate cultural capital. The different components of literate cultural capital can be measured separately, yet have a reciprocal relationship with each other and so may contribute synergistically to the development of early literacy.

Understanding of the alphabetic principle has been shown to be a reliable indicator of future literacy development (Hammill, 2004; Torgesen & Hudson, 2006). In developing this understanding, higher levels of phonological awareness have been theorized to help children to deduce letter-sound correspondences from their knowledge of letter names (Kim et al., 2010; Share, 2004). Indeed, the ability to recognize the letter sound phoneme within the letter name (where present) requires a base level of phonological awareness (Share, 2004). However, letter name knowledge has been found to be an important factor for preschoolers successfully completing phonological sensitivity tasks, suggesting that some level of letter name knowledge is necessary to develop phonological sensitivity (Burgess, 2002). In support of this, a study by Castles, Wilson and Coltheart (2011) found that 40 children who had no pre-existing knowledge of letter-sound correspondences and who were subsequently taught selected letter-sound sequences improved significantly in phonemic awareness tasks. This study reinforces the idea that letter-sound knowledge directly influences phonemic awareness. This reciprocal relationship between letter name knowledge and phonological awareness is

perhaps also shown by the fact that letter name training produces best results when combined with phonological awareness training (Piasta & Wagner, 2010).

Another reciprocal relationship is that between phonological awareness and receptive vocabulary. Growth in alphabet knowledge and phonological awareness leads to increased ability to read. An increase in reading ability leads to an increase in children's receptive vocabulary due to comprehending what they read and guessing new words. The connection here is that increasing receptive vocabulary leads to a more fine-grained phonological awareness as children need to differentiate between an increasing number of potentially similar vocabulary items (Walley et al., 2003). This more highly-developed phonological awareness then feeds back into reading ability.

In summary, alphabet knowledge fosters basic phonological awareness, which then facilitates the development of alphabet knowledge and the understanding of the alphabetic principle. Better understanding of the alphabetic principle leads to increased reading ability and growth in receptive vocabulary, which leads to higher levels of phonological awareness that results in improvements in reading ability, forming a feedback cycle of literacy development.

Learning to Read in New Zealand

Children start formal schooling in primary schools when they turn 5. Prior to this, most of them have had preschool experiences in some form of ECE setting. In 2012, 95% of children starting school had participated in an ECE program (MOE, 2013a). Such programs may be more or less formal, depending on the age of the children, type of program being attended and whether these are parent-led or teacher-led. Examples of parent-led programs include playgroups, playcenters and programs run within Maori immersion environments. Teacher-led programs include not-for-profit kindergartens, and more commercial education and care service establishments. The curriculum framework that guides all ECE programs is outlined by the MOE in a document known as Te Whāriki (MOE, 1996). It comprises 4 broad principles and 5 learning strands that create a learning map for children. The principles are a) empowerment to learn and grow, b) holistic development in intellectual, social, cultural, emotional and spiritual learning, c) family and community as part of learning

experience, and d) learning taking place through positive relationships. The five strands of learning are directed at well-being, contribution to society, belonging, communication and exploration.

McLachlan (2008) points out that these principles and strands are fairly holistic and may be interpreted differently among ECE educators. The links to literacy development may be uncovered in this curriculum document, in that the MOE expects children to gain knowledge about language in their immediate learning environments of home and ECE facility to communicate and use language to make sense of the world around them. Further evidence of MOE expectations for literacy development may be noted in the communication strand where some of the learning outcomes include language skills associated with skills such as problem-solving in more formal language contexts like books, the development of some phonological awareness such as alliteration and rhyme, and growing understanding of grammatical syntax and meaning (MOE, 1996). However, such outcomes do not possess or require detailed evaluation or assessment by ECEs. Hence, with MOE guidelines being open to interpretation and not sufficiently specific in terms of learning outcomes of particular literacy skills, children coming from different ECEs may be equipped with different sets of literacy skills at the time they commence school, when they turn 5.

On or shortly after their fifth birthdays, children enter the formal school system. In 1997 the MOE introduced the School Entry Assessment (SEA) for teachers to use in assessing school entrants' literacy and numeracy skills within the first 8 weeks of starting school. The SEA has two purposes, which are to provide teachers helpful information about the abilities and needs of their students, and to give the MOE an understanding of the kind of skills and knowledge that children begin school with in New Zealand. However, this assessment is not compulsory and a 2001 survey revealed that 28% of primary schools did not use the SEA, while just 31% of schools sent SEA data to the MOE (Dewar & Telford, 2003). Therefore, the SEA is not successfully painting a picture of new entrants' abilities nationwide. Of the new-entrant teachers who did use the SEA, 67% called for improvements and updates, with 12.5% of these teachers requesting that the SEA be modified to include more explicit testing of alphabet names and sounds, and word knowledge (Dewar & Telford, 2003). Based on

this, these teachers feel that there are not enough emergent literacy skills being assessed at school entry in New Zealand.

As McLachlan and Arrow (2011) point out, the SEA is still the only national literacy assessment tool for teachers of new entrants, in spite of the fact that the problems identified with it remain unaddressed by the MOE. As a result, official assessment of children's literacy commences only with the national standards assessments at the age of 6 (McLachlan & Arrow, 2011). While the national curriculum, including that which is related to literacy teaching, is formulated by the New Zealand MOE, it is to be considered a framework instead of a detailed plan (MOE, 2007). Schools have an obligation to base their teaching agenda on the New Zealand curriculum but can vary the methods of implementation of their literacy programs.

The underlying philosophy that dominates the teaching of reading in the majority of New Zealand classrooms is the top-down theory, which corresponds most closely to the whole language approach to literacy (Blaiklock & Haddow, 2007; Smith & Elley, 1994; Tunmer et al., 2008). This approach was, to a large extent, influenced by reading researcher and educator, Marie Clay. The whole language theoretical orientation to learning to read involves teaching children text-based strategies. These include the use of cues (including picture cues, semantic and syntactic cues) in reading instruction. Children focus on the context of what they read, making predictions while trying to extract meaning from a text. When they come across a difficult word, children are urged to substitute the word for one that fits into the context, skip it, or continue reading to the end of the sentence, before revisiting the start of the sentence to guess what the difficult word might be. The use of letter-sound cues is a strategy that is only encouraged as a last resort. This top-down approach is thought to enable children to focus on gaining meaning from the text rather than have them focus on word-level strategies (Clay, 1998).

The MOE has produced a handbook of guidelines for teachers, *Effective Literacy Practice in Years 1 to 4*, in teaching reading in the classroom. Instructional approaches include reading to students, shared reading, guided reading and independent reading (MOE, 2003, 2006; Smith, 2000). Teachers provide scaffolded interactions with children to enable them to utilise the above text-based strategies with increasing

confidence and independence. Instruction on specific pre-reading skills and strategies are not the primary focus in teaching reading in the New Zealand classroom. For instance, word identification and spelling skills, and phonics knowledge are not noted in the Ministry's handbook on *Effective Literacy Practice in Years 1 to 4* and are not systematically taught in the reading classroom. Instead, children are expected to pick up these skills incidentally. Blaiklock and Haddow (2007) argue that such incidental learning cannot ensure that all children will pick up the reading skills that they need.

While this approach to teaching reading has placed New Zealand children above average in the global context, there still exists a wide gap between good and poor readers. This indicates that *Effective Literacy Practice in Years 1 to 4* may not have approaches that are valuable for the casualties of the New Zealand reading classroom (Blaiklock & Haddow, 2007; Patel, 2010). The plight of these 'casualties' has been highlighted by many researchers over the years (Nicholson, 2005; Tunmer & Greaney, 2010; Tunmer et al., 2006). In a nutshell, Nicholson (2005) reports that while three quarters of children learn to read in the New Zealand system, about a quarter of them are reading below appropriate levels. Currently, New Zealand takes a 'wait to fail' approach where children at the bottommost 15% are identified at the end of their first year of school. These children may then be entered into a Reading Recovery program. In this program, children receive daily, one-to-one instruction from a specially trained Reading Recovery teacher. This is supplementary to in-class reading literacy instruction time. The program may last up to 20 weeks, depending on each child's needs, with follow-up monitoring of the children's reading progress and the need for additional one-to-one training sessions, where necessary (National Reading Recovery Centre, 2011). Implementation of the Reading Recovery program is a decision taken by individual schools.

Some reading experts argue that Reading Recovery is not working, as the reading gap identified by several international studies has not closed since its implementation. Looking at the MOE 2012 Reading Recovery data (Cowles, 2014), 11,202 children were involved in Reading Recovery in that year and 61% of children successfully discontinued lessons during that time. Comparing this data to 2003 figures, 10,875 children entered the program with a 59% success rate (Anand & Bennie, 2005). While the figures for numbers of children in the program and success rates have

remained stable over the last 10 years (Cowles, 2014), the reading gap still remains. As mentioned, the group representing the children at the lower end of the reading gap in the international studies had a higher incidence of Maori/Pasifika children who were from low-income backgrounds. According to the MOE (Cowles, 2014), this same profile of children were less likely to be successfully discontinued from the Reading Recovery program than their New Zealand European/Pakeha and Asian, and high-SES counterparts.

Reading experts identify several key elements that have contributed to the failure of Reading Recovery. A top-down, whole language, constructivist approach to teaching reading fails to impart essential skills that beginning readers need. This includes the ability to transform letters into sound segments, which is an important skill (Snow & Juel, 2005; Tunmer & Nicholson, 2011). Some reading researchers argue that teaching of bottom-up skills such as alphabetic coding is more beneficial than the top-down, whole-language approach currently in place (Brady, 2011; Hattie, 2009; Snow & Juel, 2005; Tunmer et al., 2013). Another problematic aspect of Reading Recovery is that it is selectively beneficial. Tunmer et al. (2013) contend that students who start Reading Recovery with higher scores on Reading Recovery assessment measures are more likely to benefit from the program than children who start with lower scores. This latter group of children had greater numbers of Maori/Pasifika and low-SES background children, as evidenced by the percentage of children from those groups who were not successfully discontinued from Reading Recovery program in 2012, but rather were referred on for additional specialist help. Over the longer term, gains made in Reading Recovery may also not be sustainable (Nicholas & Parkhill, 2013). Finally, Reading Recovery does not adequately address the wide variation in the amount of literate cultural capital that children start school with.

As literate cultural capital has been shown to be a good predictor of later reading success, helping poor readers raise their level of literate cultural capital at school entry should be an obvious response by educators and policy makers. However, there is a reluctance to measure children's literate cultural capital at school entry. Clay (2005) made the case that children should not be assessed at point of entry as they needed time to adjust to a school setting and formal literacy instruction. In spite of this, critics call for earlier intervention to support these children who read with less proficiency before

their difficulties become more acute (Lonigan & Phillips, 2012; Tunmer et al., 2013; Wagner, 2008), rather than adopt a 'wait to fail' attitude. This involves assessing children's literate cultural capital or emergent literacy skills at school entry to identify potentially struggling readers.

Addressing this issue, McLachlan (2008), in her paper on transitioning from early childhood centers to primary schools, advises that assessment in emergent literacy should take place before, during and after children begin school and that this is a matter that needs attention. Assessment should involve all stakeholders and be used to make decisions around children's learning by informing teaching practice. She highlights the importance of teachers' ability to recognise the predictors of literacy achievement and respond to these predictors. Teacher education and professional development in this regard may be required to inform teachers about what these predictors are and the best methods of response. This is especially so due to the way that both initial schooling and subsequent Reading Recovery programs fail to reduce the literate cultural capital gap and the reading gap among good and poor readers, which may be compounded by the Matthew effects (Stanovich, 2008) in reading development. While literate cultural capital theory and Matthew effect theory may contribute to the reading gap, a third possible factor affecting the reading gap may be what happens over the summer holidays. This will be discussed in the next sections.

Summer Slide

The long summer vacation may be a potential cause of the reading gap. The association between the summer vacation and learning loss is also known as the summer slide. This presents as significantly lowered tests scores on standardised tests in reading at the end of summer than on the same tests in the beginning of summer. The earliest known study on summer learning loss dates back to 1906. Through the years, various studies have been conducted to establish the subject areas affected by summer learning loss and the elements that influence the degree of slide. Studies show that the degree of summer learning loss in reading varies significantly by grade level, subject matter and family income (Fairchild & Boulay, 2002; McLaughlin & Smink, 2009).

The following sections review the literature on the summer slide effect on reading and other literacy-related skills. The majority of the literature on the reading slide over summer is anchored in research conducted in the United States. Wiseman and Baker (2004) conducted a review of the available literature on the subject of summer learning loss outside of the United States but found no research evidence of this, at the time their publication. Based on this finding, the authors suggest that the summer learning gap appears to be an issue unique to the United States. One reason put forward for this is that schools in the United States have a longer continuous break during the summer than schools in many other nations. The majority of schools have a 180-day school year (Bush, Ryan, & Rose, 2011). School generally begins in late August or early September and continues till June. The summer break is approximately 2 months or 8 weeks long, from July to September. In New Zealand, according to the MOE (2014), the school year generally begins in early February and ends in mid-December. The summer break in New Zealand is similar in length to that in the United States, lasting approximately 7 weeks from mid-December to early February. Hence, children in New Zealand should similarly experience the summer slide effect, although there is limited research evidence to show this. In light of this, studies reviewed here are mainly of those conducted in the United States, with a small number of studies from elsewhere in the world, including the New Zealand studies, which will be situated within these.

Summer slide effect.

Some children experience a reading slide over the summer vacation. Looking at research findings in the United States, a commonly cited early study on summer slide in reading is by Heyns (1978). Her study involved a stratified sample of approximately 3000 students in sixth and seventh grade in public schools in Atlanta. Students' word knowledge was tested during the school year and the summer break. Heyns (1978) found that during the school year, growth in word knowledge was similar for all students. However, this was not the case over the summer break with some children making gains as much as 0.29 grade equivalents, while others suffered losses of up to 0.28 grade equivalents.

A much-cited meta-analysis by Cooper et al. (1996) explored the effect of the summer vacation on literacy achievement test scores. Results confirmed the existence of

summer slide, as they showed that test scores declined over the summer vacation. In terms of reading, the authors reviewed 13 empirical studies involving more than 40,000 students. Findings were that the average weighted differences in grade-level equivalent scores for reading accuracy and reading comprehension were -.07 (less than a month), and -.32 (about 3 months) respectively. From these results, it may be noted that, on average, while children lost some ground in reading accuracy, this was not as substantial as the losses in comprehension. Cooper et al. (1996) also note that the summer slide effect appeared to increase as students progressed through school.

Downey at al. (2004) have also found evidence of the summer slide in reading while tracking approximately 20,000 students in around 1,000 schools from data obtained in an Early Childhood Longitudinal Study - Kindergarten cohort (ECLS-K). Reading development was assessed in the spring and fall of kindergarten and first grade to understand seasonal impacts. The study examined the reading development of children in the kindergarten year, the summer that followed and the first-grade learning rate. Reading ability was measured by knowledge of names of upper and lowercase alphabet, knowledge of sounds of letters at the beginnings and ends of words, common word recognition, and contextual word reading. Scores were recorded on a 92-point scale. The data indicated that on average, children began kindergarten with 19.34 points on the reading scale. During their time in kindergarten, which was 9.5 months, they gained 1.65 points per month in kindergarten and 2.49 points per month in first grade, also over 9.5 months. In the summer break over 2.5 months, however, they lost ground by a mean of 0.01 points per month. On average, this loss was marginal and not significant. However, when divided along SES lines, the authors explain that the reading gap between low-SES children and high-SES children began in kindergarten at 6.9 points but increased to 8.44 points at the start of first grade after a year. The gap developed differently between school years and the summer. Over the kindergarten year and first grade, the gap developed at a rate of 0.07 and 0.05 points per month respectively. During the summer, the gap increased by about 0.16 points per month. Making a conservative estimate, the high-SES children gained between 2 and 3 times more in reading ability over the summer compared to the low-SES children.

Similar results have appeared in research by Alexander, Entwisle and Olson (2007b), who conducted a longitudinal study looking at the seasonal fluctuations in

reading among just over 300 Baltimore public school children in the first grade over a period of 5 years from Years 1 to 5. The data for the sample was obtained from a bigger sample of the Baltimore Beginning School Study (BSS), which was a representative random sample of just under 800 students whose progress in reading was monitored from the children's first year at school till they turned 22. The study looked at fluctuations in reading comprehension within the school year and over the summer vacation using the California Achievement Test (CAT) for reading comprehension. Results were reported cumulatively over the first 5 years, which included five school years linked by four summer breaks. A final assessment of reading comprehension was administered at the end of Year 9 to examine the long-term reading development. The study found that on average, children started school with average scores of just under 280 points on the CAT. Over the 5 years, when school was in session, on average, children cumulatively gained 195 points on the same measure. The average cumulative summer gain was 11.1 points. However, low-SES children slid on average by 1.9 points, while high-SES children gained an average of 46.58 points. Although the loss by low-SES children was minimal, this loss was in reading comprehension scores rather than reading accuracy scores. It should be borne in mind that at the beginning of school children are still acquiring skills that involve decoding and vocabulary development. Hence, the impact on comprehension could be minimal at this stage. This study found the substantial reading gap between high- and low-SES of children at Year 9 to be 73 points. To put this into perspective, over Years 1 to 5, during school time, cumulative gains were about 195 points. Hence the gap of 73 points represents about 30% of comprehension skill development over five school years. This considerable gap could be traced to initial school entry scores, summer learning differences and school year differences with two thirds of the total attributable to summer differences alone. Using the same BSS data, the researchers (Alexander et al., 2001) also followed the seasonal development of 665 children's reading comprehension scores over four summers and five school years. Results, analysed by SES, revealed that the gap between low- and high-SES children in reading comprehension fluctuated over the four summers. The biggest gap occurred in the first summer after the children had finished first grade and a smaller gap developed in the second summer.

While some summer slide studies have been conducted to examine the impact of the summer on children's reading, others have examined interventions that decelerate

or prevent it, or keep children on par with reading development of their counterparts who actually make gains in reading over the same summer period. Indirectly, these studies also look at the degree of slide and the other literacy-related skills that can atrophy over the summer. Additionally, some of these studies also examine the cumulative impact of several summers on reading development. A selection of these studies is reported below.

Borman, Goetz and Dowling (2009) conducted a randomized field trial of a 6-week kindergarten camp summer program for 128 low-income children. In this study, the 35 control group students who received no summer enrichment lost ground in their ability to read high-frequency words by about 0.21 raw score points, equating to about 5% over one summer.

Elsewhere in the world, there is limited research about summer learning loss in reading. A study in Ontario, Canada (Davies & Aurini, 2013) looked at the summer slide effect among 1,376 students, mostly from low-income families. Children were in Grades 1 to 3. Literacy was measured using the STAR Reading online test which examines reading sub-skills of phonetic awareness, readiness for reading, vocabulary knowledge and comprehension. Scores on this measure were then converted to grade-level equivalents. Participants were tested in June and September, before and after the summer break. The study found that children from this cohort on average experienced a loss of .006 grade-level equivalents. This was about 6% of a month in literacy development. Looking at the range of learning loss, 46% of participants experienced loss, with the bottom quartile losing 3 or more months over one summer. The authors comment that while average summer learning loss may not be as much as what children experience in the United States, nevertheless, some children do experience significant loss. Compared to the United States, they explain that this weaker pattern of learning loss could be attributed to the fact that Canada has more upward social mobility, less economic inequality in the population and less concentrated poverty in urban areas. Moreover, the average length of the school year is 194 days, which shortens the summer break when compared to the 180-day school year in the United States.

Closer to home, in Australia, only one study by Vale et al. (2013) has somewhat addressed this phenomenon in Victoria. The study was part of a wider response by the

Department of Education and Early Childhood Development to address school reform directed at the problem of literacy decline. The authors explain that summer decline in Australia has not been researched much, as the summer holiday lasts for between 4 and 5 weeks, a period significantly shorter than the break in the United States. To contextualize, the school year is divided into four terms with the starting point of the summer holiday at the end of the fourth term, which also marks the end of the school year. This study used reading achievement data collected from students between Grades 3 and 9 over five testing points, at intervals of 6 months. These testing points were at the end of the first and third terms of the school year in March and September, from March 2009 to September 2011. Hence, the data did not exactly measure school year versus summer learning rates. Nevertheless, The On Demand Adaptive Test for Reading was used to measure children's reading comprehension. It is a multiple-choice measure with standard scores for students completing Grades 2 and Grade 10 of 2 and 6 respectively. By this measure, students are expected to gain 0.5 points in one school year or 0.25 points each semester. Results indicate that between the second and third terms (March to September) when school was in session, all children, with the exception of one group who moved from Grades 7 to 9, made gains significantly higher than the expected 0.25 points. However, between the fourth and first terms (including the summer break), the same children made gains that were significantly less than the 0.25 points that was expected. While none of the data showed reading losses, the results do include reading development during the term before and after the summer holiday as well as the summer holiday period. The authors of this paper suggest that this finding is consistent with summer slide in reading observed in the United States. This study has been included in this literature review as it acknowledges that the summer slide effect has not been well-researched in the Australian context, but the results suggest that there might be summer learning loss among children even during the shorter summer break.

In the New Zealand context, there is limited research about summer learning loss in reading. A small study evaluated the effectiveness of a summer school reading program among 72 children in a decile 1 school. The children in the study were from 5.5 to 10.5 years old, and were between Year 1 and Year 5 in school. The experimental group comprised 36 children who attended summer school and the control group had 36 who did not attend the summer program. Children's reading comprehension ability before and after the summer break was measured using the PM Benchmark tests (Smith

& Randall, 2002). Both groups were of similar reading ability and age range at the start of the study. The findings were that children who were not involved in the summer remediation program experienced a reading comprehension loss, on average, of about 5.8 months (Tiruchittampalam, 2006). Typically, schools break up for the summer holidays in mid-December and resume for the new school year at the end of January or early February. This works out to about 6 to 7 weeks of summer holiday. The summer vacation in New Zealand, although not as lengthy as that in the United States, is still quite considerable. However, not many studies have examined the reading slide over the summer, let alone the associated literacy-related skills.

Summer slide and social class differences in children's summer activities.

While the phenomenon of the summer slide is evident, this in itself is not problematic, but for the fact that the summer reading shortfall occurs unevenly among different groups of children. Most research points to SES background perpetuating this reading gap. This finding will be discussed in the context of some of the previously mentioned studies, as well as extended upon with additional research from the literature.

In Heyns' study (1978), during the school year, growth in word knowledge was similar for middle- and low-income group students, white students and African American students. However, this was not the case over the summer break. During this time, over and above their school achievement, middle-income white students gained about 19% while the moderately lower income African American students lost 25% of their school gains and the severely disadvantaged African American students lost up to 67% of their school gains. Heyns (1978) concluded that one of the major factors affecting summer slide in reading word knowledge was the SES of the child's background.

The study by Cooper et al. (1996) also showed a reading gap over summer that was divided along socioeconomic lines. Findings were that it was children from low-income families who lost about 2 months of grade-level equivalency (- .19 *SD*) in reading accuracy, while their middle-income counterparts gained slightly by about 1.5 months (+ .16 *SD*) over summer. This pattern produced a 3-month achievement gap between these two groups of children over one summer. No moderating effects for

gender or ethnicity were noted. For reading comprehension, the review found both groups displayed significant loss. However, the low-SES children recorded a loss of 0.7 months more than the mid-SES children. Cooper et al. (1996) suggest that this disproportionate degree of slide experienced by the low-SES children may be related to differences in opportunities to practice and develop reading skills, with greater opportunity available for the middle-income group children.

Similarly, Alexander et al.'s Baltimore-based study (2007b), also found SES impacted the degree of slide. In their study, changes in reading scores among low- and high-SES children were tracked over 5 years, during the year and over summer. Results showed that during the school year, both groups made gains, with low-SES children keeping pace with their higher SES peers. However, over the four summers, low-SES children made gains and losses. They slid over some summers and made marginal gains over others, essentially treading water over the summer holidays. The study revealed that low-SES children generally started the new school year where they had been the previous spring or even behind. However, high-SES children improved over the summer months, beginning the new school year ahead. This cumulative gap resulted in the performance of low-SES children lagging far behind their more advantaged counterparts at the end of the fifth year. By the end of the fifth grade, summer learning among children in higher income families had contributed to a 47 point gain on test scores compared to a loss of 2 points on the same tests by the children from lower income backgrounds. This represented about a 90% difference in reading comprehension ability between the high-SES and low-SES children. Results showed that this disparity was linked primarily to SES and not gender or ethnicity. Worryingly, by the end of their ninth grade, more than half the reading gap between the high-SES children and low-SES children was attributed to the unequal learning occurring over the summer. The low-income family children lagged on average 73 points behind their high-SES counterparts. The researchers analysed what elements contributed to the gap and surmised that the initial gap of 26.5 points at the start of the study when children began first grade contributed to a third of the Grade 9 gap. The remaining two thirds points to the years in elementary and middle school with the 48 point difference from the four summers being the single largest contributor to the gap in Year 9.

The study by Downey et al. (2004) on the ECLS-K data also found an achievement gap of 4 months in reading age was present at the beginning of kindergarten among children of different SES backgrounds. During the kindergarten year, while the gap between the high- and low-SES children continued to widen, it did not widen as quickly as it did over the summer vacation. The study found that the reading gap between low- and high-SES children grew by about 2.5 months over the summer between kindergarten and first grade.

A more recent publication by some of the same authors examined the same ECLS-K data in a different way. In their evaluation of failing schools, Downey, von Hippel and Hughes (2008) firstly suggested that the distinction be made between school impact and student achievement. The former is defined as the difference between the in-school learning rate in first grade and the summer learning rate. This average value was 2.64 points per month, using a 92-point reading ability scale. As a point of reference, as mentioned in this review in the previous section on summer slide effect, children started kindergarten with a reading score of about 19 points. At the end of first grade, students' achievement on average was 59.33 points. When schools were evaluated against achievement data, schools with low-SES children were more likely to be labeled as failing. Specifically, type of school, location, level of students' poverty background, and minority enrollment figures accounted for 51% of achievement level variation. However, when schools were evaluated in terms of impact, the level of variation was 7%. In sum, low-SES children tended to have lower achievement scores, although the impact of schools may not have been different for these students compared to high-SES children. In some schools with low-achieving students, the impact of these schools may have been as much or more than higher achieving schools, giving support to the theory that school had an equalizing effect for low-SES children.

Entwisle et al. (2001) constructed 'faucet theory' to explain this, proposing that opportunities for learning flow freely for all children when school is in session. In contrast, when school is in recess, the school resource faucet is turned off and inequalities in learning opportunities and outcomes lead to uneven learning gains and losses. Alexander et al. (2007a) explain that the uneven achievement in the early years of school has long-term effects that impact high-school drop-out rates, college attendance and curricular track placement in high school. They state that 62% of high-

SES children enrolled in college preparatory programs, compared to just 13% of low-SES children. Low-SES children were more likely to start post-school life without a high-school certificate compared to high-SES children, at 3% and 59% respectively. Furthermore, low-SES children were less likely to complete college, at 7%, compared to high-SES children at 59%. The authors found that low-SES children who were not on track to attend college had CAT-Reading scores 116 points behind those of high-SES children on track for college. Of these 116 points, 40 points were attributed to the gap at the beginning of first grade, while 76 points was attributed to the summer reading loss. Consequently, Alexander et al. (2007b) conclude that schools have an important counterbalancing effect in helping low-SES children maintain near parity with their high-SES counterparts, but that seasonal differences in learning over summer left these low-SES children behind, despite the compensatory effect of the school experience.

A study by Burkam, Ready, Lee and LoGerfo (2004) also found links between rate of summer learning and social class differences in a study on children between kindergarten and first grade. They note that previous research had been limited to particular social or regional groups and that, in their study, they used the nationally representative ECLS-K data. Secondly, although many studies had focused on elementary school children, no study had looked at the summer learning between kindergarten and first grade and they suggest that this group may provide more insight as children at this age learn quickly, and their learning may be more dependent on parental resources and home activities and less on school resources that they can build on. Summer reading development was measured for 3,664 children in post-kindergarten and pre-first grade. Literacy measures included tests of print familiarity, letter and word recognition, beginning and ending sounds in words and rhyming sounds. Difference in scores of low-SES children pre- and post-summer show that lower SES children slid by about 9 months in grade-level equivalency, with an effect size of -0.9 *SD*, while higher SES children gained a little over half a month in grade-level equivalency, with an effect size of .07 *SD*.

The study in Ontario, Canada (Davies & Aurini, 2013), also found SES a powerful predictor of summer learning loss. In this study, SES was classified according to family income. Results show that an increase of one standard deviation in student SES accounted for 10% greater post-summer literacy scores. When SES data was split

into quartiles, the bottom quartile lost nearly a month in reading age during the summer break, while the top quartile gained a month.

There is adequate evidence to show reading proficiency drops over the summer. Many of the studies in the literature have measured this decline in terms of changes in reading age and grade levels. Reading scores may have been single measures of word or passage reading, reading comprehension, a sub-skill of reading, or a composite score of a combination of one or more of these. Not many studies examine the individual literacy-related skills associated with reading that succumb to the summer slide effect. This present study hopes to add to the research on summer slide in reading in this regard.

Reasons for the summer slide in reading.

While there have been many studies documenting the summer slide in reading, research on the reasons for the summer setback is more limited (Allington et al., 2010). Slates, Alexander, Entwisle, and Olson (2012) nevertheless suggest that children identified in the low-SES bracket have a better chance of keeping up with their more advantaged counterparts during the school year than when out of school in the summer holidays. This implies that school benefits these low-SES children and that in the absence of schooling input, family environments and resources play a part in creating a lag in reading development. Terzian, Moore, and Hamilton, (2009) explain that the reasons why low-SES children suffer greater reading loss than higher SES children are not fully understood. They summarise the reasons identified so far as including less time spent reading, lack of access to books at home, and less time spent going to the library during the summer months for low-income children compared to their middle- and high-income peers. The subsequent sections will review some of the literature concerning these factors contributing to SES-related summer reading achievement differences.

Volume of reading.

Extensive practice in reading leads to a greater development of reading skills (Allington, 2009). Hence, volume of reading activity over summer and reading

development are strongly linked (Allington & McGill-Franzen, 2013). Allington and McGill-Franzen (2013) cite Share and Stanovich's (1995) self-teaching hypothesis to explain that through extensive practice and high-success reading experiences, children develop a range of reading skills, including phonemic segmentation, decoding, and vocabulary acquisition. They further explain that individual skills, such as decoding skills, on their own are not sufficient to develop good readers. Rather, the reading proficiency of beginning readers is enhanced through repeated successful exposure to common English orthographic letter patterns that develops greater automaticity of word identification skills and strategies. Additionally, extensive reading is also a powerful vocabulary building strategy, and a useful source of world knowledge as well as contributing to the readers' awareness of complex, written language syntax and grammar related to written texts. If extensive reading contributes to reading development, unsurprisingly, the volume of reading during the summer break would impact on the reading progress of children. The following sections examine some of the key studies that correlate the extent of summer reading with reading loss over the summer.

As far back as the 1970s, research has indicated that lack of reading activity during the summer months is a major indicator of a summer slide in reading (Heyns, 1978, 1987). In fact, in her study on 1,128 sixth and seventh grade students, she found that the number of books read and the amount of daily reading for leisure were factors that contributed to the large variation in children's scores on a standardised test of word recognition. She identified reading volume as the single most influential factor that correlated consistently to reading gains over summer (Heyns, 1978).

A study by Kim (2004) found results similar to Heyns' (1978) study. He found that the volume of summer book reading was positively related to fall reading achievement. Interestingly, he found this result was independent of SES. Moreover, findings were that when children read four to five books, there were significantly larger effects on post-summer reading scores than when children read zero to three books. An effect size of .12, found in the study for reading four to five books, was sufficiently large to ameliorate the summer slide effect. As in Cooper et al.'s (1996) meta-analysis of summer reading loss, post-summer scores were on average .10 *SD* lower than pre-summer scores. Kim therefore recommended summer reading programs that motivated

children to read independently as a cost-effective approach to preventing the reading slide.

A prominent initiative that led from Heyns' (1978) finding was the No Child Left Behind Summer Reading Achievers program in Atlanta Public Schools (U.S. Department of Education, 2004a). Children in Grades K-8 were encouraged to read at least 10 books during the summer, for which they were rewarded with prizes. The program was piloted in 2003 among 81 public schools in Atlanta. Twenty-nine percent of students who participated in the program in 2003 completed it (U.S. Department of Education, 2003). In 2004, the Department of Education in the United States expanded the program to 671 schools in 10 cities and one state. However, the number of students who completed the program dropped to 7%. In an evaluation of the 2004 program (U.S. Department of Education, 2004b), a statistically significant difference was seen in pre- and post-summer reading achievement for second graders only. Second graders performed better in reading achievement tests after the summer. No statistically significant difference in reading achievement was found for first graders and children between Grades 3 and 8. The measure of reading achievement was not stated. Interestingly, the Department of Education did not conduct a Summer Reading Achievers program in 2005. They surmised that children who participated in the program, and those who did not, both improved in reading over the summer because of other educational initiatives ongoing at that time. Specifically, Atlanta's sustained focus on student achievement, whole school reform initiatives and standards-based reform schemes appeared to have had an impact on summer reading development for all children (U.S. Department of Education, 2004b). In this study, summer reading did not appear to have an impact on fall reading scores for children in all grades except for the second grade.

However, following this, summer losses in reading continued to be evidenced in the research. Kim and White (2011) suggest that reading volume may be important, but that other factors need to work in tandem. These include having book access, providing books that are matched to children's reading levels and interests, and having teacher and parent scaffolding that encourage comprehension and fluency practice. The following sections explore these issues through various studies in the literature.

Book access.

Research shows that economically-disadvantaged children have less access to books in the home (Constantino, 2005; Fryer & Levitt, 2004; Heyns, 1978; McGill-Franzen, Lanford, & Adams, 2002). As a result, this affects the volume of reading that occurs in the homes of these disadvantaged families (Allington & McGill-Franzen, 2003; Chin & Phillips, 2004; Cooper et al., 1996; Neuman & Celano, 2012).

A study by Kim (2004) evaluated a voluntary summer reading program exploring whether access to books resulted in increased reading among more than 1,600 elementary school children in the sixth grade in a mid-Atlantic state in the United States. The study examined the impact of summer reading on subsequent fall reading scores. Access to books in this study was defined by how easy it was for children to find books at home, at the local library or to buy books. The results were that children who read between four and five books over the summer managed to prevent a summer slide in fall reading achievement. The effect size was .12. Access to books was found to be linked to increased volume of summer book reading. Hence, better access to books resulted in increased reading, which in turn impacted on improved reading scores. Research has shown that low-income families have fewer books in homes and that the parents of these families may lack the strategies to provide greater access to books for their children (Bauman & Wasserman, 2010; Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Chin & Phillips, 2004; Lee & Burkam, 2002). Therefore, one reason why the summer slide exists among low-income children is that there may not be enough books in the home or parents may not engage this group of children in literacy-enhancing activities, such as visiting the library or buying books from a bookstore.

Kim (2006) conducted a further study on preventing the summer slide in reading by examining the summer reading development of 486 students. This study provided book access to children, including some from low-income backgrounds and of multi-racial backgrounds. All participants were at the Grade 4, as this was deemed the appropriate stage at which the participants had mastered decoding skills and were able to practice reading and comprehension skills. Participants were divided into a treatment group and a control group. During the summer, children were provided with eight books. The study reported a marginally significant effect, with an effect size of .06, on

reading achievement of treatment group children with effect sizes stronger for Black students than for Latino students, at effects sizes of .22 and .14 respectively. A smaller effect size was also found for children who reported owning fewer than 50 books, at .13.

Allington et al. (2010) proposed that interventions over one summer may not be sufficient to see considerable gains and conducted a study involving supplying books to 1,330 children from low-income families in Florida over a period of 3 years. Children were in the first or second grade at school at the beginning of the study. Children in the treatment group were given 12 books to read over the summer, while those in the control group received none. Results of a standardised test of reading comprehension at the end of the study showed the treatment group performing significantly above the control group. The effect size was statistically significant at .14. When results in reading gains were analysed according to most economically disadvantaged children, the effect size was found to be larger at .21. The authors' reasoning was that this group of children had the least access to books and so benefited the most from the intervention.

However, Kim and White (2008) suggest that increased book access and volume of reading alone may be insufficient to prevent the summer reading setback. They looked at the impact of teacher and parent scaffolding on children's summer reading. In their study of 400 children in Grades 3, 4 and 5, pre-summer reading lessons were conducted by 24 teachers focusing on comprehension strategies and fluency practice. The study also included additional parental scaffolding elements of reading fluency practice and/or reflecting on comprehension strategies used in reading during the summer holiday. Therefore, this study included teacher scaffolding as well as parental involvement in a summer reading program. Children were randomly assigned to one of four groups in the study. The first, a control group, received no books. The second received eight books over the summer and represented the group with access to books only. The third received eight books and fluency lessons, while the fourth received the same as the third with additional comprehension strategy lessons at year end. Different results were found between selected groups. Firstly, there was no significant difference in posttest scores of the first two groups. In other words, access to books did not improve posttest scores for children who were given eight books, compared to children in the control group who received no books. Secondly, children in the fourth group with

eight books, fluency reading and comprehension strategy lessons performed significantly better, with an effect size of .14, than children in the control group, and marginally better than children in the second group with eight books. Lastly, the two groups that received scaffolding performed better in reading posttests than the two that did not receive scaffolding, with an effect size of .09. This study shows that book access alone is not enough to produce reading gains over summer. Rather, additional scaffolding may be needed in conjunction.

However, all of the abovementioned elements may not work for all groups of children. Another study by Kim (2007) focused on 331 children from kindergarten to Grade 5 who came from low- and middle-income backgrounds. Of the participants, 68% were native English speakers, while 23% spoke Spanish as their first language. Stratified by grade level, the sample was divided into a control and treatment group. The latter received 10 books matched to their interest and reading level. They also received instructions from a teacher in the last week before the summer holidays on how to engage with each book by answering questions on a reading postcard. During the summer holidays, children also received a letter from their teachers reminding them to read their books. Pretests and posttests of reading ability of the participants from both groups showed no significant difference. Additionally, when results were analysed by grade level, small effect sizes for children in Grades 1 and 2, at -0.1 and .07 respectively, suggest that beginning readers are unlikely to gain much from voluntary reading. Kim (2007) explains that without assistance in decoding unfamiliar words and comprehension monitoring from teachers or tutors, the benefits of reading were minimized.

If increased volume of reading, engineered through greater book access and scaffolding by teachers and parents, is insufficient, perhaps more focus in other areas is also is needed. The National Reading Panel (2000) has suggested that there is a need for increased practice of crucial alphabet and word reading skills. This would support the findings by Kim and White (2008) and the notion that beginning readers need more than access to books and general encouragement to read.

A small-scale study on a summer learning program suggests that targeting younger at-risk readers coming from low-SES backgrounds and working explicitly on

emergent literacy skills development may be a more focused approach. Graham, McNamara and Van Lankveld (2011) worked with 14 4-year-old children in their pre-kindergarten year in Ontario, Canada. These children were identified as at-risk for reading failure by their classroom teachers and reading assessments. These children, along with one of their caregivers each, participated in a literacy based program with activities focusing on print awareness, phoneme awareness and letter-sound knowledge. The program lasted 5 weeks. This study did not include a control group. Pretest and posttest scores of the 14 participants showed significant gains in all these measures. The participants were placed below the 25th percentile at the beginning of the study but at the end of the study had percentile rank scores of 45 and 58 for print awareness and phonological awareness respectively. Family or caregiver involvement may have played an integral part in children's improvement, as skills learned during the program could have been practiced at home. Thus, perhaps another reason that the summer slide occurs is that at-risk children are not identified early on and provided with a greater degree of explicit training in emergent literacy skills. A possible limitation of the study was that there was no control group. Therefore, it is possible that children may have progressed similarly in the normal course of the school year.

Kim and White (2011) also raise motivation issues which may hinder children from reading books that they have access to. This means that increased book access may not lead to increased volume of reading. According to Kim and White (2011), children may not engage with these books because of a lack of motivation. This lack of engagement may be caused by children picking books that may be beyond their level of independent reading ability. Hence, another reason for the summer slide may be that although books may be available, children's motivation to read may be affected.

Gambrell (2009), a noted researcher on reading motivation, also highlights the need for reading opportunities to continue to be made available to all children to prevent the summer slide. She points out that with increased opportunities to read, reading achievement and intrinsic motivation to read is enhanced. A New Zealand study by Jesson, McNaughton and Kolose (2014) examined low-SES children's motivation to read. The study involved 16 children from Years 4 to 8 in low-decile schools in Auckland. They examined motivation levels of two groups of children, one that experienced high summer reading loss and one that encountered low or no reading loss.

The children in the study came from eight classes in the school that was involved in the study. Four of these classes comprised students that had high summer reading loss and four experienced low summer reading loss. Matched pairs were formed between two groups, which were the one that experienced high summer learning loss and the one that experienced low summer learning loss. Each of the matched pairs was at similar year levels and similar mean year end reading achievement profiles. Students were interviewed about their personal reading practices over summer. Similar responses were recorded among both groups in terms of reading for enjoyment as their motivation for summer reading. Interviews were also conducted with parents and teachers regarding their support for children's summer reading. The results were that there were differences between the two groups in the teacher and parent scaffolding for summer reading. What was different was that teachers of students with greater reading losses provided support for students by focusing on reading skills. This was in contrast to the teachers of children who had less or no reading loss over summer. This group of teachers concentrated on metacognitive prompts that encouraged reading for thinking, learning and inquiring, in approaches to choosing books, and on specific practices including seeking out opportunities to read, such as visiting libraries. At home, students with minimal or low summer learning losses had greater support by parents in terms of book access. These parents were also able to better articulate the guidance they received from teachers. For instance, they were able to explain specific practices, such as explaining the meanings of unknown words and correcting children's pronunciation. This was in contrast to the group who experienced greater losses over summer, whose parents only reported back on guidance in general terms, such as to continue reading over the summer.

When viewed in the context of summer reading and reasons for the summer slide, it may be suggested that motivation to read is affected by similar factors highlighted by the two sets of researchers. That is to say, children who are motivated to read over the summer may need texts that are interesting to them as well as some form of social collaboration with others (maybe a teacher or parent), which may include some form of scaffolding in the form of instruction on cognitive strategy use combined with texts that make sense to them. Lack of one or more of these may cause motivation to decline, resulting in less reading and summer reading loss as a consequence. The final

section of this literature review backgrounds the research related to motivation to read and reading achievement.

Motivation to Read

Motivation to read has important consequences for reading progress. Malloy and Gambrell (2012) explain that when children are motivated to read, their learning is deeper and more internalized, and motivation, combined with spending more time reading, creates better readers. Therefore, more motivated readers have better educational outcomes.

Gambrell (2009, 2011) identifies several factors that contribute to motivation to read. Firstly, access to reading materials and time spent in sustained reading is crucial. Additionally, the opportunity for children to be able to select the books they want to read also influences motivation. An added factor is social interactions about books. This can include talking about books, or reading together with others. Such interactions raise motivation by arousing greater interest in books and increasing children's positive self-perception resulting from greater confidence in the ability to be successful in reading. Similar findings have been published by Guthrie et al. (2007), who highlight interesting texts, real-world interactions, coherence, cognitive strategy instruction and social collaboration as factors that foster positive reading motivation.

Studies have found that motivation to read correlates with reading ability and achievement. Malloy and Gambrell (2012) explain that highly motivated readers tend to create their own reading opportunities, thereby improving their reading ability through extended practice. They explain that in the classroom context, easily accessible reading materials, teacher guidance in reading strategies, social collaboration and opportunities for success foster motivation to read.

Differences in reading motivation levels can lead to Matthew effects (Stanovich, 2008) of both the 'rich get richer' and poor get poorer' variety. Children who are more highly motivated to read engage in reading more than those who have lower motivation and this is important because time spent engaged in reading results in better reading ability (Gambrell, 2011; Morgan & Fuchs, 2007; Retelsdorf, Köller, & Möller, 2014).

As a result, children with high motivation who spend more time reading develop the literacy skills that then enable them to read even more. This success at reading is also likely to maintain or increase their motivation levels by making them feel that reading is easy for them and by raising their confidence in their own reading ability. The resulting high motivation levels, engagement in reading, and literacy skill development enable these children to keep on progressing in a 'rich get richer' cycle. Conversely, children with lower motivation to read are less likely to engage in reading, thus gaining less reading practice and consequently less reading skill development. This in turn leads to reading difficulties, which contribute to both perceptions of reading as being difficult and of themselves as poor readers. These perceptions can create negative Matthew effects (Stanovich, 2008) by keeping motivation to read low, which keeps levels of engagement with reading low and so limits reading skill development in a self-sustaining negative cycle (Morgan & Fuchs, 2007).

Motivation to read can be measured by the Motivation to Read Survey (Gambrell, Palmer, Codling, & Mazzoni, 1996). This measure examines motivation in the context of two sub-scales: value of reading and reader self-concept. Marinak and Gambrell (2010) explain that this instrument design is based on Eccles (1993) expectancy-value theory of motivation which posits that motivation is strongly affected by two main factors. These are the relative appeal that is placed on the task, that is, how much the reading activity is valued, and by children's expectations of the degree of success to be encountered in a particular task, that is, their self-concept as readers.

The value of reading is a gauge of the significance that children place on reading tasks and activities, specifically with regard to frequency of engagement in reading and reading-related activities (Gambrell et al., 1996). Many of the factors mentioned above as contributing to motivation to read relate to the aspect of reading value. For example, the children's degree of interest in the reading subject matter, how easily they are able to access a rich variety of reading resources, the amount of time they spend reading, and how much pleasure is derived from reading, all influence the degree to which children value reading (Gambrell, 2011). Another major factor is the social interaction that takes place around books and reading, either in the school context with teachers and classmates or in the home environment with family and friends. This social component of the value that children place on reading may be one factor that links parental

involvement with children's ability to read well. This is because parents who are more involved in their children's reading activities foster a positive value of reading that motivates them to become even better readers by reading more (Ames & Archer, 1988; Baker, Scher, & Mackler, 1997; Gambrell et al., 1996).

A study by Wigfield and Guthrie (1997) examined the motivation factors that influenced the amount and breadth of children's reading, including the value that children place on reading. The study involved 105 Grade 4 and 5 children from a mid-Atlantic state school. The Motivation to Read Survey was used to assess motivation to read and was scored according to several scales, which included aspects of reading self-concept including efficacy, and the value of reading in terms of curiosity (the desire to learn about a topic that the reader found interesting), involvement (the pleasure of reading), accessibility of books, social reasons for reading, and reading for grades (compliance). Information on amount and breadth of reading was collected through a reading activity inventory questionnaire and reading logs that children completed. Results indicated that children who placed a higher value on reading read more than children who valued reading less. The former group also read with more breadth. In one particular school year, this group of children spent almost 3 times (29 minutes a day compared to 10 minutes a day) as much time reading outside of school. The children who valued reading highly mainly did so due to their levels of curiosity and involvement. The authors posit that children who read more and with greater breadth were more likely to continue to do so, whereas the converse would have been true for the less motivated children, resulting in positive and negative Matthew effects (Stanovich, 2008) respectively. They contend that as amount of reading correlates with reading achievement, motivation may have been a consequence of reading achievement. An alternative view proposed by the same researchers is that the correlation between the amount of reading and reading achievement was mediated by motivation to read.

The second sub-scale of motivation to read, that is, reader self-concept, is an indication of the reader's perception of themselves as good or poor readers (Gambrell et al., 1996). As explained by Retelsdorf et al. (2014), the skill-development hypothesis proposes that students compare their own academic performance with that of their peers to arrive at an academic self-concept. Higher ability students compare themselves with less able peers to reach the conclusion that they have a high degree of competency in

any particular academic domain. The flip side is that lower achieving students rate their own performance against high-achieving classmates and so perceive themselves as being less capable (Retelsdorf et al., 2014). These self-perceptions can have a profound impact on children's confidence in their ability to achieve reading tasks and their willingness to engage in reading, which in turn affects their literacy development (Morgan & Fuchs, 2007; Retelsdorf et al., 2014).

Various studies have found positive correlations between reading self-concept and reading achievement (Chapman & Tunmer, 1995; Chapman, Tunmer & Prochnow, 2000; Katzir, Lesaux, & Kim, 2009; Retelsdorf et al., 2014). According to Park (2011), some studies have shown that beginning readers generally have positive self-concept as readers, but their perceptions become more accurate as they go through primary grades. However, this was not the case in a longitudinal study by Chapman et al., (2000). This research on 60 children from the beginning of school to third grade found that reading self-concept differences were apparent within the first 2 months of starting school. At the beginning of Year 1, children who were more pessimistic about their reading ability had significantly lower test scores for reading-related skills than the children who had more optimistic views of their reading ability. These reading-related skills were aspects of phonological awareness and alphabet knowledge. By the end of Year 1, the gap between scores on reader self-concept between these two groups had widened. This translated into significant differences in word reading and comprehension ability between the two groups. Similarly, in the middle of Year 3, the gap in reader self-concept, word reading and comprehension further increased. In sum, whether all children start schooling with positive or varying degrees of reader self-concept, the relationship between reading ability and self-concept strengthens with schooling experience.

The relationship between motivation to read and reading achievement has also been researched in an international context by the robust series of PIRLS studies, which included New Zealand children. The PIRLS 2011 study looked at elements of motivation to read, including value of reading and reading self-concept among children who were between 9 and 10 years old. Participants read various statements relating to motivation and were scored according to their degree of agreement with those statements. Results were condensed into three scales of liking reading, motivation in

reading and confidence in reading. The first two scales were linked to value of reading while the confidence aspect related to reading self-concept. To elaborate, the scale of liking reading involved children's degree of interest, involvement and frequency of reading for pleasure. Motivation in reading was more goal-oriented and involved reading for fulfilling future educational goals, to facilitate independent thought and for approval by family. Finally, confidence in reading was an appraisal of children's perceptions about their own reading. Results for each aspect were then classified into three broad categories. For instance, results for the liking reading aspect were categorized into 'like reading', 'somewhat like reading' and 'do not like reading'.

For New Zealand children, similar to the international average, the majority of children (53%) fell into the 'somewhat like reading category'. Higher reading achievement scores were noted for children who liked reading. The same was true for motivation to read aspect, whereby children who were motivated had higher average reading achievement scores compared to children who were not motivated. However, the bulk of the New Zealand cohort (72%) was in the topmost category of 'being motivated', similar to the international average. The two aspects of value of reading, more or less reflected the international averages in terms of numbers in the scoring categories. Finally, considering confidence in reading, following a similar trend, children with greater confidence had higher achievement scores. Most children (61%) fell in the middle, that is, the 'somewhat confident category'. In this aspect, compared to the international average, fewer children were placed in the highest 'confident category' and more in the 'somewhat confident category'.

Therefore, the PIRLS study adds to the literature by showing that higher value placed on reading and increased reading self-concept correlated with higher achievement averages. In the New Zealand context, most children only enjoyed reading to a certain extent but highly valued it as a learning tool. Their self-concept in reading was also moderate, but this result showed fewer New Zealand children feeling confident about their reading ability and more children feeling only somewhat confident, compared to their international counterparts.

Summary

To sum up, this review began with the statement of a problem in terms of a larger than expected reading disparity among good and poor readers in New Zealand, as compared to other OECD countries. Literature concerning three theories that may explain the gap between good and poor readers was reviewed. The first theory, the literate cultural capital theory, posits that the reading gap forms as a result of individual differences in pre-reading skills and is evident when children start school. The second, the Matthew effects theory, attempts to explain the development of the reading gap as arising out of 'rich get richer, poor get poorer' effect, in which children with higher levels of pre-reading skills learn to read faster and better than children with low levels of pre-reading skills. The third, the faucet theory, explains that the same reading disparity emerges and widens over the summer break and is largely a result of unequal home or out-of-school opportunities for learning. A constantly recurring element that arises out of the research in the reading disparity and associated theories relates to SES background. The literature points to low-SES being associated with poor reading achievement, compared to high-SES that correlates with better progress in reading.

Some early pre-reading skills are strong predictors of future reading success. These are alphabet knowledge, phonemic awareness and vocabulary knowledge. It seems that to identify factors that compound the reading gap, both reading and pre-reading skills need to be tracked. Bearing in mind that reading development may progress differently between the school year and the summer holidays, this review looked at the literature on seasonal fluctuations in reading and reading skill development. As not a great deal of literature was available on this, especially in the New Zealand context, the present study focused on whether the reading disparity is affected by gaps present in pre-reading skills at school entry, whether the gap continues during school years, and whether it changes over the summer. The study examined these aspects of reading disparity among children of different SES backgrounds. To sum up, the study was framed by the following research questions:-

1. Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?

2. Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?
3. Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?
4. Does the summer reading effect widen over the two summers?
5. Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?
6. Is motivation to read related to progress in reading?

Chapter 3: Method and Design

Hypotheses

The purpose of the study was to monitor the reading development of school entry children of different family income backgrounds, starting with their first year of formal schooling and continuing as they moved through the first 2 years of school. The study also assessed the impact of the summer vacation on reading development among these children, and whether any summer effect increased across the two summer breaks in the study. This longitudinal study tracked the children's reading ability, as well as related language and literacy skills.

The first hypothesis was that children from the four different SES groups begin school with differing amounts of literate cultural capital. This is a set of reading-related skills conceptualised in the present study as alphabet knowledge, phonemic awareness and vocabulary knowledge.

The second hypothesis was that the children in the study would not make the same relative gains during the school year in reading and the reading-related skills of alphabet knowledge, phonemic awareness and vocabulary knowledge. The study proposed that the gains made in these skills would be defined along SES lines.

The third hypothesis was that the children would not make similar gains in the same reading-related skills and in reading over the summer break and that some groups of children would experience a slide in reading ability.

The fourth hypothesis was that reading gains or losses made by these children would increase over two summers.

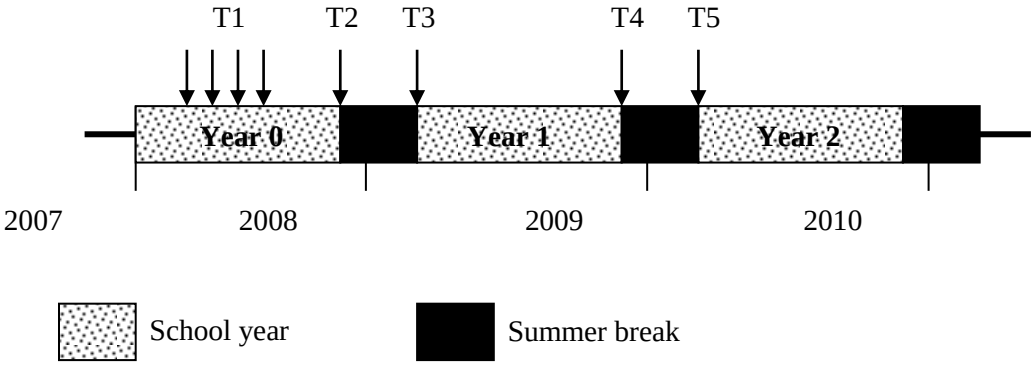
The fifth hypothesis was that there would be a direct link between the degree of literate cultural capital that these children had at school entry and relative changes in reading ability over the two school years and the two summer breaks in the study.

The sixth hypothesis was that children's motivation to read would be associated with their progress in reading.

Preview of the Chapter

The present study aimed to create a profile of language literacy skills that children from four different SES groups possessed at school entry. It tracked progress made during two school years and over two summer breaks in word reading and in the reading-related skills of alphabet knowledge, phonemic awareness and vocabulary knowledge.

The four groups of children attended deciles 1, 4, 7 and 10 primary schools, with decile 1 representing the lowest SES group and decile 10 representing the highest. Children in the study were new entrants at the beginning of the study. They were assessed for the first time as and when they commenced school at or around their fifth birthday. These children were then assessed at four other time points over the next 15 to 18 months, as shown in Figure 1.



T1: Test point 1 - New Entrants tested as and when they entered school

T2: Test point 2 - Same children tested at the end of the Year 0 school year

T3: Test point 3 - Same children tested at the beginning of the Year 1 school year

T4: Test point 4 - Same children tested at the end of the Year 1 school year

T5: Test point 5 - Same children tested at the beginning of the Year 2 school year

Figure 1. Testing points of reading and reading-related skills in the study.

Specifically, the study attempted to answer the following research questions:

Research Question 1: Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?

Children in the study were assessed for various reading-related skills at the initial entry point when they started school at Year 0 (T1). More specifically, they were assessed for the literate cultural capital variables of alphabet letter name and sound knowledge, phonemic awareness, receptive vocabulary knowledge, high-frequency word reading, and graded word reading. Results were analysed for differences between decile groups.

Research Question 2: Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?

Children were assessed on these dependent variables at the beginning (T1) and end (T2) of the first school year (Year 0) to establish changes during that first year in the reading-related skills and in word reading. They were again assessed with the same measures at the beginning (T3) and end (T4) of their second year in school (Year 1) to determine changes in that school year. Results were analysed for differences between decile groups.

Research Question 3: Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?

To chart reading development over the summer, children in the study were assessed immediately upon returning to school following the two summer vacations (at T3 and T5). They were assessed in alphabet knowledge, phonemic awareness, vocabulary knowledge and graded word reading ability. Scores were compared with scores that children received immediately before each summer to compute a gain or loss. These changes in scores were analysed for differences according to decile.

Research Question 4: Does the summer reading effect widen over the two summers?

Children were assessed in alphabet knowledge, phonemic awareness, vocabulary knowledge and graded word reading before and after the first (T2-T3) and second (T4-T5) summer holidays. Changes in scores over the second summer break were compared with changes in scores of the first summer break.

Research Question 5: Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?

Children's alphabet knowledge, phonemic awareness, vocabulary knowledge and graded word reading scores at school entry were correlated against changes in graded word reading scores over four time periods. Two of these time periods were over the school years (T1-T2, and T3-T4) and two were over the summer breaks (T2-T3, and T4-T5). Results were examined for significant correlational relationships.

Research Question 6: Is motivation to read related to progress in reading?

To answer this question, the Motivation to Read Survey was administered to all children in the study at the final test point (T5). Scores were computed into reading self-concept, value of reading and total scores. Each of these components were correlated against changes in word reading scores during the two school years and over the two summer breaks of the study.

This chapter begins with situating this study in the context of the New Zealand primary school classroom. Details of the participants are then presented. Following this, measures used, including specifics of reliability data, will be documented. Finally, the procedures of the study are reported.

Context

Schools in New Zealand are expected to teach the New Zealand curriculum. This includes following guidelines produced by the Ministry of Education in their

handbook, *Effective Literacy Practice in Years 1 to 4* (MOE, 2003). Hence in the reading classes of the schools involved in this study, reading lessons comprised one or a combination of various activities including reading aloud, shared reading, guided reading, and independent reading. Through these activities, teachers used a selection of instructional strategies to help children construct meaning from text. These instructional strategies included modeling, prompting, questioning, giving feedback or explanations. Through this repertoire of instructional strategies, children were expected to look for cues in the reading text including known words, syntax patterns, and pictures to predict meaning while constantly cross-checking and self-correcting along the way.

Participants

A group of 136 children from six different primary schools in Auckland formed the participant pool. These six schools reflected the range of lowest to highest SES backgrounds of the children in this study. The SES background of children in schools is reflected in the decile rating of a school. The MOE assigns a decile rating to a school based on the SES background of its children. This is calculated every 5 years using information obtained from the national census. The factors taken into account in this rating calculation are household income, parental employment, the degree of household crowding, parental educational qualifications, and level of income support received by the parents (MOE, 2013b). Each decile is a 10% grouping with deciles ranging from 1 to 10. The lowest SES ranking is decile 1 while the highest SES ranking is decile 10 (Norris, Bathgate, & Parkin, 1994). To elaborate, decile 1 schools contain the largest proportion of children from low-SES backgrounds, while decile 10 schools contain the smallest proportion of low-income background children.

Two of the participating schools were decile 1, a further two schools were decile 4, and one each were of deciles 7 and 10. At the start of the study, letters were sent to numerous schools around the Auckland area inviting them to take part in the study. Schools that responded positively were included in this study. The decile 7 and 10 schools were able to confirm at least 30 new entrants each. Hence, only one school of each decile became part of this study. In view of a higher degree of attrition and transience among families of children of lower decile schools in general, a greater number of participants was initially recruited. Consequently, two participating schools

for each lower decile were included. At the start of the study, together the lower deciles 1 and 4 had 71 children, at 34 and 37 children respectively. The higher deciles 7 and 10 had 33 and 32 participants. Table 1 shows the attrition across deciles over the five tests points for the Schonell Reading Test. This totaled 10 participants. While there was slightly greater attrition in the low decile schools, at the conclusion of the study, there were similar numbers across the four different decile groups.

Table 1

Participant and Attrition Numbers at Five Test Points

	Decile				
Test point	1	4	7	10	Total
T1	34	37	33	32	136
T2	32	37	33	32	134
T3	32	37	33	32	134
T4	31	34	33	30	128
T5	31	34	33	30	128
Attrition	-3	-3	0	-2	128

Participants ranged in age from 5.00 years to 5.33 years at the time they were first assessed. Overall, the mean age of the target participants at school entry was 5.07 years (*SD* = .08). In terms of gender breakdown, as a general trend, each decile group had a smaller proportion of females than males, except for decile 7. Table 2 shows the gender breakdown in percentages for each decile group. Table 3 illustrates the means and standard deviations of age, by gender and decile group.

Table 2

Gender Breakdown of Participants by Decile (Expressed as Percentages) at School Entry (T1)

Decile	Females	Males
1	41.2	58.8
4	43.2	56.8
7	54.5	45.5
10	37.5	62.5

Table 3

Means and Standard Deviations of Participants' Age (in Years) by Gender and by Decile at School Entry (T1)

	Females			Males		
Decile	*n*	*M*	*SD*	*n*	*M*	*SD*
1	14	5.05	0.06	20	5.08	0.10
4	16	5.10	0.11	21	5.09	0.08
7	18	5.08	0.08	15	5.05	0.07
10	12	5.05	0.05	20	5.06	0.07

Ethics

Massey University Human Ethics Committee: Northern approved the Human Ethics Application for this study on 20 June 2007, referenced MUHECN 06/083. Information pertaining to this application is contained in the ethics approval letter, found in Appendix A. Samples of information sheets and consent forms for all parties are included in Appendix B.

Assessors

Assessors in the study were the researcher and two research assistants. The researcher was experienced in assessing children using similar measures to those used in this study. The research assistants were university undergraduate trainee teachers

sourced through the university. They were trained in using these measures by the researcher. This involved about 2 hours of training prior to each testing point. During this time, the rationale of the study, the aims of each measure, and method of use were discussed. The research assistants also had opportunities to have their questions answered. The research assistants were reminded of participants' age and the necessity of using graded language and of creating a positive system of encouragement to motivate participants to work through the series of measures. The research assistants were then monitored by observation, and feedback provided, where necessary.

In order to reduce assessor bias, each decile group of participants was divided into groups of three. Each research assistant was assigned a different group to assess at each test point. Hence, for instance at T1, a research assistant who had tested a third of the children in decile 1 would not have assessed this same group at T2 or T3 and would only have encountered this group of children again in T4.

Design

This study involved establishing a profile of language and literacy skills of children across four different SES groups. A sample size of approximately 30 children for each group was deemed to be adequate for statistical analyses for difference between groups. The study was a longitudinal one, taking into account the language literacy skills that children possessed on school entry, and how these skills developed during the school year and over the summer vacation. To study this, it was necessary to track these children's language skills over the school year and separately over the summer vacation. To establish if the difference in language skills among children from different SES groups widened over two summers, it became necessary to track the participants over two summers. Hence, a longitudinal study design was adopted to measure school entry literacy skills, development of these skills over the two school years, and developmental trajectories over the first summer and second summer.

Measures

A range of measures were used to establish the children's literacy profiles at each testing point. These are detailed below.

Clay Letter Identification.

The Clay Letter Identification task of the Reading Recovery Diagnostic Survey (Clay, 1993) (see Appendix C) was used to establish which letters of the alphabet and their corresponding sounds the children knew. Children were shown the 26 letters in non-alphabetical sequence, first in upper case then in lower case. They were asked to state each alphabet letter name and sound. Assessors had a scoring sheet for recording scores which were up to 26 for names and 26 for sounds separately for upper and lower case. For alphabet letter name, accurately identifying the name of the letter constituted one correct response in the alphabet name category. For alphabet letter sound, children either stated the sound(s) of the letter or said a word beginning with that letter. Both were considered acceptable signs that children had letter sound knowledge. Final scores were computed as a mark out of 26 and consisted of four sets of scores, for alphabet name and sound for upper and lower case. A split-half reliability of this test is .95.

Gough-Kastler-Roper Phonemic Awareness Assessment.

The Gough-Kastler-Roper (GKR) Phonemic Awareness Assessment (Roper, 1984) was used to evaluate phonemic knowledge (see Appendix D). It is an oral test consisting of six subtests each assessing a different aspect of phonemic awareness, progressing from simple to more complex phoneme manipulation tasks. These are phoneme segmentation, blending, deletion of initial phoneme, deletion of final phoneme, substitution of initial phoneme and substitution of final phoneme. According to Nicholson (2005), the first four subtests are simple tasks in which only one mental operation is required. For instance, in phoneme segmentation, the child holds the word /no/ in their memory while splitting it into its component phonemes, that is, /n-o/. The final two subtests are considered more complex as they entail two mental operations. The first involves holding a word in memory and the second involves deleting part of the word, holding the modified word in memory and substituting that with a new phoneme. An example would be for a child to delete the /t/ phoneme out of /toy/ and substitute it with the /b/ phoneme to make /boy/. Each subtest comprises seven test items. The score in this test range from 0 to 42. All subtests have Cronbach alpha reliabilities of .7 or greater (Juel, 1994; Juel, Griffith, & Gough, 1986).

Peabody Picture Vocabulary Test.

Receptive vocabulary was measured using the Peabody Picture Vocabulary Test – Third Edition (PPVT-III) (Dunn & Dunn, 1997). Children were required to identify the correct picture out of a choice of four which matched the stimulus word presented orally by the test administrator. The stimulus words were grouped into sets of 12. The basal set and ceiling set were established. All stimulus words in each set were tested. The basal set was the one which corresponded to the age of the child and in which the child had made a maximum of one error in the set of 12 stimulus words. The ceiling set was the one in which eight or more errors were made in identifying the correct picture for the given stimulus word. A raw score was then established by deducting the lowest number on the basal set from the highest number of the ceiling set. Corresponding standard scores, stanines and vocabulary age could then be derived from the raw score data. The internal reliability for this test is .81. For the age 5 to 6 range, split-half reliabilities of between .86 and .94 have been reported (Williams & Wang, 1997).

Clay Word Reading Test.

Children's high-frequency word reading ability was measured using the Clay Word Reading Test of high-frequency words, also from the Reading Recovery Diagnostic Survey (Clay, 1993) (in Appendix E). This test consists of three different lists of 15 words each. The words on this list are frequently occurring and this test is considered to measure children's personal banks of high-frequency vocabulary. Children were asked to read the words on one list. Each word read correctly scored 1 point with a maximum of 15 correct responses. In terms of reliability, a Kuder-Richardson coefficient of .90 is reported for this test.

Graded Word Reading Test.

A second measure of word reading ability was established using the Graded Word Reading Test (GWRT) (Schonell, 1950) (see Appendix F). This measure was used in addition to the Clay word reading test at T1 as it has a wider range of difficulty. The GWRT was used at all subsequent test points from T2 to T5, as it was considered to be more sensitive to change over time. Children were presented with 100 printed words

which were context-free. Words ranged in difficulty, beginning with relatively simple words such as “tree”, “little”, and “milk” to more difficult words, including “bibliography” and “idiosyncrasy”. Children were asked to read the words from left to right, skipping the ones they did not know. Self-corrections were permitted, but prompting by the researcher was considered unacceptable, thereby rendering the test reusable. One mark was awarded for each correctly pronounced word. Testing was discontinued when children could no longer read any of the words due to mispronunciations or the lack of an attempt. Reading age was calculated based on the number of correct responses using the formula:

$$\frac{\text{Number of correct responses}}{10} + 5 = \text{Reading Age}$$

Reading ages measured in this test can range from 5 to 15 years, so it is an appropriate assessment tool to use considering the age range of the children in this study, which was from 5 years old to approximately 7 years old. Some reliability information for this test comes from Kiely et al. (2011). In their survey of adult readers, they found a correlation of .91 between the GWRT and the National Adult Reading Test. Further reliability information is provided by Neale, McKay and Barnard (1999), who reported correlations of .95 to .96 between the GWRT and the passage reading accuracy component of the Neale Analysis of Reading Ability.

Neale Analysis of Reading Ability.

The Neale Analysis of Reading Ability (NARA) (revised, Forms 1 & 2) (Neale et al., 1999) was used to measure reading accuracy in context and reading comprehension. The test consists of graded passages with corresponding comprehension questions. Children were asked to read each passage aloud. A maximum number of permissible errors for each passage was defined by the test designers. Only when children were able to read each passage without reaching this maximum number were they asked the accompanying comprehension questions. The NARA passage reading accuracy and comprehension measures are normed for children between 6 and 12 years old. At Year 1 level, these measures have Kuder-Richardson internal consistency

reliabilities of .95 for reading accuracy and .81 for reading comprehension. Because the NARA is only appropriate for use on children from 6 years old, it was only administered in this study at test points T4 and T5. At T4 all children in the study were at least 6 years old.

Motivation to Read Survey.

In order to assess how highly motivated children were as readers, the Motivation to Read Survey (Gambrell et al., 1996) (in Appendix G) was administered. This survey of 20 items assesses two dimensions of the readers' motivation, namely reader self-concept (10 items) and value of reading (10 items). Children chose one out of four responses for each item. Reader self-concept provides information about how children rate themselves in terms of their competency in reading and their perceptions of their reading ability relative to those in their peer group. Value of reading provides information on how much value is placed on reading-related tasks and activities. Reported Cronbach's alpha reliabilities for this survey are .75 for reader self-concept and .82 for value of reading. It was felt that not all children would be able to read the survey questionnaire, therefore, it was verbally administered to the children individually by the assessors. Because the Motivation to Read Survey can be difficult for young children to understand, it was only used at the very end of the study (T5).

Procedure

The study involved 136 children from four different decile schools. All children were assessed as and when they commenced school (T1) between the months of July and December. The study began in July because ethics approval was received too late for it to commence at the beginning of the school year, in January or February. Typically, children start school on or around their 5th birthday in New Zealand. Children born between the months of January and June enter school at the Year 1 level. Children born in the remaining months begin at the Year 0 level. Hence, the children in this study commenced school at the Year 0 level.

Assessments of nearly all the children were undertaken by the assessors within 2 months of school entry. In a small number of cases it took longer to complete all

assessments, due to reasons such as absenteeism, the number of assessments for each participant and availability of assessors. This resulted in the assessment of eight children being completed within 3 months of starting school, and of two children within 4 months of entering school.

Information sheets and consent.

The initial approach to schools was conducted by letter. If a school expressed interest in participating in the study, Information Sheets were sent to the Principals and the Board of Trustees (see Appendix B) detailing the study and its implementation. Once approval was gained from these parties, the schools were supplied with Parent Information Sheets (see Appendix B) and Child Consent Forms (see Appendix B) to pass on to the parents. Typically, these were included in the enrolment packs that the parents of new entrants received.

The children of parents who consented to having their children participate in the study then formed the pool of participants for that school. Parents were also asked to complete a Pupil Information Sheet (see Appendix B).

As new entrants started school on or around their 5th birthday, the participating schools then informed the researcher as and when new children entered school. These new entrants were then approached as close to commencement of school as possible to begin assessment at the first test point (T1).

All assessments were individually administered at each of the five test points. At the first test point (T1), Child Participant Information Sheets (see Appendix B) were handed out and the study was explained to the children. Their agreement to participate was obtained in a Child Consent Form (see Appendix B) whereby children had a choice of pictures of puppy dogs with differing expressions ranging from happy to sad. Children were asked to colour in the puppy dog that reflected their willingness to participate in the study. If children coloured in the happy or very happy puppy dog, they were considered to have given consent to taking part in the study. They were then assessed in various reading and reading-related measures. Testing of children ranged from about 15 minutes to an hour and a half. In view of the fact that children may have

been fatigued, their level of engagement and motivation was checked every 15 minutes using a 5-point Likert scale with puppy dogs instead of numbers. Children were shown the puppy dogs and asked to point to the one that reflected how they felt about carrying on. If they pointed to the happy or very happy puppy, testing carried on. Otherwise, testing was discontinued for that day and recommenced on the next possible day. Table 4 below outlines the measures that were administered at each of the five test points.

Table 4

Measures Administered at the Five Test Points

Test Point (T)	Measures
T1	Clay Letter Identification GKR - Gough-Kastler-Roper Phonemic Awareness Assessment PPVT - Peabody Picture Vocabulary Test – Third Edition Clay Word Reading Test GWRT - Graded Word Reading Test
T2	Clay Letter Identification GKR - Gough-Kastler-Roper Phonemic Awareness Assessment PPVT - Peabody Picture Vocabulary Test – Third Edition GWRT - Graded Word Reading Test
T3	Same measures as in T2
T4	Same measures as in T2 and: NARA - Neale Analysis of Reading Ability (3rd Edition) Passage Reading Accuracy and Comprehension
T5	Same measures as in T2 and: NARA - Neale Analysis of Reading Ability (3rd Edition) Passage Reading Accuracy and Comprehension Motivation to Read Survey

Data Analysis

The study aimed to establish a profile of the literate cultural capital of the participants at school entry and their subsequent literacy development across two school years and two summer breaks. In order to achieve this, the means and standard

deviation scores of all measures (see Table 4) at the five test points from T1 to T5 were determined. All data analyses were performed using SPSS version 16.0.

Research Question 1: Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?

Firstly, to obtain a profile of the literate cultural capital of the participants at school entry, the means and standard deviation scores of all measures at the first test point (T1) were established.

To answer research question 1, a one-way multivariate analysis of variance (MANCOVA) was carried out on the scores obtained for each measure at T1 to see if further analysis was warranted. This was followed by univariate analysis of variance (ANOVA) on these scores. The dependent variable was the score obtained for each measure and the independent variable was decile grouping. Results were analysed for significant overall decile effects. Pairwise comparisons were performed to establish if there were differences between different decile schools.

Research Question 2: Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?

This research question addressed change scores during each of the two school years. Hence, to begin with, gain scores in alphabet knowledge, phonemic awareness, vocabulary knowledge and word reading were computed between the relevant time periods accordingly. These were between T1 and T2, and T3 and T4. As an example, the changes between the time periods T1 and T2 were computed by deducting test scores at T1 from T2. Following this, similar one-way MANCOVA and follow-up ANOVAs were conducted on all measures between T1 and T2, and T3 and T4.

The reading measure used from this time point on was only the GWRT, measuring graded word reading. While the Clay Word Reading Test, measuring high-frequency word reading, was reported at school entry, subsequent analyses did not

include this measure as word reading ability was already covered by the GWRT. The GWRT has a wider range of difficulty and is more sensitive to change over time.

Research Question 3: Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?

Similar to research question 2, this question examined the gains or losses made over the two summer breaks (T2-T3 and T4-T5). Once again, differences in test scores before and after each summer were computed. A MANCOVA followed by ANOVAs for each measure were carried out for each time period to establish if change scores were similar. Pairwise comparisons were made to detect differences between deciles.

Research Question 4: Does the summer reading effect widen over the two summers?

To establish whether summer changes in scores varied across the two summer vacations, the analysis focused just on changes in word reading over the first summer (T2-T3) and second summer (T3-T4). The analysis used a repeated measure ANOVA for word reading with decile group as the independent variable. Data were analysed by decile group. The raw scores of the GWRT were used as the measure of graded word reading ability, hence this was the dependent variable. The within subjects factor was Time and the between subjects factor was word reading scores.

Research Question 5: Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?

In order to address this research question, correlations were made between school year (T1-T2 and T3-T4) and summer (T2-T3 and T4-T5) changes in word reading and the reading-related variables of alphabet knowledge, phonemic awareness, word reading and receptive vocabulary. Regression analyses were also carried out. Results were analysed to see which dependent variables predicted school and summer changes in word reading ability.

Research Question 6: Is motivation to read related to progress in reading?

To answer this research question, scores obtained from administering the Motivation to Read Survey were correlated with changes in graded word reading raw scores across the four different time periods of the study (T1-T2, T2-T3, T3-T4, and T4-T5). Results were analysed for significance.

Summary

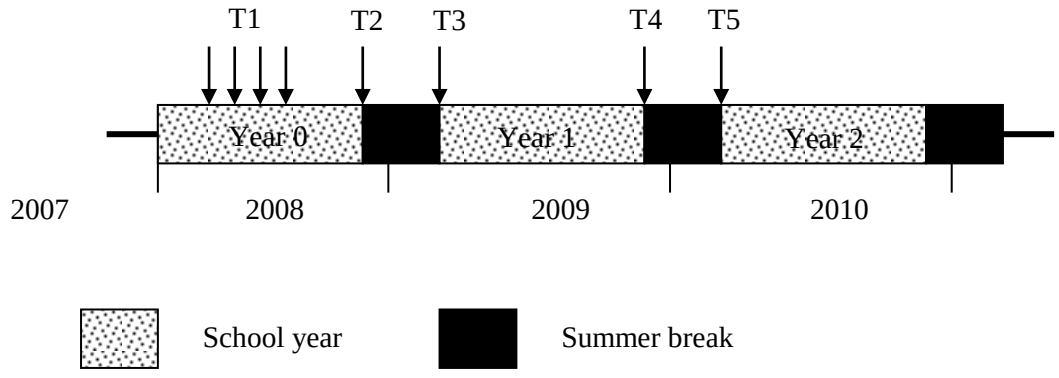
This chapter has explained the methodology. The aim was to carry out a longitudinal study of the development of reading, language, and reading-related skills in children from four different SES backgrounds across their first 2 years at school and their first two summer vacations. The researcher recruited 136 children into the study from schools representing four different SES groups or deciles. There were more than thirty children from each of deciles 1, 4, 7 and 10. The study measured children's levels of reading-related skills, which were alphabet knowledge, phonemic awareness and vocabulary knowledge, as well as their reading ability. Measurements were taken by the assessors at school entry, at the end of the first school year, at the beginning and end of the second school year, and finally at the end of the second summer vacation. Results were analysed for differences between deciles, for the effect of each time period, for correlation between reading-related skills at school entry and later progress in reading ability, and lastly for correlation between children's levels of motivation to read and progress in reading.

Chapter 4: Results

Overview of the Study

The study tracked the reading development of four groups of children across four different SES levels. The four SES groups were defined by the decile rating of the school and these were deciles 1, 4, 7 and 10. There were 136 children in the study. These children's reading development was tracked from the time they began school till the end of the summer break after their second year at school.

The first part of the study painted a picture of the literate cultural capital that children possessed when they began school. The term literate cultural capital refers to a bank of reading and reading-related skills that children possess prior to school entry. The same skills were examined as children progressed through school, over two school years and two summer breaks. The study then examined how the degree of literate cultural capital impacted the changes in reading scores of these four groups of children from four different SES groups throughout the duration of the study. Figure 2 shows a chart representing the study. Finally, the study examined whether children's level of motivation to read was associated with their progress in reading.



T1: Test point 1 - New Entrants tested as and when they entered school

T2: Test point 2 - Same children tested at the end of the Year 0 school year

T3: Test point 3 - Same children tested at the beginning of the Year 1 school year

T4: Test point 4 - Same children tested at the end of the Year 1 school year

T5: Test point 5 - Same children tested at the beginning of the Year 2 school year

Figure 2. Testing points of reading and reading-related skills in the study.

Preview of Results

The study found that the 136 children in the study who were from different SES backgrounds started school with differing amounts of literate cultural capital. Children in the lower SES groups started school with less literate cultural capital than children in the higher SES groups. In mapping their reading progress over the term of the study, results showed that while all groups of children made gains in reading over the school years, some children lost ground over the summer holidays. This latter group of children belonged to the lower SES groups.

An overview of the results is shown in the tables below. Table 5 shows results for GWRT as reading ages (in months). Table 6 shows standard scores of PPVT vocabulary knowledge. This is done because these results will be referred to in the Discussion chapter, but in the remainder of this chapter the statistical analyses will use raw scores for all measures.

Table 5

Means and Standard Deviations of GWRT Word Reading (Reading Age in Months) by Decile at the Five Test Points

Decile	T1		T2		T3		T4		T5	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1	60.00	0.00	60.50	1.09	60.00	0.00	65.77	6.25	62.78	2.85
4	60.23	1.05	61.00	2.26	60.52	1.99	70.74	16.31	70.38	12.39
7	60.73	3.35	62.22	4.88	62.26	4.47	74.80	10.88	77.57	13.74
10	60.30	0.86	61.80	3.90	61.84	4.16	81.80	16.60	86.00	12.25

Table 6

Means and Standard Deviations of PPVT Vocabulary Knowledge Standard Score by Decile at the Five Test Points

Decile	T1		T2		T3		T4		T5	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1	81.06	16.60	84.63	15.00	85.72	14.84	84.29	15.40	78.13	16.76
4	89.70	17.77	91.00	16.60	90.97	17.18	90.25	15.30	86.94	13.41
7	98.30	20.79	102.67	17.31	104.00	15.49	102.12	13.15	104.06	13.97
10	104.97	14.88	106.12	11.41	107.63	14.41	106.07	16.42	110.97	13.97

Figure 3 shows a snapshot of the word reading development, which comprised the raw scores of the GWRT, of all children throughout the period of the study.

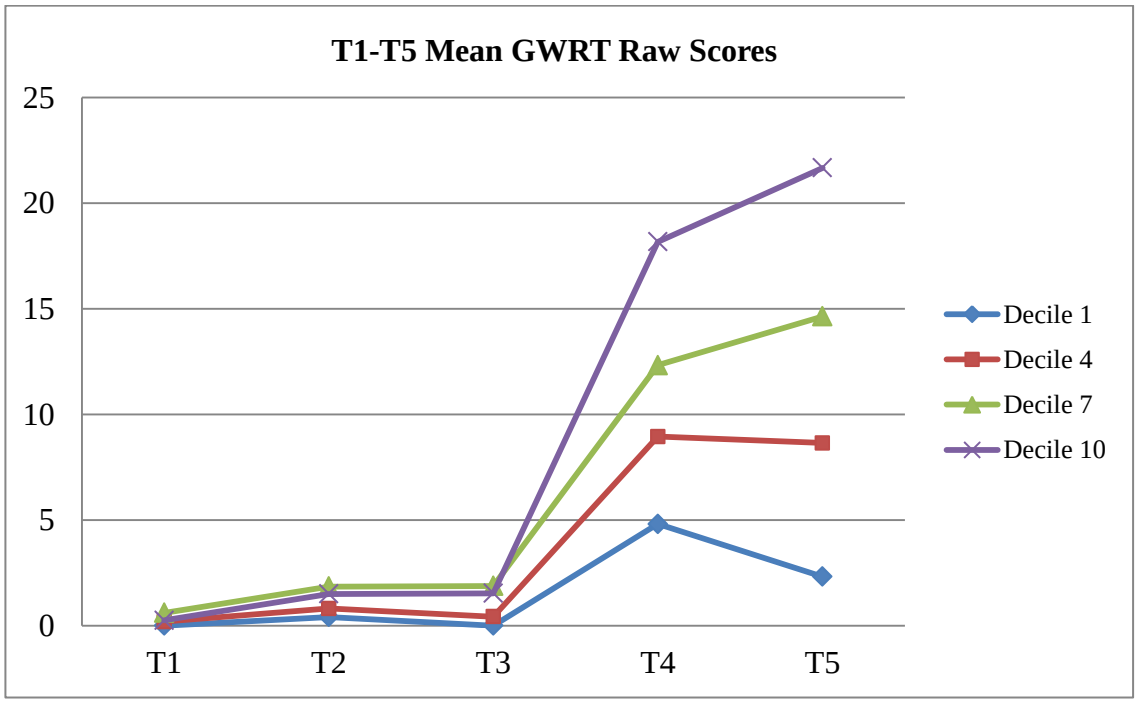


Figure 3. Mean GWRT word reading raw scores at the 5 test points.

Overall, in terms of reading development, it can be seen that there is a fan effect, whereby children from the higher deciles progressed at a faster rate than children from the lower deciles. This study was interested in specific parts of the above picture with a particular focus on progress in reading and reading-related skills over the school years

and the summer breaks separately. The following sections outline the hypotheses that were made and the research questions that were formulated to confirm these hypotheses.

Hypotheses

Specifically, the study tested the following hypotheses.

The first hypothesis was that children from the four different SES groups begin school with differing amounts of literate cultural capital. This is a set of reading-related skills conceptualised in the study as alphabet knowledge, phonemic awareness and vocabulary knowledge.

The second hypothesis was that the children in the study would not make the same relative gains during the school year in reading and the reading-related skills of alphabet knowledge, phonemic awareness and vocabulary knowledge. The study proposed that the gains made in these skills are defined along SES lines.

The third hypothesis was that the same children would not make similar gains in reading and reading-related skills over the summer break and that some children would experience a backslide in reading ability.

The next hypothesis was that reading gains or losses made by these children would increase over two summers.

The fifth hypothesis was that there would be a direct link between the degree of literate cultural capital that these children had at school entry and relative changes in reading ability over the two school years and the two summer breaks in the study.

Finally, the last hypothesis was that children’s motivation to read was associated with their progress in reading. In line with the above hypotheses, six research questions were formulated and these are outlined below.

Research Questions

The study addressed six specific research questions.

1. Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?
2. Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?
3. Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?
4. Does the summer reading effect widen over the two summers?
5. Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?
6. Is motivation to read related to progress in reading?

Design

The design of this longitudinal study involved tracking children's reading and reading-related skills over the course of two school years and two summer breaks. This was a survey study taking empirical measurements of reading and reading-related variables over 5 different test points.

A total of 136 children from four different decile group schools were recruited. These four decile groups were deciles 1, 4, 7 and 10. Hence, the groups were known by their decile rankings. Each group comprised at least 30 children.

The study commenced when children started school at or around their fifth birthdays. The amount of literate cultural capital children started school with was established by creating a profile of scores on reading and reading-related variables made up of alphabet knowledge, phonemic awareness, and receptive vocabulary knowledge. The aim of the study was to observe the literacy development patterns of these variables over the school year and the summer holidays.

The following sections address the research questions, providing descriptive statistics where applicable, statistical analyses, and findings.

Literate Cultural Capital of New Entrants

Research Question 1: Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?

Effect of date of entry on numbers of new entrants in each school.

Children entered school on or around their fifth birthdays between the months of July and December. Table 7 shows the number of new entrants each month in each of the four different decile groups. Figure 4 shows that the most popular months for enrolling new entrants were October and November.

Table 7

Number of New Entrants by Month by Decile at School Entry (T1)

Decile	July	August	September	October	November	December
1	4	6	1	7	15	1
4	3	5	0	12	15	2
7	0	4	0	17	10	2
10	2	7	0	10	13	0

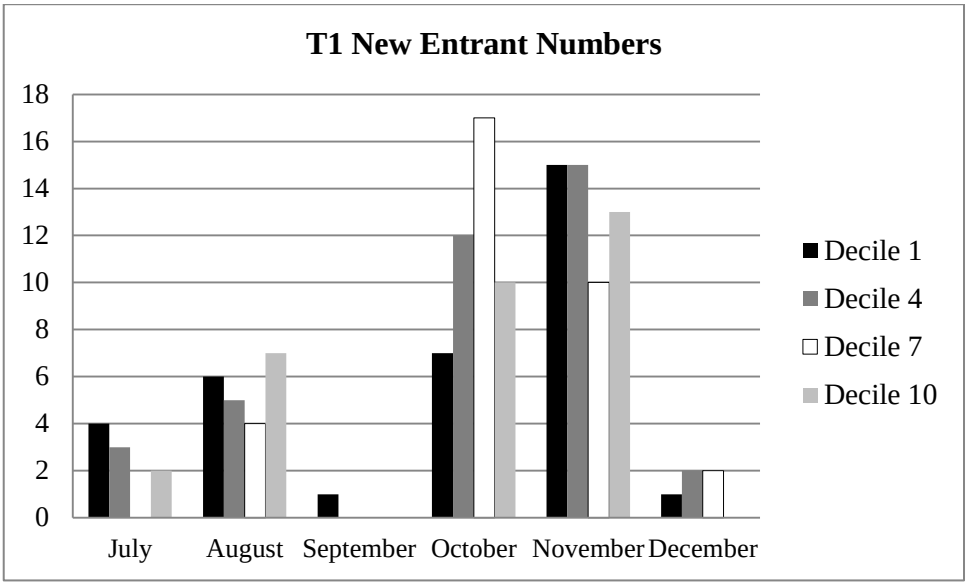


Figure 4. Number of new entrants by month by decile at school entry (T1).

A crosstabs analysis compared the distribution of numbers of new entrants enrolled in the four schools across the months from July to December. The chi square calculation was not significant, $\chi^2(15) = 15.71$, $p = .40$. The result indicates that there was no effect of time of entry. The pupils entered the four schools in similar numbers from July to December.

The first time children were tested (T1) was when they turned 5 years of age and were allowed to commence school. This was different for each child, depending on when their birthdays fell. Therefore, children started school at different times between July and December. As a result of this variable starting date, the average amount of time the children spent in the first school year (T1-T2) was only 1.65 months.

Profile of literate cultural capital of new entrants by decile.

The term literate cultural capital refers to the reading and reading-related variables, which children possess varying degrees of, at school entry. These are associated with literacy-related activities that occur in the home and which impact on early literacy development (Tunmer et al., 2006). For the purposes of this study, the literate cultural capital variables of alphabet knowledge, phonemic awareness, and receptive vocabulary knowledge were examined.

The approach to the first research question was to establish if there was a difference in levels of literate cultural capital among children of the four different decile schools at school entry (T1). A multivariate analysis of variance (MANOVA) was conducted. The independent variable was the four different decile groupings, which were decile 1, 4, 7 and 10. The dependent variables were the three measures that constituted the three elements of literate cultural capital, which were alphabet knowledge, phonemic awareness, and receptive vocabulary knowledge, as well as high-frequency word reading and graded word reading.

The first dependent variable was alphabet knowledge, measured using the Clay Letter Identification task of the Reading Recovery Diagnostic Survey (Clay, 1993). Children's knowledge of uppercase and lowercase letter names and sounds were measured, generating four sets of scores out of a maximum of 26 for each. For this study, a composite score of letter name and sound knowledge was created. The scores out of 26 for each of the four measures were added together, and then divided by 4. The final composite score was out of 26. The second dependent variable was phonemic awareness, which was measured with the GKR Phonemic Awareness Assessment (Roper, 1984). The maximum raw score for this measure is 42. The third dependent variable was receptive vocabulary knowledge. The PPVT (Dunn & Dunn, 1997) was used for this and the raw scores for this measure were analysed. The fourth dependent measure was the Clay Word Reading Test (Clay, 1993), measuring the children's ability to read high-frequency words. This has a maximum score of 15. The final dependent measure was the GWRT (Schonell, 1950). This is a list of 100 words graded for difficulty. It is norm-referenced and allows for the calculation of a reading age from the raw test scores.

The means of the three dependent literate cultural capital variables were compared for differences using a multivariate analysis of variance (MANOVA) and this was done to reduce family wise error. Table 8 shows the results of the MANOVA. The Multivariate Wilks' lambda value was significant, Wilks' $\lambda = .64$, $F(15, 353.75) = 4.15$, $p < .001$, indicating that the effects for the dependent variables were significant and that the univariate ANOVAs for each dependent variable could be further examined.

Table 8

Means, Standard Deviations, and MANOVA with Follow-up LSD Contrasts for Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge, Clay Word Reading and GWRT Word Reading by Decile at School Entry (T1)

Measure	Decile	*M*	*SD*	ANOVA *F*(3, 132)	*p*	η²	1v4	1v7	1v10	4v7	4v10	7v10
Clay	1	2.29	3.41	18.52	<.001*	.30	<.001*	<.001*	<.001*	.002*	.007*	.692
Letter	4	8.76	8.32									
Identification	7	14.47	8.97									
Task	10	13.73	8.17									
GKR	1	0.06	0.34	4.11	.008*	.09	.442	.009*	.004*	.054	.029*	.785
Phonemic	4	1.03	1.97									
Awareness	7	3.48	6.62									
Assessment	10	3.84	8.32									
PPVT	1	44.03	18.19	12.25	<.001*	.22	.026*	<.001*	<.001*	.044*	<.001*	.132
Vocabulary	4	55.00	19.08									
Knowledge	7	64.97	25.07									
	10	72.66	18.84									
Clay Word	1	0.32	0.54	5.88	.001*	.12	.074	<.001*	.037*	.065	.708	.045*
Reading	4	1.24	1.66									
Test	7	2.52	3.65									
	10	1.44	1.54									
GWRT	1	0.00	0.00	0.97	.41	.02						
Word	4	0.19	0.88									
Reading	7	0.61	2.79									
	10	0.25	0.72									

*$p < .05$

Alphabet knowledge.

The ANOVA showed a significant result for Clay Letter Identification, measuring alphabet knowledge, $F(3, 132) = 18.52$, $p < .001$, $\eta^2 = .30$. The effect size was large, showing that alphabet knowledge accounted for about 30% of the variance. Follow-up LSD contrasts showed that decile 1 scored significantly lower than deciles 4, 7, and 10. Decile 4 scored lower than 7 and 10. There was no difference between mean scores in deciles 7 and 10, even though the mean score for decile 7 was marginally greater than that of decile 10. The general pattern was that the higher decile pupils were more knowledgeable about the alphabet than the deciles below them, except that deciles 7 and 10 had similar knowledge. Figure 5 shows the alphabet knowledge of children at school entry.

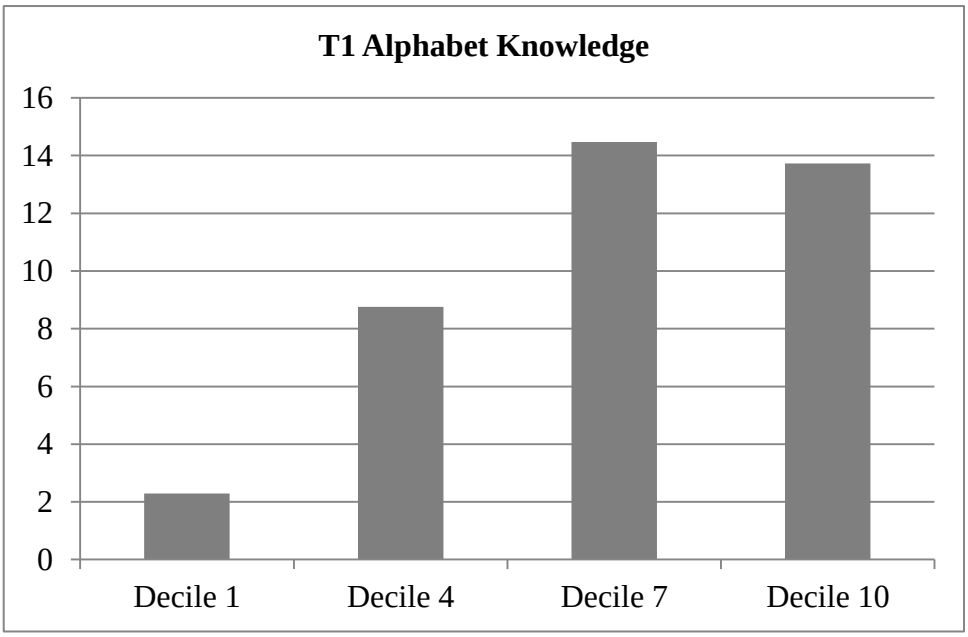


Figure 5. Mean raw scores for Clay Letter Identification by decile at school entry (T1).

GKR phonemic awareness.

The ANOVA showed a significant *F* value for GKR phonemic awareness, $F(3, 132) = 4.11$, $p = .008$, $\eta^2 = .09$. The effect size was medium, showing that phonemic awareness accounted for 9% of the variance. Follow-up contrasts showed that there was no significant difference in scores between deciles 1 and 4, but decile 1 scored significantly lower than 7 and 10. Additionally, decile 4 was not significantly lower than decile 7, but it was significantly lower than decile 10. Finally, there was no difference between deciles 7 and 10. The general pattern was that the higher decile pupils had more phonemic awareness knowledge than the lowest decile pupils and that deciles 7 and 10 had similar knowledge. Figure 6 shows the above results.

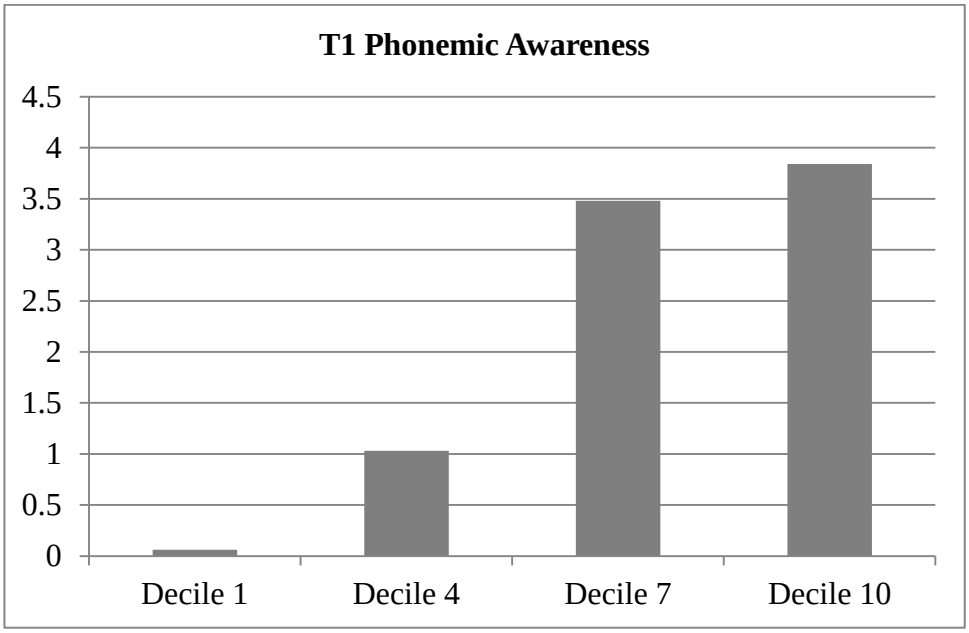


Figure 6. Mean raw scores for GKR Phonemic Awareness Assessment by decile at school entry (T1).

PPVT vocabulary knowledge.

The ANOVA showed a significant F value for receptive vocabulary (PPVT), $F(3, 132) = 12.25$, $p < .001$, $\eta^2 = .22$. The effect size was large, showing that vocabulary knowledge accounted for 22% of the variance. Follow-up contrasts showed that decile 1 scored significantly lower than 4, 7, and 10, and that decile 4 scored significantly lower than 7 and 10. However, there was no significant difference between 7 and 10. The general pattern was that the higher decile pupils had more vocabulary knowledge than the deciles below them, except that deciles 7 and 10 had similar knowledge. This can be seen in Figure 7 below.

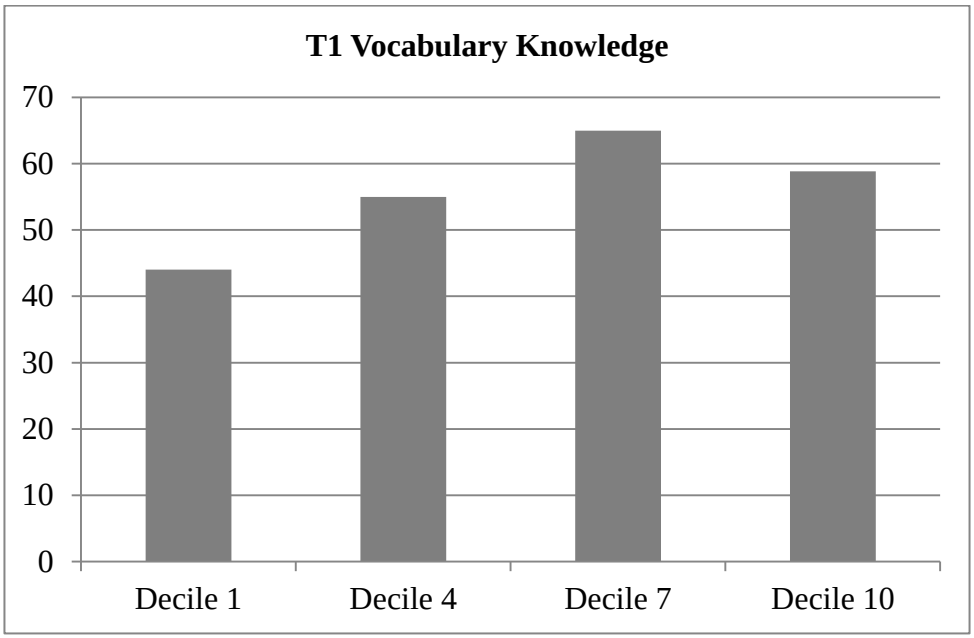


Figure 7. Mean raw scores for PPVT vocabulary knowledge by decile at school entry (T1).

Clay word reading.

High-frequency word reading was analysed at this point to examine reading ability of high-frequency words among children of different deciles. The ANOVA showed a significant *F* value for Clay Word Reading, $F(3, 132) = 5.88$, $p = .001$, $\eta^2 = .12$. The effect size was moderate, showing that high-frequency word reading accounted for 12% of the variance. Follow-up LSD contrasts showed that decile 1 scored significantly lower than 7 and 10, but not 4, and that decile 4 was lower than 7 but not 10, and that 7 was significantly higher than 10. The general pattern was different to the other two variables in that decile 7 pupils had the highest scores and that deciles 1, 4 and 10 were below them, and decile 1 were similar to 4, but lower than 7 and 10. This is shown in Figure 8.

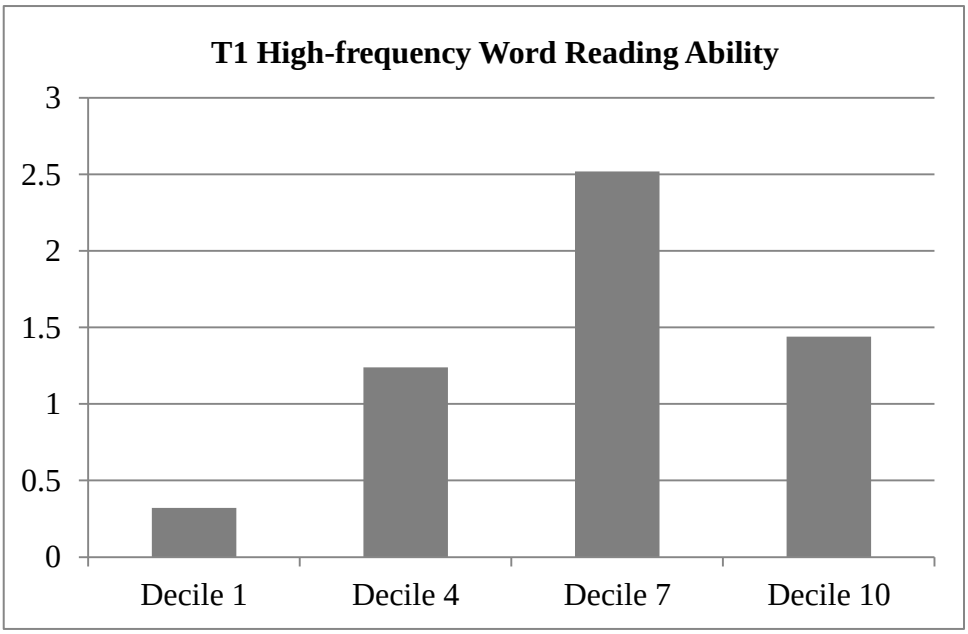


Figure 8. Mean raw scores for Clay Word Reading Test by decile at school entry (T1).

GWRT word reading.

Although graded word reading is not considered a literate cultural capital variable, graded word reading scores were measured to provide a benchmark for gauging future reading progress. The results of the children's graded word reading ability according to decile group are reported below.

In contrast to the results for the Clay word reading test, the ANOVA showed a non-significant *F* value for GWRT word reading, $F(3, 132) = 0.97$, $p = .41$, $\eta^2 = .02$. The very small effect size showed that GWRT word reading accounted for only around 2% of variance. Although decile 1 children scored zero on this test and decile 7 children scored the highest, at a mean of 0.61 raw score points, this difference was not found to be significant. This might have been because the school entry scores in general were very low. The mean raw scores for the GWRT are shown in Figure 9.

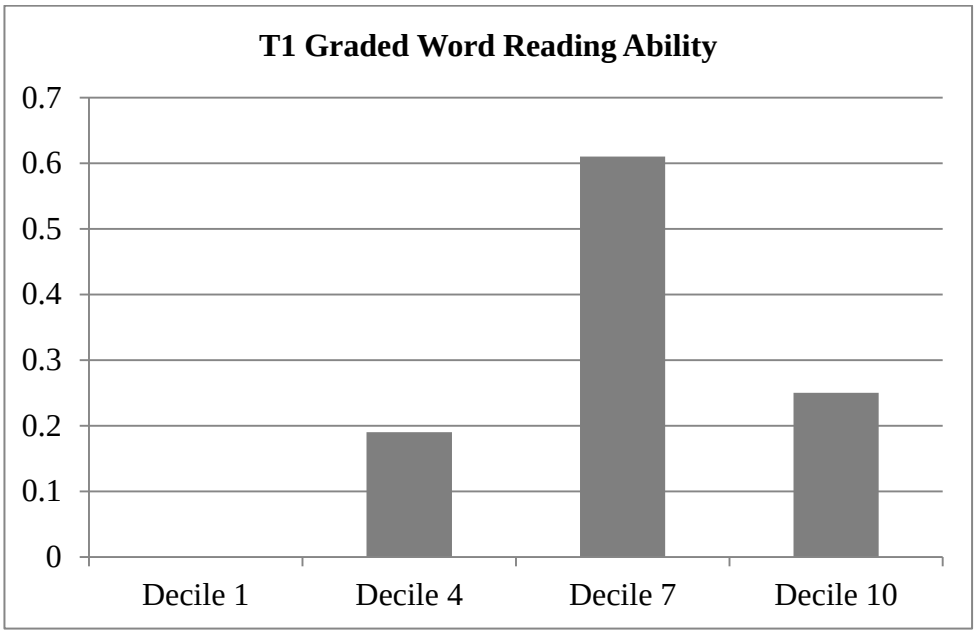


Figure 9. Mean raw scores for GWRT word reading by decile at school entry (T1).

Summary.

The overall results of the MANOVA showed that the two strongest variables in terms of accounting for differences among the four deciles were alphabet knowledge and vocabulary knowledge. Phonemic awareness and high-frequency word reading accounted for a smaller amount of variance.

In answer to research question 1, pupils in the deciles 1, 4, 7, and 10 schools did not start with similar levels of literate cultural capital. New entrants in the high-decile schools started with large advantages in alphabet and vocabulary knowledge and modest advantages in terms of reading ability and phonemic awareness.

Literacy Development in the School Years

Research Question 2: Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?

In this study, new entrant children were tracked in their reading and reading-related skills over four time periods, two of which were during the school year (T1-T2, and T3-T4), while the other two were over the summer break (T2-T3, and T4-T5). In order to answer research question 2, children's scores in reading and reading-related skills were examined over the two time periods spanning the first 2 years at school. The first time period was from T1 to T2, which was from the time children started school as new entrants in or after July of that year to the time the school year ended in December of that same year. As new entrants start on or around their fifth birthday, the children in this study began at various points during this period and hence their first school year ranged in duration from between 1 to 5.5 months, with an average of 1.65 months. The second time period was from T3 to T4. This time period was the same for all children in the study, spanning their second school year from February to December of that year. Results to answer this research question will be presented in the following sections according to these two time periods.

The reading and reading-related skills that were tracked during the school year were alphabet knowledge, phonemic awareness, receptive vocabulary knowledge and graded word reading. While the results for the high-frequency word reading test were reported at school entry for research question 1, analyses for subsequent research questions did not involve this measure as word reading ability was already covered by graded word reading, which had a wider range of difficulty and was more sensitive to change over time.

Similar to research question 1, alphabet knowledge was a composite score generated from individual scores of lowercase and uppercase letter identification and sound knowledge on the Clay Letter Identification task. The individual scores were divided by 4 to produce the composite score out of 26. Phonemic awareness was assessed using the GKR Phonemic Awareness Assessment, with a maximum possible raw score of 42, and vocabulary knowledge was measured using raw scores of the PPVT. Word reading skills for this part of the study were measured using the GWRT. For this study, the raw scores were examined.

To answer this research question, a MANOVA was used to compare mean gain scores of the above dependent variables against the independent variable of decile groups. The same analysis was done for each of the two time periods. To establish gain scores, the differences in scores of the four dependent variables were computed between each of the two time periods, namely between T1 and T2, and T3 and T4. Where main effects were detected, LSD contrasts compared the individual differences between deciles.

First school year (T1 to T2).

The means and standard deviations of raw scores for the dependent variables of Clay Letter Identification, GKR Phonemic Awareness Assessment, PPVT vocabulary knowledge and GWRT word reading are displayed in Table 9. Overall, although gains were made among all children and in all reading-related scores, these appear to be marginal.

Table 9

Means, Standard Deviations and Gain Scores of Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the First School Year (T1-T2)

Measure	Decile	T1		T2		T1-T2 Gains
		M	*SD*	*M*	*SD*	*M*
Clay	1	2.29	3.41	5.47	5.69	3.18
Letter	4	8.76	8.32	12.60	8.76	3.84
Identification	7	14.47	8.97	18.03	8.28	3.56
Task	10	13.73	8.17	16.69	7.90	2.96
GKR	1	0.06	0.34	0.44	1.61	0.38
Phonemic	4	1.03	1.97	3.24	8.12	2.21
Awareness	7	3.48	6.62	7.42	11.05	3.94
Assessment	10	3.84	8.32	6.03	10.43	2.19
PPVT	1	44.03	18.19	49.56	16.68	5.53
Vocabulary	4	55.00	19.08	58.19	19.06	3.19
Knowledge	7	64.97	25.07	72.76	21.56	7.79
	10	72.66	18.84	76.09	14.02	3.43
GWRT	1	0.00	0.00	0.41	0.91	0.41
Word	4	0.19	0.88	0.81	1.88	0.62
Reading	7	0.61	2.79	1.85	4.06	1.24
	10	0.25	0.72	1.50	3.25	1.25

MANOVAs of the reading-related variables and word reading for decile effects are shown in Table 10. The Wilks lambda statistic was not significant, Wilks' $\lambda = .92$, $F(12, 336.30) = 0.94$, $p = .51$. It appears that there were no significant differences in mean gain scores of Clay Letter Identification, GKR Phonemic Awareness Assessment, PPVT vocabulary knowledge and GWRT word reading between the decile groups. Hence, it can be concluded that all children made similar gains in their first school year (T1-T2).

Table 10

Mean Gain Scores, and MANOVA for Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the First School Year (T1-T2)

Measure	Decile	T1-T2 Gains *M*	ANOVA *F*(3, 130)	*p*	η^2
Clay	1	3.18	0.18	.91	.004
Letter	4	3.84			
Identification	7	3.56			
Task	10	2.96			
GKR	1	0.38	1.79	.15	.04
Phonemic	4	2.21			
Awareness	7	3.94			
Assessment	10	2.19			
PPVT	1	5.53	1.10	.35	.03
Vocabulary	4	3.19			
Knowledge	7	7.79			
	10	3.43			
GWRT	1	0.41	1.32	.27	.03
Word	4	0.62			
Reading	7	1.24			
	10	1.25			

Alphabet knowledge.

A comparison of gain scores on alphabet knowledge, measured by the Clay Letter Identification task, showed a non-significant main effect, $F(3, 130) = 0.18$, $p = .91$, $\eta^2 = .004$. The effect size was very small, at less than 1% of the variance. The pattern was that children from all deciles made similar mean gains of between 2.96 and 3.84 in alphabet knowledge during the first school year.

GKR phonemic awareness.

As shown in Table 9, the results were that there was a non-significant main effect for the GKR Phonemic Awareness Assessment, $F(3, 130) = 1.79$, $p = .15$, $\eta^2 = .04$. The effect, which was very small, accounted for 4% of the variance. Although the average gains made by all decile groups ranged from 0.38 to 3.94 raw score points, no significant differences were found.

PPVT vocabulary knowledge.

A non-significant main effect was found for PPVT receptive vocabulary, $F(3, 130) = 1.10$, $p = .35$, $\eta^2 = .03$. There was a very small effect, accounting for around 3% of the variance. All deciles made gains in vocabulary knowledge during the first school year. Mean gains made varied from 3.19 to 7.79 PPVT raw score points, but no significant differences between deciles were found.

GWRT word reading.

The results were that there was a non-significant main effect for GWRT word reading, $F(3, 130) = 1.32$, $p = .27$, $\eta^2 = .03$. Similar to receptive vocabulary, the effect size was very small, accounting for about 3% of the variance. The results for word reading followed the same pattern as the other reading-related skills measured, in that on average, children from all deciles similar made gains with no significant differences found. Average gains ranged from 0.41 to 1.25 raw score points on the GWRT.

Second school year (T3 to T4).

Table 11 shows the means and standard deviations of the raw scores for the same measures of alphabet knowledge, phonemic awareness, vocabulary knowledge and word reading by decile for the second school year (T3-T4). For the sample as a whole, raw scores increased during this time.

Table 11

Means, Standard Deviations and Gain Scores of Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the Second School Year (T3-T4)

Measure	Decile	T3		T4		T3-T4 Gains
		M	*SD*	*M*	*SD*	*M*
Clay	1	3.77	4.10	15.36	8.65	11.59
Letter	4	11.79	8.70	19.11	8.00	7.32
Identification	7	18.38	7.35	23.65	5.15	5.27
Task	10	18.12	6.91	24.63	1.34	6.51
GKR	1	0.25	1.24	3.26	7.33	3.01
Phonemic	4	2.76	7.32	9.29	13.93	6.53
Awareness	7	6.79	9.82	17.70	11.67	10.91
Assessment	10	9.44	13.19	21.57	13.64	12.13
PPVT	1	53.78	17.56	64.06	19.01	10.28
Vocabulary	4	61.14	19.72	71.97	19.08	10.83
Knowledge	7	76.91	19.94	86.06	17.08	9.15
	10	81.19	17.92	92.43	18.23	11.24
GWRT	1	0.00	0.00	4.81	5.17	4.81
Word	4	0.43	1.66	8.95	9.07	8.52
Reading	7	1.88	3.77	12.33	9.92	10.45
	10	1.53	3.46	18.17	12.25	16.64

Table 12 shows the results of the MANOVA comparing the same four variables for decile effect. The Multivariate Wilks' lambda value was significant, Wilks' $\lambda = .67$, $F(12, 315.14) = 4.27$, $p < .001$, indicating that the effects for the dependent variables were significant and that the univariate ANOVAs for each dependent variable could be further examined. The LSD contrasts are also indicated, where applicable.

Table 12

Mean Gain Scores, and MANOVA with LSD Contrasts for Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the Second School Year (T3-T4)

Measure	Decile	T3-T4 Gains	ANOVA	*p*	η^2	1v4	1v7	1v10	4v7	4v10	7v10
		M	*F*(3, 122)								
Clay	1	11.59	5.22	.002*	.11	.089	<.001*	.003*	.059	.164	.641
Letter	4	7.32									
Identification	7	5.27									
Task	10	6.51									
GKR	1	3.01	4.89	.003*	.11	.070	.002*	.001*	.176	.111	.783
Phonemic	4	6.53									
Awareness	7	10.91									
Assessment	10	12.13									
PPVT	1	10.28	0.56	.64	.01						
Vocabulary	4	10.83									
Knowledge	7	9.15									
	10	11.24									
GWRT	1	4.81	11.79	<.001*	.23	.167	.006*	<.001*	.161	<.001*	.003*
Word	4	8.52									
Reading	7	10.45									
	10	16.64									

*$p < .05$

Alphabet knowledge.

When a comparison of gain scores on the Clay Letter Identification task, measuring alphabet knowledge, were made, a significant main effect was noted, $F(3, 122) = 5.22$, $p = 0.002$, $\eta^2 = .11$. The effect size was about 11%. Subsequent LSD contrasts indicate that significant differences in mean gains are present among children from decile 1 and deciles 7 and 10 schools. Decile 1 children made the biggest gains in alphabet knowledge, while decile 7 and 10 children made about half as much gains as decile 1 children.

GKR phonemic awareness.

Looking at Table 12, the results were that there was a highly significant main effect for GKR Phonemic Awareness Assessment, $F(3, 122) = 4.89$, $p = .003$, $\eta^2 = .11$. Similar to alphabet knowledge, the effect size accounted for 11% of the variance. Follow-up contrasts showed no significant difference for mean gain scores between decile 1 and decile 4 schools. However, mean gain differences were significant between decile 1 children and decile 7 and 10 children. Hence the pattern was that the lowest decile school made the least gains in phonemic awareness compared to the two highest decile schools in the study.

PPVT vocabulary knowledge.

Analysis for PPVT receptive vocabulary showed a non-significant main effect, $F(3, 122) = 0.56$, $p = .64$, $\eta^2 = .01$. The effect size was very small, accounting for 1% of the variance. The pattern was that all deciles made similar gains in vocabulary during the school year. No decile made greater gains than other deciles.

GWRT word reading.

As shown in Table 12, a significant main effect was found for GWRT word reading, $F(3, 122) = 11.79$, $p < .001$, $\eta^2 = .23$. The effect size was large, accounting for about 23% of the variance. Follow-up contrasts showed that the mean gain for decile 1 was significantly less than for 4, 7, and 10. The mean gain for decile 4 was significantly

less than 10, and the mean gain for 7 was significantly less than 10. The pattern was that the higher decile schools made greater gains in word reading during the school year than the deciles below them.

Summary.

In terms of alphabet knowledge, all children made more or less equal gains over the first school year from T1 to T2. The average gain at this stage for all children was in a score of about 3 to 4. However, in the second school year, the greatest gains were made by decile 1 children with the scores increasing on average by approximately 12. This was notably different from the much lower gains made by decile 10 children, possibly because of a ceiling effect in that the high-decile children were already near the maximum for alphabet knowledge. Individual scores in the first school year (T1-T2) are shown in Figure 10, while scores in the second school year (T3-T4) are shown in Figure 11. The degree of gains made are shown in Figure 12.

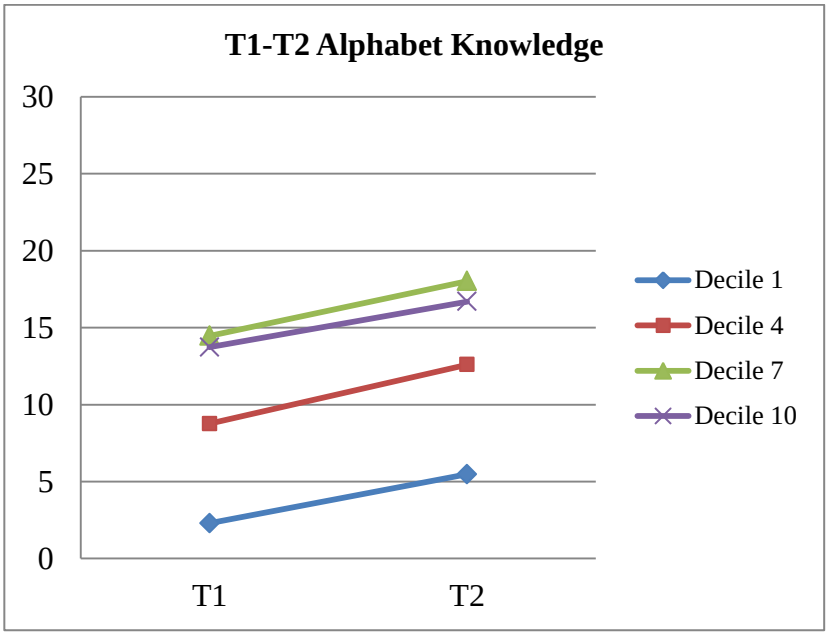


Figure 10. Mean Clay Letter Identification task raw scores in the first school year (T1-T2).

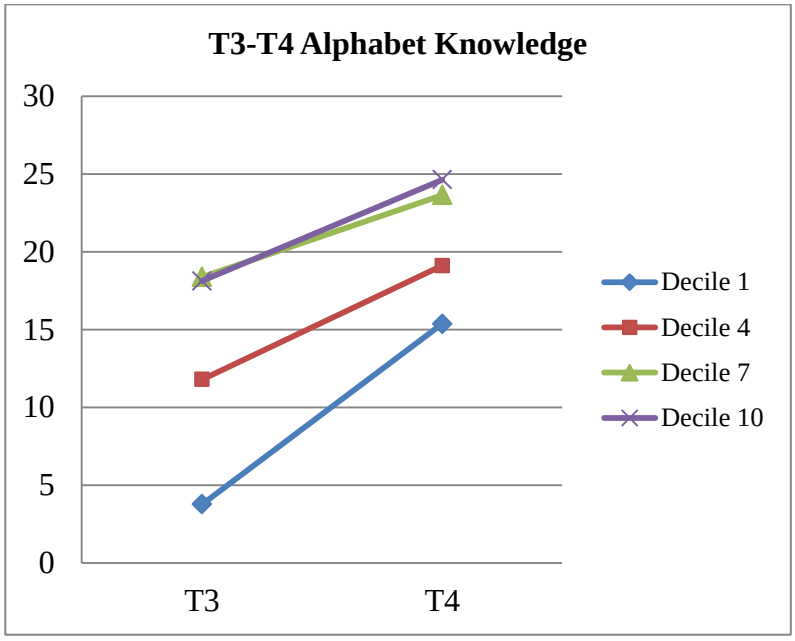


Figure 11. Mean Clay Letter Identification task raw scores in the second school year (T3-T4).

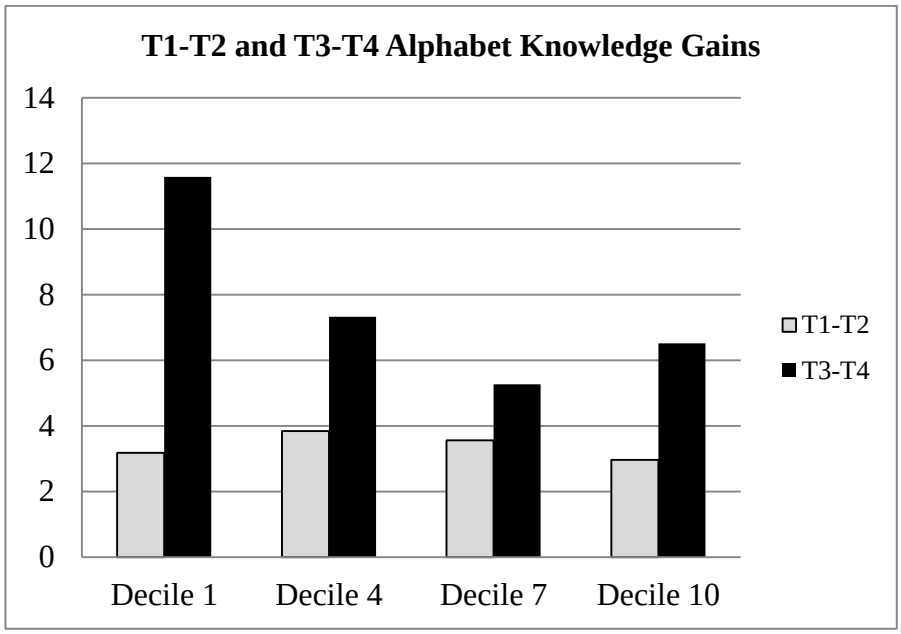


Figure 12. Mean Clay Letter Identification task raw score gains in the first school year (T1-T2) and second school year (T3-T4).

With regard to phonemic awareness, differences in gains in the first school year (T1-T2) were not significant, even though gains made ranged from less than 1 to almost

4 raw score points. In the second school year (T3-T4), considerably bigger gains were made by all 4 decile groups, with significant differences between groups. Decile 1 children made the least gains of about 3 raw score points while the highest decile groups, that is decile 7 and 10, made gains of approximately 11-12 points respectively. The differences in gains between deciles 1 and 7, and 1 and 10 were significant. Figures 13, 14 and 15 illustrate this.

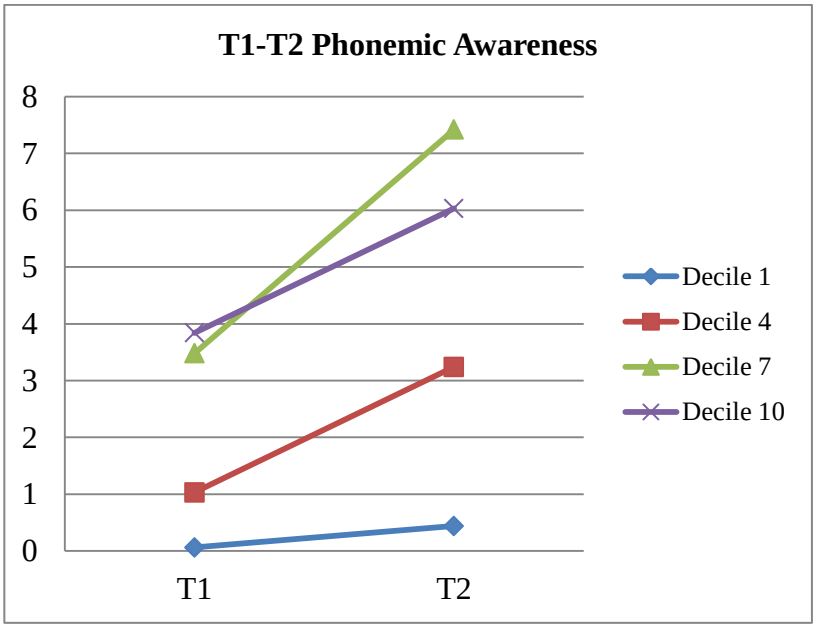


Figure 13. Mean GKR Phonemic Awareness Assessment raw scores in the first school year (T1-T2).

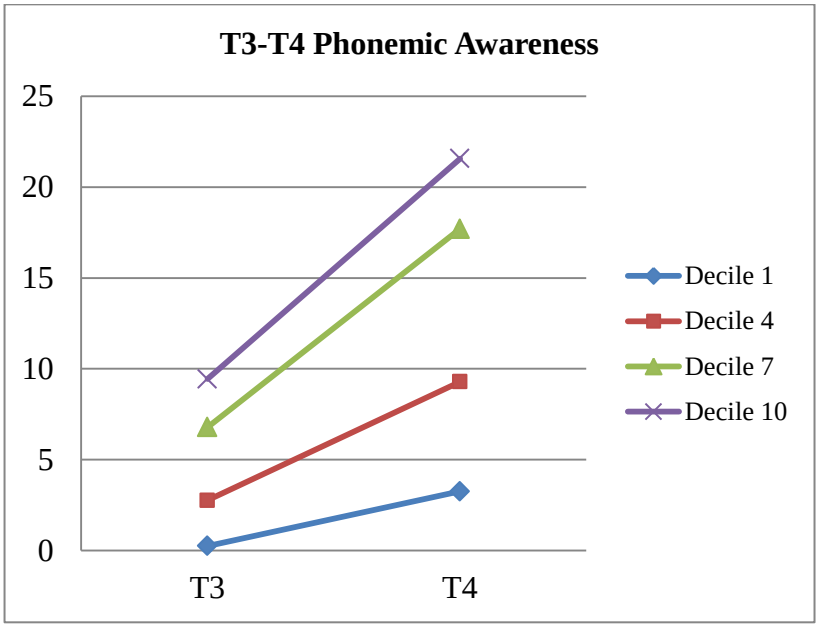


Figure 14. Mean GKR Phonemic Awareness Assessment raw scores in the second school year (T3-T4).

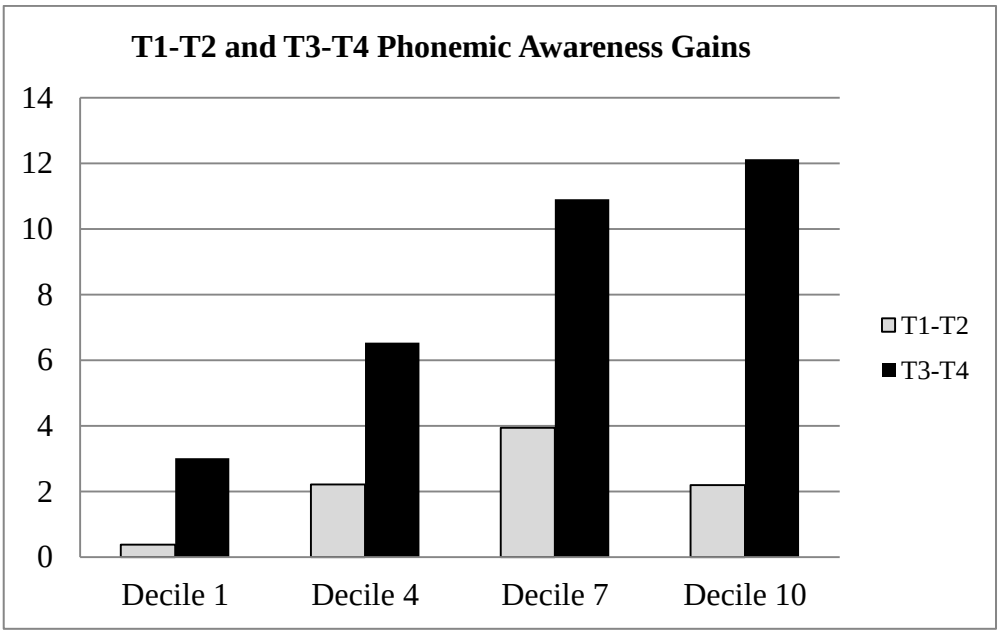


Figure 15. Mean GKR Phonemic Awareness Assessment raw score gains in the first school year (T1-T2) and second school year (T3-T4).

The results for the PPVT vocabulary were neutral in that all deciles made gains, but no one decile made greater gains than the other. This is so for both the school years, that is, T1 to T2, and T3 to T4. Gains made were greater in the second school year than

in the first, possibly due to the fact that children did a full year of school during this time. Results are illustrated in Figures 16, 17 and 18.

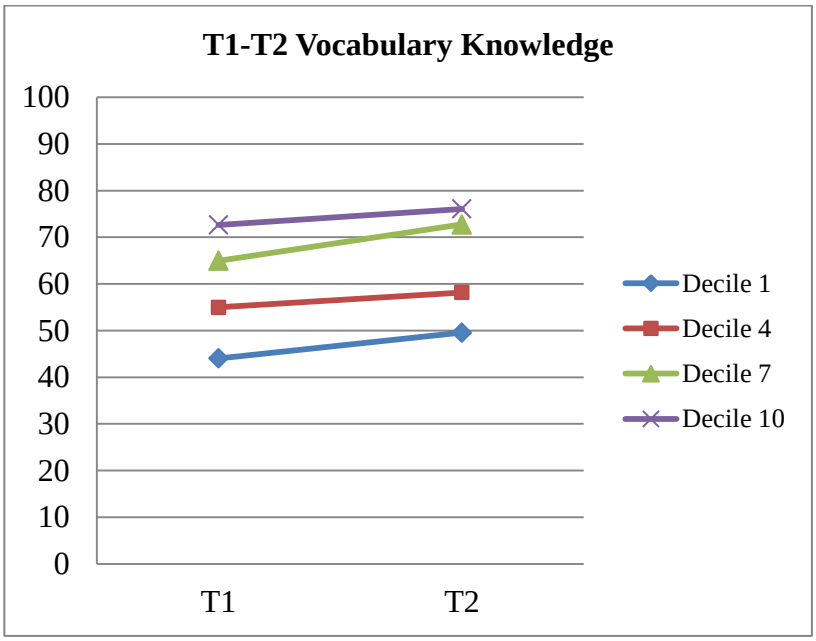


Figure 16. Mean PPVT vocabulary knowledge raw scores in the first school year (T1-T2).

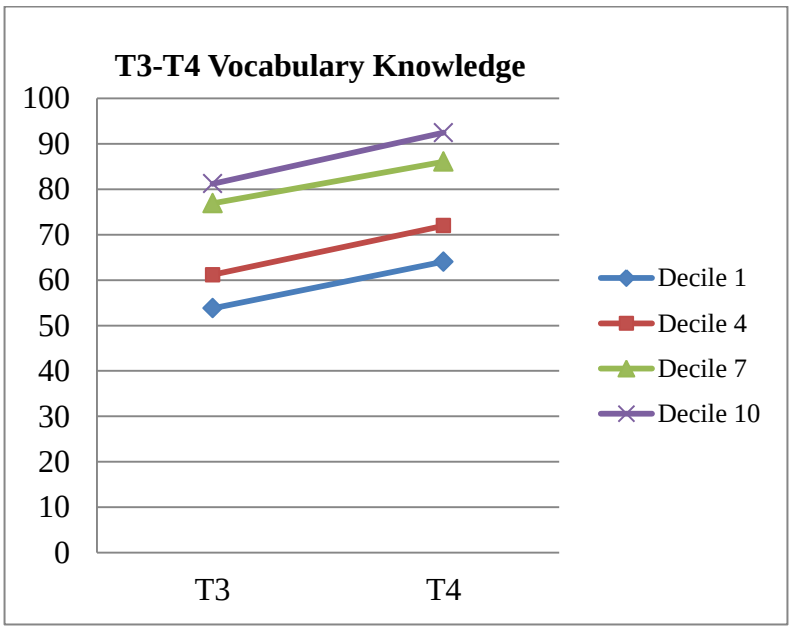


Figure 17. Mean PPVT vocabulary knowledge raw scores in the second school year (T3-T4).

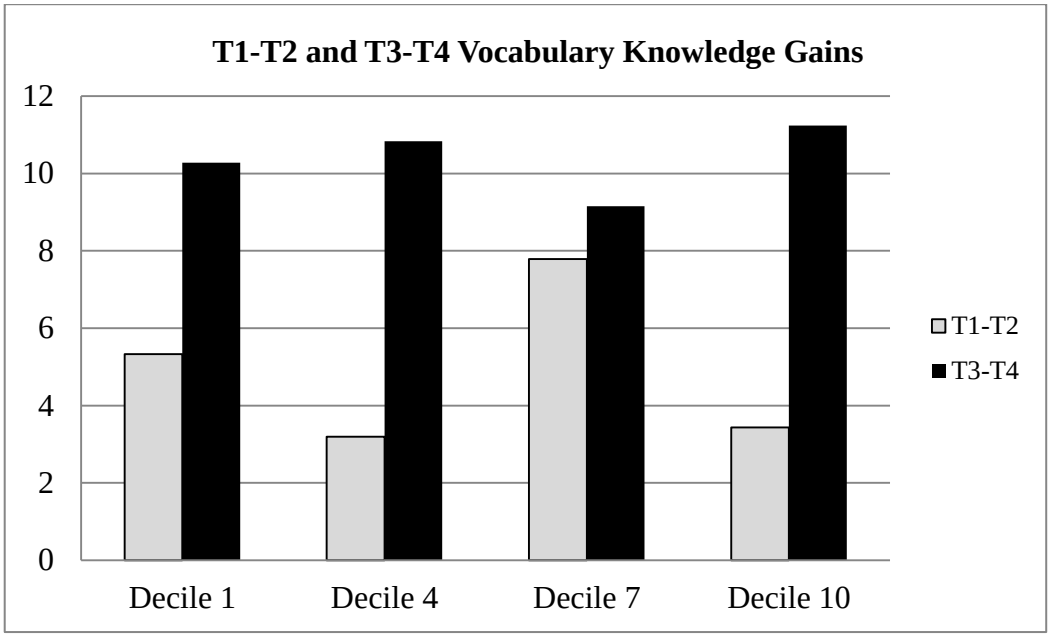


Figure 18. Mean PPVT vocabulary knowledge raw score gains in the first school year (T1-T2) and second school year (T3-T4).

Looking at GWRT word reading results, all children in the different decile schools gained equally in the average of 1.65 months of the first year at school (T1-T2) (see Figure 19). The gains were minimal, with an overall mean gain of about 1 raw score point. In the second school year (T3-T4), as illustrated in Figure 20, the results for GWRT word reading suggested a hierarchy of progress, with higher decile schools making greater gains than the schools below them. The mean gain for the higher decile schools was 13.55 raw score points, while that of the lower decile schools was a little less than half at 6.67 raw score points. Mean gains for these two time periods are shown in Figure 21.

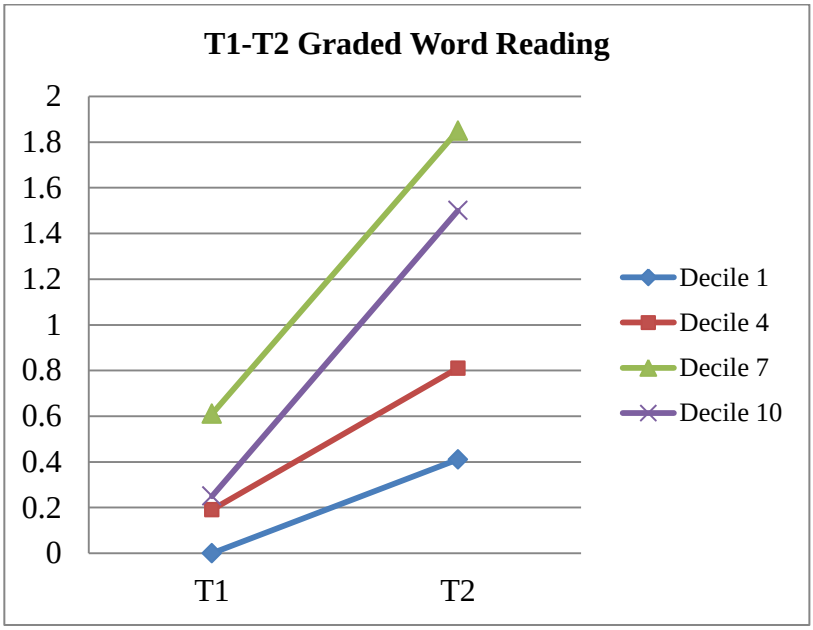


Figure 19. Mean GWRT word reading raw scores in the first school year (T1-T2).

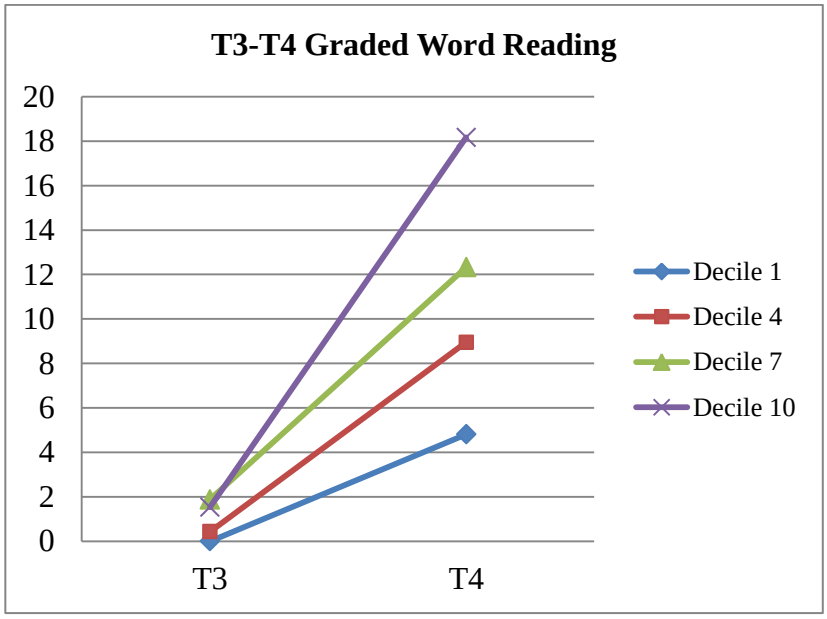


Figure 20. Mean GWRT word reading raw scores in the second school year (T3-T4).

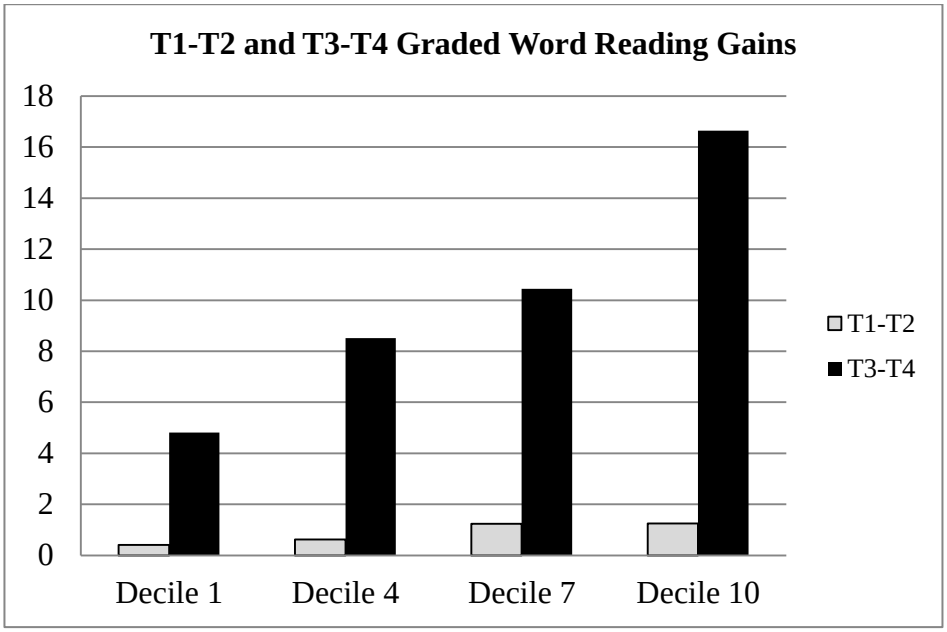


Figure 21. Mean GWRT word reading raw score gains in the first school year (T1-T2) and second school year (T3-T4).

Hence, to answer research question 2, in the first school year (T1-T2), all children gained in alphabet knowledge, phonemic awareness, vocabulary knowledge and word reading. There were no significant differences between deciles.

In the second school year (T3-T4), the lowest decile school group, that is, decile 1, made significantly greater gains in alphabet knowledge than the higher decile schools (7 and 10). The effect sizes for these were small to medium, at about 8% and 11% respectively. However, the higher decile schools (7 and 10) made significantly greater gains in phonemic awareness against the decile 1 school. In terms of receptive vocabulary, surprisingly, all deciles made similar gains. No deciles made greater gains in vocabulary than the other deciles. Looking at word reading skills, the two lower deciles made smaller gains than the two higher decile schools. The degree of gains made followed SES lines, with decile 1 children making the smallest gains and significantly lower than the gains made by deciles 7 and 10. Decile 10 gains were significantly higher than all other deciles. The effect size for this was large, at about 23%.

Alphabet knowledge, phonemic awareness and vocabulary knowledge gains are supposed to go hand in hand with reading gains. Yet this was not the case. It seems that high-decile schools gained more in phonemic awareness and reading, but low-decile schools achieved greater gains in alphabet knowledge, and there were no differences in vocabulary gains between deciles.

Literacy Development in the Summer Breaks

Research Question 3: Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?

During the two summer holidays, the study tracked children's reading and reading-related skills of alphabet knowledge, phonemic awareness, vocabulary knowledge and word reading. The first summer holiday was at the end of their first school year and is represented by the time period T2 to T3. The second summer break, from T4 to T5, occurred after the children's second year in school.

As was the case for research questions 1 and 2, alphabet knowledge was a composite score derived from the Clay Letter Identification task individual raw scores of lowercase and uppercase letter identification and sound knowledge. The composite score was derived by dividing individual scores by 4, so the composite score had a maximum of 26. The GKR Phonemic Awareness Assessment was used to measure the children's levels of phonemic awareness out of a maximum possible raw score of 42, while the raw scores of the PPVT were used to assess vocabulary knowledge. Reading progress was measured using the GWRT for the first time period as the children were between 5 and 5.5 years old. At this age, the GWRT measure was one of the few measures available for establishing children's reading levels. Between T4 and T5, the GWRT, and the NARA test of passage reading accuracy and comprehension were administered to children. The results below will be reported chronologically.

First summer break (T2 to T3).

Table 13 shows the means, standard deviations and change scores of measures used in the first summer break (T2-T3). These measures were the Clay Letter Identification task, GKR Phonemic Awareness Assessment, PPVT and the GWRT. The GWRT was the only word reading measure that was used for children at this point, as the lower age limit for the NARA was 6 years. Change scores for all measures were calculated by subtracting scores at T2 from scores at T3.

Table 13

Means, Standard Deviations and Change Scores for Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the First Summer Break (T2-T3)

Measure	Decile	T2		T3		T2-T3 Changes
		M	*SD*	*M*	*SD*	*M*
Clay	1	5.47	5.69	3.77	4.10	-1.70
Letter	4	12.60	8.76	11.80	8.69	-0.80
Identification	7	18.03	8.28	18.38	7.35	0.35
Task	10	16.69	7.90	18.12	6.91	1.43
GKR	1	0.44	1.61	0.25	1.24	-0.19
Phonemic	4	3.24	8.12	2.76	7.32	-0.48
Awareness	7	7.42	11.05	6.79	9.81	-0.63
Assessment	10	6.03	10.43	9.44	13.19	3.41
PPVT	1	49.56	16.68	53.78	17.56	4.22
Vocabulary	4	58.19	19.06	61.14	19.72	2.95
Knowledge	7	72.76	21.56	76.91	19.94	4.15
	10	76.09	14.02	81.19	17.92	5.10
GWRT	1	0.41	0.91	0.00	0.00	-0.41
Word	4	0.81	1.88	0.43	1.66	-0.38
Reading	7	1.85	4.06	1.88	3.77	+0.03
	10	1.50	3.25	1.53	3.46	+0.03

MANOVAs of the above variables for decile effects are shown in Table 14. The Wilks lambda statistic was significant, Wilks' $\lambda = .79$, $F(12, 336.30) = 2.58$, $p = .003$. One-way ANOVAs were then conducted on these scores as dependent variables and decile as the independent variable. The results indicate that although deciles 1 and 4 made marginal losses, and deciles 7 and 10 made small gains, there were no significant differences between deciles in terms of scores in word reading, $F(3, 130) = 1.04$, $p = .38$, $\eta^2 = .02$.

Table 14

ANOVA Comparing Mean Change Scores of Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge and GWRT Word Reading by Decile in the First Summer Break (T2-T3)

Measure	Decile	T2-T3 Changes *M*	ANOVA *F*(3, 130)	*p*	η²	1v4	1v7	1v10	4v7	4v10	7v10
Clay	1	-1.70	4.49	.005*	.09	.315	.025*	.001*	.188	.013*	.239
Letter	4	-0.80									
Identification	7	0.35									
Task	10	1.43									
GKR	1	-0.19	6.22	.001*	.13	.780	.683	.001*	.888	.000*	.000*
Phonemic	4	-0.48									
Awareness	7	-0.63									
Assessment	10	3.41									
PPVT	1	4.22	0.27	.85	.01						
Vocabulary	4	2.95									
Knowledge	7	4.15									
	10	5.10									
GWRT	1	-0.41	1.03	.38	.02						
Word	4	-0.38									
Reading	7	0.03									
	10	0.03									

*$p < .05$

Alphabet knowledge.

Comparing changes in the Clay Letter Identification task scores, a significant main effect was found for alphabet knowledge, $F(3, 130) = 4.49$, $p = .005$, $\eta^2 = .09$. The effect size was small, at about 9% of the variance. LSD contrasts carried out subsequently showed significant differences in mean change scores. Decile groups 1 and 4 made losses that were not significantly different from each other, but which were both significantly different from the gains made by decile 10 children. Children from the decile 7 group made gains that were significantly different from the decile 1 group's losses. However, no significant difference was found between decile 7 gains and those of the decile 10 group, or between decile 7 gains and the losses of the decile 4 group. The pattern was that the two lower decile school groups lost alphabet knowledge during the first summer break, while the two higher ones gained it. The lowest decile children lost the most knowledge, while the highest decile children gained the most.

GKR phonemic awareness.

Analysis showed a main effect for GKR Phonemic Awareness Assessment that was highly significant, $F(3, 130) = 6.22$, $p = .001$, $\eta^2 = .13$. The effect size for phonemic awareness was slightly larger than that of alphabet knowledge, accounting for around 13% of the variance. Follow-up contrasts showed that there was a significant difference between the mean gain scores of the children from decile 10 schools and the mean losses of children at the deciles 1, 4 and 7 schools. The losses made by the three lower decile groups did not differ significantly. The pattern was that only the highest decile children made gains in phonemic awareness, while children from all the other deciles made roughly the same degree of losses. The decile 10 children gained over 3 times as much in phonemic awareness as the others lost over the first summer holiday period.

PPVT vocabulary knowledge.

The results were that there was a non-significant main effect for PPVT receptive vocabulary, $F(3, 130) = 0.27$, $p = .85$, $\eta^2 = .01$. There was a very small effect size, accounting for about 1% of variance. The pattern was that over the first summer break,

children from all deciles made similar gains in their level of vocabulary knowledge. No decile group made significantly greater or lower gains than any other decile group.

GWRT word reading.

The main effect for GWRT word reading was also found to be non-significant, $F(3, 130) = 1.03$, $p = .38$, $\eta^2 = .02$. The effect size was very small, accounting for only around 2% of the variance. Although the pattern was that the two lower decile groups made very small losses and the two higher deciles made minimal gains, these differences were not significant. Overall all participants' word reading ability did not change significantly over the break.

Second summer break (T4 to T5).

Table 15 shows the means and standard deviations of the raw scores on the same measures in the second summer break (T4-T5). Two additional measures were included during this period. These were the NARA Passage Reading Accuracy and NARA Reading Comprehension tests. Change scores for each measure were calculated from T4 and T5 scores and are also shown in the same table.

Table 15

Means, Standard Deviations and Change Scores for Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge, GWRT Word Reading, NARA Passage Reading Accuracy and NARA Reading Comprehension by Decile in the Second Summer Break (T4-T5)

Measure	Decile	T4		T5		T4-T5 Changes
		M	*SD*	*M*	*SD*	*M*
Clay	1	15.36	8.64	12.46	9.09	-2.90
Letter	4	19.12	8.00	18.16	8.28	-0.96
Identification	7	23.65	5.15	24.73	2.73	1.08
Task	10	24.63	1.34	25.60	0.73	0.97
GKR	1	3.26	7.33	0.23	0.62	-3.03
Phonemic	4	9.29	13.93	2.29	8.04	-7.00
Awareness	7	17.70	11.67	19.73	12.41	2.03
Assessment	10	21.57	13.64	28.33	12.74	6.76
PPVT	1	64.06	19.01	60.19	19.80	-3.87
Vocabulary	4	71.97	19.08	73.09	17.84	1.12
Knowledge	7	86.06	17.08	92.15	18.40	6.09
	10	92.43	18.22	100.73	17.83	8.30
GWRT	1	4.81	5.17	2.32	2.37	-2.49
Word	4	8.95	9.07	8.65	10.31	-0.30
Reading	7	12.33	9.92	14.64	11.32	2.30
	10	18.17	12.25	21.67	11.80	3.50
NARA	1	4.87	6.42	3.42	6.27	-1.45
Passage	4	9.97	10.91	8.70	11.54	-1.27
Reading	7	17.88	13.33	19.58	15.79	1.70
Accuracy	10	23.50	14.56	27.80	16.84	4.30
NARA	1	1.29	1.99	1.00	1.93	-0.29
Reading	4	2.91	3.26	2.94	4.14	0.03
Comprehension	7	5.12	4.57	5.00	3.82	-0.12
	10	6.43	4.16	6.47	4.42	0.04

A MANOVA compared mean score changes against decile groups. The Wilks lambda value was significant, Wilks' $\lambda = .37$ at $F(12, 315.14) = 12.15$, $p < .001$. One-way ANOVAs were then conducted on these change scores as dependent variables and decile as the independent variable. If ANOVAs were significant, follow-up LSD contrasts were analysed for individual differences between deciles. Table 16 shows the ANOVA and follow-up LSD contrasts for the three measures of literate cultural capital, word reading, passage reading accuracy and reading comprehension.

Table 16

ANOVA Comparing Mean Change Scores of Clay Letter Identification Task, GKR Phonemic Awareness Assessment, PPVT Vocabulary Knowledge, GWRT Word Reading, NARA Passage Reading Accuracy and NARA Reading Comprehension, with Follow-up LSD Contrasts by Decile in the Second Summer Break (T4-T5)

Measure	Decile	T4-T5 Changes *M*	ANOVA *F*(3, 122)	*p*	η²	1v4	1v7	1v10	4v7	4v10	7v10
Clay	1	-2.90	12.89	<.001*	.24	.023*	.000*	.000*	.003*	.005*	.885
Letter	4	-0.96									
Identification	7	1.08									
Task	10	0.97									
GKR	1	-3.03	16.73	<.001*	.29	.030*	.020*	.000*	.000*	.000*	.030*
Phonemic	4	-7.00									
Awareness	7	2.03									
Assessment	10	6.76									
PPVT	1	-3.87	13.07	<.001*	.23	.024*	.000*	.000*	.015*	.001*	.298
Vocabulary	4	1.12									
Knowledge	7	6.09									
	10	8.30									
GWRT	1	-2.49	13.45	<.001*	.25	.009*	<.001*	<.001*	.034*	<.001*	.236
Word	4	-0.30									
Reading	7	2.30									
	10	3.50									
NARA	1	-1.45	8.43	<.001*	.17	.864	.022*	<.001*	.013*	<.001*	.060
Passage	4	-1.27									
Reading	7	1.70									
Accuracy	10	4.30									
NARA	1	-0.29	0.11	.95	.003						
Reading	4	0.03									
Comprehension	7	-0.12									
	10	0.04									

*$p < .05$

Alphabet knowledge.

When comparing Clay Letter Identification task change scores over the second summer break, a significant main effect was found for alphabet knowledge, $F(3, 122) = 12.89$, $p < .001$, $\eta^2 = .21$. Accounting for about 21% of variance, the effect size was medium. Follow-up LSD contrasts found significant differences in mean change scores among children from all deciles, except for that between decile 7 and 10 schools. Decile 1 children were found to have made significantly greater losses than the decile 4 group, and the level of alphabet knowledge losses made by both the decile 1 and 4 children was shown to be significant when compared to the gains made by both the higher decile schools. The difference in mean gains between the decile 7 and 10 children was not significant. The pattern was that decile 1 and 4 children made losses in alphabet knowledge, while decile 7 and 10 children made gains. Decile 1 children made the greatest losses in alphabet knowledge over this second summer break.

GKR phonemic awareness.

Analysis for GKR Phonemic Awareness Assessment revealed a highly significant main effect, $F(3, 122) = 16.73$, $p < .001$, $\eta^2 = .29$. The result for phonemic awareness showed a large effect size. It accounted for approximately 29% of variance. LSD contrasts carried out to follow up the significant main effect revealed significant differences between the mean change scores for each decile. Decile 1 and 4 children made losses, while decile 7 and 10 children made gains. Decile 4 children made the greatest losses, losing significantly more than decile 1 children. Additionally, the losses made by both decile 1 and 4 groups were significantly different from the gains made by the higher decile schools, while decile 10 children gained significantly more than those from decile 7. The pattern was that the lower decile children made losses, while the higher decile children made gains over this second summer holiday period. Decile 4 children made the largest losses, while decile 10 children made the biggest gains.

PPVT vocabulary knowledge.

Looking at Table 16, the results were that there was a significant main effect for PPVT receptive vocabulary, $F(3, 122) = 13.07$, $p < .001$, $\eta^2 = .23$. The effect size was

medium, accounting for about 23% of the variance. Following up the main effect, LSD contrasts showed significant differences in mean change scores for all decile groups except for those between the two highest decile schools. Decile 1 children's loss of vocabulary knowledge was found to be significant when compared to the gains made by all other deciles. Decile 4 children made significantly lower gains than those from deciles 7 and 10, but the difference between gains made by decile 7 and 10 children was not significant. The pattern was that decile 1 children lost vocabulary knowledge over the summer break, while decile 4 children gained less than deciles 7 and 10.

GWRT word reading.

A significant main effect was found for GWRT word reading, $F(3, 122) = 13.45$, $p < .001$, $\eta^2 = .25$. The effect size was medium, accounting for 25% of the variance. Follow-up contrasts showed that the mean loss for decile 1 was significantly greater than the mean loss for decile 4. The mean loss for decile 1 was significantly different from the gains made by deciles 7 and 10. The mean loss for decile 4 was significantly different to the gains made by 7 and 10, but the mean gain for decile 7 was not significantly different to the gain made by decile 10. Similar to the pattern for alphabet knowledge, the higher decile schools made gains in word reading during the summer holidays, while the lower decile schools made losses.

NARA passage reading accuracy.

The results for NARA passage reading accuracy were that there was a significant main effect, $F(3, 122) = 8.43$, $p < .001$, $\eta^2 = .17$. The effect size was medium, accounting for 17% of the variance. Follow-up contrasts showed that the mean loss for decile 1 was not significantly different from the mean loss for decile 4. The mean loss for decile 1 was significantly different from the gains made by deciles 7 and 10. The mean loss for decile 4 was significantly different to the gains made by 7 and 10, and the mean gain for decile 7 was not significantly different to the gain made by decile 10. The pattern was that the higher decile schools made gains in NARA passage reading accuracy during the summer holidays while the lower decile schools made losses.

NARA reading comprehension.

As shown in Table 16, there was a non-significant main effect for NARA reading comprehension, $F(3, 122) = 0.11$, $p = .95$, $\eta^2 = .003$. The effect size was negligible, accounting for less than 1% of the variance. Since the main effect was not significant, there were no follow-up contrasts. The pattern was that none of the deciles made progress in NARA reading comprehension over the summer holidays.

Summary.

During the first summer break, from T2 to T3, on average the lower decile children made small losses in alphabet knowledge. In contrast, the two higher decile groups made small gains. The decile 1 children made mean losses of -1.70, while children from the decile 10 schools gained a mean of 1.43, which is almost the same amount that the decile 1 children lost.

This pattern was largely repeated in the second summer holiday period, from T4 to T5. Again, the lower deciles lost alphabet knowledge, while the higher deciles gained. The highest decile children did not gain quite as much as in the previous summer, but this is likely due to a ceiling effect, as decile 10 children scored an average of 25.60 out of 26 for alphabet knowledge at T5. Decile 7 children gained more in the second summer than they had in the first, increasing by an average 1.08, though they too probably neared the ceiling for alphabet knowledge, scoring a mean of 24.73 at T5. Decile 4 lost about the same amount each summer. On the other hand, the lowest decile children made greater mean losses in the second summer break than they had done in the first summer break, at -2.90. Individual scores at T2, T3, T4 and T5, reflecting summer changes, are shown in Figures 22 and 23, while the degree of change in alphabet knowledge scores over the two summer holiday periods are shown in Figure 24.

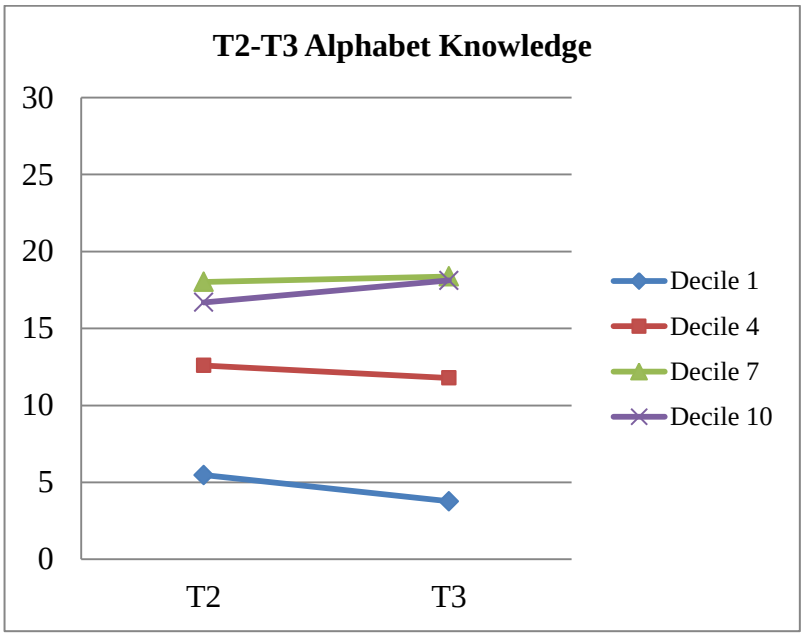


Figure 22. Mean Clay Letter Identification task raw scores across the first summer break (T2-T3).

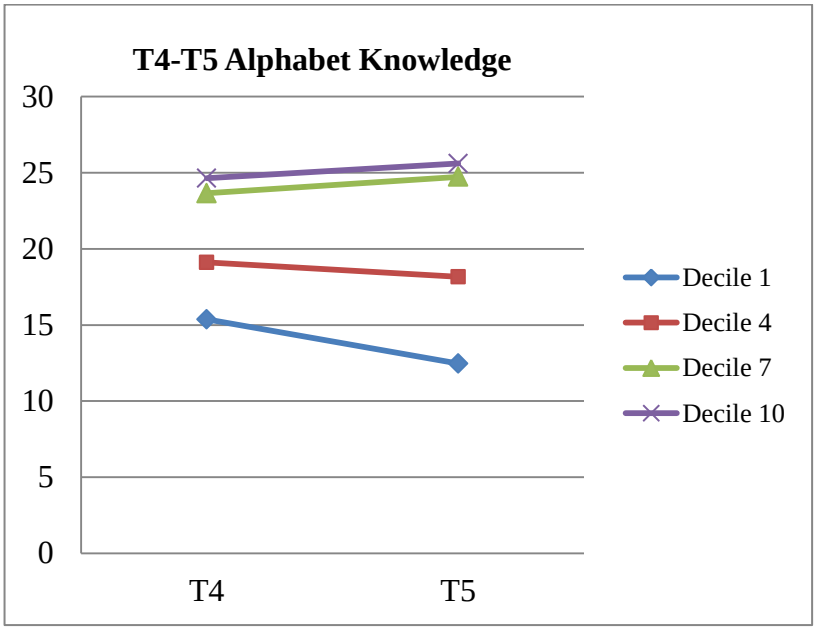


Figure 23. Mean Clay Letter Identification task raw scores across the second summer break (T4-T5).

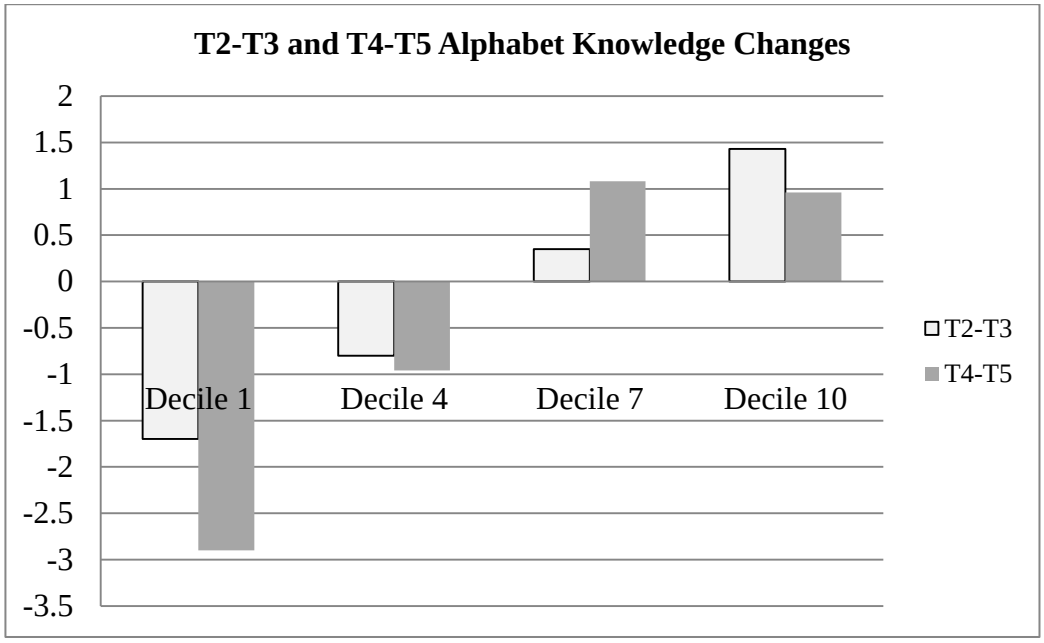


Figure 24. Mean Clay Letter Identification task raw score changes in the two summer breaks (T2-T3 and T4-T5).

Over the first summer, changes in phonemic awareness scores showed a slightly different pattern to alphabet knowledge in that only the highest decile made gains, at an average of 3.41 raw score points on the GKR Phonemic Awareness Assessment. All the others made small mean losses in the T2 to T3 period.

However, by the end of the second summer, the pattern more closely resembled that of alphabet knowledge, as both higher decile groups made gains, while the lower deciles made losses. Decile 4 children lost more in average raw score points than decile 1, at -7.00 and -3.03 respectively. The smaller mean loss for decile 1 children is probably a result of a floor effect though, in that at T5 they scored an average of only 0.23 out of a possible 42 points. The decile 10 children made the highest mean gains of 6.76 raw score points.

In the first summer, only the phonemic awareness gains made by the highest decile were significantly different from the small losses of the other three decile groups. By the end of the second summer, this situation had changed as there were significant differences between the degrees of change in phonemic awareness scores for all deciles. Figures 25, 26 and 27 show the details of these differences.

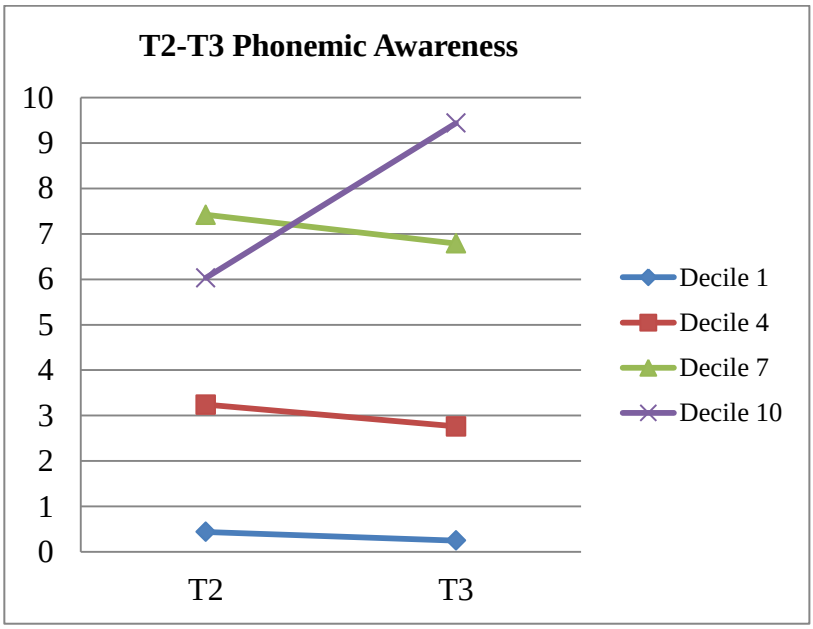


Figure 25. Mean GKR Phonemic Awareness Assessment raw scores across the first summer break (T2-T3).

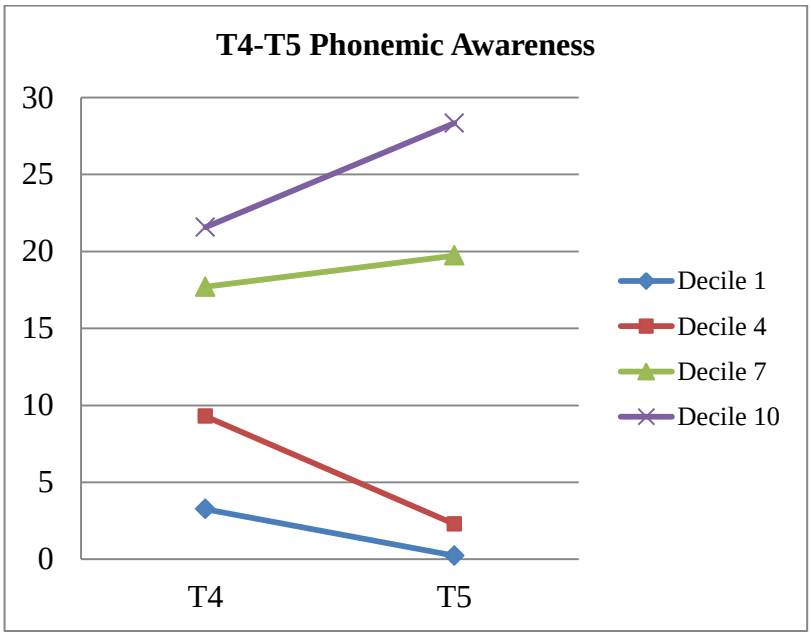


Figure 26. Mean GKR Phonemic Awareness Assessment raw scores across the second summer break (T4-T5).

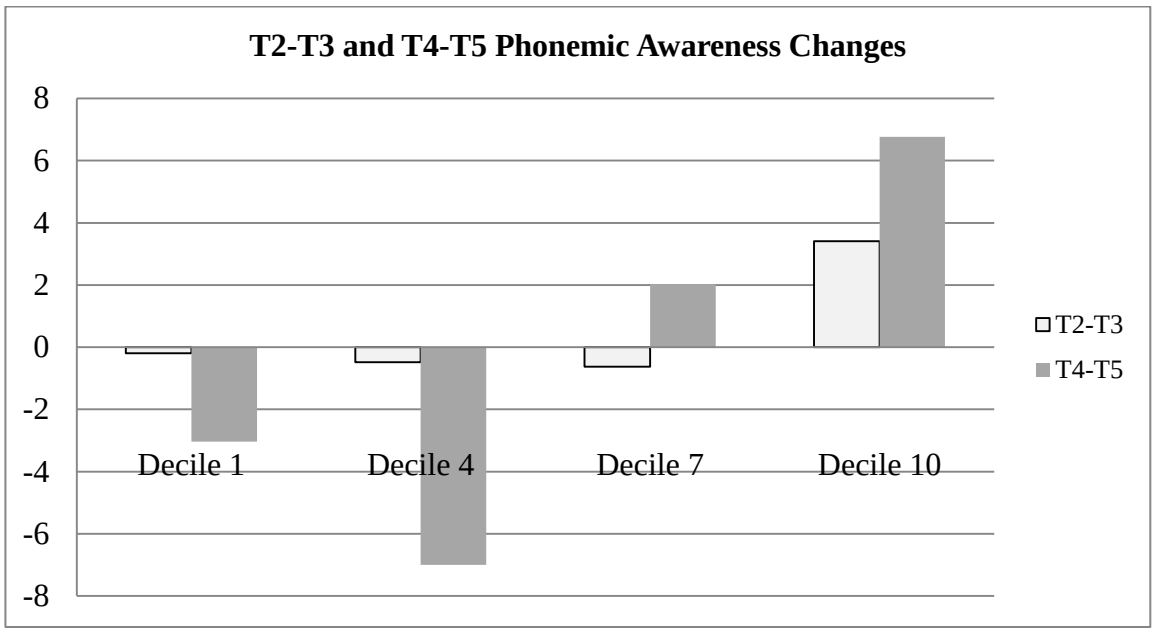


Figure 27. Mean GKR Phonemic Awareness Assessment raw score changes in the two summer breaks (T2-T3 and T4-T5).

Regarding PPVT vocabulary scores, in the first summer (T2-T3), differences between the gains made by all deciles were not significant. Mean gains ranged from 2.95 to 5.10 PPVT raw score points. The second summer holiday (T4-T5) presented a different picture, with significant differences between the changes in mean scores for all groups, except for those between the two highest decile schools. Decile 1 children made mean losses of -3.87 raw score points, while decile 7 and 10 groups made mean gains of 6.09 and 8.30 respectively. Decile 4 children gained 1.12 raw score points on average.

While the first summer showed equal gains, the second summer break revealed significant decile-related differences in changes in PPVT scores. In the second summer, decile 1 children lost almost as much as they had gained in the first summer, while decile 4 children gained only about half as much in the second summer (T4-T5) as they had in the first summer (T2-T3). Meanwhile, decile 7 and 10 children increased their summer gains by about 50% from the first summer to the second. The PPVT raw scores for the first summer break (T2-T3) are shown in Figure 28, while Figure 29 shows the scores for the second summer break (T4-T5). Figure 30 displays the changes in vocabulary knowledge scores across the two summers.

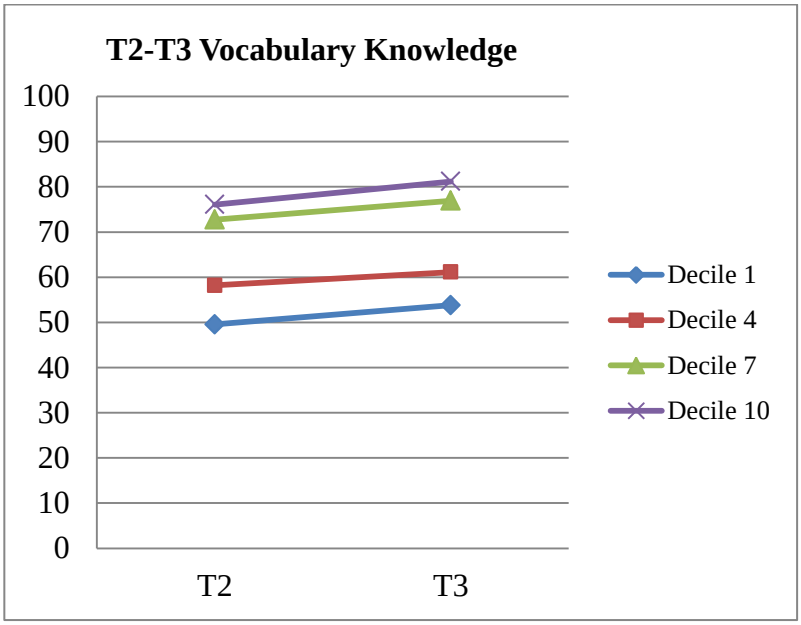


Figure 28. Mean PPVT vocabulary knowledge raw scores across the first summer break (T2-T3).

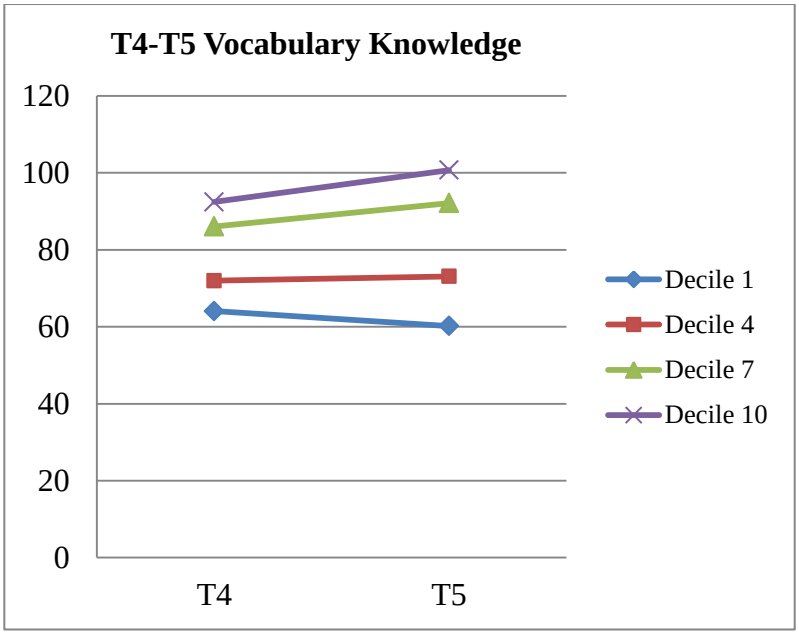


Figure 29. Mean PPVT vocabulary knowledge raw scores across the second summer break (T4-T5).

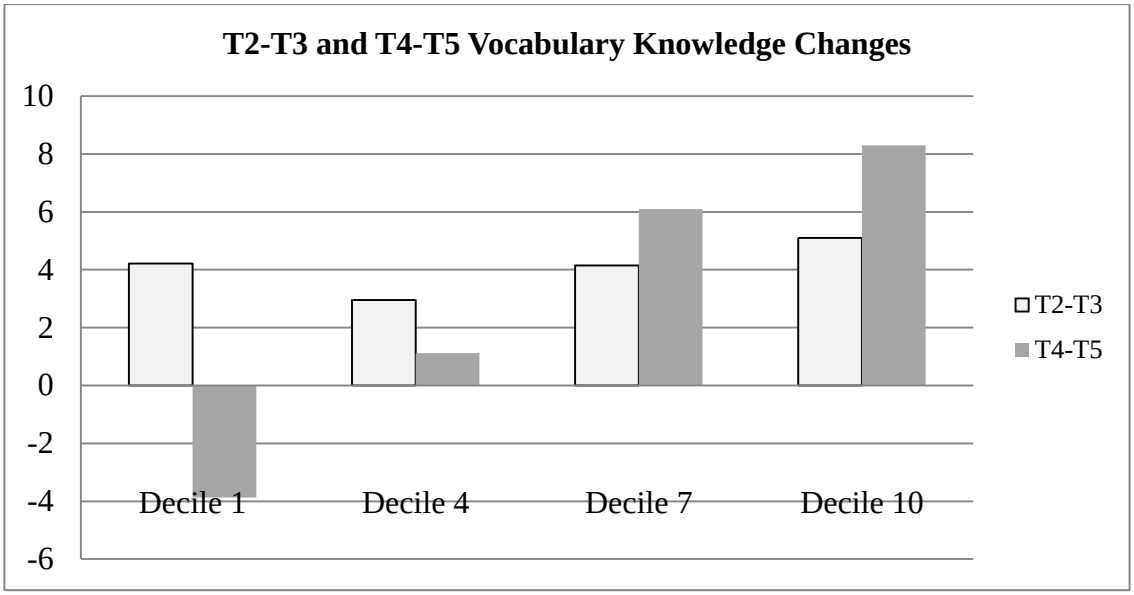


Figure 30. Mean PPVT vocabulary knowledge raw score changes in the two summer breaks (T2-T3 and T4-T5).

Graded word reading results over the two summer holidays were similar to those of alphabet knowledge and phonemic awareness. In the first summer break (T2-T3), although the lower deciles experienced word reading loss and the higher deciles experienced gains, the differences between the deciles were not significant. Over the second summer (T4-T5), these changes in graded word reading scores became more pronounced. The two higher decile schools made gains in word reading while the two lower deciles experienced losses. Looking more closely at the results, the gains made in word reading by decile 7 and 10 children amounted to a little under 20%, as compared to their pre-summer word reading scores. This is in sharp contrast to the losses made by decile 1 children, which were about 50%. From an alternative perspective, in the second summer break (T4-T5), all children in the study were between 6 and 6.5 years old. Decile 10 children began the summer with a reading age equivalent of 6.8 years, which was slightly over their chronological age. By the end of the summer break, their reading age had increased to 7.2 years. Decile 1 children, on the other hand, had a reading age of 5.5 years and this dropped to 5.2 years by the end of that summer. The difference between decile 1 and 10 children was 2 years in reading age at the end of the second summer (T5). Figure 31 shows the word reading raw scores at the beginning and end of

the first summer (T2-T3), while Figure 32 shows the scores for the second summer (T4-T5). Figure 33 shows the changes in word reading scores across the two summers.

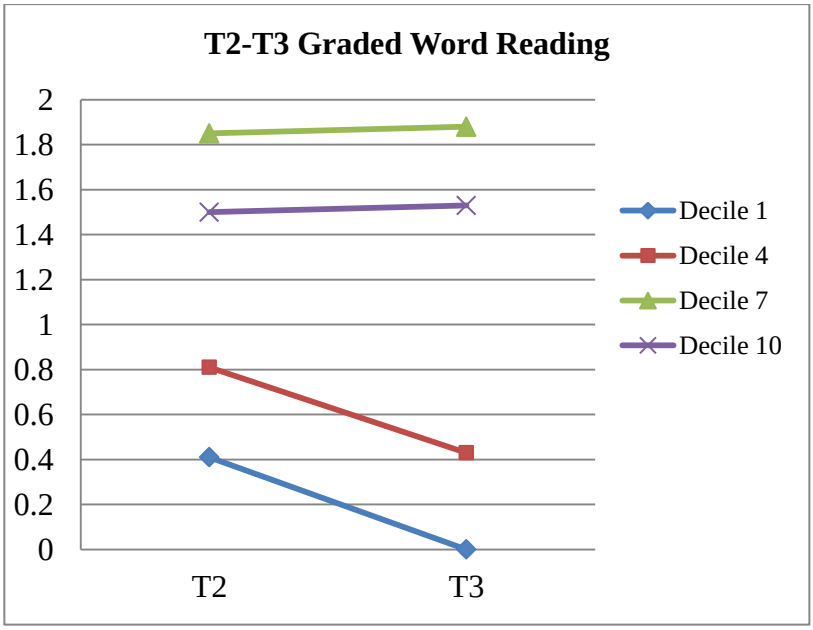


Figure 31. Mean GWRT word reading raw scores across the first summer break (T2-T3).

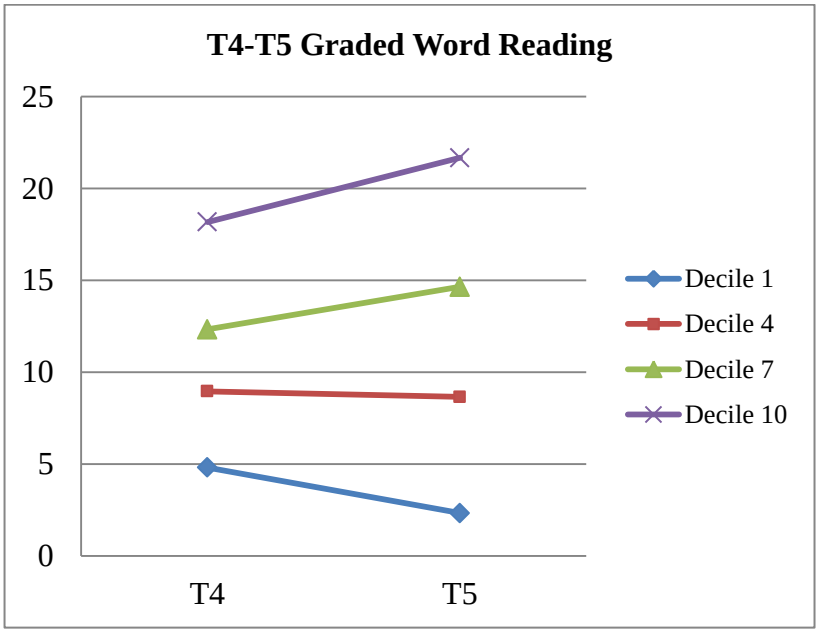


Figure 32. Mean GWRT word reading raw scores across the second summer break (T4-T5).

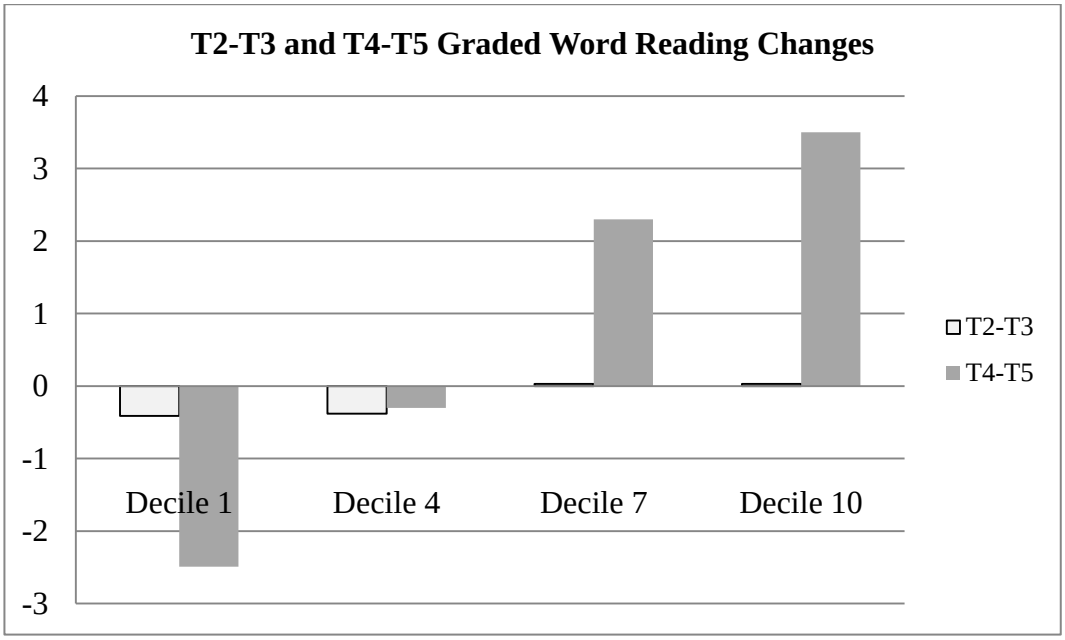


Figure 33. Mean GWRT word reading raw score changes in the two summer breaks (T2-T3 and T4-T5).

The results for NARA passage reading accuracy followed similar trends to that of word reading. A hierarchy of progress occurred with higher decile schools (deciles 7 and 10) making gains over summer and the lower deciles (deciles 1 and 4) making losses. Figure 34 shows these results. Interestingly, decile 10 children gained about 18%, a figure close to that gained in word reading. However, decile 1 children only made losses of about 30%.

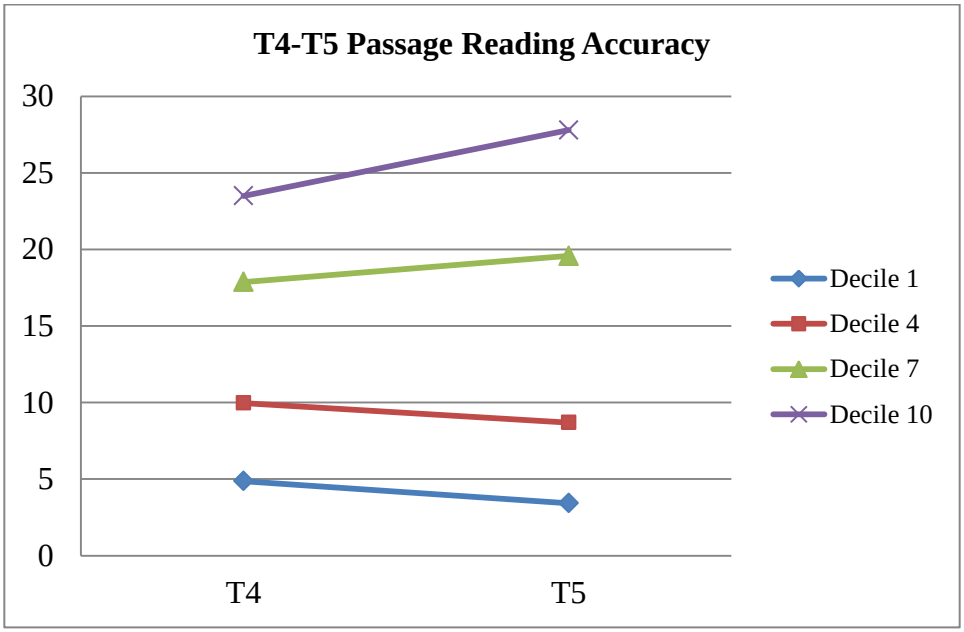


Figure 34. Mean NARA passage reading accuracy raw scores during the second summer break (T4-T5).

The results for NARA reading comprehension were neutral in that the scores of all the decile groups did not change one way or the other over the summer break.

The answer to research question 3, as to whether scores change over the summer holidays is that the high-decile schools (7 and 10) made significant gains in the reading-related skills of alphabet knowledge, phonemic awareness and receptive vocabulary, as well as in graded word reading and passage reading accuracy, while the low-decile schools made significant losses by comparison with the high-decile schools. This showed a widening of the reading gap between high- and low-decile schools over the summer holidays. For example, the difference in gains between decile 1 and 10 for passage accuracy was nearly 5 raw score points.

In reading comprehension, none of the decile schools changed their scores over the summer break. In some ways, this is encouraging in that there was no widening of the gap in reading comprehension.

The Summer Reading Effect over Two Years

Research Question 4: Does the summer reading effect widen over the two summers?

In order to answer this research question, a repeated measure ANOVA was used to examine word reading ability of children by decile over the first (T2-T3) and second summers (T3-T4). The measure of word reading ability that was used was only the raw scores of the GWRT. This was the measure that was most important to the study, therefore, it was the only one analysed and accordingly used as the dependent variable. The within subjects factor was Time and the between subjects factor was Word Reading. Results are presented according to the first and second summer breaks.

First summer break (T2 to T3).

In the first summer, a repeated measures ANOVA showed that there was a non-significant effect for Time, $F(1, 130) = 2.27$, $p = .14$, $\eta^2 = .02$. There was a significant effect for Decile, $F(3, 130) = 2.80$, $p = .04$, $\eta^2 = .06$. There was a non-significant interaction effect, $F(3, 130) = 1.03$, $p = .38$, $\eta^2 = .02$. As can be seen in Table 16, showing mean GWRT scores, there was little change in scores from T2 to T3. Time was not significant in this analysis. The overall results for Decile were that the higher decile schools had better word reading scores. Therefore, Decile was significant. In sum, over the first summer, the pattern was that all deciles made small non-significant changes, as shown in Table 17.

Table 17

Means, Standard Deviations, and Raw Score Changes for GWRT Word Reading by Decile in the First Summer Break (T2-T3)

Measure	Decile	T2		T3		T2-T3 Changes
		M	*SD*	*M*	*SD*	*M*
GWRT	1	0.41	0.91	0.00	0.00	-0.41
Word	4	0.81	1.88	0.43	1.66	-0.38
Reading	7	1.85	4.06	1.88	3.77	+0.03
	10	1.50	3.25	1.53	3.46	+0.03

Second summer break (T4 to T5).

In the second summer, the repeated measure ANOVA indicates that there was a significant effect for Time, $F(1, 124) = 4.58$, $p = .03$, $\eta^2 = .04$. There was also a significant effect for Decile, $F(3, 124) = 16.91$, $p < .001$, $\eta^2 = .29$. There was a significant interaction, $F(3, 124) = 13.06$, $p < .001$, $\eta^2 = .24$. Table 18 shows the overall mean GWRT scores for the second summer. The results of the repeated measure ANOVA show that the lower deciles lost ground over the second summer, hence the significant interaction showing that the higher decile schools made greater gains.

Table 18

Means, Standard Deviations, and Raw Score Changes for GWRT Word Reading by Decile in the Second Summer Break (T4-T5)

Measure	Decile	T4		T5		T4-T5 Changes
		M	*SD*	*M*	*SD*	*M*
GWRT	1	4.81	5.17	2.32	2.37	-2.48
Word	4	8.95	9.07	8.65	10.31	-0.30
Reading	7	12.33	9.92	14.64	11.32	2.30
	10	18.17	12.25	21.67	11.80	3.50

As was found for research question 3, the general pattern for the second summer was that the higher decile schools gained in word reading, while the lower decile schools made losses.

To explore the significant interaction further, a check was made for each decile to see if changes in GWRT raw scores in the second summer break were significant. Table 19 shows the mean summer GWRT raw score changes and results of the t-tests for each decile.

Table 19

T-test Analysis for Mean GWRT Word Reading Raw Scores by Decile in the Second Summer Break (T4-T5)

Measure	Decile	T4		T5		T4-T5 Changes	*t*	*p*
		M	*SD*	*M*	*SD*	*M*		
GWRT	1	4.81	5.17	2.32	2.37	-2.48	3.16	.004*
Word	4	8.95	9.07	8.65	10.31	-0.30	0.33	.74
Reading	7	12.33	9.92	14.64	11.32	2.30	4.37	< .001*
	10	18.17	12.25	21.67	11.80	3.50	3.67	<.001*

*$p < .05$

The *t*-test results show that the decile 1 schools experienced a significant loss in word reading skills, the decile 4 schools remained static, and the decile 7 and 10 schools made significant gains. The progressive changes in GWRT scores are depicted in Figure 35.

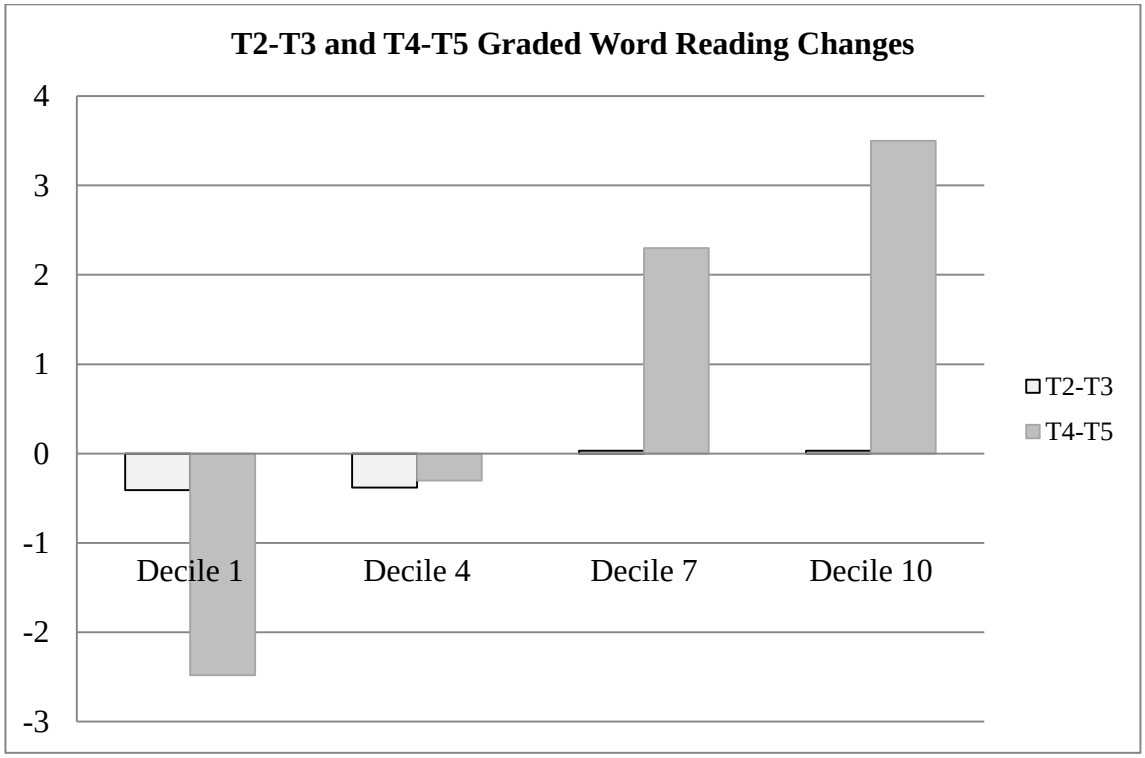


Figure 35. Changes in mean GWRT word reading raw scores in the two summer breaks (T2-T3 and T4-T5).

Summary.

The answer to research question 4, as to whether the summer gains and losses widened across the two summer breaks is that, in terms of word reading, there was no summer slide over the first summer vacation, but there was a summer slide over the second vacation for decile 1 children. There was no slide for decile 4 and there were gains for deciles 7 and 10. In brief, the decile 1 schools experienced a widening loss, the decile 4 schools stayed the same, and the decile 7 and 10 schools experienced widening gains.

The significant losses in the second summer vacation may have been because decile 1 children were not practicing reading during the summer. They did not make significant losses in the first summer break perhaps because they had very few word reading skills at that point. In the second summer break they lost 2.48 raw score points out of the 4.81 mean raw score points they had before the holidays began. That is, over the second summer, they lost 52% of the gains they had made during the previous year. In contrast, the decile 10 school made an 18% improvement on the gains they had made the previous year.

Literate Cultural Capital and Literacy Development

Research Question 5: Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?

In order to address this research question, the reading-related variables of alphabet knowledge, phonemic awareness, word reading, and receptive vocabulary were correlated against the school year changes in word reading scores. These change scores were of all time periods, that is, two during the school year (T1-T2 and T3-T4) and two during the summer break (T2-T3 and T4-T5). Results were examined for significance. These results are shown in Table 20.

Table 20

Correlations of Literate Cultural Capital Measures against Mean GWRT Word Reading Changes across the Two School Years (T1-T2 and T3-T4) and the Two Summer Breaks (T2-T3 and T4-T5)

Measure	T1-T2 *r*	T2-T3 *r*	T3-T4 *r*	T4-T5 *r*
Clay Letter Identification Task	0.35**	0.003	0.54**	0.25**
GKR Phonemic Awareness Assessment	0.56**	0.02	0.41**	0.22*
PPVT Vocabulary Knowledge	0.26**	0.01	0.41**	0.18*
Clay Word Reading Test	0.56**	-0.37*	0.38**	0.21*

*$p < .05$ **$p < .01$

The results show that at the first test point (T1), when children started school, the amount of literate cultural capital correlated with gains made during the first school year (T1-T2). Interestingly, phonemic awareness knowledge and high-frequency word reading scores had strong positive correlations, both at 0.56 and 0.56. Moderate to weaker correlations were noted in alphabet and vocabulary knowledge.

Over the first summer break (T2-T3), there were no significant correlations except for word reading. Here, there was a moderate, negative correlation.

In the first full year at school (T3-T4), there were moderate to strong correlations between the variables of the literate cultural capital. The strongest correlation at this time was alphabet knowledge at 0.54. The next strongest correlations were seen in phonemic awareness and vocabulary knowledge. High-frequency word reading ability appeared to be weakening at this point.

In the second summer break (T4-T5), all correlations were significant. However, correlations during the second summer were weaker than for the first summer break.

In summary, the amount of literate cultural capital at school entry was found to impact on school year gains and summer gains and losses in word reading. The stronger correlations appeared to be during the two school years. Over the two summer breaks, only one significant correlation occurred in the first summer, but correlations were significant for all literate cultural capital variables in the second summer.

To establish which variable was the strongest predictor, linear regression analysis compared effects of the dependent measure of graded word reading change scores over each of the four time periods from the components that made up the literate cultural capital measure, which were alphabet knowledge, phonemic awareness and vocabulary knowledge, and high-frequency word reading. Table 21 shows the results of the analyses.

Table 21

Regression Analyses of Literate Cultural Capital Measures against Mean GWRT Word Reading Raw Score Changes across the Two School Years (T1-T2 and T3-T4) and the Two Summer Breaks (T2-T3 and T4-T5)

Measure	T1-T2		T2-T3		T3-T4		T4-T5	
	β	*t*	β	*t*	β	*t*	β	*t*
Clay Letter Identification Task	-0.14	-1.41	0.39	3.32**	0.40	3.57**	0.08	0.59
GKR Phonemic Awareness Assessment	0.35	4.11**	0.27	2.70*	0.17	1.95	0.08	0.81
PPVT Vocabulary Knowledge	0.09	1.04	-0.18	-1.78	0.12	1.24	0.07	0.61
Clay Word Reading Test	0.45	4.86**	-0.68	-6.21*	-0.13	-0.13	0.16	1.44

*$p < .05$. **$p < .001$.

During the first school year (T1-T2), linear regression analyses showed a significant average *p* value, $F(4, 131) = 24.37$, $p < .001$. The three literate cultural capital variables and high-frequency word reading ability together contributed about 43% of variance. The main predictors of reading gains during this period were high-frequency word reading ability and phonemic awareness knowledge.

Over the first summer vacation (T2-T3), the *F* value was significant $F(4, 130) = 9.65$, $p < .001$, indicating variation of about 23% was caused by the three literate cultural capital variables and high-frequency word reading.

In the next school year (T3-T4), the average *p* value of literate cultural capital measures was significant, $F(4, 123) = 15.33$, $p < .001$. All independent variables together accounted for 33% of variance in change scores. Examination of *t* values showed that alphabet knowledge was the only significant predictor.

Finally, in the second summer break (T4-T5), while a significant overall result was noted, $F(4, 123) = 3.11$, $p = .02$, all independent variables together only explained 9% of the variance. Individual β and *t* values showed no significant predictors.

Summary.

In summary, in answer to research question 5, all three literate cultural capital variables and high-frequency word reading correlated with graded word reading gains made by the children during the two school year periods. However, there was only one significant correlation between the literate cultural capital variables and graded word reading in the first summer break. In the second school year and the second summer break, results showed significant correlations for all literate cultural capital variables.

In terms of predictors of reading success, phonemic awareness and high-frequency word reading ability were the best predictors of reading gains in the first year of school. In the following school year, alphabet knowledge became the strongest predictor of reading success.

Motivation to Read

Research Question 6: Is motivation to read related to progress in reading?

Reading gains were made by children during the first school year (T1-T2) and the second school year (T3-T4). Hence, to answer this research question, gain scores in GWRT during these 2 time periods were correlated with the scores obtained from administering the Motivation to Read Survey. Three different sets of scores were generated from this survey. These were reading self-concept, value of reading and a total score. The means and standard deviations of these scores, by decile, are indicated in Table 22. Table 23 shows the results of the correlations between the three scores generated by the Motivation to Read Survey and reading gains made in the two school years.

Table 22

Means and Standard Deviations of Motivation to Read Survey Scores of Reading Self-Concept, Value of Reading and Total Scores by Decile

Decile	Reading self-concept		Value of reading		Total score	
	M	*SD*	*M*	*SD*	*M*	*SD*
1	27.32	6.28	30.13	4.12	57.26	8.26
4	26.44	5.09	27.44	4.78	53.88	8.95
7	29.45	4.42	32.09	4.03	61.55	7.34
10	29.70	6.47	30.07	3.81	60.33	8.18

Table 23

Correlations of Motivation to Read Survey Scores against Mean GWRT Word Reading Raw Score Changes over the Two School Years (T1-T2 and T3-T4)

Measure	T1-T2 Changes	T3-T4 Changes
	r	*r*
Reading self-concept	0.27**	0.46**
Value of reading	0.22*	0.33**
Total score	0.31**	0.49**

*$p < .05$. **$p < .01$.

Looking at Table 22, it is noted that there was little variation in reading self-concept, value of reading and total scores between decile groups. Generally, the two higher decile groups scored higher in each of the three components of the survey than the two lower decile groups.

As can be seen from Table 23, there were significant relationships between word reading gain scores in both time periods with reading self-concept, value of reading and total scores on the Motivation to Read Survey.

Summary.

In answer to research question 6, motivation to read was found to be positively correlated to progress in word reading. While there was a moderate positive correlational relationship with reading progress in the first school year, this relationship strengthened in the second year that the children were in school. During this second year, higher levels of motivation to read were linked to greater gains in graded word reading raw scores.

Summary of Results

The results of this study were that higher decile children began school with higher levels of literate cultural capital than lower decile children did. These literate cultural capital variables were alphabet knowledge, phonemic awareness and receptive vocabulary knowledge. However, children in all decile groups started with similar levels of word reading skills.

As children progressed through the study, in terms of the literate cultural capital variables, while different decile groups made gains and losses during different time periods, the general trend was that gaps at school entry remained and widened over the two school years and two summers. Figures 36, 37 and 38 show an overview of these trends in each literate cultural variable of alphabet knowledge, phonemic awareness and receptive vocabulary knowledge respectively at the five test points.

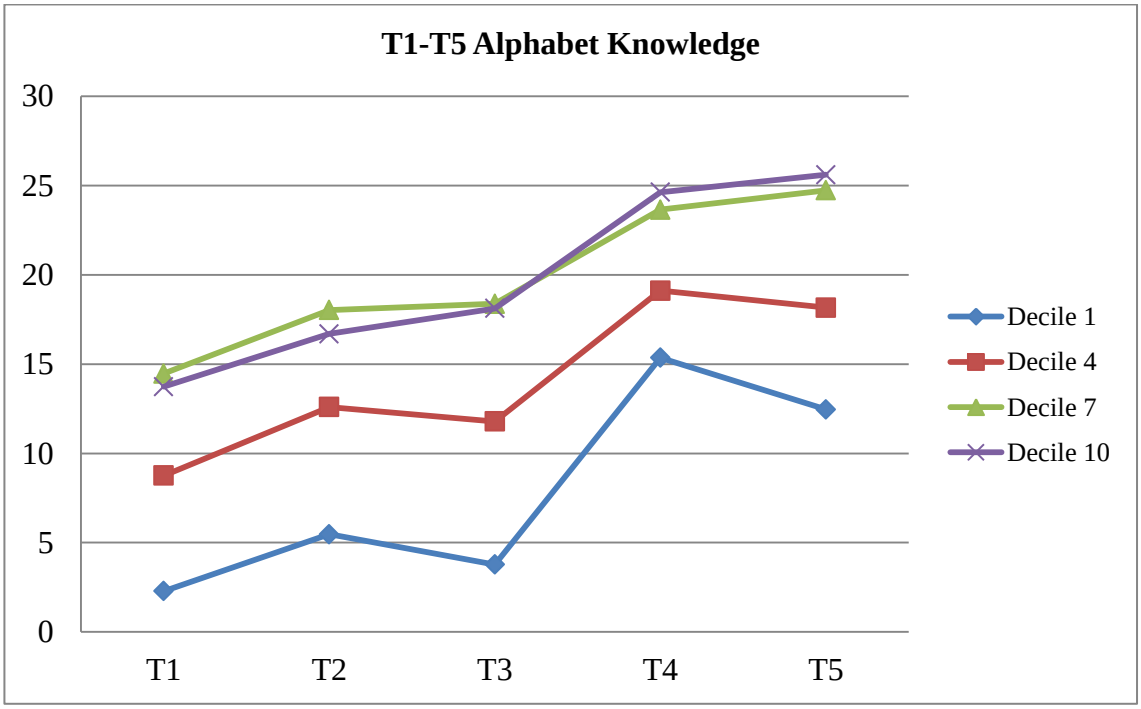


Figure 36. Mean Clay Letter Identification task raw scores at the five test points.

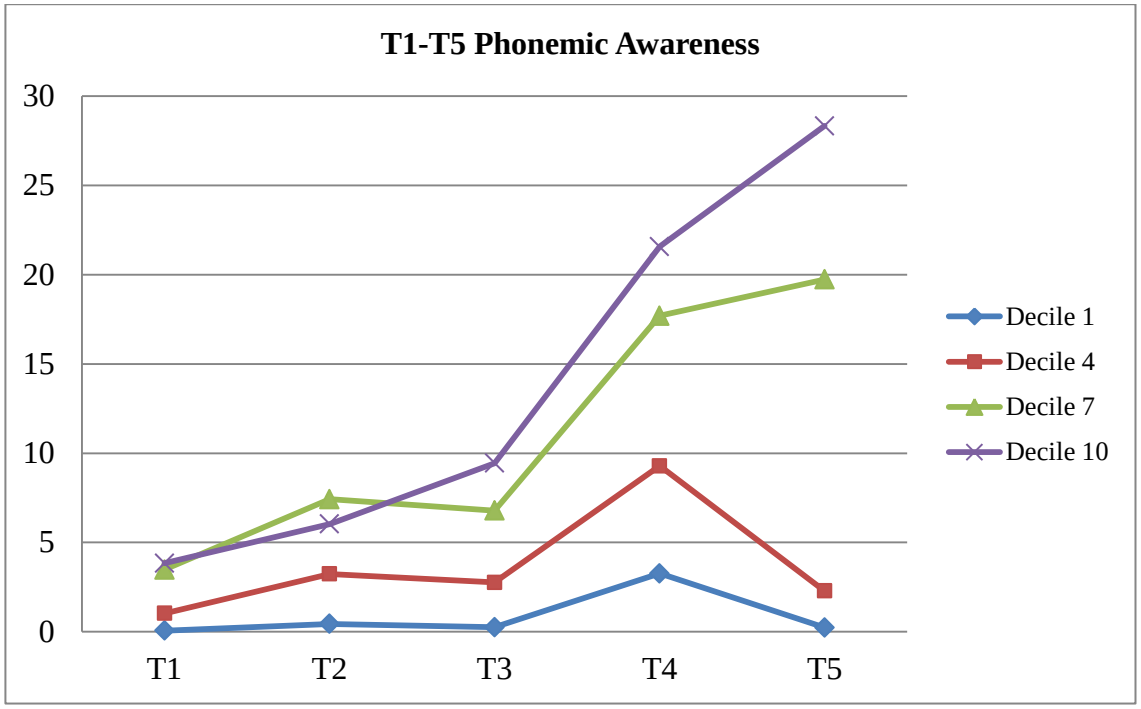


Figure 37. Mean GKR Phonemic Awareness Assessment raw scores at the five test points.

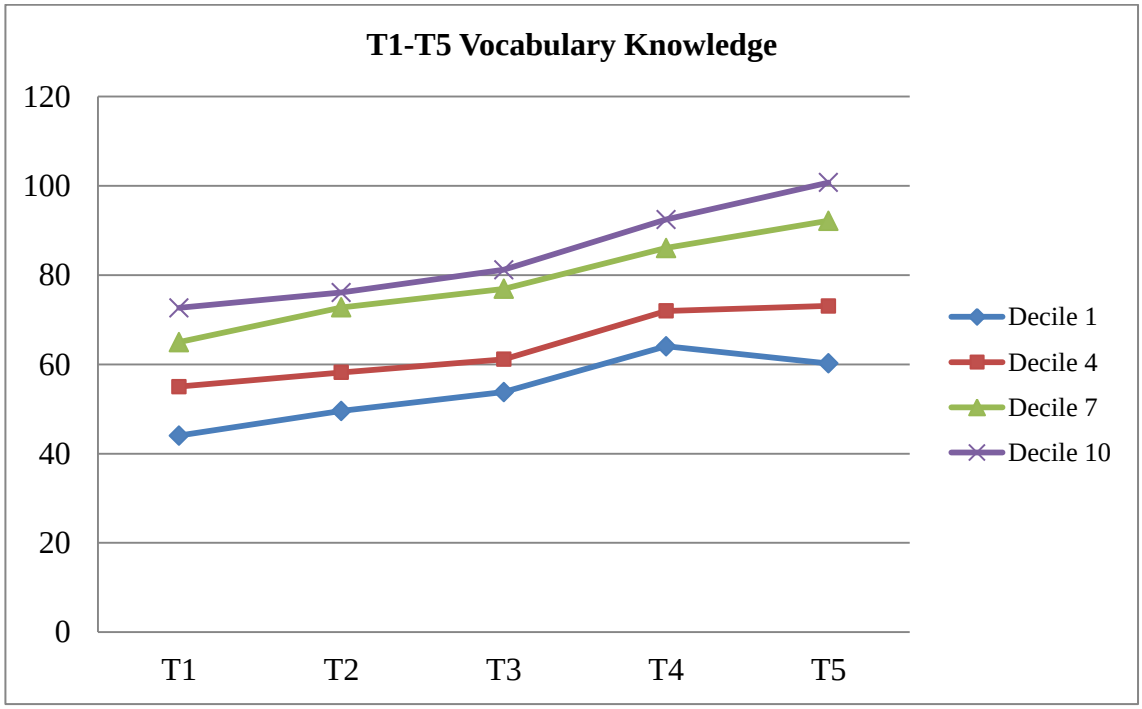


Figure 38. Mean PPVT vocabulary knowledge raw scores at the five test points.

Turning to word reading skills, at school entry all decile groups started with similar levels of graded word reading ability. The general trend was that when school was in session, all decile groups made gains, whereas over the summer some decile groups made losses and others gained. Figure 3 in the preview section of this chapter illustrates GWRT word reading raw scores charted chronologically for all time periods in the study. Table 24 below provides a snapshot of GWRT word reading raw scores by decile group at all time points, whereas Table 25 displays the changes in the same word reading raw scores for each time period.

Table 24

Mean GWRT Word Reading Raw Scores by Decile at the Five Test Points

Decile	T1		T2		T3		T4		T5	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1	0.00	0.00	0.41	0.91	0.00	0.00	4.81	5.17	2.32	2.37
4	0.19	0.88	0.81	1.88	0.43	1.66	8.95	9.07	8.65	10.31
7	0.61	2.79	1.85	4.06	1.88	3.77	12.33	9.92	14.64	11.32
10	0.25	0.72	1.50	3.25	1.53	3.46	18.17	12.25	21.67	11.80

Table 25

Mean GWRT Word Reading Raw Score Changes by Decile across the Two School Years (T1-T2 and T3-T4) and Two Summer Breaks (T2-T3 and T4-T5)

Decile	T1-T2 Changes	T2-T3 Changes	T3-T4 Changes	T4-T5 Changes
1	0.41	-0.41	4.81	-2.49
4	0.62	-0.38	8.52	-0.30
7	1.24	0.03	10.45	2.30
10	1.25	0.03	16.64	3.50

Although the higher decile groups entered school with higher graded word reading scores than the lower decile groups, this difference was not significant. Similarly, gains made by all decile groups during their first school year were not

significantly different. Over the first summer, though the lower decile groups regressed slightly and the higher decile groups made marginal gains, these changes were also not significantly different. However, during the second school year, differential gains were made by all decile groups, stratified along SES lines. This marked the first point in the study where a significant reading gap was noted. Over the second summer, this gap widened as the lower decile groups lost ground, while the higher decile groups gained.

The greatest gap was noted between the lowest and highest decile groups, and most clearly illustrates the development of the gap. Hence, the graded word reading results for the decile 1 and decile 10 groups are used to illustrate the details of the development of the reading disparity in Figures 39 to 41 below.

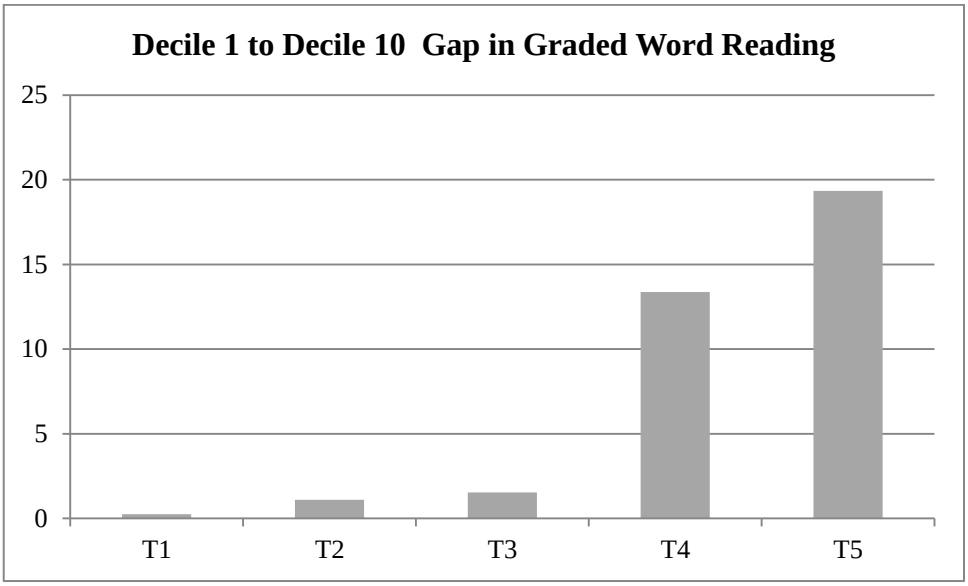


Figure 39. Difference between decile 1 and decile 10 mean GWRT word reading raw scores at the five test points.

As can be seen from Figure 39 above, the difference in graded word reading scores at school entry (T1) is minimal. Small increases in the gap are noted at the end of the first school year (T2) and at the end of the first summer vacation (T3). However, the gap increased considerably by the end of the second school year (T4) and further increased by the end of the second summer (T5). The net result of these compounding increases was that the initial non-significant gap of less than 1 raw score point rose to a

significant difference of a little more than 19 raw score points at the end of the second summer (T5).

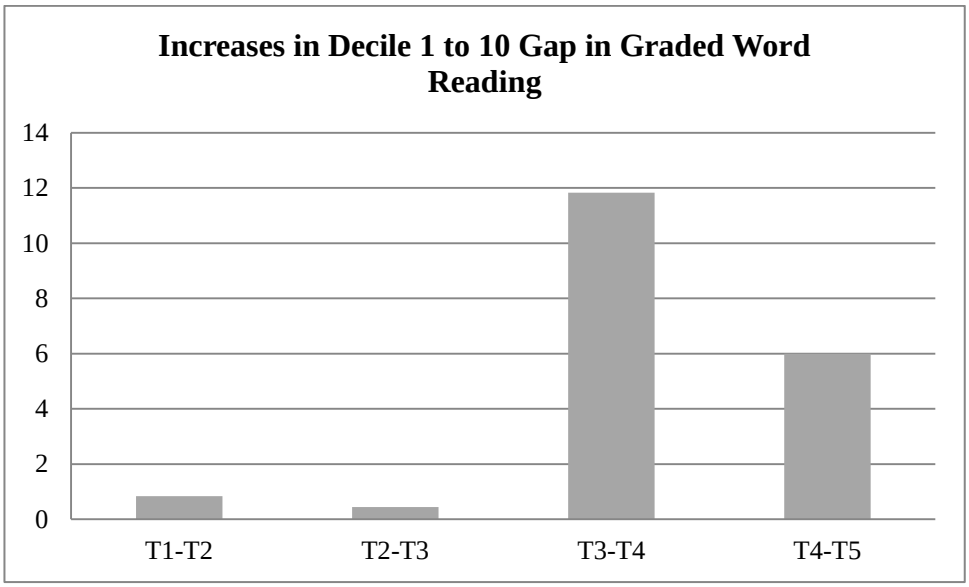


Figure 40. Amount of increase in the difference between decile 1 and decile 10 mean GWRT word reading raw scores across the two school years (T1-T2 and T3-T4) and the two summer breaks (T2-T3 and T4-T5).

Looking at the amount by which the gap widened in each time period, the results show that the largest increase occurred in the second year of school (T3-T4). The second largest rise was in the second summer holiday (T4-T5). These changes are illustrated in Figure 40.

Bearing in mind that each time period was not necessarily of the same length, the monthly rate of increase in the reading disparity was calculated. This is shown in Figure 41 below. The figure for the first school year (T1-T2) was arrived at by dividing the difference in gain scores by 1.65 months, as this was the average length of time that the children spent in school during that time period. Both summer periods (T2-T3 and T4-T5) were based on a break of 7 weeks or 1.75 months. The second school year (T3-T4) was taken as being 10.25 months.

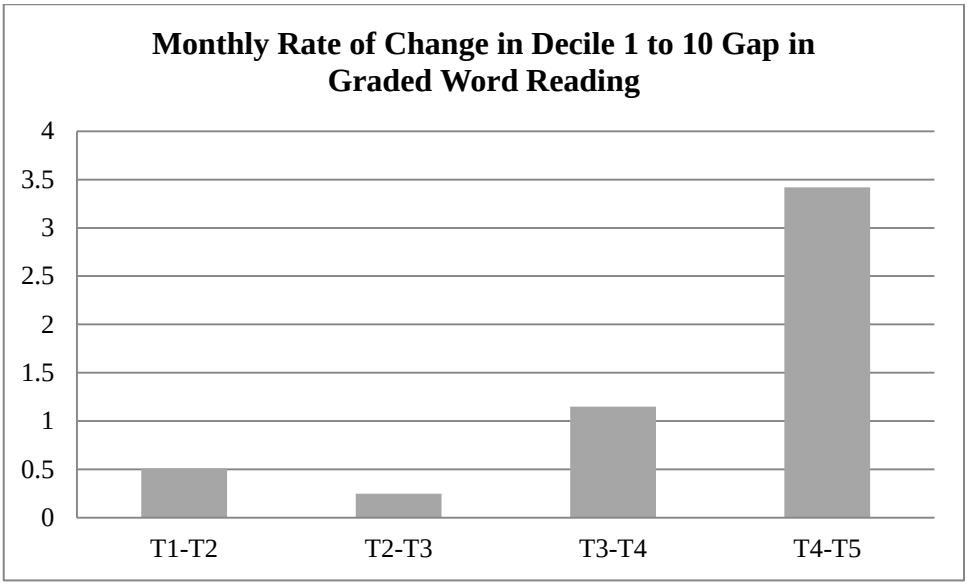


Figure 41. Monthly rate of increase in the difference between decile 1 and decile 10 mean GWRT word reading raw scores across the two school years (T1-T2 and T3-T4) and the two summer breaks (T2-T3 and T4-T5).

The rate of change in the first school year and the first summer were minimal and not significant. However, in the second year of school, the disparity developed at a considerably faster rate. More alarmingly, the rate of development of this disparity increased by almost 3 times as much over the following summer holidays.

To sum up, findings of the study were that the reading disparity increased over the two school years, as well as the two summers in the study. At the start of the study, the reading gap between the highest and lowest decile groups was below 1 raw score point. This meant that both groups were reading at a reading age of about 5 years. By the end of the study, the reading gap had increased to about 19 raw score points, equating to a reading age difference of a little under 2 years. Finally, the literate cultural capital variables of alphabet knowledge, phonemic awareness and vocabulary knowledge correlated more strongly with reading development among all groups of children over the school years rather than the summer breaks.

Chapter 5: Discussion

Introduction

The reading disparity among children in New Zealand is evidenced in numerous local and international studies. This investigation attempted to shed more light on where this gap is rooted and the factors that may contribute to the widening reading gap among different groups of children. SES background of children is considered one of the key elements that impact on their reading achievement (Tienken, 2011). Studies point to SES as the single most accurate predictor of reading achievement.

The present study looked at the reading gap, following four different groups of children stratified along SES lines. Firstly, this study aimed to establish a profile of reading sub-skills that children from the four groups entered school with. This was done to uncover whether a reading gap existed at the outset of formal schooling, or not. Secondly, the study examined the reading gains made by these different groups of children during the school year. This was done to observe whether a reading gap developed over this period. Thirdly, the study examined the reading progress of children over the summer holidays when school influences were not as significant. Next, the study examined the summer reading progress over two summers in relation to the reading gap to observe any widening of reading disparity among the four groups of children. The study also attempted to relate initial levels of reading sub-skill knowledge to school year and summer changes in word reading ability. Finally, the study examined children's level of motivation to read as this was considered to be an important element in successful reading achievement.

In sum, the study examined the following research questions: -

1. Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?
2. Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?

3. Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?
4. Does the summer reading effect widen over the two summers?
5. Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?
6. Is motivation to read related to progress in reading?

Literate Cultural Capital of New Entrants

Research Question 1: Do children in decile 1, 4, 7 and 10 schools begin with similar amounts of literate cultural capital at school entry?

This study found that children with low-SES backgrounds started school with significantly lower levels of literate cultural capital than children from high-SES backgrounds. These findings were similar to that of Tunmer et al. (2006). The conceptualization of literate cultural capital in this study was slightly different from the Tunmer et al. (2006) study. In their study, the four variables of literate cultural capital considered to support early literacy development were phonological sensitivity, grammatical sensitivity, receptive vocabulary knowledge and alphabet knowledge, and scores of each of these variables were condensed into one composite score. In this study, literate cultural capital was established by similar variables of phonemic awareness, vocabulary knowledge and alphabet knowledge. This study also examined raw score data for each group of children for each measure as opposed to a composite score. This was done in order to paint a more detailed picture of the components associated with literate cultural capital differences across different SES levels. Reporting of individual measures also served to identify any particular component(s), if any, that may have impacted school entry reading ability more than the others.

In terms of alphabet knowledge, children from low-SES families started school at age 5 with considerably lower levels of this skill. On average, decile 1 children started off only being able to name and sound out two letters while children in the higher deciles (decile 7 and 10) managed about 14. This aligns with research by Bowey (1995), which found that low-SES and high-SES children in her study had an alphabet

knowledge gap ranging from 7.5 to 11 for low-SES and high-SES children respectively. Similarly, the Nicholson (2003) study also found an alphabet knowledge gap between high- and low-SES children, but the gap in this study was considerably bigger than that found in the Nicholson (2003) study. This is possibly because the Nicholson (2003) study tested children after they had been in school a few months, between 5.26 and 5.27 years, and not at school entry.

Relating alphabet knowledge to Whitehurst and Lonigan's (1998) model of emergent literacy, lower levels of this metalinguistic skill among low-SES children would translate to diminished inside-out skills, which directly relates to reduced reading acquisition. Alphabet knowledge is a necessary part of decoding, which is a critical initial step in Gough's (1972) bottom-up theory of reading acquisition. Reading usually involves alphabetic print being converted into phonological form, after which the meaning of decoded words may then be retrieved from memory. Therefore, from the standpoint of Gough's (1972) bottom-up theory, lower levels of alphabet knowledge may bring about lower reading achievement. Higher levels of alphabet knowledge also allow children to retrieve sound more easily when letter names contain the phoneme associated with them. This results in the development of stronger phonological concepts of print and phonologically based strategies for decoding print (Foulin, 2005), thereby reinforcing learning of alphabetic principle. The high-SES children, with greater alphabet knowledge would have been more advantaged in developing these phonologically based strategies. On the other hand, the lower levels of alphabetic knowledge in low-SES children would have resulted in these children being less able to make grapheme-phoneme connections in the decoding process (Ehri, 2014).

Benchmarks of alphabet learning by educational authorities in the United States are variable. By the end of preschool, benchmarks of letter knowledge can range from 10 to 20 letters, although most states have a 10-letter standard (Bracken & Crawford, 2010; Piasta et al., 2012). The higher decile children in this study, with knowledge of between 14 to 15 letters could have comfortably exceeded this benchmark, and would not have been at risk of literacy difficulties (Piasta et al., 2012). In fact, relating this to Piasta et al.'s (2012) study on negative predictive power of these children not being at risk of literacy difficulties in first grade, at least 89% of these higher decile children would not have been at risk of spelling difficulty, and at least 74% to 85% would not

have been at risk for passage reading. The lowest decile children, on the other hand, with knowledge of only about two letters and sounds would have already been starting school far behind. This would have possibly led to lower levels of word recognition. Although not all studies have shown transfer of alphabet knowledge skills to other early literacy skill development (Piasta & Wagner, 2010), most research identifies the lack of alphabet knowledge as placing children more at risk of later reading difficulty (Foulin, 2005; Hammill, 2004; Lonigan et al., 2000; Lonigan et al., 2008; McBride-Chang, 1998; National Early Literacy Panel, 2008; Nicholson, 2003; Schatschneider et al., 2004; Stanovich, 2008; Torgesen, 2002; Torgesen & Hudson, 2006; Tunmer & Nicholson, 2011).

Phonemic awareness results also showed high-decile children having greater knowledge in this area than low-decile children. This result is consistent with what is found in the literature (Juel, 1988; Lonigan et al., 2013; Lundberg et al., 2012; McCoach et al., 2006; Nicholson, 2003; O'Connor et al., 2009).

Comparing this phonemic awareness gap with another local study, the Nicholson (2003) study likewise identified a clear divergence of phonemic awareness levels between high- and low-SES children. However, the present study found initial school entry scores generally lower than that of the Nicholson (2003) study. While the Nicholson study found that low-SES children scored an average of 3 out of 42 on the GKR Phonemic Awareness Assessment, this study found decile 1 children possessed almost no phonemic awareness ability. High-SES children in the Nicholson (2003) study, on average, scored 9 out of 42, while in this study the average score was a little under 4. Comparing the percentage difference between low- and high-SES children, high-SES children started school with approximately 3 times more phonemic awareness ability than low-SES children in both studies. This result was also reflected in research by McIntosh et al. (2007) who found that low-SES children's phonological awareness ability, in terms of rhyming ability, was about 2.5 times less than the average expected score. Poor phonemic awareness was also noted among poor readers in a low-SES group of children in the study by Juel (1988). However, in that study, similar to the Nicholson (2003) study, phonemic awareness levels of poor readers at school entry was around 4 raw score points on the same phonemic awareness measure used in this study. This was higher than the school entry scores of children in the present study. However,

this could have been due to the fact that the Juel (1988) study involved children in the first grade in the United States, who are typically 6 years old. This meant the children in that study were most likely a year older than the children in this study and could have had more developed phonemic awareness ability.

As explained in the literature, children with high levels of phonemic awareness develop literacy skills faster than those with lower levels (Juel, 1988; Lonigan et al., 2000; Torgesen, 2002). Firstly, it contributes to the children's understanding of the association between graphemes and phonemes, which is the alphabetic principle. In order to understand this association, children first need to develop the level of phonological awareness at which phonemes in speech can be segmented and identified, following by matching these to individual letters of the alphabet in print (Kim et al., 2010; Lundberg et al., 2012; Shankweiler & Fowler, 2004). In the context of this study, those children with enhanced phonemic awareness skills, who were in the higher SES groups, may have been more able to recognize the individual phoneme segments from speech than the lower SES children. The high-SES children would then have been able to manipulate these sounds in words to decode words in text and construct words by spelling them. This would have placed the high-SES children ahead of low-SES children in terms of inside-out emergent literacy skills.

Greater phonemic awareness also reinforces alphabet knowledge. In English, most alphabet letter names contain the phonemes that represent them and this serves as a clue for children learning alphabet names (Kim et al., 2010). Hence, high-SES children, with higher levels of phonemic awareness, may have had a correspondingly higher ability than the low-SES children to make the link between letters in print and sounds, thereby aiding in decoding and spelling skills. Both these skills would then have had an impact on decoding in word reading. This would have resulted in the more advantaged high-SES children with greater phonemic awareness knowledge having a higher degree of word reading skills compared to the low-SES children. Once again, this may have contributed to high-SES children developing a higher level of inside-out skills than low-SES children.

Phonological awareness has been shown to be a unitary construct in which children develop from awareness about larger segments of sounds to awareness of

smaller segments, which are the individual phonemes (Anthony & Lonigan, 2004; Anthony et al., 2003; Schatschneider et al., 1999; Stanovich et al., 1984). That the low-SES children in this study had less phonemic awareness could indicate that they were placed at the lower end of the scale, with awareness of larger segments of sounds, but without the appreciation yet, that these larger segments were made up of smaller segments.

At the start of school, the gap in phonological awareness between different SES groups places the lower SES children at a distinct disadvantage. This is because studies have shown that relative rankings of phonemic awareness at school entry predict relative rankings of this same skill later on (Lonigan et al., 2000). Phonological awareness has been shown to be a crucial part of developing reading ability (Tunmer et al., 2006), and it also strongly predicts future success in reading (Morrow, 2009; Nicholson, 2003, 2004, 2005; Nicholson & Ng, 2006). Therefore, the low levels of phonological awareness possessed by the low-SES children in this study may not only have been an indication of concurrent reading delay but also could have had negative implications for their future reading progress.

In terms of receptive vocabulary knowledge, an SES-stratified gap was also observed among children at school entry. Children from low-SES backgrounds started with similar standard scores in the receptive vocabulary measure in this study, as found in the Nicholson (2003) study and the Qi et al. (2006) study. The study by Froiland et al. (2013), however, found slightly higher average standard scores for low-SES children than the two previously mentioned studies and this study. Nevertheless, standard scores found in all these studies placed the vocabulary knowledge of low-SES children below the average expected national norms. Looking at the gap in vocabulary knowledge between rich and poor children, the results of this study were also similar to that found in the Nicholson study (2003), with the gap at approximately 27 standard score points, ranging from below average for low-SES to slightly above average for high-SES children.

Low receptive vocabulary knowledge impacts the gap between high- and low-SES children in several ways. Firstly, as discussed in the literature review, low levels of receptive vocabulary predict low levels of reading comprehension (Lonigan et al., 2008;

Nelson et al., 2011; Pearson et al., 2007; Stahl & Fairbanks, 1986; Storch & Whitehurst, 2002). This allows the high-SES group of children to hit the ground running at the start of school, compared to their low-SES peers. High-SES children who start school with a larger resource of vocabulary can leverage this knowledge to comprehend texts more easily and to a sufficient level that then results in the opportunity to further expand their vocabulary banks concurrently (Beck & McKeown, 2007; Sinatra et al., 2012). Children in this high-SES group would probably have had the background content knowledge and the receptive vocabulary necessary to understand 95% of the words they encountered in age-appropriate texts. Both of these are features necessary for comprehension as well as for guessing the meanings of new words in texts and thereby enlarging their receptive vocabulary (Ehri, 1998; Mol & Bus, 2011).

On the other hand, children from low-SES backgrounds with low receptive vocabulary may have been less able to construct meaning from text because they were not able to assign meaning to printed words that they were unfamiliar with (Tunmer & Chapman, 2012; Tunmer & Greaney, 2010). This may have been so despite the fact that they may have been able to decode the unfamiliar words. The result is that the low-SES group of children might have been unable to expand their vocabulary bank by reading.

Secondly, since receptive vocabulary knowledge predicts reading comprehension later on, the negative effects of low receptive vocabulary among low-SES children may have been compounded as the children made their way through school. The receptive vocabulary gap has been shown to predict reading comprehension levels 5 years after starting school (Ouellette & Beers, 2010).

Thirdly, limited receptive vocabulary also impacts the development of phonological decoding skills. Because low-SES children comprehend less of what they read, they may not get the same amount of grapheme-phoneme correspondence practice as their higher SES counterparts do (Tunmer & Chapman, 2012). High-SES children can reinforce their knowledge of spelling-sound relationships when reading while low-SES children may not have access to the same level of opportunity to do this. In addition, according to the lexical restructuring model, expansion of receptive vocabulary knowledge results in more fine-grained phonological awareness. This is because an increase in vocabulary requires a corresponding increase in phonemic

awareness to identify the more subtle differences between words (Walley & Flege, 1999; Walley et al., 2003). Hence, as noted in the research, children with high levels of receptive vocabulary are more likely to show high levels of phonemic awareness, as is the case in the results of this study at school entry. The converse applies for children with low levels of receptive vocabulary. Consequently, high-SES children in this study with enhanced receptive vocabulary knowledge may have not only had higher levels of reading comprehension, but also more developed phonological skills.

There are several possible explanations for the vocabulary gap that is stratified by SES at the start of school. Before they begin school, this vocabulary gap can be primarily attributed to differences in children's home, community and preschool experiences. As children's vocabulary knowledge develops primarily as a result of oral interaction, one explanation for the vocabulary gap may be the differences in the amount and quality of verbal interactions between parents and children. Hart and Risley (1995) found that high-SES children were engaged with 3 times more than low-SES children. The former group also experienced better quality of speech in terms of breadth and depth of vocabulary than the latter group. Predictably, the vocabulary bank of the high-SES group was 2 times larger than the low-SES group by the time they were 3 years old. This may have been the case for the New Zealand children as well.

Another contributing factor is that low-SES households have been shown to have fewer books than high-SES ones do. This would constrain the opportunities for the shared book reading activities at home that entail scaffolded language exposure and interactions (Froiland et al., 2013; Hoff, 2013; Qi et al., 2006; Rowe & Goldin-Meadow, 2009; Storch & Whitehurst, 2002; Vaden-Kiernen et al., 2010). As the research shows, low-SES combined with any one or a combination of the following factors - low maternal education level, single parent family structures and families with more than three children also impact on children's vocabulary acquisition before formal schooling (Qi et al., 2006). In this study, perhaps children from low-SES backgrounds whose mothers were less educated engaged in less reading and oral interactions with their mothers while using a smaller range of vocabulary in doing so. Another possibility is that the low-SES children in this study came from single parent families or had more than three siblings, thereby reducing the amount of interaction they had with their parents. In these kinds of low-SES families, financial pressures are likely to be higher

and fewer material resources, such as books, may have been available to the children, resulting in less shared reading practice.

In sum, low-SES children in this study started with lower levels of the pre-reading skills of alphabet knowledge, phonemic awareness and receptive vocabulary knowledge, while the opposite was true for high-SES children. To relate literate cultural capital to reading ability at school entry, a high-frequency word reading test was administered at this time. Significant differences in high-frequency word reading ability were noted between the highest and lowest decile groups. As discussed, the pre-reading skills mentioned are vital contributing factors to the decoding aspect of reading. From a theoretical standpoint, the results of the study correspond with Tunmer et al.'s (2006) SES influences of literate cultural capital theory, whereby the degree of pre-reading skills possessed by children at school entry, largely a reflection of their home and preschool experiences, determine how well children read at the start of school.

In order to benchmark children's reading progress throughout the study, a second graded word reading test was administered at the first time point. This contained a larger number of words and allowed for better discrimination of word reading ability as students progressed through the study as well as enabling reading ages to be calculated from raw scores. Results of this graded word reading measure were that a small gap of less than a month in terms of reading age was noted between the higher and lower deciles. However, the differences between deciles were not significant. This could have been due to the floor effect of this assessment as the variance in scores among all deciles was below 1 raw score point, with the lowest decile scoring zero. As this measure was used for evaluating word reading ability at the rest of the test points, subsequent reference to word reading ability scores in this study relate to this graded word reading measure.

The results of this study are consistent with Whitehurst and Lonigan's (2001) explanation that emergent literacy skills are necessary in learning to read. Indicators of emergent literacy in this study included alphabet knowledge, phonemic awareness and vocabulary knowledge. These develop primarily at home and in ECE settings. Emergent literacy skills develop as a result of interactions such as shared book reading, increased receptive vocabulary through greater verbal interaction, and heightened awareness of

alphabetic knowledge through games. Hence, one reason for the gap in emergent literacy among the different groups of children could have been that their home environments fostering these skills were stratified according to SES lines. Children from low-SES backgrounds may have had fewer books, fewer shared book reading experiences with adults, fewer library visits and/or fewer adult verbal interactions that may have then impacted on the development of emergent literacy skills (Anderson et al., 2012; Sénéchal, 2012).

Another reason for the literacy gap at the start of school could be that ECE settings in New Zealand may not have a common, shared focus in identifying and working on pre-reading skills. The MOE's Te Whāriki curriculum document addresses early literacy development through principles and learning outcomes that are open to wide interpretation (McLachlan, 2008). There is no requirement for ECEs to formally teach and assess pre-reading skills. This may not serve low-SES children well, as it is this group of children who begin school with lower levels of literate cultural capital. If 95% of children attend some form of ECE program (MOE, 2013a), then it follows that any literacy focus at ECEs in general does not have enough impact to counter the gap.

This culture is then carried forward by schools which do not assess school entry emergent literacy skills. In a way, this relieves ECE facilities from the need for accountability. However, knowledge about children's level of these emergent literacy skills may be necessary in bridging the gap between low-SES and high-SES children (McLachlan, 2008). Part of the problem may be that in New Zealand, there is no formal requirement to measure emergent literacy skill levels of children at school entry. At school entry, the School Entry Assessment, implemented in 1997, is a suggested practice for teachers to know what skills children start school with, as well as to contribute to national data about new entrants. Obviously, the MOE saw the need, at that stage, to have a national, holistic view of children's skills at school entry. Unfortunately, issues with actual assessments and schools' application of these assessments and data reporting back to the ministry have prevented a national picture of being formulated even though two thirds of teachers report that the SEA needs to be modified in its assessment of children's knowledge about alphabet, letter and word identification skills (Dewar & Telford, 2003). While this is the situation in New Zealand, benchmarks exist in the United States for school entry pre-reading skill levels

to be established (Bracken & Crawford, 2010) as the importance of these is presumably recognized as a key aspect of developing literacy in the classroom.

Literacy Development in the School Years

Research Question 2: Do children in decile 1, 4, 7 and 10 schools make the same gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and reading during the school year?

Turning to the first school year, it should be noted that for children in this study, their fifth birthdays fell between 1 July and around the middle of December. In the New Zealand system, these children started their first 'year' in a Year 0 class. They completed Year 0 at the end of the year in mid-December. Hence, the length of time that children in this study were in school in Year 0 was for a maximum of 5.5 months, depending on when their fifth birthdays were, and accordingly, when they started school. On average, these children only attended 1.65 months of school in Year 0. In Year 1, all children were in school for the full school year, which typically runs from late January to mid-December. From Year 0, children's alphabet knowledge, spelling, vocabulary knowledge, and word reading skills were tracked over the school years and summer breaks. This research question examined the development of reading and reading-related skills over the first and second year of formal schooling, during the school year.

In the first year (Year 0) of school, children across deciles progressed similarly in alphabet knowledge, vocabulary knowledge, phonemic awareness and word reading. This could have been due to the fact that all children experienced less than 6 months in school with the average participant spending about 1.65 months in school. Bearing in mind that low-SES children started with lower levels of pre-literacy skills than the higher decile children, although all children made progress during Year 0, the gap between the different deciles did not narrow during this time.

In the second year (Year 1), all children spent a full year in school and significant differences were noted in changes in levels of the pre-reading skills of alphabet knowledge, phonemic awareness and word reading skills. In terms of alphabet

knowledge, decile 1 children made the greatest gains, while decile 10 children made smaller gains. This is to be expected, as decile 10 children started the second year of schooling with knowledge of about 18 letters, while decile 1 children started with knowledge of between three and four letters of the alphabet. Consequently, the high-decile children neared the ceiling of alphabet knowledge at the end of the school year, which limited the gains that could have been made in that year. Pre-reading skills like alphabet knowledge are only important for a limited period of time during reading acquisition. Once this is mastered, only children with reading difficulties may need to develop these skills further and hence improvement may have been evidenced by those with lower scores more than those with higher scores.

Looking at phonemic awareness skills, there were significant differences between gains made by the lowest decile children and the two higher decile groups. Decile 10 children gained about 4 times as much in this skill as decile 1 children did. At the end of the second school year, phonemic awareness levels of children in the lowest decile school were still lower than those of decile 10 children at school entry the year before. As explained in the literature, phonological awareness develops in children along a continuum from identifying larger segments of sounds to smaller segments (Anthony & Francis, 2005; Anthony et al., 2003; Ziegler & Goswami, 2005). Decile 1 children were probably placed in the initial phases of this continuum, only being able to identify whole words or larger segments of sound, while the decile 10 children may have been further along this continuum, therefore being able to identify smaller segments of sound. This may have put them at an advantage in terms of decoding ability, as well as reinforcing grapheme-phoneme knowledge (Kim et al., 2010; Lundberg et al., 2012; Shankweiler & Fowler, 2004).

Turning to vocabulary knowledge, the study found that all four groups of children made similar gains. As pointed out by Berliner (2006), the majority of language experience may still have been happening at home for school-going children, and the only factor to have changed by this point was children's school experience. This is an interesting result showing that the schooling may have advantaged low-SES children, whereby they were able to make similar gains in vocabulary knowledge as high-decile children, despite differential gains in alphabetic knowledge and phonemic awareness skills.

With their much greater alphabet and phonemic awareness knowledge, the high-decile children should have theoretically been able to acquire vocabulary at a faster rate given their increased decoding skills and larger vocabulary base to begin with, as posited by various researchers including Jalongo and Sobolak, (2011) and Sinatra et al. (2012). Additionally, the high-SES children would likely have been acquiring vocabulary knowledge through their home environments at a greater rate than the low-SES children (Hart & Risley, 1995; Hoff, 2013; Qi et al., 2006; Nicholson, 2003; Roberts et al., 2005; Storch & Whitehurst, 2002; Vaden-Kiernen et al., 2010), further contributing to theoretically overall greater gains in the school year. However, this was not the case in this study, as the low-SES children made the same level of vocabulary gains as their high-SES counterparts during the school year.

Total vocabulary gain during the school year would have occurred through a combination of vocabulary gain from the home language environment (HLE) and gains from schooling. If the low-SES children were most likely making lower gains in their HLE, then to make the same level of gains overall as the high-SES children did, they may have made comparatively more gains in vocabulary knowledge from schooling than the high-SES children. This might have been because the exposure to increased oral interaction at school helped the low-SES children to compensate for the lower quantity and quality of speech that they may have encountered in their home environments (Hart & Risley, 1995).

Hence, at school, in addition to low-SES children learning words through reading and explicit teaching (Beck et al., 2013), their vocabulary base may also have expanded through oral conversations in the school context (Cunningham & Stanovich, 1998). Although conversation is not typically noted as a significant medium for vocabulary acquisition after the start of formal schooling (Beck et al., 2013), this may not have been the case for low-SES children. This is because the low-SES children started school with significantly lower levels of vocabulary. Conversations in the school context may have contributed more to their vocabulary bank than for children in the later stages of the developmental curve, such as the higher SES children. For the high-decile children, conversations at school may have contained words that they already knew, leading to less vocabulary acquisition in this manner. The high-decile children would have picked up more vocabulary in the home environment through oral

interaction, but in the school, this would have mostly occurred through explicit teaching. In sum, while all children may have been expanding their vocabulary base equally, this may have been occurring through different mechanisms and contexts, but with the gap between the high- and low-SES children remaining constant. In other words, although schooling equalized the rate at which children from different deciles gained vocabulary, it may not have been able to compensate for the much lower levels of vocabulary knowledge that low-SES children started school with.

In word reading ability, a significant difference among different decile groups was noted for the first time in the second year of school. By the end of the second year, the highest decile children were reading 1 year and 4 months ahead of their lowest decile counterparts. This could point to the former group's superior alphabet knowledge and phonemic awareness skills enabling them to decode more words. Vocabulary knowledge did not appear to enhance decoding ability in the children in this study.

To summarise, in the first few months of school, the results of the study do not show evidence of Matthew effects (Stanovich, 2008). Although children started school with different levels of pre-reading skills of alphabet knowledge, phonemic awareness and vocabulary knowledge, the ones with greater pre-reading skills were not able to read better than the children with lower levels of pre-reading skills. This may have been the case because of the short amount of time students had been at school (an average of 1.65 months) and the low level of gains made by all deciles in word reading.

Alternatively, the results of this study do support the faucet theory (Alexander et al., 2001), because all children made similar gains in the pre-reading and reading skills in that short period of time. The school resource faucet, turned on for all children, resulted in equal gains in alphabet knowledge, phonemic awareness, vocabulary knowledge and word reading. Despite this, the gap between rich and poor children did not diminish. This would suggest that while children made equal gains, there was no equalizing effect whereby low-SES children were able to narrow the gap or catch up to their more advantaged peers. This may lend support to the literate cultural capital theory (Tunmer et al., 2006) which points to the degree of pre-reading skills that children possess as predicting their reading ability at the end of their first formal school year.

In the second year of school, while all children gained in alphabet knowledge, phonemic awareness and vocabulary, the results differed according to the actual skills. In the whole language classroom, where instruction of specific pre-reading skills are not the focus (Blaiklock & Haddow, 2007; Smith & Elley, 1994; Tunmer et al., 2008), children are usually taught to read using text-based strategies, with word level strategies like alphabetic principle and sounding out of words not taught systematically. Rather such skills are picked up through incidental learning (Blaiklock & Haddow, 2007). If this was the case in the lower decile school in the study, it appears that such incidental learning was taking place at least in terms of learning about alphabet knowledge. However, by the end of the second year in school, lower decile children still did not know all 26 letters of the alphabet. Decile 1 and 4 children only had knowledge of approximately 15 to 16, and 19 letters respectively. On the other hand, decile 10 children knew almost all the letters, at between 24 and 25 letters. As alphabet knowledge is a predictor of reading achievement (Hammill, 2004; Foulin, 2005; Lonigan et al., 2000; Lonigan et al., 2008; McBride-Chang, 1998; National Early Literacy Panel, 2008; Schatschneider et al., 2004; Stanovich, 2008; Torgesen, 2002; Torgesen & Hudson, 2006; Tunmer & Nicholson, 2011), perhaps the lower decile children would have greatly benefited from more direct instruction.

Vocabulary knowledge in the second year was gained equally by the four groups of children, suggesting support for the faucet theory, where the steady flow of opportunity existed for all children, enabling the low-decile children to make similar gains to the high-SES children. Lower decile children gained the most in alphabet knowledge, and this appeared to be the lowest decile children catching up to their more knowledgeable peers, who had already neared the developmental ceiling for this aspect of pre-reading skills.

In phonemic awareness, the fan spread, characteristic of Matthew effects (Stanovich, 2008) was noted. To elaborate, the children in the higher decile schools made greater gains in phonemic awareness ability than their lower SES counterparts. A similar effect was noted in the word reading trajectories of the children in different deciles in that year. At the end of the second year, a significant disparity in word reading was found and the magnitude of the reading age gap was approximately 1 year and 4 months in reading age. This had widened substantially from a reading gap of less

than 1 month at the previous test point, which was at the beginning of this school year. As this was the first full year of school, it is felt that this represented a more accurate picture of the children's development of pre-reading and word reading skills.

The results could indicate that the whole language approach in teaching reading may have favoured high-SES children with greater levels of pre-reading skills, who were then able to better utilize text-based strategies taught in school to enjoy more successful reading experiences. It could also indicate that higher levels of pre-reading skills may have reduced the decoding demands on these children, allowing them more processing time for using cues, such as semantic and syntactic cues, to comprehend a text. Low-SES children, without such high levels of pre-reading skills, may have been trapped in cycles of incidental learning, which may take longer. Additionally, with not as much practice in actual reading as their high-SES peers, they may not have fully benefitted from a top-down approach to reading instruction. As children did not gain equally, faucet theory (Alexander et al., 2001) was not supported. It appears that the results add weight to literate cultural capital theory (Tunmer et al., 2006), because low-SES children, with lesser literate cultural capital at school entry, progressed in reading much more slowly than high-SES children during the school year.

Literacy Development in the Summer Breaks

Research Question 3: Do children in decile 1, 4, 7 and 10 schools maintain their alphabet knowledge, phonemic awareness, vocabulary knowledge and reading levels over the summer holidays or is there a summer slide?

Looking at the summer effect on children's reading skills and reading ability, this research question addressed the impact of two summer holidays on children's reading achievement. The first summer was between Year 0 and Year 1, after the children had spent an average of 1.65 months in school. The second summer occurred between Year 1, which was a full school year, and Year 2. The following sections detail progress in these skills over the first and second summer.

In the first summer, beginning with alphabet knowledge, the lowest decile children lost almost 30% of their alphabet knowledge, compared with what they had

before the summer holidays commenced. Compared to what they had gained in the school year prior to the summer vacation, the lowest decile children lost approximately 50% of their school year gains in alphabet knowledge. The highest decile children, on the other hand, gained in alphabet knowledge by almost 10% over the summer holiday. Compared to their school year gains, decile 10 children gained an additional 50% of what they had gained in the previous school year. Alphabet knowledge is considered to be factual knowledge, which, as Cooper et al. (1996) explain, may be lost during the summer break due to lack of opportunity to practice using this knowledge. Consequently, this may impact children differently, depending on how much this factual knowledge was used over the summer. Children in this study lost ground in alphabet knowledge along SES lines, with decile 1 children losing the most, and decile 4 children also experiencing losses, but not as great as those affecting decile 1 children. Decile 7 children, on the other hand, gained but not as much as decile 10 children.

In terms of phonemic awareness knowledge, over the first summer, only the highest SES children gained ground, by approximately 55% of their pre-summer knowledge. Compared to the school year gains, decile 10 children gained more over the first summer break than they did in their time in school in Year 0. This would make sense to a certain degree, as the average time spent in school was 1.65 months and the summer break lasted approximately 1.75 months, which was fractionally longer in duration. All other deciles lost ground in phonemic awareness knowledge, though decile 1 children were the most disadvantaged. Similar to their losses in alphabet knowledge, this group lost 50% of their school year gains in phonemic awareness skills. It appears that the reciprocal relationship between phonemic awareness skills and alphabet knowledge development (Kim et al., 2010; Share, 2004; Walley et al., 2003) may have contributed to high-decile children's enrichment in these two skills. Children with greater phonemic awareness have been found to have greater ability to recognize letter sound phonemes from letter names (Share, 2004). This could have been the case for high-decile children in this study. In turn, letter name knowledge has been found to be necessary in developing phonological sensitivity (Castles et al., 2011). This could also have enabled high-decile children, with greater letter name knowledge to continue to develop phonemic awareness knowledge over the summer. The reverse effect could have occurred for lower decile children.

Children made similar progress in vocabulary knowledge over the first summer. Bearing in mind that there was a vocabulary gap among different SES groups at school entry, vocabulary development over the summer resulted in this gap being maintained. This was encouraging in the sense that the gap between high- and low-SES children did not widen. However, it also did not close.

In terms of word reading, children also made similar progress over the first summer and there were no statistically significant differences among the four groups. This might have been caused by the floor effect of the measure used. At the end of the first summer, the reading age gap between the highest and lowest decile groups was minimal at around 2 months. Interestingly, decile 1 children lost as much as they had gained in the previous school year, while decile 10 children only marginally improved on their school year gains.

Considering the first summer's results in its entirety, loss of alphabet knowledge and phonemic awareness ability among decile 1 children did not translate to loss in reading ability. As mentioned, this could have been the result of the floor effect on the word reading measure, whereby all average scores for this group, up to the end of the first summer, hit the bottom end of the distribution at below 0.5 raw score points for low-SES children. For the highest decile children, gains in alphabet knowledge and phonemic awareness also did not translate to significantly higher reading gain scores compared to their low-SES counterparts, even though gains were registered over the previous school year and the summer break.

Results showed a significant summer slide effect for low-SES children in alphabet knowledge and phonemic awareness in the first summer. The gap between high- and low-SES children widened over the first summer for these skills, reflecting Matthew effects (Stanovich, 2008), in which the children with a greater degree of reading skills (alphabet knowledge and phonemic awareness) were able to enhance their levels of these skills. In contrast, children who started the summer with a lesser degree of these skills lost some of their ability in those skills through the holiday period. The faucet theory (Alexander et al., 2001) can also be used in the interpretation of these results. While children were out of school, learning opportunities may not have been the same for all children, resulting in some children losing ground and others gaining in

these skills. As Alexander et al. (2001) explain, progress in reading and related skills over summer is influenced by home background and SES. Low-SES children may not have had the same opportunities for enriching experiences that high-SES children had, resulting in a widening gap in rich and poor children's reading ability and reading-related skills.

As beginning readers, it is thought that the summer slide effect would be more greatly reflected in these pre-reading skills than in actual word reading, as all children in the study would still be picking up these skills at the beginning of formal schooling. Hence, a backslide in such skills poses possible wider implications. The first is that time would need to be spent in the following school year to bring these children back up to the point where they were at the end of the previous school year. Secondly, the gap between these children and those who gained ground in these skills widened over the summer, with the latter group starting the next school year ahead of where they had left off the previous year. A third implication would be delayed reading progress in two ways. Individually, these skills have been shown to be reliable indicators of future reading development (Ehri, 2014; Kim et al., 2010; Lonigan et al., 2008; Lundberg et al., 2012; McBride-Chang, 1998; National Early Literacy Panel, 2008; Nicholson 2003; Stanovich, 2008; Torgesen, 2002; Torgesen & Hudson, 2006; Tunmer et al., 2008; Tunmer & Nicholson, 2011). As a result, losing ground over the summer would result in negative effects on reading achievement in future years as well. The other way that summer slide in reading-related skills affects literacy development is connected to the reciprocal relationships between these skills. Higher levels of phonemic awareness help children to deduce letter-sound correspondences from their alphabet knowledge, while higher levels of letter name knowledge also enhance phonological awareness (Adams, 2011; Adams et al., 1998; Ehri, 2014; Foulin, 2005; Share, 2004; Turnbull et al., 2010). These phonological awareness skills and alphabet knowledge then lead to increased reading development, which in turn facilitates vocabulary development. Rising levels of receptive vocabulary mean that as children read more, they are increasingly able to comprehend more of what they read by guessing meanings from context (Ehri, 1998; Mol & Bus, 2011). Hence, reduced alphabet knowledge and phonemic awareness for the low-SES children in this study could have negatively impacted on their reading acquisition later on. Conversely, increased knowledge of these pre-reading skills could have had the opposite effect on the high-SES children's future reading development.

Moving on to the second summer, by which time all children had spent a full year in the second year of school, changes in development of pre-reading and reading skills were more clearly defined. Children in the lower deciles were still losing ground in alphabet knowledge, while the higher decile children gained in this skill. Once again, the alphabet knowledge of low-SES children may have deteriorated due to a lack of practice in using this knowledge in the context of literacy-related activities occurring in out-of-school environments. Decile 1 children lost approximately 25% of what they had gained in the school year, with their alphabet knowledge scores at the end of the summer lower than the decile 10 children's *school entry* scores on the same measure, which was more than a year earlier. Decile 10 children gained on average by about one letter, but this could well have been due to the ceiling effect, as decile 10 children had almost full knowledge of the alphabet by the end of that summer.

Similar trends were noted in the phonemic awareness, with lower SES children registering losses, while higher SES children made gains. Children in decile 1 had lost almost all phonemic awareness knowledge by the end of that summer, placing them almost back at square one in terms of their school entry phonemic awareness scores. This result does not bode well for children in this group in terms of future reading progress. As mentioned previously, phonemic awareness contributes to phoneme-grapheme knowledge, which in turn aids the decoding process in reading, so low-SES children in this study without these skills may have experienced difficulty in reading (Burgess, 2002; Bus & van Ijzendoorn, 1999; Castle et al., 1994; Ehri, 2014; Kim et al., 2010; Lonigan et al., 2000; Lundberg et al., 2012; Nicholson 2003; Tunmer et al., 2013).

The second summer was also the first instance that decile 1 children lost ground in vocabulary development. Low-SES children lost approximately 40% of what they had gained in the previous school year. Perhaps at this point, the cumulative impact of less general and language interaction in the home contexts, as well as lower quality of speech in lower SES families (Hart & Risley, 1995) affected the vocabulary development of this group of children. Certainly, the opposite could have been true for high-decile children, who gained an additional 70% in vocabulary over the summer break, compared to that which they had gained during the preceding school year.

Looking at word reading progress over the second summer, once again, the two lower deciles lost ground, with the lowest SES children losing approximately 50% of what they had gained in the previous school year. While this group began the summer at a reading age of about 5 years and 6 months, over the 7-week summer break, they lost 3 months in reading age, so ending the summer at an average reading age of 5 years 3 months. On the other hand, by the end of the second summer, on average, the high-SES children were reading at 7 years 2 months, with the reading gap between these two groups measuring about 2 years. This result was also echoed in the passage reading ability of the different groups of children, with low-decile children also losing ground while high-decile children made significantly greater gains.

Situating the reading progress result in the literature, the 3-month loss in reading accuracy result among low-SES children was similar to findings by Heyns (1978), where some children lost ground in reading by 2.8 months. To compare the results of this study with that of Downey et al. (2004), low-SES children in this study gained about 5 words per year in Year 1 of school, while high-SES children gained about 16.5 words per year. Hence the gap over this year developed at a rate of 1.15 words per month during the school year, which was effectively 10 months. In the approximately 2-month summer, children in low-SES schools lost about 2.5 words while high-SES children gained about 3.5 words. This gap equated to 3 words per month. Hence, the gap widened more quickly over the summer, at between 2 and 3 times faster. This was similar to Downey et al.'s (2004) result of a 2 to 3 times greater reading development by the high-SES group compared to the low-SES group.

The summer reading development among children in this study was, however, greater than some of the summer losses recorded in the literature. Firstly, the average 3 month loss by low-decile children in this study was considerably greater than the meta-analysis by Cooper et al. (1996), which found a reading accuracy slide of less than 1 month. Compared to the Borman et al. (2009) study and the Davies and Aurini (2013) study, in which children experienced an average of 5% and 6% loss respectively, the 50% loss by the children in this study was also considerably greater. It should be noted though, that the Davies and Aurini (2013) study found that the bottom quartile of their sample had lost the equivalent of 3 months of literacy. This result was similar to that of the present study.

In terms of reading comprehension, the results of this study indicate that over summer, the gap between high- and low-SES children widened. Although this was not significant, it is similar to findings in the study by Alexander et al. (2007b) who found that low-SES children made minimal cumulative losses in reading comprehension in the first four summers after starting formal schooling, while high-SES children made considerable gains over the same period. They found, however, that these cumulative gains and losses resulted in a much bigger gap among these children in Year 9. Therefore, in this study, while reading comprehension scores among the different groups did not reflect hierarchical changes along SES lines, the differences cannot be ignored. It could be that differences in decoding widen out over the summer because decoding requires practice, in a 'use it or lose it' scenario, and some children do not practice reading during this time. Comprehension, however, is more than just decoding. It involves what Whitehurst and Lonigan (1998) term outside-in processes, including knowledge about conventions of print, syntax and narrative discourse structure. Hence, comprehension skills may be more resistant to change. The effects of the minimal gains and losses in reading comprehension skills over the second summer may have impacted the children in the study as they progressed through later years in school, as found in the study by Alexander et al. (2007a).

The reading comprehension result of this study, showing marginal gains and losses over the second summer with no significant differences between deciles, was not similar to results found in two studies reviewed in the literature. The first, by Cooper et al. (1996), was a meta-analysis which found a summer reading comprehension loss of about 3 months. The second study was a local one (Tiruchittampalam, 2006) that found a bigger summer reading comprehension loss of about 6 months. One possible explanation is that the age range of the children in the reviewed studies was between 5.5 years and 14 years. This was different to the children in this study, whose reading comprehension ability was measured when they were between 6 and 7 years old. As Cooper et al. (1996) explain, the negative effect of summer does increase with students' grade levels. The majority of children in this study may still have been mainly mastering decoding skills and were less focused on developing comprehension skills, and so the differences might not have been as evident. The summer losses may have increased, had the children's comprehension ability been tracked as they progressed further through school.

In the second summer, Matthew effects (Stanovich, 2008) were noted in all pre-reading skills and reading ability, with a widening gap developing between the low- and high-SES groups. The faucet theory (Alexander et al., 2001) also resonated in this second summer result, in that it perhaps reflected the diminished opportunities for low-SES children. One possible reason for uneven gains and losses in reading and reading-related skills could be attributed to the volume of reading that occurred over the summer, as these are strongly linked (Allington & McGill-Franzen, 2013; Heyns, 1978; Kim, 2004). According to Share and Stanovich's (1995) self-teaching hypothesis (as cited in Allington & McGill-Franzen, 2013), extensive practice and high-success experiences in reading contribute to children's development of phonemic awareness, decoding skills and vocabulary knowledge acquisition. Building on these skills, enhanced reading proficiency develops as readers have repeated successful exposure to common orthographic letter patterns leading to heightened inside-out skills, such as greater automaticity of word identification. The high-SES children in this study may have had greater opportunities to engage in reading practice than the low-SES children. Therefore, with increased volume of reading, the high-decile children may have developed greater proficiency in reading than the low-SES children (Allington, 2009). High-SES children's vocabulary bank may have also expanded through extensive reading, as reading texts are a useful source of world knowledge. Extensive reading could also have developed children's outside-in skills, such as knowledge of written language syntax, and understanding of grammar related to written texts (Allington & McGill-Franzen, 2013; Whitehurst & Lonigan, 1998).

On the other hand, low-SES children in this study may not have reaped as much of the benefits of extended reading practice. This may have been partly due to the fact that volume of reading can be affected by book access (Kim, 2004). Low-SES children generally have less access to books in the home (Constantino, 2005; Fryer & Levitt, 2004; Heyns, 1978; McGill-Franzen et al., 2002), so this could have been one factor that affected the low-decile children in this study. One study found that reading four to five books over the summer prevented the summer slide in reading among children in the sixth grade (Kim, 2004). Another study by Kim (2006) found only marginally significant effects when fourth grade children read about eight books. While the actual number of books that need to be read to prevent the summer slide is as yet unclear, results indicate that the number is not necessarily a large one. However, as low-decile

children in this study lost ground in reading, it seems that they may have been reading fewer than four to five books over the 7-week summer break. A study by Allington et al. (2010), with children in the same age group as those in this study, also found that increased access to books over two consecutive summers brought about significant gains in comprehension scores in the second year. Therefore, the cumulative effect of summer reading is another factor to be considered. Hence, it could also be that the low-decile children who experienced summer reading loss in the second summer may have been affected by a possible lack of book access and reading activity over the first summer as well. In this case, the result of the second summer would perhaps reflect the cumulative effects of both summers in the study.

Some experts claim that volume of reading and book access may not be the only factors in summer reading loss and suggest parent and teacher scaffolding of summer reading may also contribute to uneven gains and losses (Kim & White, 2008). Another reason for the summer slide could have been that the variable teacher input about children's summer reading could have occurred before the summer holidays in the different decile schools. Greater parent scaffolding focusing on comprehension strategies and reading fluency practice may have occurred among high-SES children and this could have resulted in greater gains made by this group.

Some researchers argue that beginning readers are not likely to gain much from voluntary reading (Kim, 2007; National Reading Panel, 2000), without assistance in decoding and comprehension monitoring. In the summer, this assistance would arise in home and community settings. Some researchers point to the SES link in differences in shared reading experiences in the home (Whitehurst & Lonigan, 2001). Ninio (as cited in Whitehurst & Lonigan, 2001) found that in the context of shared reading, mothers from lower SES families engaged in fewer teaching behaviours with their children compared to mothers of higher SES families. The low-decile children in this study may have had similar shared reading experiences in the home with fewer teaching behaviours including less decoding assistance and comprehension monitoring, perhaps contributing to their loss in reading skills.

In sum, over the first summer, the lowest decile children in the study did not maintain their alphabet knowledge and phonemic awareness gains, compared to their

school year progress. They also failed to keep up with their more advantaged, high-SES peers. However, they managed to make similar gains in vocabulary knowledge and reading accuracy when measured against the high-SES cohort. Over the second summer, low-SES children did not maintain their gains in all measures, which were alphabet knowledge, phonemic awareness, vocabulary knowledge, word reading and reading accuracy. In contrast, the high-SES children gained in all measures. The exception was reading comprehension ability, in which all children made marginal gains or losses, with no significant differences between groups. The general pattern over the second summer was that low-decile children made losses while high-decile children made gains in the measures.

The Summer Reading Effect over Two Years

Research Question 4: Does the summer reading effect widen over the two summers?

This question looked at whether the summer effect widened over two consecutive summer holidays. The results showed that the gap between the lowest decile children and the highest decile children widened on word reading scores from a little under 2 months in reading age at the end of the first summer to a gap of 2 years by the end of the second summer. This represented a widening of the reading gap by more than 10 times from one summer to the end of the next one.

The gap was almost minimal in the first summer. Pre- and post-summer word reading scores were below 2 raw score points for all deciles, indicating a possible floor effect. The actual gap between the highest and lowest deciles increased by only 0.44 raw score points in the first summer and this did not represent a significant difference between groups. The reading age difference by the end of the first summer was about 2 months. This may have been because the children had not been in school long and were probably still developing word reading skills. During the second summer, pre- and post-summer word reading scores among different decile groups diverged much more. The gap between highest and lowest deciles at this time increased by 5.99 raw score points. This represented a summer effect that was over 10 times greater in the second summer than the first. Additionally, the reading age difference had increased considerably to about 2 years. Looking at the rate of reading loss over the two summers, in the first

summer, the gap between rich and poor children rose by 0.25 words per month, while in the second summer, this gap increased more quickly, by 3.42 words per month. This represented the gap widening more than 10 times faster over the second summer compared to the first summer.

The only other study that examined seasonal fluctuations in reading was the study by Alexander et al. (2007b), who measured overall reading comprehension, rather than word reading ability. The results of this study are dissimilar to the Alexander et al. study (2001), who found the results for the reading comprehension gap fluctuated over four summers, with the biggest gap in the first summer, after first grade. The results of the present study showed an increasing reading gap over the two summers. This is consistent with Whitehurst and Lonigan's (1998) model of emergent literacy skills determining development of reading ability, in that when the low-SES children in this study experienced loss in the pre-reading skills of alphabet knowledge and phonemic awareness, their ability to decode was diminished and thereby word reading was correspondingly affected. As the high-decile children gained in the pre-reading skills of alphabet knowledge and phonemic awareness, it was to be expected that they also gained in word reading ability.

From a theoretical standpoint, the summer slide effect appears to support the Matthew effects theory (Stanovich, 2008), whereby the good readers get better more quickly than the poor readers, who actually regress. The fan spread is evidenced over the two summers, although it was only significant over the second summer. The results also support the faucet theory, in that the school resource faucet being shut off from all children results in unequal gains among different groups of children. As explained by Alexander, Entwisle and Olson (2001, 2004), learning opportunities are not available for all children. This may stem from the limited home resources of low-SES children, lack of intrinsic motivation to read, and lower quality and quantity of real interaction with family and community that result in low-SES children having delayed reading development.

Literate Cultural Capital and Literacy Development

Research Question 5: Is there an association between the literate cultural capital of new entrants at school entry and the school year and summer changes in reading ability?

In general, the results in this study showed that the literate cultural capital variables of alphabet knowledge, phonemic awareness, and receptive vocabulary knowledge at school entry mostly correlated positively with word reading over the four time periods during which children were assessed. However, greater positive correlations between these literate cultural capital measures and word reading were noted during the school years than over the summer breaks. An interesting finding was that no significant positive correlations were found between literate cultural capital variables at school entry and reading development over the first summer. The correlations between each of the literate cultural capital variables and reading development are discussed in more detail in the following sections.

Comparing the first school year to the next, it is noted that alphabet knowledge at school entry increasingly impacted word reading from a moderately positive relationship, in the first year, to a strongly positive correlation in the second year. This finding may suggest that a larger proportion of beginning readers may still have been at the stage of acquiring alphabet knowledge, rather than applying this knowledge in decoding words. Hence, the range of reading gain scores in the first school year was not so large, generating only a moderate correlation between the two variables. By the second school year, as a greater proportion of children developed higher levels of pre-reading skills, they would have been more able to apply these skills in word reading, yielding a wider range of scores in reading progress. This then produced a stronger correlation between alphabet knowledge and word reading achievement during this time. Over the first summer, alphabet knowledge did not correlate with reading gains or losses. This could have been because the degree of gain or loss in reading in that first summer was minimal and was not sufficiently large for a relationship to be detected between that and alphabet knowledge. In the second summer, changes in word reading ability were more clearly pronounced, which may explain the weak but positive correlation result then.

Phonemic awareness at school entry enjoyed a strong positive relationship with word reading ability during both school years, and a weak positive relationship over the second summer. Similar to alphabet knowledge, there was a negligible relationship between phonemic awareness at school entry and word reading ability over the first summer. A similar explanation to that given above for the lack of correlation between alphabet knowledge and word reading ability during this time could be used to interpret this absence of correlation.

Vocabulary knowledge showed a weak positive relationship with word reading ability in the first school year, but this relationship strengthened in the second school year. Hence, literate cultural capital theory is validated in the school year reading development. The amount of vocabulary knowledge at the start of school was a reasonable to strong predictor of subsequent reading progress. However, over the first summer, no relationship was evidenced. Again, the lack of any significant differences in the minimal reading gains and losses over the first summer may have prevented any relationship from being uncovered at this stage. Even though literate cultural capital theory is not reflected in this result, it could have been due to the lack of discrimination afforded by the word reading measure used in the study because of floor effects. Although age appropriate, as mentioned previously, this measure resulted in average change scores of less than 0.5 raw score points over the first summer. Over the second summer, a small but significant correlation was noted between initial school entry vocabulary scores and changes in word reading scores. This correlation may have represented a step in an increasing trend from the lack of correlation observed over the first summer to a possibly strengthening relationship developing over future summers. On the other hand, it is possible that over summer, other factors may negate the effect of initial vocabulary knowledge on changes in word reading ability during this period. It is not clear what these factors may be and further research would need to be undertaken to investigate this possibility. As it stands, literate cultural capital theory is not evidenced in the results of either summer holiday period as far as school-entry vocabulary knowledge is concerned.

This finding for literate cultural capital adds to the literature in showing the individual contributions of aspects of literate cultural capital at school entry to reading progress in the early years of children’s schooling and over the summer holidays. This

is in contrast to Tunmer et al.'s (2006) study, which used a composite measure of literate cultural capital at school entry to predict reading achievement later on, in Year 7. The results of this study suggest that alphabet knowledge and phonological awareness at school entry are better indicators of later reading development than school entry vocabulary knowledge. The implications of this are that it would perhaps be most efficient to target any remedial efforts towards enhancing children's knowledge of and ability in the stronger predictors of early reading success, which are alphabet knowledge and phonological awareness.

In sum, over the two school years, there were moderate to strong correlations between all literate cultural capital variables measured in this study and word reading ability. This lends support to literate cultural capital theory (Tunmer et al., 2006), which states that the literate cultural capital children possess at school entry determines how well children learn to read later on. The data in this study supports Tunmer et al.'s (2006) literate cultural capital theory in the second summer, but not in the first. An explanation could be that word reading ability was also at low levels in the first summer and hence no relationship could be discerned. However, by the time of the second summer, word reading ability was developed to a sufficient degree that correlations could be detected between literate cultural capital variables and word reading. A further explanation could be that perhaps literate cultural capital knowledge and word reading skills developed more effectively in tandem in a classroom context, where more formal reading instruction and shared reading activities took place. Reading instruction in the whole language classroom in schools may have indirectly utilized the literate cultural capital reading sub-skills to enable children to practice applying these skills in decoding and guessing meaning from context. With greater practice opportunities, reading development could possibly have been accelerated. This was in contrast to what may have happened over the summer. Home environments varied from child to child, and activities over the summer may not have engaged the children's reading sub-skills as explicitly as formal schooling, which may explain the weak correlations that were found between literate cultural capital variables and word reading progress during this time.

Literate cultural capital variables correlate significantly with subsequent word reading progress, as shown in this study and other research by Tunmer et al. (2006). In this study, the variables of alphabet knowledge, phonemic awareness and vocabulary

knowledge correlated strongly over the beginning two school years, and increasingly over the first two summer holidays. It then stands to reason that the level of such skills needs to be ascertained at school entry to identify which children are most likely to be at risk of delayed reading development, as previously suggested by McLachlan (2008). This would be the first step in addressing the skills deficiency that exists at school entry for poor readers and so adopt a preventive approach to reading difficulty rather than the current practice of, as Nicholson (2005) explains, taking the 'wait to fail' approach that may eventually lead down the Reading Recovery path. The latter alternative, as has been discussed, has so far not closed the reading gap between good and poor readers.

Motivation to Read

Research Question 6: Is motivation to read related to progress in reading?

The general pattern of results, in terms of motivation to read, was that it correlated positively with reading progress during the two school years. That is to say, when school was in session, children who displayed greater reading progress had higher levels of motivation to read. To recap, motivation to read was measured once, at the end of the second year in school and correlations between this measure and reading progress over the two school years were made. Moderate positive correlation relationships were noted between motivation to read and reading achievement in the first year of school. However, strong positive correlational relationships were noted in the second year of school when motivation to read was measured concurrently with reading progress.

As mentioned in the literature, motivation to read can be analysed through the two sub-scales of value of reading and reading self-concept. The former is a gauge of the significance that children placed on reading tasks, while the latter concerns self-rating of reading ability, as explained by Gambrell et al. (1996). Looking at the relationship between value of reading and reading achievement, there was a weak but positive correlation in the first year of school, but it strengthened over the next year to a moderate positive one. Children who experienced greater reading progress were the ones who also valued reading and this correlation increased from the first school year to the next.

As noted by Gambrell (2011), factors that may contribute to children's value of reading include interest in books, accessibility of books, amount of time spent reading, pleasure derived from reading, and social interactions that occur both at home and in the school context around activities such as shared book reading. One or more of these factors may have contributed to the children's value of reading in this study as they progressed through school. This might have been because in more formal school settings, with increased successful reading experiences, a stronger relationship between these two variables may have developed.

Lower correlations were noted in the first school year compared to the second year. One explanation may be the comparative length and impact of the two school years. In that first year, children on average only spent about 1.65 months in school. This was considerably shorter than the second full school year comprising about 10 months. Additionally, reading gains in that first year were marginal compared to the second year of school. Therefore, any effects of the first 'year' of schooling on the children's value of reading would likely have been correspondingly smaller than those of the second year.

Another possibility is that in the first year of school, perhaps children were not as engaged as much in actual book reading, but were instead still mainly developing skills associated with reading, such as gaining alphabet knowledge. Hence, not as many children would have had the capacity to engage in much independent reading, resulting in a weaker relationship with the value of reading. In contrast, at the end of the second year, more children might have been able to read age-appropriate texts, with some children reading words about 8 months beyond their word reading age. With greater ability to engage in independent reading behaviours, the factors affecting value of reading may have had more of an impact. Firstly, they could have been able to spend more time reading because they would not have had to rely solely on shared book reading experiences with more proficient readers. Secondly, these children may have been able to make better decisions about choosing books that interested them, and thus they may have derived greater pleasure from reading. Thirdly, the effect of a full school year of social interaction with peers and teachers could have raised the value of reading for children.

The results of this study confirm that the value of reading aspect of motivation enjoys a strong positive correlational relationship with reading achievement, as suggested by Wigfield and Guthrie (1997). Their findings were that interest and pleasure in reading were the key components that impacted on the value that children placed on reading. This resulted in children who valued reading highly reading a great deal more than those who did not. As the length of time spent reading has a strong effect on reading progress, children who valued reading highly were likely to make more progress, as posited by Gambrell (2011), Morgan and Fuchs (2007), and Retelsdorf et al. (2014). Similarly, in the present study, interest and enjoyment levels may have affected the children's value of reading, resulting in correspondingly higher or lower engagement levels in reading, thereby affecting reading achievement.

Turning to the second sub-scale of reading self-concept, in this study, the relationship between self-concept in reading and reading progress also strengthened over the two school years from a weak to strong positive correlational relationship. This strengthening relationship is noted in Park (2011) and is similar to the findings of Chapman et al. (2000). The study by Chapman et al. (2000) specifically found lower reader self-concept related to lower levels of phonological awareness and letter knowledge at school entry. This study has found that lower levels of phonological awareness and alphabet knowledge at school entry resulted in lower levels of reading progress in the two following school years, and that lower reading progress then correlated with lower perceptions of reading ability. Therefore, similar to the Chapman et al. (2000) study, lower levels of phonological awareness and letter knowledge at school entry were found to correlate with lower reader self-concept, leading to lower levels in motivation to read, which could have contributed to the children's lack of reading progress. The explanation of a shorter first 'year' of school and a longer second year of school in interpreting the weak to stronger correlational relationship that was observed for value of reading can also be applied to patterns of reading self-concept development.

As explained by Gambrell et al. (1996), reader self-concept relates to a reader's perception of their own ability to read. In their summary of aspects of reader motivation, Retelsdorf et al. (2014) explain that self-concept develops as students compare their own reading performance to that of their peers. In the first 'year', the

children may have had limited time to make these kinds of comparisons accurately and hence formulate an opinion about their reading ability. On the other hand, the longer second year would have presented the children with much greater opportunity to do this, allowing children to make a more accurate self-rating. The children with greater levels of reader self-concept may have enjoyed increased confidence levels in their reading ability and so been more willing to engage in reading tasks, compared to their counterparts who had lower reader self-concept, as suggested by Morgan and Fuchs (2007) and Retelsdorf et al. (2014).

Unsurprisingly, overall motivation to read, in general, also followed trends similar to the relationship between the value of reading or reader self-concept, and reading development. A recurring theme in the research literature is that motivation to read is strongly correlated to reading achievement (Gambrell, 2009, 2011; Malloy & Gambrell, 2012; Morgan & Fuchs, 2007; Retelsdorf et al., 2014). This has been confirmed in the latest PIRLS study involving New Zealand children. Several leading researchers (Chapman & Tunmer, 1997; Chapman et al., 2000; Morgan & Fuchs, 2007; Stanovich, 2008; Wigfield & Guthrie, 1997) have suggested that Matthew effects (Stanovich, 2008) are at work. Children in this study with higher overall motivation to read levels may have engaged in more reading which could have resulted in greater progress in reading ability. This may have in turn led to a higher value being placed on reading and higher levels of reading self-concept. The result of this could have been increased overall motivation to read. This in turn could have led to further engagement in reading and even greater reading achievement in a positive feedback cycle of ‘rich get richer’ Matthew effects (Stanovich, 2008; Wigfield & Guthrie, 1997). The converse could have been true for children with lower overall motivation levels, as the negative effects of less time spent reading and less reading skill development compounded to make their reading experiences less successful and pleasurable, possibly lowering overall motivation levels. Considered from this viewpoint, there could well have been a reciprocal effect between motivation to read and reading achievement as suggested by Wigfield and Guthrie, (1997).

Limitations and Directions for Future Research

One limitation of the study was that some of the instruments used resulted in likely floor effects as a number of children hit the bottom end of the scoring scale. Examples of measures where this occurred were the measures of phonemic awareness and graded word reading. Greater discrimination of phonemic awareness and word reading ability, especially at the earlier stages of the study, may have been possible had alternative measures been used.

Another limitation was that the Motivation to Read Survey relied on self-reported responses. These responses could have been influenced by the children's desire to present themselves in a more favourable light and hence the reliability of the data could have been compromised. Future research could triangulate data by collating observational responses of children's motivation to read from teachers and parents.

An additional limitation is that variations in reading progress were essentially measured over two time periods each year, which were during the school year and summer break. However, within the school year, there were breaks of varying lengths. Although these were not as long as the summer breaks, it is possible that they could have had some effect on progress made during the school year. This is especially so as this study has found that the rate of growth in reading disparity increased over the holidays. Future research in the measurement of changes in word reading ability between decile groups over these holidays may shed more light on how the disparity develops during the school year.

The classification of the SES backgrounds of children in the study according to the MOE's school decile ranking could also be considered a limitation. Decile ratings are assigned by the MOE based on census factors including household income and parental occupation. A decile 1 school has the highest proportion of low-SES background children, while a decile 10 school has the lowest proportion of low-SES children. Yet, there is a possibility that some high-SES background children may have attended a low-SES school and vice versa. This could have affected the results of this study, although the general trends of the results did reflect reading development trajectories that were stratified along the school SES decile ratings, as defined by the

MOE. School decile ratings are commonly used to reflect SES backgrounds of children in New Zealand. However, more detailed data on individual children's SES level could have provided confirmation of each child's SES background.

A further possible limitation was the use of gain scores to assess relative progress of the reading and pre-reading skills of the children, although the debate is ongoing. Some statisticians argue that the repeated measures or analysis of covariance is preferable. However, others argue that using gain scores is better than the covariance approach. Allison (1990) argues that these claims are unfounded. In this study, the results for each procedure are exactly the same. In the results chapter, the correlation of the motivation to read measure with word reading gains between T1-T2 and T3-T4 may have missed some individual variance in gains but follow-up correlations of the motivation measure with reading scores at T2 and T4 showed almost identical correlations, which indicates that the gain score correlation procedure was equivalent.

In addressing the problem of the reading disparity, it is important to know the extent of the problem of underdeveloped pre-reading skills. While the present study tracked alphabet knowledge, phonemic awareness, and vocabulary knowledge over two school years and two summers, children in the lowest decile groups had less knowledge and ability in these skills at the end of the study than the highest decile group at the beginning. Extended tracking of the development of these skills as the children progress through school would reveal if and when the low-SES children attained sufficient levels of these skills to read more efficiently. This would facilitate more targeted remedial action in specific pre-reading skill deficiencies earlier on.

Conclusion

Returning to the reading disparity among children of different SES backgrounds, the findings of this study showed a significant high-frequency word reading gap when children began school at 5 years of age. Additionally, significant differences in literate cultural capital variables were present among children of different decile groups. These differences in crucial pre-reading skills were a precursor to the differential developmental trajectories in reading development of children from different decile groups. Perhaps unsurprisingly, the study noted a widening reading gap during the

period of the study over two school years and two summers. This culminated with the highest decile children reading at almost 2 years above the reading age of the lowest decile children by the end of the study.

To conclude, based on the findings of this study, the reading disparity seems partly due to how much literate cultural capital children enter school with. Over the school years, reading gains may be made by all decile groups, as found in this study, although these gains may not always be equal. The disparity can develop substantially over the school year, and this is a reflection of how the current school system may advantage good readers, generally from high-decile schools, over poor readers in the lower deciles. Over the summer, reading development can follow different trajectories, with some children experiencing additional reading gains, but others losing ground and experiencing a summer reading slide. Hence, the summer break can also result in the reading disparity widening. In one summer break alone, the gap between low- and high-decile children increased at a rate of almost 3 times the rate the same gap developed during the school year, as found in the second year of this study. This occurred as the highest decile children gained by as much as 20% over one summer, while the lowest decile children experienced a summer reading slide, losing about half of what they learned in the previous school year. This perhaps reflects the effect of unequal out-of-school learning opportunities when school is not in session.

A cautionary note is that while the results of the present study are clear, the discussion of possible explanations for the results has been necessarily speculative in that the results of the study are descriptive and correlational and do not show causes. The present discussion of causes has focused on relating the results to previous research on similar issues as a way to suggest possible causal factors to explain these results.

An important implication of this study for educators is that SES inequalities in literate cultural capital need to be identified early on, perhaps at the preschool level and remediated especially among lower SES children. Literacy cultural capital benchmarks for school entry and subsequent progress need to be developed and used in schools so that educators may more accurately gauge children's reading development against national norms. The impact of the summer vacation should not be ignored. Measures to prevent the summer slide in reading need to be implemented, targeting children at risk

for reading difficulty. These measures could help in leveling out the playing field, and perhaps reduce the persistent reading gap that continues to exist among New Zealand children.

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Appendices

Appendix A: Ethics Approval

OFFICE OF THE DEPUTY VICE-CHANCELLOR
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20 June 2007

Shanthi Tiruchittampalam
c/- Professor T Nicholson
College of Education
Massey University
Albany

Dear Shanthi

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 06/083
"A longitudinal survey of the effects of the summer holidays on children's literacy"

Thank you for your application. It has been fully considered, and approved by the Massey University Human Ethics Committee: Northern.

Approval is for three years. If this project has not been completed within three years from the date of this letter, a reapproval must be requested.

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

Yours sincerely

Ann Dupuis

Associate Professor Ann Dupuis
Chair
Human Ethics Committee: Northern

cc. Professor T Nicholson
College of Education

Appendix B: Information Sheets and Consent Forms

Private Bag 102 904,
North Shore Mail Centre,
Auckland, New Zealand
Telephone: 64 9 443 9685
Facsimile: 64 9 443 9717

Principal and Board of Trustees of XX School
Information Sheet

Title of research: A longitudinal survey of the effects of the summer holidays on children's literacy

To: Principal and Board of Trustees

My name is Shanthi Tiruchittampalam. I am a PhD student in the School of Education at Massey University based in Albany. I wish to conduct a longitudinal survey of the effects of the summer holidays on children's literacy. Tom Nicholson will be my main supervisor in this study.

The reason for the survey is this. Some overseas studies have found that children lose ground in literacy during the summer break. If so, then schools may need to take this into account when making instructional plans for the new school year. The purpose of this study is to find out if this might be the case in New Zealand.

A group of 120 children from four schools across a range of decile levels will be invited to take part in this study. Participants will be all new entrants beginning school on or after July 2007. All participants will be assessed using standardised, age-appropriate literacy measures as and when they enter school in 2007. Assessments will take about an hour and a half per child. Subsequent assessments will occur several times during the study.

1. At the end of the 2007 school year
2. In the beginning of the 2008 school year
3. At the end of the 2008 school year
4. In the beginning of the 2009 school year

Following the first round (1) of assessments, new entrants from each school will be matched based on chronological age, gender, and pre-literacy skills to form four groups of 30 children from each school. Assessments at stages (2) to (4) will only involve this matched group of children.

Parents will be asked to give their consent and to complete a Pupil Information Sheet. Teachers of the children will need to complete a Strengths and Difficulties Questionnaire for each child.

I would like to send out information sheets and consent forms to parents to invite their children to participate in this study. I think that the best way to do this would be to include these in the enrolment packs that go out to parents. I would also like to arrange a time to meet with the liaison team/Maori, Pacific Island and Asian advisors at the school and to meet with any parents who may have questions about the project.

The results of the assessments will be kept confidential, and will only be available to the school and the parents/caregivers of each child. Names of participants and schools will be omitted in the publication of results or in any conference presentations. The results of this study will be

summarised for my PhD thesis. A summary report will be available for the school and parents at the end of the study. Data will be stored by my main PhD supervisor, Tom Nicholson, in a locked cabinet on Massey University premises and will be destroyed after 6 years.

You may ask questions at any time or to withdraw your school from this study at any time without having to give a reason up until 31 March 2009.

If you have any queries or wish to know more about the proposed study, please phone or write to me at:

Shanthi Tiruchittampalam
c/o School of Language Studies
Unitec
Carrington Road
Auckland
Tel. 815 4321 ext 6171
email : stiruchittampalam@unitec.ac.nz

Alternatively, you may contact my supervisor at:

Professor Tom Nicholson
School of Education
Massey University
Albany Campus - Auckland
PB 102904 North Shore MSC
Tel. 443 9685 or 414-0800 Ext 41281
email : t.nicholson@massey.ac.nz

I look forward to working with you.

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 06/083R. If you have any concerns about the conduct of this research, please contact Associate Professor Ann Dupuis, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x9054, email humanethicsnorth@massey.ac.nz.

Massey University
COLLEGE OF EDUCATION
Te Kupenga o Te Mātauranga

Private Bag 102 904,
North Shore Mail Centre,
Auckland, New Zealand
Telephone: 64 9 443 9685
Facsimile: 64 9 443 9717

Title of research: A longitudinal survey of the effects of the summer holidays on children's literacy

PARTICIPANT CONSENT FORM

Principal and Board of Trustees of XX Primary School

This consent form will be held for a period of six (6) years

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree* to take part in this project

I agree/do not agree* that the results of the project may be presented at a conference or in a publication

* delete where necessary

I understand that I may withdraw this school or any information traceable to the school at any time up to 31 March 2009 without giving any reason.

Signature: ..... **Date:** .....

Full Name - printed .....

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Parents/Caregivers
(XX Primary School)
Information Sheet

Title of research: A survey of the effects of the summer holidays on children's literacy

Hello,

My name is Shanthi. I am a research student in Education at Massey University in Albany.

I want to find out whether the summer holiday break has an effect on children's reading and spelling at school. Some overseas studies have found that children lose ground in their reading and spelling during the summer break. I want to find out if this also happens in New Zealand.

There are 120 children in my study. The children are from your child's school and three other schools. I would like your child to be in my study.

The benefit of being in my study is that at the end of this year and for the next two years I will send you a report about your child's reading and spelling.

If you agree that your child can be in my study I will test his/her reading, spelling and language when he/she begins school. This will take about 1½ hours for me to do. I will do the tests when your child starts school this year and again three more times in the next 2 years. The last tests will be in February or March 2009.

When I write up my PhD I will not mention your child's name or the name of the school so that you can keep your privacy. When the work is all finished in 2009 I will write a report and I will give this to you and to the school.

The study starts in July this year. Before I start, I will make a set time at school to meet with you in case you have any questions.

If you agree for your child to be in my study, please sign the consent form that comes with this and return it to the school. There is also a Pupil Information Sheet for you to fill out. This is so that we can keep in touch with you to let you know how your child is doing in the tests and so that you can let us know if you move house or if your child changes schools.

If you change your mind later on, this is no problem. Your child can stop being in my study at any time before 31 March 2009. Changing your mind is OK – it will not affect anything your child does at school. You do not have to give a reason for changing your mind.

If you have any questions or wish to know more about my study, please contact me at:

Shanthi Tiruchittampalam
c/o School of Language Studies
Unitec
Carrington Road
Auckland
Tel. 815 4321 ext 6171
email : stiruchittampalam@unitec.ac.nz

You can also contact my supervisor at:

Professor Tom Nicholson
School of Education
Massey University
Albany Campus - Auckland
PB 102904 North Shore MSC
Tel. 443 9685 or 414-0800 Ext 41281
email : t.nicholson@massey.ac.nz

I look forward to working with you.

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 06/083R. If you have any concerns about the conduct of this research, please contact Associate Professor Ann Dupuis, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x9054, email humanethicsnorth@massey.ac.nz.

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Auckland, New Zealand
Telephone: 64 9 443 9685
Facsimile: 64 9 443 9717

Title of research: A longitudinal survey of the effects of the summer holidays on children's literacy

CONSENT FORM
Parents/Caregivers
(Glen Eden Primary School)

This form will be held for a period of six (6) years

I have read the form that tells about this study. It has told me all I need to know. I know I can ask more questions at any time.

I agree/disagree that my child, _____ can be in Shanthi's study.

I agree/disagree that Shanthi's study can be made public at a conference or in a written report.

I know I can take my child out of this study at any time up to 31 March 2009 and I do not need to give any reason at all.

Signature: ..... **Date:** .....

Full Name - printed .....

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Child Information Sheet

Title of research: A longitudinal survey of the effects of the summer holidays on children's literacy

Note: I will read this Information Sheet to the pupil.

Hello, my name is Shanthi. I am a student like you but my school is Massey University.

Today, I want to listen to you talk, and I want to see how you read and write. It will take me quite a long time to do this but we can take breaks when you get tired. After we are finished, I would like to tell your teacher and the people that take care of you at home about how well you are doing. I am sure they want to know how well you are doing. I will not tell anyone else. I'd like to come back and do the same thing again another time. I will keep coming back from now on until you are 7 years old.

You do not have to do what I say unless you want to. Just tell me and I will stop. You do not need to tell me why. I will still like you and I will not be worried about it at all.

Now I am going to show you some pictures of dogs. Some of the dogs are happy and some are unhappy. If you want to do work with me today, please colour in the happy dog. If you do not want to do work with me, then please colour in the unhappy dog.

Can you write your name? If you can, and if you want to work with me today, please write your name just under the picture that you coloured in.

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 06/083R. If you have any concerns about the conduct of this research, please contact Associate Professor Ann Dupuis, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x9054, email humanethicsnorth@massey.ac.nz.

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Child Consent Form

This form will be held for a period of 6 years

My name is _____

Appendix C: Clay Letter Identification Task – Reading Recovery Diagnostic Survey

Letter Identification Score Sheet
Student Copy

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

Appendix D: Gough-Kastler-Roper Phonemic Awareness Assessment

Gough-Kastler-Roper Phonemic Awareness Assessment

1. PHONEMIC SEGMENTATION Practice: Say HAT. What are the 3 sounds in HAT? (answer = /h – a – t/) Say (target). "What are the 2 sounds in (target)?"

1.	2	no	(answer = N-O)
2.	2	at	(answer = A-T)
3.	2	up	(answer = U-P)
4.	3	keep	(answer = K-EE-P)
5.	3	man	(answer = M-A-N)
6.	3	teeth	(answer = T-EE-TH)
7.	4	into	(answer = I-N-T-O)

2. BLENDING Practice: Say H-A-T (Pronounce the word very slowly H-----A------T). What word is H-A-T? Say (target phonemes). "What word is (target…)?"

1.n i ce
2.t oo
3.h e
4.r a ke
5.t r ai n
6.p l a ne
7.f u nn y

3. DELETION OF A PHONEME Practice: Say HAT. Now say HAT without the /h/ (answer = AT). Say (target). "Now say (target) without the (first phoneme)"

1.top	t	(answer = OP)
2.gasp	g	(answer = ASP)
3.find	f	(answer = IND)
4.paint	p	(answer = AINT)
5.up	u	(answer = P)
6.at	a	(answer = T)
7.so	s	(answer = O)

4. DELETION OF A PHONEME Practice: Say HAT. Now say HAT without the /t/ (answer = HA). Say (target). "Now say (target) without the (final phoneme)"

1.same	m	(answer = SA)
2.me	e	(answer = M
3.ate	t	(answer = A)
4.go	o	(answer = G)
5.frog	g	(answer = FRO)
6.grab	b	(answer = GRA)
7.stride	d	(answer = STRI)

5. INITIAL PHONEME SUBSTITUTION Practice: Say HAT. Instead of Hh, begin a new word with K (answer = CAT)
Say (target). "Instead of (first phoneme), begin a new word with (new phoneme)"

1.ball	b	c	(answer = CALL)
2.goat	g	b	(answer = BOAT)
3.took	t	c	(answer = COOK)
4.fish	f	d	(answer = DISH)
5.two	t	z	(answer = ZOO)
6.chair	ch	p	(answer = PAIR)
7.meat	m	f	(answer = FEAT)

6. FINAL PHONEME SUBSTITUTION Practice: Say HAT. Instead of T, end a new word with M (answer = HAM) Say (target). "Instead of (last phoneme, begin a new word with (new phoneme)"

1.park	k	t	(answer = PART)
2.run	n	g	(answer = RUG)
3.late	t	m	(answer = LAME)
4.mess	s	n	(answer = MEN)
5.rope	p	d	(answer = RODE)
6.fame	m	s	(answer = FACE)
7.wet	t	b	(answer = WEB)

Score = /42

Appendix E: Clay Word Reading Test

Clay 'Ready to Read Word' Test

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

Total = / 15

Stanine Group = _____

Research Group										
320 urban children aged 5.0 -7.0 (in 1968)	Stanine Group	1	2	3	4	5	6	7	8	9
	Test Score	0	0	1	2-5	6-12	13-14	15	15	15
282 urban children aged 6.0-7.3 (in 1978)	Stanine Group	1	2	3	4	5	6	7	8	9
	Test Score	0-1	2-5	6-9	10-12	13-14	15	15	15	15

Appendix F: Graded Word Reading Test

Schonell Reading Test

tree	little	milk	egg
book	school	sit	frog
playing	bun	flower	road
clock	train	light	picture
think	summer	people	something
dream	downstairs	biscuit	shepherd
thirsty	crowd	sandwich	beginning
postage	island	saucer	angel
ceiling	appeared	gnome	canary
attractive	imagine	nephew	gradually
smolder	applaud	disposal	nourished
diseased	university	orchestra	knowledge
audience	situated	physics	campaign
choir	intercede	fascinate	forfeit
siege	recent	plausible	prophecy
colonel	soloist	systematic	slovenly
classification	genuine	institution	pivot
conscience	heroic	pneumonia	preliminary
antique	susceptible	enigma	oblivion
scintillate	satirical	sabre	beguile
terrestrial	belligerent	adamant	sepulchre
statistics	miscellaneous	procrastinate	tyrannical
evangelical	grotesque	ineradicable	judicature
preferential	homonym	fictitious	rescind
metamorphosis	somnambulist	bibliography	idiosyncrasy

Reading age = _____

Instructions to Examiner

The child should read the words left to right. When a word that gets a little difficult, ask the child to sound it out. If the child can't say what the word is, then go on to the next one. One mark for each correct answer - even if the reader self corrects. **The examiner should not suggest corrections**. No prompting. No hurrying. If the reader mis-pronounces ***slightly*** as in ***postage*** with a short '***o***', the first time, then ask for the word again, marking it correct if the reader has self corrected. Otherwise, do not ask for a word to be re-read. If you do not give away the pronunciation of words that the reader does not know, then this same test may be used again at a later date to assess progress as a result of a teaching programme. Reading age = [(Number of words correct) / 10] + 5

Appendix G: Motivation to Read Survey

Motivation to Read

Sample 1: I am a _____
☐ boy ☐ girl

Sample 2: I am in _____
☐ Year 1 ☐ Year 3
☐ Year 2 ☐ Year 4

1. My friends think I am _____
☐ a very good reader **[4]** ☐ an OK reader **[2]**
☐ a good reader **[3]** ☐ a poor reader **[1]**

2. Reading a book is something I like to do.
☐ Never **[1]** ☐ Sometimes **[3]**
☐ Not very often **[2]** ☐ Often **[4]**

3. I read _____
☐ not as well as my friends **[1]** ☐ a little better than my friends **[3]**
☐ about the same as my friends **[2]** ☐ a lot better than my friends **[4]**

4. My best friends think readings is _____
☐ really fun **[4]** ☐ OK to do **[2]**
☐ fun **[3]** ☐ no fun at all **[1]**

5. When I come to a word I don't know, I can _____
☐ almost always figure it out **[4]** ☐ almost never figure it out **[2]**
☐ sometimes figure it out **[3]** ☐ never figure it out **[1]**

6. I tell my friends about good books I read.
☐ I never do this. **[1]** ☐ I do this some of the time. **[3]**
☐ I almost never do this. **[2]** ☐ I do this a lot. **[4]**

7. When I am reading by myself, I understand _____
☐ almost everything I read **[4]** ☐ almost none of what I read **[2]**
☐ some of what I read **[3]** ☐ none of what I read **[1]**

8. People who read a lot are _____
☐ very interesting **[4]** ☐ not very interesting **[2]**
☐ interesting **[3]** ☐ boring **[1]**

9. I am _____
☐ a poor reader **[1]** ☐ a good reader **[3]**
☐ an OK reader **[2]** ☐ a very good reader **[4]**

10. I think libraries are _____
☐ a great place to spend time **[4]** ☐ an OK place to spend time **[2]**
☐ an interesting place to spend time **[3]** ☐ a boring place to spend time **[1]**

11. I worry about what other kids think about my reading _____
☐ every day **[1]** ☐ once in a while **[3]**
☐ almost every day **[2]** ☐ never **[4]**

12. Knowing how to read well is _____
☐ not very important **[1]** ☐ important **[3]**
☐ sort of important **[2]** ☐ very important **[4]**

13. When my teacher asks me a question about what I have read, I _____
☐ can never think of an answer **[1]** ☐ sometimes think of an answer **[3]**
☐ have trouble thinking of an answer **[2]** ☐ always think of an answer **[4]**

14. I think reading is _____
☐ a boring way to spend time **[1]** ☐ an interesting way to spend time **[3]**
☐ an OK way to spend time **[2]** ☐ a great way to spend time **[4]**

5. Reading is _____
☐ very easy for me **[4]** ☐ kind of hard for me **[2]**
☐ kind of easy for me **[3]** ☐ very hard for me **[1]**

16. When I grow up I will spend _____
☐ none of my time reading **[1]** ☐ some of my time reading **[3]**
☐ very little of my time reading **[2]** ☐ a lot of my time reading **[4]**

17. When I am in a group talking about stories, I _____
☐ almost never talk about my ideas ☐ almost always talk about my ideas **[3]**
[1]
☐ sometimes talk about my ideas **[2]** ☐ always talk about my ideas **[4]**

18. I would like for my teacher to read books out loud to the class _____
☐ every day **[4]** ☐ once in a while **[2]**
☐ almost every day **[3]** ☐ never **[1]**

19. When I read out loud I am a _____
☐ poor reader **[1]** ☐ good reader **[3]**
☐ OK reader **[2]** ☐ very good reader **[4]**

20. When someone gives me a book for a present, I feel _____
☐ very happy **[4]** ☐ sort of unhappy **[2]**
☐ sort of happy **[3]** ☐ unhappy **[1]**

Scoring

Self-Concept as a Reader	**Value of Reading**
1. _____	2. _____
3. _____	4. _____
5. _____	6. _____
7. _____	8. _____
9. _____	10. _____
11. _____	12. _____
13. _____	14. _____
15. _____	16. _____
17. _____	18. _____
19. _____	20. _____
SC raw score: _____	V raw score: _____

Full survey raw score: _____