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The effects of book reading over the summer holidays on the reading skills of Year 3 students

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Mary Louise Turner

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ABSTRACT

The existence of an achievement gap between high- and low-performing students is neither unique nor new to New Zealand. Such differences have been documented since the 1930s, and despite decades of reforms and initiatives these disparities persist. Results from the most recent PIRLS study (Chamberlain & Caygill, 2012) showed no narrowing of the margin since the early 2000s, and patterns evident in previous PIRLS studies continue.

A growing body of international research into achievement gaps has focused on summer learning loss and the different impact this has on students from low and high socioeconomic backgrounds. Some argue that even small differences in summer learning amass over the years, and by the end of elementary school the achievement gap is substantially larger than at the beginning (Kim & White, 2011). Further, this cumulative summer learning effect is the primary cause of the widening achievement gap between students from high and low socioeconomic levels (Terzian, Moore, & Hamilton, 2009). Various strategies have been implemented to try to counter this, including summer schools, reading programmes offered by public libraries, and reading books at home.

Although summer learning loss and differential growth in learning when school is closed is well- documented in international studies, little is known about this effect on student achievement in New Zealand. This study addresses the gap in knowledge for the New Zealand context by examining whether encouraging young children to read books over the summer vacation helps stem the summer slide. Using a randomized control group experimental design, a sample of 583 year 3 children in ten schools, seven of them low SES and three of them high SES in South and East Auckland were randomly

assigned to four different groups over the summer break: a books group, a books plus quizzes group, a treatment control group that received math books, and a no-treatment control group that received books only after the study was completed. All groups were pre and post tested with a range of reading measures. The results showed a significant effect of the summer books programme but only for one reading measure while a number of other measures showed no clear effect. The home literacy measures used in the study showed large differences in home literacy resources between high and low SES families such as number of books and access to the computer and to libraries. The study showed that a summer books programme is workable and was much enjoyed by children but that more research is needed to establish the benefits of summer books.

DEDICATION

This thesis is dedicated to my mother, Mary Tonks Turner (July 3rd 1938 – April 22nd 2013)

You are forever in my heart

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CHAPTER ONE

INTRODUCTION

In February 2010, the most recent revision of The New Zealand Curriculum became mandatory for use in New Zealand schools. In this, the Ministry of Education makes explicit its vision for young New Zealanders. It describes creative, energetic, enterprising young people who will seize opportunities to secure a sustainable social, cultural, economic, and environmental future for Aotearoa New Zealand, a country in which all cultures are valued. During their school years, all young people will continue to develop the values, knowledge, and competencies that will enable them to live full, satisfying lives and be successful citizens of the 21st century (Ministry of Education, 2010).

In order to achieve this vision, it is essential to have a high-performing education system where teaching and learning environments are focused on the needs of students and promote achievement. Learning to read and spell are probably the most important skills that students acquire in the early years of school, especially since difficulties in learning these skills can impact on other areas such as self-concept, behaviour, peer esteem, and emotions (Lonigan, Burgess, & Anthony, 2000; McGregor, 2005). Mastering literacy competencies early is vital to enable students to learn effectively across the curriculum and has an important influence on students' achievement into secondary schooling years (Ministry of Education, 2011).

The Reading Gap

While many students achieve well in New Zealand schools, the education system underperforms for some learners. There is a significant disparity between high and low performing groups with a disproportionate number of Māori and Pasifika underachieving (Ministry of Education, 2010). Many students experience difficulty in learning to read and spell. Reading and spelling progress is most noticeably delayed in schools where there are many children from low socioeconomic and minority backgrounds (Nicholson, 2009; Rubie-Davies, Hattie, & Hamilton, 2006; Tunmer, Chapman, & Prochnow, 2004; Nash, 2004).

In the 2010 report of New Zealand's compulsory school sector (Ministry of Education, 2011) achievement gaps across all levels of the schooling system are evident. The report examines the performance of New Zealand students and concludes:

By international standards, students in New Zealand schools are, on average performing well in reading and literacy at primary and secondary levels. However, there are differences in reading and writing abilities across the different ethnic and socioeconomic groups in New Zealand schools. (p. 29)

These differences manifest themselves at all levels of education: primary, secondary, and tertiary. At the primary level, over 11,000 six-year-old students participated in Reading Recovery in 2010. This early literacy intervention aims to reduce reading and writing delay by providing intensive, individualised help to students who are falling behind in reading and writing after one year at school. Only 66% of state and state-integrated schools with six year olds offered Reading Recovery in 2010.

Fewer Māori and Pacific Island students attended schools that offered the programme which suggests that Reading Recovery is not being offered in some schools with high numbers of Māori and Pasifika students. It seems likely that the actual number of students falling behind after one year of school is considerably higher than the 11,000 given support in 2010 (Lee, 2011a).

As well as Reading Recovery, the other key resource for primary school students struggling with literacy is the Resource Teachers: Literacy (RT:Lit). These specialist literacy teachers support and assist staff and students in Years 1 to 8 who are experiencing difficulties with literacy learning. In 2010, 3,995 students were on the RT:Lit roll. Māori students were overrepresented in this group compared to the total student population in schools where RT:Lit worked. Māori students made up 23.5% of the ethnicity profile of Year 1 to 8 students in primary education in 2010. However, they constituted 34.6% of the group receiving support from RT:Lit (Lee, 2011b).

Recognition of the disparity between high and low performing groups is not new. Differences between Māori and non-Māori achievement have been documented since the 1930s (Phillips, McNaughton, & MacDonald, 2001). In the 1960s, the Hunn Report (1960) and the Currie Report (1962) both identified these differences as areas of concern. Next, in the 1970s there was a national effort to improve literacy, particularly in underachieving schools, through the development of the Early Reading In-service Course (ERIC). ERIC was implemented across the country, and as a result, common practices in literacy teaching were established.

A decade later, a report was released on the allocation and use of additional resources to schools in Otara and Mangere. In this report, Ramsay (1981) described the educational and social situation of most children in these two low socioeconomic suburbs of South Auckland as “worrying signs for the future” (p. 258). He stressed that action to encourage desirable developments in both school and community was a matter of some urgency.

The 1990s saw a continuation of the concern over literacy achievement, and from this the Literacy Task Force and Literacy Experts Group were established. The taskforce was set up by the National Government to address reading underachievement within specific groups of students and to advise the Minister of Education on how best to achieve the Government’s goal that “By 2005, every child turning nine will be able to read, write, and do maths for success” (Ministry of Education, 1999, p.1).

Evidence of this achievement gap also comes from cross-national studies of reading achievement. In one of the first international surveys of reading comprehension conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 1970 - 1971, New Zealand 14-year-old students had the highest mean achievement scores in reading comprehension across the 15 participating countries. In a further survey of 10 countries, New Zealand students had the highest mean achievement in literature comprehension and interpretation. The results also indicated that variation in achievement among students in New Zealand was around the median of all the countries (Wilkinson, 1998).

By the time of the second IEA survey of reading literacy in 1990 – 1991, New Zealand was one of 32 countries participating. This time, New Zealand 14-year-old students were ranked fourth in overall achievement, and at the 9-year-old level New Zealand students were sixth. In contrast to the 1970 – 1971 results, in this survey variation in achievement among students in New Zealand was relatively large, and at the 14-year-old level New Zealand had one of the widest spread of scores of any participating country. A similar pattern occurred with the 9-year-old student results.

In the 2001 study of literacy achievement among 15 year olds conducted by the Organisation for Economic Cooperation and Development (OECD), New Zealand's mean reading scores were in the top two to eight countries of the OECD. Of the top eight countries, New Zealand had the highest and lowest levels. Further evidence of a gap came from a 2002 UNICEF study that found New Zealand had one of the highest proportions of “bottom-end” inequality – a measure of the difference in achievement between students at the bottom and middle of each country's achievement range. In another study of literacy achievement undertaken by IEA, New Zealand had the largest variation in achievement in any of the 32 participating countries. The majority of poor readers were from low-income backgrounds with an overrepresentation of Māori students (Tunmer, Chapman, & Prochnow, 2003).

More recently, in the 2006 Progress in International Reading Literacy Study (PIRLS; Ministry of Education, 2008) which compared the reading literacy achievement of middle primary school students in 40 countries, the average reading literacy score for New Zealand Year 5 students was significantly higher than the average for students in 19 countries and significantly lower than the average scores for students in 17 countries

including England, Hong Kong, and the United States. Statistically the average reading score for New Zealand did not change from 2001 to 2005. Compared with many other countries participating in this study, New Zealand had a relatively large group of students who demonstrated very advanced reading comprehension skills. However, it also had a slightly bigger group of weaker readers than some other high performing countries. There were both high and low achieving students in all four main ethnic groupings: Pakeha/European, Māori, Pasifika, and Asian. Pakeha/European and Asian students generally scored at a much higher level than Māori and Pasifika students. Pasifika and Māori boys had the weakest average achievement and together with Pasifika girls were more likely to be overrepresented among students with weaker comprehension skills than other Year 5 students. New Zealand's standing relative to the 25 other countries with comparative data from both the 2001 and 2006 cycles moved down from 11th in 2001 to 14th in 2006. This change could be attributed to the significant improvements in achievement made by Singapore, Hong Kong-China, and the Russian Federation (Comparative Education Research Unit, 2008).

A similar pattern is seen in reading literacy achievement at the senior secondary level. In the Programme for International Student Assessment (PISA) 2009 survey, 15 year old students from 65 countries were assessed in three domains: reading literacy, mathematical literacy, and scientific literacy. Reading was the major focus, and students' achievements were examined across a wide range of reading content areas and skills. Results from this survey indicated that New Zealand students continued to perform highly in reading literacy at this level. Only two of 34 OECD countries, Korea and Finland, achieved significantly higher mean scores than New Zealand. Two non-OECD partner economies, Shanghai-China and Hong Kong-China, also achieved

significantly higher mean scores than New Zealand. However, 14% of New Zealand 15-year-old students did not achieve above the lowest levels of reading literacy.

Differences were also evident between ethnic groupings. The mean scores for Pakeha/European and Asian 15-year-old students were significantly higher than the OECD average; however, Māori and Pasifika mean scores were significantly lower than the OECD average. There were lower proportions of Māori and Pasifika students achieving at the highest levels in reading and they were overrepresented at the lower levels when compared with Pakeha/European and Asian students. Similar patterns were reported for both mathematical literacy and scientific literacy (Telford & May, 2010).

Findings from the latest PIRLS study (Chamberlain & Caygill, 2012) indicated that New Zealand's achievement in reading has "remained static, with no positive shift in student achievement since the early 2000s" (p. 33). Patterns that were evident in earlier PIRLS studies continue; for example, the gap between New Zealand's best and weakest readers persists. New Zealand continues to be well represented among the best readers; however, there is still an overrepresentation among weak readers. Results indicated that 8% of New Zealand Year 5 students did not reach the lowest international benchmark, compared with the international median of 5%. Students achieving at this level struggled to locate and reproduce explicitly stated information (Chamberlain & Caygill, 2012). In addition, the range of reading scores for New Zealand students was wide indicating lower equity of scores. Finland, by comparison, which achieved the second highest mean literacy score, had a relatively narrow range of reading scores among students indicating higher equity. Further findings of interest for New Zealand included the socioeconomic impact on student achievement. The difference in achievement between students from households with many resources and those with

fewer resources was wider than many other countries including Canada and Australia. Although these differences were still evident at the lower secondary level, New Zealand's differences were similar to those of England and Australia. Generally the achievement differences between New Zealand primary schools according to their economic composition were very high compared to many other countries (Chamberlain & Caygill, 2012).

The Ministry of Education acknowledges that this achievement gap is one of the widest in the OECD and identifies targeting underachievement in schools and driving improved educational performance across the system to improve the education outcomes for all young New Zealanders as a priority (Ministry of Education, 2010).

Reforms and interventions

Reforms and programmes to improve student achievement have been a major focus at both local and national levels since the 1990s. Resources have been deployed and a range of schooling improvement initiatives implemented to help address these problems. Examples of such initiatives include Strengthening Education in Mangere and Otara (SEMO), Analysis and Use of Student Achievement Data (AUSAD), and Otara: The Learning Community (OTLC). SEMO was designed to increase the capacity of the schools and communities of Mangere and Otara to offer high-quality learning environments for children. AUSAD evolved out of SEMO and was designed to help principals, teachers, and board members improve teaching through analysis and discussion of student achievement. All three initiatives provided a platform for

partnerships between various organisations to develop and support the schools (Ministry of Education, 2004).

Although it has been argued that there is insufficient summative evaluation attached to the schooling improvement initiatives to be certain about what was happening with all the students' learning (Annan, 2007), some research evidence suggests that programmes of school improvement, such as those outlined above, have been effective in implementing changes in beginning instruction in groups of schools (Lai, McNaughton, Amituanai-Toloa, Turner, & Hsiao, 2009). Lai et al. acknowledge that there has been little, if any, impact on reading comprehension from Year 4 onwards and in fact the gaps may have increased nationally. Further findings from the Literacy Professional Development Project: Evidence of Improved Student Outcomes (Learning Media, March 2008) suggest that there were generally positive outcomes, but despite these, close analysis reveals ongoing worries, puzzles, and inconsistencies. An example cited from this project came from the second cohort of schools involved in the reading professional development. In this cohort 85% of the students who began in stanine one were still within the "at risk" band of stanines one to three after two years. More concerning was that over one third of the students who began in stanine one remained there.

One direct outcome of the Ministry of Education's ongoing concern that some students are not realising their potential has been the development of the Best Evidence Syntheses documents, which provide evidence-based findings on how to enhance the development and achievement of all New Zealand students. The original intent was for these documents to be a catalyst for systemic improvement and sustainable development

in education. Included in these is “Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis” (Alton-Lee, 2003) which identifies ten characteristics of quality teaching linked to student achievement. It highlights the central role of teacher creativity, expertise in scaffolding, and responsiveness to student learning processes.

Two further Ministry of Education initiatives have been the development of Ka Hikitia- Managing for Success: The Māori Education Strategy 2008-2012 and the Pasifika Education Plan. While these are not mandatory, schools are expected to take account of these initiatives in their practice. Ka Hikitia – Managing for Success outlines the strategy for improving equity in education for and with Māori and is a programme of action encompassing all levels of the education sector. It aims to step up the performance of the education system to ensure Māori enjoy education success as Māori. There are two critical factors identified to realise these goals: ako and partnerships. Ako refers to reciprocal teaching and learning which includes identity, language and culture, knowing where learners come from, and building on what knowledge, background, and experiences they have. Productive partnerships are established when links are made between Māori learners, families, iwi, and educators, with all working together to produce better outcomes for Māori (Ministry of Education, 2011).

A midterm review of Ka Hikitia in 2010 to 2011 found that despite improvements across a number of key indicators, disparities still exist in achievement between Māori and non-Māori students. As a result of this, the Ministry implemented a more intensive action plan which sets specific targets to be achieved by 2015. Included in these targets is that by 2015 the percentage of Māori students who have not achieved basic literacy and numeracy skills by age 10 will reduce from 18% (2010) to 10%

(2015). For secondary school students one target is that the percentage of Māori students leaving school without any qualification will reduce from 34% (2010) to 24% (2015).

The Pasifika Education Plan has a similar focus to Ka Hikitia. It concentrates on building strong learning foundations, lifting Pasifika literacy and numeracy achievement by using the National Standards to improve teaching and plain language reporting to parents, increasing the number of Pasifika students achieving school-level qualifications, and emphasising the importance of supporting Pasifika learners' identities, languages, and cultures to raise Pasifika achievement. Targets have also been set to increase the percentage of Pasifika school leavers reaching NCEA Level 1 numeracy and literacy from 84% in 2008 to 93% in 2012. A review in 2010 indicated that the figure had increased slightly to nearly 86% in 2009, and by 2011 had dropped to 83.1% (J. Cording, Ministry of Education, personal communication, March 28, 2013). If this trend continues, it seems unlikely that the 2012 target will have been met (2012 data is unavailable until the end of May 2013).

One of the most controversial initiatives designed to increase achievement in literacy and numeracy came into effect in 2010. National Standards in reading, writing, and mathematics were established with the intent to lift achievement in literacy and numeracy by identifying reference points that describe what students need to achieve in order to meet the requirements of The New Zealand Curriculum in all subjects. The aim is to help students, teachers, parents, families, and whānau gain a better understanding of their learning goals and the steps required to achieve these. By providing reference points, National Standards will help teachers and schools understand the expected levels

of achievement at stage or year appropriate levels, know how to measure the achievement of each student against the expectations, and improve teaching and learning for better student learning and progress. By identifying students who are not making the expected progress as early as possible, schools, teachers, and parents will be able to make informed decisions about how best to support students in order to improve their achievement. A central tenet of National Standards is that timely and targeted interventions make the difference. Implementation of the English-medium National Standards began in 2010, and they are being phased in over three years.

Despite several decades of school improvement initiatives, the achievement gap persists. Clearly, schooling improvement is a complex issue, and there are no quick or easy solutions to resolving the disparities in New Zealand student achievement. With projections that by 2040 the majority of students in New Zealand primary schools will be Māori and Pasifika (Alton-Lee, 2003), there is an even greater sense of urgency to address this underachievement. Annan (2010) examined schooling improvement initiatives since Tomorrow's Schools and concluded:

The journey also signals a long term commitment to improve New Zealand schools...That commitment over the past 20 years is going to remain essential well into the future, if New Zealand is to prosper in an increasingly globally connected world. (p. 13)

The Summer Slide as a Contributor to the Reading Gap

Achievement gaps between students from low and high socioeconomic backgrounds are not unique to New Zealand and are evident in most industrialised societies (Cheung & Andersen, 2003). A study by Downey, von Hippel, and Broh (2004) which examined high and low-income students' learning rates during the school year and over summer found that the achievement gap was already present before the students began school. The gap continued to increase after school started; however, it grew much more slowly during the school year than over the summer months. Some argue that even small differences in summer learning accumulate over the years and by the end of elementary school the achievement gap is substantially larger than at the beginning (Kim & White, 2011). Further, it is this cumulative effect of summer learning differences that is the primary cause of the widening achievement gaps between students from high and low socioeconomic levels (Terzian, Moore, & Hamilton, 2009).

In the United States a range of strategies have been implemented that attempt to address the issue of summer learning loss. The three main approaches include summer schools, summer reading programmes offered by public libraries or other community organisations, and reading books available in the home. Research on summer school programmes indicates that although overall reading achievement may increase it actually increases the gap between middle and low-income children. In addition, many school districts have eliminated summer school programmes due to their prohibitive costs (Kim & White, 2011).

Many public libraries offer summer reading programs (Celano & Neuman, 2001). Despite this, children from low socioeconomic backgrounds are still disadvantaged because distance to the library and lack of transport often limit their access. Findings from Allington and McGill-Franzen (2003) indicate that public library use among poor children reduces when a library is more than six blocks from their home compared with public library use among middle class children which declines when the library is more than two miles from their home.

The best predictor of summer learning loss, according to Allington and McGill-Franzen (2003), is whether or not a child reads over summer. This is determined largely by whether he or she owns books. Access to any print materials, including books, newspapers, and magazines, is an issue for children from low-income families (Celano & Neuman, 2008). This can be particularly problematic over the summer holidays when books from school are usually not available. In their 2001 study, Celano and Neuman reported that book availability for middle-class children was about 12 books per child; however, in poor neighborhoods about one book was available for every 355 children. More recently, these researchers have argued that the result of unequal access to information is a steadily growing knowledge gap between rich and poor children. They suggest this knowledge gap is “fueling — and overshadowing — the achievement gap. Without closing one, the other will not go away.” (p. 258)

Allington and McGill-Franzen (2003) suggest that the key to reducing summer reading loss is finding new ways to get books into children’s homes over summer. However, simply giving students books is not sufficient to minimise summer reading loss. It is important that children are provided with books that match their skill levels

and their interests. They claim that if children are given the opportunity to listen to, discuss, and read books on topics that they choose, or books about characters that they love, they develop extensive background knowledge that can support their independent reading and keep them engaged.

Voluntary reading of books over summer has been used as a strategy to counter summer learning loss. Findings from several studies support the idea that this strategy can enhance reading achievement and reduce summer loss (White & Kim, 2008; Kim, 2004; Allington et al., 2010). Such interventions are both powerful and cost-effective and when run over several summers may be pivotal in stemming summer reading loss and closing the achievement gap (Smith & Brewer, 2007; Allington & McGill-Franzen, 2003).

Although summer learning loss and the differential growth in learning over the months when school is closed is well documented in international studies, little is known about the summer effect on student achievement in New Zealand. The Ministry of Education have initiated a range of strategies which aim to address the disparity in achievement over several decades; however, the achievement gap persists. To date no initiatives have examined the effect summer learning loss has on student achievement. It is this gap which the current study addresses.

The Present Study – and Research Questions

This thesis attempts to contribute to the ongoing commitment to improve New Zealand schools that Annan (2010) alluded to. It will do so by examining whether encouraging young children to read books over the summer vacation helps to stem the summer slide. The difference between this and other studies is that this study has a sample of children from high and low decile (i.e. socioeconomic status, SES) schools. The sample has a wide range of reading ability and represents a diverse population of students including Pakeha, Chinese, Māori and Pacific ethnicities. The sample includes only children from Years 2 and 3. This is an experimental-control group design with random assignment of children to groups.

Pilot study

A trial study took place over the 2010-2011 summer holidays. This involved 81 Year 2 and 3 students from one decile 1 school. The aim of the trial was to determine the effects of a voluntary summer reading programme on students' reading achievement levels. In the pilot study there were three groups: books only, math control, and a dot-to-dot control group.

Main study

Following the completion of the pilot study, the main study was developed. This was a replication of the pilot study; however several modifications were made including a much larger sample from a wider range of schools of both high and low SES, the provision of a greater number of books to read, and the inclusion of a control group that did not receive any intervention over the summer holidays. In this study, Year 3

students from 10 schools were involved. Seven of the schools were low-decile schools in South Auckland and three were decile 10, the highest decile ranking, representing schools that draw their students from areas of least socioeconomic disadvantage. The increased sample size and provision of books at an appropriate reading level for students were similar to the design of other summer studies conducted overseas. The wide range of SES included in the one study was a point of difference in that no other summer books study had included both high and low SES in the one study. The 25 books was also a point of difference from other studies in that it was a larger number of books. The inclusion of Chinese, Māori and Pacific pupils was a further difference.

Overseas studies have found that giving students access to books and allowing them to read self-selected books over the summer improved the reading skills of both high and low SES pupils during the summer break, though this did not occur for low SES Hispanic pupils (Allington et al., 2010; Kim, 2006, 2007). The main study aimed to replicate other overseas studies to examine whether similar results are possible in the New Zealand context.

The research questions for the main study were:

1. Do students who receive reading books matched to their reading levels and interests over the summer vacation make greater gains in reading achievement than students who receive math workbooks and students who do not receive any books?
2. Do students who receive reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation make greater gains in reading comprehension than students who receive reading books only?

3. Do students in high- and low-decile schools who receive reading books matched to their reading levels and interests over the summer vacation make similar gains in reading achievement?
4. Do poor readers who receive reading books matched to their reading levels and interests over the summer vacation make greater gains in reading achievement than good readers who receive reading books matched to their reading levels and interests?

Chapters Two to Five

Chapter Two covers the research literature on the summer slide and examines interventions to overcome the slide. Chapter Three presents the methodology for the present study. The first part of the chapter presents the method for the main study. The second part of the chapter presents the method for phase 1 of the study – the pilot study. Chapter Four presents the results for the main study. Chapter Five discusses the results giving attention to the main findings. In this chapter, limitations of the present study are noted and suggestions for future research are given.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The first part of this chapter reviews four theoretical perspectives on the causes of inequality in school achievement. It is important to understand what causes persistent inequalities in order to develop effective interventions to close the gap in educational achievement. The second part of the chapter reviews research relating to summer learning loss, how this impacts on student achievement, and its contribution to the achievement gap between low-income students and their more advantaged peers. The third part of the chapter reviews research relating to summer learning loss in New Zealand and identifies the gap in the literature which this study addresses.

Part A: Theoretical Perspectives

Most explanations of inequality fit within the four accounts identified by Flude (1974) in his metaaccount of theories of social difference in education (Nash, 2010). The accounts include deficit, labelling, school resource, and structural theories. Deficit theories suggest that the cognitive and linguistic inadequacies of low-status students, as well as deficient family resources, are the causal factors of educational inequalities. Labelling theories propose that the assumptions, understandings, and categories teachers use influence the self-conceptions of students, which thus affects their learning. School resource theories attribute curriculum, pedagogy, and evaluation practices within schools as reflecting the values of the dominant class and as such being only available

to those within that class. Structural theories suggest that educational access for dominated social classes is constrained by economic, political, and cultural structures.

The four theories reviewed in this chapter fit within Flude's metaaccount.

Deficit Theory

The deficit-based theory has the longest history of any explanatory model for understanding the achievement of low-status students (Trueba & Bartolome, 1997). This theory gained prominence in the 1960s and attempted to explain the higher rates of education failure by disadvantaged students in terms of their verbal deprivation due to economic disadvantage. It is suggested that a lack of exposure to the cultural models that are affirmed by schools and considered valuable results in low-status students entering school without the prerequisite linguistic cultural capital needed for success (Bourdieu, 1997). In this view, students from such groups are seen as intellectually disadvantaged as a result of their inferior linguistic development (Eller, 1989). School failure is explained by characteristics within the individual students and their families and cultures. Deficit theories suggest that working-class families and ethnic minority students lack certain values and skills in comparison with the middle-class norm and consequently perform relatively poorly in the educational system (Nash, 1997a).

Flude (1974) described the deficit model as a product of two interrelated assumptions. Firstly, those students whose backgrounds are different from those who succeed in school are often regarded as likely to experience difficulties in doing well at

school. Secondly, judgments of comparison can be made between different groups in terms of certain values and these values are embodied in the middle-class culture.

Despite the influence of the deficit theory, it has been widely criticised as being ethnocentrically biased and invalid (Bartolome, 1994; Dudley-Marling, 2007; Ladson-Billings, 2007; Trueba & Bartolome, 1997). By determining the causes for student underachievement as lying within students and their communities, the deficit model ignores the role of institutional barriers such as those within schools and the relationships between school practices, sociopolitical factors, and student outcomes (Irizarry, 2009). Dudley-Marling argued that a deficit stance that pathologises individuals, families, and communities is manifested in the pedagogical practices that are primarily responsible for disproportionate levels of failure among poor and minority populations. From this deficit perspective, students' background knowledge, culture, and experiences are not given significance and are unavailable as resources to support students' learning, making learning more difficult. It has been argued that making links with students' background knowledge, culture, and experiences "is fundamental to the learning process and one of the recurrent and strongest findings in research on teaching" (Alton-Lee, 2003, p. 89). According to Trueba and Bartolome (1997), acknowledging and using students' knowledge not only makes good pedagogical sense but also constitutes a humanizing experience for students traditionally dehumanised and disempowered in schools.

Underpinning the deficit perspective is a behavioral model of learning which defines learning in terms of hierarchical sets of discrete skills. Low-achieving students are seen as requiring decontextualised skills and subskills which are acquired through more time and better teaching methods (Dudley-Marling, 2007). Bartolome (1994) argued that by focusing on teaching methods and educational programmes as the solution to the underachievement problem the issue is separated from the sociocultural reality that shapes it. She has asserted that the reasons for underachievement of certain culturally and linguistically subordinated student populations are generated from the asymmetrical power relations of society that are reproduced in schools. An additional reason is the deficit view of minority students that school personnel uncritically and unknowingly hold. Bartolome emphasised that it is not a particular methodology or set of activities that will make a difference, rather it is the teacher's politically clear educational philosophy that underlies the varied methods and activities being used that makes the difference. This philosophy will reflect a humanising pedagogy that respects the background, experiences, and perspectives of students as a fundamental part of the educational practice.

Evidence of the deficit view in the New Zealand context can be seen in Smith and Elley's discussion of the results from the 1990 IEA survey which identified New Zealand as having the widest spread of scores for any of the 32 participating countries (Smith & Elley, 1997). They suggest that the outstanding abilities of New Zealand's high-achieving students were offset by a substantial group of struggling students, many of whom came from poor and bookless homes, non-English speaking backgrounds and were more often of Māori and Pasifika origin. These students spent more hours

watching television than they spent at school, with boys being more highly represented than girls in this respect. New Zealand students showed the second largest gender gap at age nine and the largest disparity between non-English speaking background and English speaking students in both the nine and 14-year-old age groups. These comments suggest that if the students who were struggling had books at home, did not watch so much television, spoke English, and were not from poor backgrounds, there would not be the variability of scores. The problem is identified as lying within the student, family, and culture, and thus, consequently shifts attention from school effects on student performance.

Cultural Capital Theory

Cultural capital theory has been used to explain how family background, cultural knowledge, characteristics, and behaviors interact with education to reproduce social inequality (Jæger, 2009; Dumais, 2002; Roscigno & Ainsworth-Darnell, 1999; Harker, 1990). The idea of an effect of cultural capital on educational success originates in Bourdieu's cultural reproduction theory (Bourdieu, 1997). He argued that schools reflect and value the culture of the class that controls economic, political, and social resources. Students who possess a lot of this valued cultural capital have a better understanding of it, are more likely to be favoured by teachers, achieve higher grades, and consequently succeed in the education system. Jæger (2011) suggests that teachers mistake students' cultural capital as representing outstanding academic ability and therefore develop distorted views of them. These students are perceived as being more motivated than their lower class peers because they can comfortably interact with teachers (Dumais, 2006). While it is possible for students from all classes to succeed in school, Roscigno

and Ainsworth-Darnell (1999) suggest that lower and working-class students do not have a “natural familiarity” (p. 159) with these highly valued cultural practices and knowledge and are more likely to fail academically.

Children inherit cultural capital from their parents/caregivers,¹ and this becomes integrated into their knowledge, language, behaviors, and their view of the world and place in it. This is what Bourdieu refers to as habitus (Jæger 2009; 2011). Social class differences in cultural capital and habitus begin at birth and continue to increase over time. Dumais (2006) asserts that from childhood a person learns where they fit into society and what they will likely achieve. This is determined by the social class they were born into and has a lifelong effect. Someone from the lower class whose family members and neighbors have not achieved a post-secondary school qualification believes that higher education is not available for them. They realise that people from their class tend not to have much cultural capital and without it are unlikely to succeed educationally. The tendency is for students from the lower classes to behave in ways which confirm these beliefs. The school environment differs from their home environment, and they do not fit in as well as higher income students. They opt out of a higher education path based on their views of what is possible and what is not (Dumais, 2002; Georg, 2004; Jæger, 2011; Nash 2000).

The core of Bourdieu’s argument centres around three parts: firstly parents/caregivers must possess cultural capital, then they must invest time and effort

into transmitting this cultural capital to their children, and finally children must assimilate this cultural capital and convert it into educational success (Jæger, 2009).

However, there has been criticism of the key premise of cultural reproduction theory: specifically, that cultural capital has a direct effect on education success. Di Maggio (1982) argued that active participation in high-status cultures may be a beneficial strategy for low-status students who aspire towards upward mobility. Thus, whereas Bourdieu's theory suggests that students from high-status families benefit the most from cultural capital, Di Maggio argued that the returns to cultural capital are greatest for students who are least advantaged. In his cultural mobility model, Di Maggio suggested that while cultural capital benefits all students, it is the less advantaged students who have the most to gain as they can use it to offset their disadvantage in other areas (e.g., the home environment).

In his 1982 study, Di Maggio assessed the impact of cultural capital on high school grades of a sample of 1,472 male and 1,479 female eleventh grade students. Data was derived from Project Talent, which provided a stratified, random sample of all students in Grades 9 through 12 studying in the United States in 1960 (Flanagan, 1979). Cultural capital was assessed using factors including attitude to and interest in specific artistic activities, participation in arts events, reading literature, and a cultivated self-image. In testing his hypothesis that cultural capital can be used as means of upward mobility by the lower classes, Di Maggio divided out the male and female samples into three groups on the basis of father's education: specifically, sons and daughters of

college graduates, sons and daughters of high school graduates who did not graduate from college, and sons and daughters of fathers who did not hold a high school diploma. A series of separate regressions were run on all six subsamples. Results for female students indicated that the impact of cultural capital is greatest for females from high-status families, and conversely, least for females from low-status families. Effect sizes of cultural capital for all female participants ranged from 0.16 for non-high school graduate fathers, to 0.22 for high school graduate fathers, and 0.30 for college graduate fathers. Thus, these findings supported the cultural reproduction theory. Results for the male students, however, indicated that the positive impact of cultural capital on grades is limited to students from lower and middle status families. Effect sizes of cultural capital for males ranged from 0.16 for non-high school graduate fathers, the same as for females with non-high school graduate fathers, to 0.16 for high school graduate fathers, and 0.13 for college graduates. Conversely, these findings supported Di Maggio's cultural mobility model.

Bourdieu's concept of cultural capital has also been criticised for not being clearly defined as a model, although it is acknowledged that he does explicitly state the importance of linguistic competence. As a result of this imprecise definition, it has been claimed that cultural capital has been operationalised in various ways by researchers therefore producing a range of conclusions (Dumais, 2006; Flere, Kranjc, Klanjsek, Musil, & Kirbis, 2010; Lareau & Weininger, 2004; Sullivan, 2001).

Sullivan (2001) used a broad operationalisation of cultural capital in order to examine which elements actually contribute to educational success. She surveyed 465 students in their final year of compulsory schooling in England. Students attended schools which covered the spread of social classes. Data collected included responses to questions on parents' social class, educational credentials, cultural activities, occupations, and qualifications. In addition, students were surveyed on a wide range of possible components of cultural capital including activities such as reading, watching television, listening to music and playing an instrument, participating in public or formal culture, attending concerts and theatrical performances, and visiting art galleries. Students were also tested on their knowledge of famous cultural figures and assessed on their active and passive vocabulary.

Results showed an association between parental social class and cultural capital; specifically, as parental social class increased so too did their level of cultural capital. In addition, using linear regression, she established significant effects between parents' qualifications, parents' class, and school attended and pupils' cultural activities. When parents' cultural capital was introduced into the analysis, Sullivan established that this was the most influential factor accounting for the variation in pupils' cultural activities. Once parental cultural capital is taken into account, the effects of school, social class, and parents' qualifications are insignificant ($\beta = .03, p < .001$). These results support the notion that children inherit cultural capital from their parents/caregivers and that possession of cultural capital varies across social classes. The absence of a school effect on pupils' cultural capital, once parental cultural capital is introduced, further supports that cultural capital is transmitted in the home.

In addition to examining the relationship between class and education, Sullivan (2001) also sought to determine which categories of cultural activities were most associated with pupils' vocabulary scores and cultural knowledge. She found both reading and television watching habits were positively and significantly associated with pupils' vocabulary and, in fact, television viewing habits ($d = 0.04$) accounted for a larger proportion of the variation in pupils' vocabulary than reading ($d = 0.02$). Similarly, reading and television viewing had a statistically significant association with pupils' cultural knowledge and also with their national GCSE scores. Participating in formal cultural activities and music did not have a similar effect. Sullivan suggested that this result supports the argument that the "reason for the effect of cultural participation on academic attainment is that cultural participation is associated with intellectual resources which help pupils at school" (Sullivan, 2001, p. 910). Further empirical evidence has supported Sullivan's finding that reading is central among student cultural activities as it provides intellectual resources which help students at school (Cheung & Anderson, 2003; De Graaf, De Graaf, & Kraaykamp, 2000; Flere et al., 2010; Jæger 2011; Roscigno & Ainsworth-Darnell, 1999).

Structure-Disposition-Practice Model

Building on Bourdieu's analyses of social and educational reproduction, Nash (2003; 2002) proposed the structure-disposition-practice model within a realist framework to explain social events and processes. Nash suggested that social structures, for example the family, influence the way individuals think (disposition) and behave (practice). To explain why certain practices occur, it is therefore necessary to describe

the social structures in which the actions occur, the techniques of socialisation, the dispositions developed, and the practices adopted as a result.

For example, families are located in class structures and based on class groupings have access to differing financial, educational, and social resources. Thus, resources are used to support literate practices to different levels, and while not exclusively a middle-class resource, it is preschool children from middle-class families who are increasingly exposed to systematic practices of literate socialisation designed to further their intellectual development in areas highly valued by the educational system (Nash, 2010).

In an iterative fashion, families engage in long-term actions, which perpetuate their social, cultural, and economic position. Findings from the New Zealand Progress at School (Nash & Harker, 1998) project illustrate this. Case study data highlighted that students from working-class families often failed at school because they had low aspirations, had little confidence in their ability to succeed, and were not prepared to connect with the practices of school. Conversely, students who progressed at secondary school had “high aspirations, positive academic self-concepts, and a willingness to accept the pedagogic and disciplinary order of the institution” (p. 26). These students were positively disposed towards school: they liked being at school, believed they would be successful, and that their teachers treated them fairly. They attributed their success to support from their parents, teachers, and friends but also to themselves. The effective dispositions of those who succeed are longstanding and durable.

The interrelationship between early literacy experiences in the home and the development of reading skills has been extensively studied by Sénéchal and colleagues (Martini & Sénéchal, 2012; Sénéchal & Young, 2008; Sénéchal, 2006; Sénéchal & LeFevre, 2002; Sénéchal, LeFevre, Thomas, & Daley, 1998; Sénéchal, 1997).

The Home Literacy Model (Sénéchal, 2006; Sénéchal & LeFevre, 2002) focuses specifically on parent-child literacy activities and their relationship to child language and literacy development. It proposes a distinction between informal and formal literacy experiences both of which are differentially related to language, early literacy and phoneme awareness. Informal literacy activities are those where parent and child interact with print resources and the meaning is the focus of the activity not the print detail, for example story book shared reading. Formal literacy activities are those where the focus of the interaction is on the print, for example isolating and identifying letters of the alphabet. Sénéchal (2006) established that informal literacy experiences at home were directly related to language development and the frequency with which children reported reading for pleasure in Grade 4 but not to early literacy skills. Story book exposure was also indirectly related to reading comprehension in Grade 4. Formal literacy activities were found to be directly related to the development of early literacy skills, Grade 1 reading and Grade 4 reading fluency. Parent teaching predicted phoneme awareness indirectly but was not related to vocabulary development.

More recently, Martini and Sénéchal (2012) have expanded on the Home Literacy Model by examining the relationship between formal literacy activities at home, parent expectations, child interest in literacy, and young children's early literacy acquisition. They found that parent expectations and child interest remained positively and robustly associated with child literacy after controlling for parent teaching, SES levels, and

analytic intelligence. Broadening the Home Literacy Model to include the relationship between parent-child teaching activities, parent expectations and child interests Martini and Sénéchal argue increases the models ability to explain the differences in children's alphabet knowledge and emergent reading.

Linking the broadened Home Literacy Model to Nash's Structure-Disposition-Practice Model it can be argued that children who live within a family structure where both informal and formal parent-child literacy experiences occur frequently, have parents with high expectations about what their child should know before entering school, and are themselves interested in learning about literacy are likely to successfully acquire literacy skills. For children who do not have exposure to these early parent-child interactions it seems probable will begin their formal schooling at a disadvantage.

Nash's framework provides a structure within which interdisciplinary research into educational achievement can be assessed. In particular Nash focuses on the messages an individual internalises about their educational and occupational prospects, and how these can cause them to be positively or negatively disposed to learning, and this in turn, affects their practice in wanting to succeed or not. Nash suggests that these processes are best studied using a methodology that examines the structures that affect families, schools, and students. Specifically, Nash identified three distinct processes that contribute to the generation of inequality or difference: the development of cognitive schemes in early childhood, rates of learning at school as indicated by changes in relative levels of attainment, and transition to post school destinations. Further, cultural capital in the form of literacy-related cognitive skills is one element of inequality.

His framework contains resources for the construction of models in which the causes of class difference in cognitive ability on entry to school, relative progress at school, and secondary effects, can be studied. As such, it provides an explanatory narrative that refers to the structural properties of social organisations, the dispositions to act, and practices through which the effects are created. Nash's framework integrates the realist structure-disposition-practice model with a "numbers and narratives" methodology, using both qualitative and quantitative procedures, and places the individual at the centre of the framework. In this way authentic explanations of the causes and consequences of social processes are produced.

Empirical validation for the structure-disposition-practice model emerged through the examination of the relative progress of students over the four years of their secondary education (Nash & Harker, 1998). Nash found that it was possible to distinguish between students likely to succeed and those likely to fail based on certain characteristic dispositions. Analysis of case study and questionnaire data further revealed that students who had made distinct progress from average to above average levels of attainment, identified their parents as being a major influencing factor. Teachers, however, were seen in more moderate terms, with some students commenting that they had encountered teachers who were unhelpful, not able to communicate, and only interested in the most able students. Results also showed that friends were acknowledged as being enormously important to students. Nash argued that as friendships tend to form between students with similar dispositions it was not surprising that students identified friends as a contributing factor to their improvement in attainment.

Further to the three identified influences of teachers, parents and friends, students also attributed the gain in their attainment to their own determination. They acknowledged that it was their high aspirations, confidence in their ability to succeed, and their ability to accept the schooling system that lead to their progress. Findings from the study showed that specific individual dispositions such as, having high educational aspirations (e.g., tertiary education), and positive dispositions towards teachers and school were strongly linked to relative progress at school (Nash, 2002).

Nash suggests that socialisation practices directed at the development of specific forms of thinking lead to the development of the cognitive habitus. Cognitive habitus is defined by Nash (2003) as the “capacities and capabilities of the body to carry out the kind of abstract problem-solving exercised in mathematics and other language-based, symbolic information processing” (p. 172). It is given its basic structures in early childhood. It is this early socialisation into specific forms of cognitive operations that result in the formation of neural structures and networks in the developing brain. Nash posits that it is the cognitive dispositions that determine intellectual performance and from which class variation in educational achievement occurs. Specifically, children raised in families where classed forms of literate socialisation have been practiced begin school with specialised cognitive abilities.

By the time children enter school, they have been exposed to differential levels of linguistic and cognitive socialisation. Some children are able to recognise and respond

to the processes of school in ways that enhance their learning and from which they develop a positive self-concept while others experience it differentially (Compton-Lilly, 2006). Thus, from an early age children learn where they fit into society and what they can expect to achieve. It is posited that this knowledge is based on their social class and as a result can have lifelong effects on attitudes, decisions, and actions (Dumais, 2006).

Support for this position can be found in Fergusson and Woodward's (2000) longitudinal study that examined the relationship between family SES at birth and rates of university participation in a cohort of 1,011 New Zealanders studied from birth to 21 years. They found strong links between SES assessed at birth and subsequent rates of participation in university. In their study, Fergusson and Woodward used the Elley and Irving (1976) scale of socioeconomic status for New Zealand which ranked families into one of six levels based on male occupation. Levels one and two represented high SES and included professional and managerial occupations. Levels three and four were clerical, technical, and skilled occupations. Levels five and six represented low SES and included semiskilled and unskilled workers as well as those who could not be categorised. Children from high SES backgrounds (57%) had rates of participation in university education more than five times higher than children from low SES backgrounds (11%, $p < .001$). This shows the presence of a strong relationship between early family SES and children's long-term educational achievement. When the observed differences in rates of access to university are adjusted for socio-demographic factors, the ratio drops to less than 1.5:1 (Fergusson & Woodward, 2000).

Similarly, using data from the British Cohort Survey (1970), Feinstein (2003) examined the extent to which indicators of preschool development are associated with final adult educational outcomes for 1,292 children. In addition, he investigated if performance amongst these indicators was stratified by social class and further, how this stratification might change as children mature. Assessments were conducted at five time intervals: 22 months, 42 months, 5 years, 10 years, and 26 years. At 22 months, the average rank of infants in the high and low social class groups is 13 percentile points, and by 10 years this difference had grown to 28 percentile points. Feinstein argued that this finding may reflect that the later tests assess tasks at which children in the low SES group are less able. Specifically, results suggested that stratification by social class had already been established amongst infants at 22 months and became more extreme by 10 years of age. Further examination of the average rank of test scores from 22 months to 10 years indicated that a child who had a low rank at 22 months and is from a low SES background is unlikely to improve greatly. In fact, a low SES child with a top quartile score at 22 months is predicted to fall behind their high SES peers who had low quartile scores at 22 months. Feinstein added that 60% of low SES children who were in the bottom quartile at 22 months were still there at age 10, while their high SES peers who were in the bottom quartile at 22 months were more likely to be in the top quartile at 10 years than to still be in the bottom quartile. These findings supported the premise that SES continues to be important as students mature, and further, as they do more discriminating tests, the association with family background strengthens.

In an earlier study, Nash and Harker (1997) used a family resource framework to investigate school effects on attainment. The primary focus was to explore noncognitive

factors associated with relative progress at school. The progress of 5,383 students in 37 New Zealand secondary schools was monitored. This longitudinal project tracked the students' attainment from their initial enrolment at Year 9 (Grade 8) until the end of their secondary education in Year 13 (Grade 12). Student attainment was assessed at five points: at entry to Year 9, and at the completion of Years 10, 11, 12, and 13. Assessments used included New Zealand standardised assessments, for example, the Progressive Achievement Test in Reading Comprehension (Reid & Elley, 1991), and the Test of Scholastic Ability (Reid, Jackson, Gilmore, & Croft, 1981). At the completion of Year 10 (Grade 9), specially designed tests of English, mathematics, and science were administered. In Years 11, 12, and 13 nationally assessed and monitored examinations were employed. A standardised score, known as the Intake Attainment Score (IAS), was calculated from the two assessments conducted in Year 9. In addition to the assessments taken after two years, students also completed a quality of school life questionnaire from which factor score indices of academic self-concept and negative affect towards school were obtained. Observations in schools, informed by an ethnographic methodology, provided additional information on school practices and especially on students' involvement with their education.

Using the quality of school life survey, Nash and Harker (1998) examined students' modes of adaptation to school in order to explain performance at school. Cluster analysis of the responses revealed that relative progress at school was associated with students' aspirations, academic self-concept, and their perception of the way they are treated by their teachers. In addition, results showed that students' success or failure at school appeared to be most determined by how they adapt to school in terms of their

ambitions, their ability to manage its academic demands, and their acceptance of the school's forms of controls. These dispositions, which are associated with relative educational progress, are related to students' self-identity. The process of identity construction is a result of social capital realised within the family and also within the peer group. The transmission of social capital within the family acts as a resource providing adolescents with a sense of social position and status (Nash, 1998; 2010).

In a further examination of the association between social class and educational achievement, Nash (2003) compared Bursary results for students from the professional/managerial categories on the SES scale with those from the semiskilled, unskilled, and unemployed categories. The students were all in the highest ability quintile. Of students from the high SES categories, 70% achieved a University Bursary compared with 41% of students from the lowest SES categories. From this result, Nash concludes that middle-class students are almost twice as likely to obtain Bursary even though they have similar high ability test scores. Findings showed that approximately 40% of the high SES students are in the high ability quintile compared with 10% of the lower SES students. In a sample of 1,000 high SES students, 70% of the 400 with high ability achieved Bursary (280 students) while in a similar size sample of low SES students, only 40% of the 100 with high ability gained Bursary (40 students). He suggested that 300 students from the low SES categories failed because of their lack of prior knowledge, where another 60 students were due to other causes (e.g., their relative decline at secondary school and different patterns of decision making; Nash & Harker, 1998). Nash argued the results indicated that the major contribution to the failure of low SES students in comparison with the high SES students is attainment level prior to

secondary school. Further analyses examined the ethnic distribution of Year 9 test scores, social class, and successfully gaining a Bursary award. Findings showed that almost half of all students who were successful in Bursary were from the upper fifth of the Year 9 test score distribution, where 25.7% were Pakeha students, and only 8.5% were Māori and 4.9% were Pacific students (Nash, 2000). Using his “narratives and numbers” approach, Nash established that both cultural and social capital play a critical role in educational achievement.

Literate Cultural Capital Theory

Literate cultural capital refers to reading-related variables at school entry that are strongly linked to activities in the home environment that support early literacy development (Tunmer, Chapman, & Prochnow, 2006). There is substantial variation in the amount of literacy-related skills that children present with at school entry. Students from low SES backgrounds typically begin school with significantly lower levels of literacy-related skills and knowledge compared with children from higher SES backgrounds (Nicholson 2003; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2001). It has been suggested that the home literacy environment is a major contributing factor to this difference in prereading skills at school entry (Nicholson, 1999). The home literacy environment has a key role in children’s language development with adult interaction providing models of language and scaffolding acquisition in the forms and functions of language. The complexity and frequency of language interactions between children and parents/caregivers play a crucial part, with those children who are exposed to frequent and complex linguistic interactions acquiring language and linguistic skills more rapidly (Baker, 2003; Burchinal & Forestieri, 2011; Griffin & Morrison, 1997;

Martin & Sénéchal, 2012; Sénéchal, 2006; Sénéchal & LeFevre, 2002). Children from low SES backgrounds often have less access to cognitively stimulating materials which may account for some SES differences in language and literacy outcomes in early and middle childhood (e.g., Burchinal & Forestieri, 2011; Kaiser, Roberts, & McLeod, 2011).

In 2002, The National Early Literacy Panel (NELP) convened a synthesis of research into the development of early literacy skills in children from birth to age five specifically to identify interventions, parenting activities, and instructional practices that promoted the development of these skills. Developing from this research, the National Early Literacy Panel (2009) identified critical skills children must develop in order to become literate at school. These precursor skills include knowledge of the alphabet; phonological awareness; rapid automatic naming of letters, numbers, objects, and colours; and the ability to write their own name and to remember spoken information for a short period of time. In addition, children need to understand print conventions and concepts; have developed early decoding skills; be able to produce and comprehend spoken language; and have the ability to match and discriminate visual symbols. Clearly to develop these prerequisite skills before the formal literacy teaching takes place at school, a substantial amount of time and effort would need to have been put in at home.

The importance of the relationship between home and reading literacy achievement has also been emphasised in the results from the 2001 and 2005/6 Progress in International Reading Literacy Study (PIRLS) assessments. The positive role that parents/caregivers can play in promoting reading as well as the time spent on early literacy skills are two factors. Martin, Mullis, and Gonzalez (2004) examined factors

that were proposed to be associated with effective homes in terms of literacy development by middle primary school. They identified factors that discriminated between higher achieving students and lower achieving students including parents/caregivers reading to their children on a frequent basis, engaging in early literacy activities, and educational resources in the home. In New Zealand, 90% of the parents/caregivers of the higher achieving students reported they had read to their child, but only 55% of the parents/caregivers of the lower achieving students reported doing this. The difference of 35 percentage points was one of the highest internationally compared with the international average of 22%. Similarly, parental attitudes towards reading differed between the two groups. In all of the 35 participating countries, a greater proportion of higher achieving students than lower achieving students had parents/caregivers who held positive views about reading, but New Zealand had the largest difference at 39%. Parents/caregivers who viewed reading as a valuable and enjoyable activity had a positive impact on their children's reading success. Parental engagement in early literacy activities (e.g., telling stories, playing word games, and playing with alphabet toys) with their child was also examined. In all participating countries, the difference in percentages of students whose parents/caregivers frequently engaged in these early literacy activities for lowest and highest achieving students was statistically significant. The differences ranged from 6% to 26%, and the international average was 16%. For New Zealand, 55% of the lowest achieving students participated in regular early literacy activities with their parents/caregivers compared with 78% of high-achieving students. The difference of 23% puts New Zealand above the international average on this measure. These findings further support the vital role early literacy activities have in promoting later success in school.

Building on from Martin et al.'s (2004) findings, Tunmer, Chapman, and Prochnow (2006) examined the connections between New Zealand students having literate cultural capital at school entry and their reading outcomes later in school. In findings similar to Martin et al., Tunmer et al. found that students from low-income households had considerably less literate cultural capital at school entry compared with students from higher income homes. In addition, literate cultural capital at school entry was a strong explanatory variable for reading achievement when students were in Year 7.

Tunmer et al. (2006) argued that the whole language approach to reading instruction, which prevails in New Zealand primary schools, is particularly suitable for students who enter school with high levels of literate cultural capital, typically those from middle-class backgrounds. In whole language, the focus is on reading for meaning where the reader builds meaning drawing on prior learning and experience while interacting with the text. There is no sequence in which skills develop and no hierarchy of language skills. Skilled reading is not viewed as a process of identifying all the letters and linking these to make words which then make sentences convey meaning. Instead, the skilled reader is concerned primarily with meaning and then uses this to determine how much attention needs to be paid to print to confirm or correct their predictions (Renwick, 1985). Tunmer et al. (2006) claimed reading instruction that incorporates explicit and systematic teaching in alphabetic coding skills outside the context of reading connected text; in conjunction with strategy training on how and when to apply this knowledge during text reading, is more beneficial to struggling and at-risk readers, many of whom come from low-income backgrounds. They argued that for students who enter school with less literate cultural capital, the whole language approach to reading instruction and intervention is unlikely to address adequately the differences in essential

reading related skills and knowledge. These students depend more and more on ineffective word identification strategies, receive less practice in reading, and encounter material that is too difficult for them. Consequently, they avoid reading and as their experiences of difficulties in reading increase they cannot benefit from positive Matthew effects (Stanovich, 1986; 1993) in reading. For better readers, the amount and difficulty of the material they read increases leading to improved knowledge of letter sound patterns and further development of vocabulary, syntactic, and general knowledge. This enhances both word identification and reading comprehension skills. For students relying on inefficient strategies, if these remain unchecked, negative Matthew effects in reading and persistent literacy learning difficulties are the likely outcome. It is the predominant use of the whole language approach to teaching reading which Tunmer et al. attributed to causing the large number of reading failures and relatively high level of disparity between New Zealand readers in later grades. They concluded that whole language may be beneficial to students with ample literate cultural capital but inadequate and disadvantageous for students with limited amounts of literate cultural capital (Tunmer et al., 2006).

The four theoretical perspectives outlined in the first part of this chapter provide explanations on the causes of inequality in school achievement. Cultural Capital Theory, with its origins in Bourdieu's cultural reproduction theory (Bourdieu, 1997) argues that schools reflect the values of the dominant class and success in the education system is facilitated by the possession of this cultural capital. Lower and working class students in general do not have this highly valued cultural knowledge and are more

likely to fail academically. In this way class inequalities in educational attainment are perpetuated.

Building on from Bourdieu's theory, the Structure-Disposition-Practice Model (Nash, 2003) suggests that social structures such as the family, dispose people to think and act in certain ways. These dispositions shape the way a person views the world and their place within it, including their educational and occupational prospects. Nash argued that preschool children from middle class families are exposed to systematic practices of literate socialisation therefore providing the literacy related cognitive skills that support literacy achievement at school.

Children begin their formal schooling with varying amounts of literacy related skills, or literate cultural capital, with students from low SES backgrounds typically beginning with significantly lower levels than students from higher SES backgrounds (Nicholson, 2003; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2001). Students with high levels of literate cultural capital are more likely to experience early success in acquiring reading skills and as they achieve success, practice these skills more and the cumulative cycle of positive *Matthew effects* occurs. Students who begin school with less literate cultural capital, are likely to struggle to acquire reading skills and as they do not experience successes, practice less and early negative *Matthew effects* develop. Over time, what begins as a difference in literacy related skills at school entry develops into a wide achievement gap.

Part B: A Possible Explanation - Summer Learning Loss

The existence of a wide achievement gap is not unique to New Zealand. Educational inequalities endure in most industrialised societies despite extensive educational reforms (Cheung & Andersen, 2003).

McCombs et al. (2011) synthesised evidence from research in the United States on summer learning loss. They found that despite efforts to close the large achievement gap between disadvantaged and advantaged students over four decades, the discrepancies continue. This claim was supported by data from the 2009 National Assessment of Educational Progress which identified 49% of low-income fourth grade students as scoring in the lowest proficiency level compared with 20% of higher income students. Equally large gaps exist for mathematics, with 30% of low-income students achieving at the lowest performance level compared with only 9% of high-income students. A similar pattern in income disparities was seen with eighth grade students with 40% of low-income students scoring in the lowest proficiency level compared with 15% of higher income students. In mathematics, 43% of low-income students scored at the lowest performance level compared with 17% of higher income students.

It has been well established that children from different ethnic groups and socioeconomic backgrounds commence their formal education with disparities in skills and these inequalities continue throughout their primary and secondary schooling (Cheadle, 2008; Entwisle, Alexander & Olson, 2005; Sénéchal, 2011). As cognitive growth occurs more rapidly among young children, so the learning differences

associated with family background may increase during the early elementary years (Burkham, Ready, Lee, & LoGerfo, 2004). Smith and Brewer (2007) argued that evidence (e.g., Hart & Risley, 1995; Neuman, 1996) confirms that students who begin school with low levels of early academic skills and who do not receive any intervention will likely remain behind. In addition, they claimed that students who do not read at the appropriate level by Grade 4 are likely to continue to struggle to learn and may experience reduced success throughout their lives.

Benson and Borman (2007) suggested that the effect of family SES is most evident in students' achievement levels at school entry. Using 4,178 students across 292 schools in 699 neighborhoods, covering the years beginning at kindergarten through to end of the first grade, they found that low SES students began school performing about one standard deviation behind high SES students in reading and math, reflecting 4.5 months of the academic year reading growth and 5 months of mathematics growth. Thus, students from low SES backgrounds began school at a substantial disadvantage relative to all of their peers which reflects the accumulation of inequalities over the 5.5 year (average) life spans of students prior to beginning elementary school. In addition, data also showed that lower middle-class students also began school at a disadvantage compared to their more affluent upper middle-class peers, where the extent of the gap (3.1 points) amounted to 0.33 standard deviations.

Benson and Borman (2007) also investigated seasonal variations in the effects of family SES and race/ethnicity on reading achievement. A particularly important finding

was that across all socioeconomic levels, students progressed at a slower rate during the summer months in both reading and math. Their findings confirmed that low-income students experienced setbacks in reading growth during the summer while high-income students progressed. Further, comparing the size of the socioeconomic gap in reading achievement during the school and summer seasons revealed that the gap was greater during the school year than during summer. Low SES students fell behind their middle SES peers by 0.5 of a month of school year reading growth during kindergarten, 0.6 of a month during summer, and 0.8 of a month during first grade, illustrating that the total socioeconomic gap in reading achievement was greater during the school year. A similar result was found for math. One point of difference however, was that during the first grade, students from high SES families learned math at a slower pace (0.08 points) than their peers. Benson and Borman concluded that school year differences in achievement growth make a substantial contribution to social disparities in early childhood learning.

Hart and Risley (2003) also provided evidence of the effect of family socioeconomic status on school achievement. Their longitudinal study investigated children's early experiences of oral language and examined whether this could account for variation in rates of vocabulary growth. They found that the amount of conversation in the home correlated positively with a family's socioeconomic status. The higher the family's income the more language interactions were heard; the lower the family's income the fewer language interactions were heard. Hart and Risley calculated that a child from a welfare family heard 616 words per hour compared with 1,251 words per hour for a child from a working-class family, and 2,153 words per hour for a child in a

professional family. They further calculated based on a 14 hour waking day, by the age of four years, a child from a professional family had cumulative experience with 45 million words compared with 26 million for a child from a working-class family and 13 million for a child from a welfare family. In addition, they found that the rate of vocabulary growth at 3 years old was strongly associated with children's language skills (Peabody Picture Vocabulary Test-Revised, $r = .58$; Test of Language Development-2, $r = .74$) and reading comprehension scores (Comprehensive Test of Basic Skills, $r = .56$) at 9 – 10 years of age.

As the findings from the research presented in this review have indicated, children begin their formal schooling with vastly different levels of literacy and numeracy skills. It has been argued that providing children with early literacy learning experiences is essential in order to change the pattern of academic failure that originates in early childhood and has negative consequences for long term academic success (Celano & Neuman, 2001; Leslie & Allen, 1999; Lonigan & Whitehurst, 1998; Manz, Hughes, Barnabas, Bracaliello, & Ginsburg-Block, 2010; Neuman, 1996; Neuman & Celano, 2001; Roberts, Jurgens, & Burchinal, 2005). Research into the effects of family literacy practices on children's literacy development indicates that parents and the literacy environment they create in their homes play an important role in the development of children's reading and language skills and has important implications for children's later literacy success (Evans, Shaw, & Bell, 2000; Leslie & Allen, 1999; Lonigan & Whitehurst, 1998; Nye, Turner, & Schwartz, 2006; Roberts, Jurgens, & Burchinal, 2005; Sénéchal & Young, 2008; Swain & Brooks, 2012). Evidence suggests that parents can make a valuable contribution to their child's reading achievement through informal

and formal literacy experiences, with informal experiences such as shared reading promoting vocabulary development and formal experiences where parents tutor their child in alphabet knowledge and reading and writing words (Sénéchal, 2006; Sénéchal & LeFevre, 2002; Sénéchal & Young, 2008). In the 2003 Ministry of Education report, “The Complexity of Community and Family Influences on Children’s Achievement in New Zealand: Best Evidence Synthesis,” Biddulph, Biddulph, and Biddulph suggested that children who begin school having had a wide range of early literacy experiences do better as they begin the formal process of learning to read and write. In addition, family practices of literacy strongly influence children’s achievement at school and these vary widely across ethnicities and SES.

In addition to access to services and opportunities, Perry and Francis (2010), Entwisle, Alexander, and Olson (2005), and Calfee (1997) have also shown the powerful role that SES plays in children’s cognitive and behavioral development and readiness to learn at school. In “Solutions to Child Poverty in New Zealand” (Expert Advisory Group, 2012) international and New Zealand evidence on child poverty was examined. It estimated that approximately 25%, or 270,000, children in New Zealand live in poverty as measured by the percentage of children living in households with disposable incomes of less than 60% of the median income, after housing costs. Māori and Pasifika children, as well as children living with disabilities, are overrepresented in poor households. Children who experience persistent or severe poverty, according to the EAG, are at risk of poor life outcomes.

Mastering literacy competencies early is vital to enable students to learn effectively across the curriculum and has an important influence on students' achievement into secondary schooling years (Ministry of Education, 2011). Despite the importance of these skills, many students experience difficulty in learning to read and spell. Reading and spelling progress is most noticeably delayed in schools where there are many children from low socioeconomic and minority backgrounds (Nash, 2004; Rubie-Davies, et al., 2006; Tunmer, et al., 2004).

Research such as that cited above suggests that low-income students experience lower academic outcomes than students from higher income backgrounds. In "New Zealand Schools: A Report on the Compulsory Schools Sector in New Zealand – 2011," a disparity in achievement across all levels of the schooling system is acknowledged (Ministry of Education, 2012). A growing body of international research attributes the widening of the achievement gap between students of lower and higher socioeconomic levels to the cumulative effect of summer learning differences (Alexander et al., 2007; Allington & McGill-Franzen, 2003; Allington et al., 2010; Cooper, Nye, Charlton, Lindsay, & Greathouse 1996; McCombs et al., 2011; Ready, 2010; Terzian et al., 2009). Allington et al. (2010) argue that the failure of initiatives to ameliorate the rich-poor achievement gaps is likely due to a failure of policymakers to focus on the main source of this gap: summer reading setback. Further, it has been argued (Alexander & Entwisle, 1996; Borman, Dowling, Fairchild, & Libit, 2005; Heyns, 1978) that the differences in summer learning contribute more to inequality than the differences in educational opportunities offered by schools because all children learn at similar rates during the school year.

Summer learning loss can be defined as the decline in achievement test scores that manifest during the summer vacation from school. Cooper et al. (1996) conducted a meta-analysis of 39 studies on the impact of summer vacation on students' achievement levels. They estimated that the learning loss that occurs over summer equates to approximately "one month on a grade level equivalent scale or one tenth of a standard deviation relative to spring test scores" (p. 264). Cooper et al. argued this loss affects the math achievement levels of students from both low and middle income backgrounds, but it has greater negative effects on the reading skills of low SES students. McGill-Franzen and Allington (2003) also emphasised that summer reading loss is a bigger problem for students from low SES backgrounds. They estimated that the average loss in reading achievement over summer for these students is approximately three months, while middle-class students usually improve or stay at the same level.

Heyns (1978, 1987) examined word recognition test score changes on a sample of approximately 3,000 sixth and seventh grade students from Atlanta and compared the differences between test results taken during the school year with those taken during the summer vacation. She found that during summer the gap between advantaged and disadvantaged students' test scores increased. Heyns (1978) attributed this to the influence of non-school factors, such as home and neighborhood, during the school holidays. However, during the school year, when both school and non-school factors influence learning, all students gained cognitive skills at approximately the same rate. Heyns concluded that schooling reduces achievement gaps for students from various backgrounds.

Likewise, Entwisle and Alexander (1992, 1994) found similar relationships for reading achievement. They noted that low-income and high-income students learn at nearly the same rate while in school, but low-income students' learning drops below their higher income peers during summer. Entwisle and Alexander suggested these results emphasise that home disadvantages for poor children are compensated for in winter because when school is in session poor students and higher income students perform at almost the same level. They also proposed the faucet theory that suggests when school is in session, the faucet is turned on for all students; the resources needed for learning are available to everyone, so all students gain. However, when school is not in session, students whose families are poor stop gaining, because for them the faucet is turned off. Entwisle, Alexander, and Olson (1998) argued that the cognitive growth of children from low-income families differs from that of their more advantaged peers because it is more episodic and stops almost completely when school is closed. They suggested this is because the families and neighborhoods of poor children are unable to provide resources which would support the children's growth during the summer break.

Further confirmation of Heyns' and Entwisle and Alexander's findings emerged from Cooper et al.'s 1996 meta-analysis on 13 of the most recent studies at the time. Cooper et al. used a standardised mean difference, d – index, to illustrate the change in achievement scores relative to the sample's own performance. In addition, they calculated the difference in grade-level equivalents to indicate a change in achievement scores relative to national norms. Further, homogeneity analysis was used to test for possible moderators of the summer vacation effect on achievement. From their analysis, Cooper et al. found that the summer effect is more detrimental for math than reading,

and math computation and spelling showed larger effects than any other subject area. In contrast to this, they also found substantial socioeconomic differences in reading. Results indicated that middle-class children showed significantly greater summer gains in reading and language achievement than lower income students. Middle-class students displayed nonsignificant gains in grade-level equivalent reading scores, while lower income students showed a significant loss. On average summer vacation created a gap of about three months between middle and lower income students. Reading comprehension scores for both income groups dropped over summer; however, there was a greater decline among the lower income students ($d = -0.27$) compared with the middle-class students ($d = -0.14$). Reading recognition scores showed a statistically significant gain for middle-class students ($d = 0.13$) and a significant loss ($d = -0.12$) for lower income students. There were no moderating effects for students' gender or race; however, the negative effect of summer did increase with increases in students' grade levels, $\chi^2(1, n = 62) = 64.64, p < .001$. As the grade level went up, the effect of summer vacation changed from positive to negative and became more detrimental. They found, on average, that first and second grade students showed nonsignificant gains in achievement, while students in fourth grade and beyond showed statistically significant losses, some of which were quite dramatic (e.g., fourth grade, $d = -0.12$; seventh grade, $d = -0.17$; eighth grade, $d = -0.21$). Cooper et al. suggested that the negative and linear influence of increased grade level on the effect of summer vacation could be a result of a *floor effect* in scaling. For example, a first grade student can only achieve one grade below the national normed grade level therefore limiting the amount of negative change among students in earlier grades. They argued that even though summer effects may be only small in the first and second grades, they are particularly critical as they may initiate processes that influence later learning. It has been suggested (e.g., Alexander et

al., 2001; Kim and White, 2008; Krashen and Shin, 2004) that summer effects are cumulative and get larger over time. Further, Alexander et al. 2001 argued that if the achievement gap during elementary school has its origins largely in summer learning differences and this gap increases over time then the academic placements and attainment of students in the upper grades will be affected. They contended that summer learning differences during the early grades “help explain achievement-dependent outcome differences across social lines in the upper grades, including the transition out of high school, and for some, into college.” (p. 168)

More recent studies continued to find similar results (e.g., Burkam, Ready, Lee, & LoGerfo, 2004; Downey, von Hippel, & Broh, 2004). Downey et al. examined data from the Early Childhood Longitudinal Study – Kindergarten Cohort to estimate learning rates of a sample of 20,000 children from the beginning of kindergarten to the end of the first grade, including both the academic year and the summer vacation. They used a multilevel growth model to estimate students’ knowledge and learning rates. Downey et al. concluded that schools serve a mediating function while they are in session. Their analysis showed that average learning rates during kindergarten and first grade were 2.09 points per month faster than the summer learning rate. Further, they found less variability in learning rates during the school year than during the summer with summer variance ($SD = 0.57$) being significantly larger than the average of the kindergarten ($SD = 0.38$) and first grade ($SD = 0.43$) variances. Downey et al. also examined the extent to which SES affects learning rates. They suggested that the SES gap is present before students begin school and continues to grow once formal schooling has begun although it grows more slowly during the school year compared

with the summer vacation. For example, a one standard deviation advantage in SES predicts a relative gain of 0.16 points per month during summer, 0.07 points per month during kindergarten, and 0.05 points per month during first grade. Their results indicated that, during the school year, learning rates are usually negatively correlated with initial status and consequently inequality decreases. In summer, however, learning rates are usually positively correlated with initial status, thus, increasing inequality. Downey et al. argued that the disparity between households is far greater than the disparity between schools, and it is the contrast between children's non-school environments that are the main source of inequality. They asserted that even though schools may be unfair in their allocation of learning resources, they still act as "equalisers" because schools are generally fairer than non-school learning environments in their distribution of learning resources.

Miller (2007) builds on this idea and commented that schools should not bear primary responsibility for gaps in the educational system. She suggested that it is non-school factors that result in gaps in achievement-test scores. Rather, these gaps reflect deeper issues in society, including gaps in access to economic and social resources, support, and role models. Miller also alluded to differences in the level of bias and stress that students face in their school environments as contributing to the achievement gaps. She argued that to close the achievement gap relevant out of school experiences must be created so that summer provides learning opportunities for all children.

Summer learning loss produces a gap that grows over the years. Alexander, Entwisle & Olson (2007) monitored the educational progress of 790 school children from first grade through to 22 years old. By analysing data from reading comprehension tests administered to the same students twice yearly (autumn and spring), Alexander et al. were able to isolate gains made during the school year from those made during the summer. They found that when test scores reflected mostly school year learning, low-income students kept pace with their higher income peers. However, higher income students' reading skills continued to improve during the summer while lower income students lost ground. This resulted in a cumulative summer learning loss that by the ninth grade accounted for more than half the difference in reading skills. Alexander et al. stated that this difference was larger than the difference built up during the preschool years. They argue that these differences have long-lasting consequences, and achievement in ninth grade was highly associated with later dropping out and whether a student took college preparatory courses.

Reasons for Summer Learning Loss

The socioeconomic gap in summer learning has been attributed to a wide range of possible causes. Burkham et al. (2004) suggested that differences in families' economic resources may be a contributing factor. Further, higher income students have more enriching learning opportunities available, such as parents/caregivers who have completed more education and are therefore more able to support their child's learning in summer. Parents'/caregivers' attitudes toward school learning have also been associated with summer learning loss (Burkham et al., 2004). It has been argued that students from low-income families spend less time reading, have less access to books at

home, and when visiting the public library choose material that contains less information and often less print than children from middle and high-income families (Celano & Neuman, 2008). Terzian, Moore, and Hamilton (2009) argued that low-income students are affected more by summer learning loss because their families do not have the range of resources, opportunities, and cultural capital which could effectively mitigate the lack of support, learning, and school structure that occurs during the summer break.

Summer reading activity, or lack of it, has been identified as one source of summer setback (Allington et al., 2010). Strategies to address summer learning loss in the United States generally fit into one of three approaches: attendance at a summer school, summer reading programmes offered by public libraries or other community organisations, and the reading of books available in the home (Smith, 2007). Despite the existence of these resources and programmes, they are often not readily available to all students. For example, Smith argues many homes lack sufficient resources such as books and transportation to public libraries. Thus, the challenge is to find new and innovative ways to get books into the hands of students where such obstacles exist.

A number of recent studies have taken up this challenge by examining the effectiveness of voluntary summer reading programmes (Allington & McGill-Franzen, 2003, 2008, 2009; Allington et al., 2010; Kim, 2004, 2006; Kim & White, 2008; Kim & Guryan, 2010).

Voluntary summer reading has been defined as “an instructional approach in which children self-select texts, are encouraged to read texts silently on their own, and are given little or no feedback on their reading by teachers, parents, or older peers” (Kim & White, 2008, p.1). This approach has been the focus of numerous studies by Kim and colleagues (Kim, 2004, 2006, 2007; Kim & Guryan, 2010; Kim & White 2008). As their studies evolved, a scaffolded voluntary summer reading programme was developed and two experimental studies conducted to test its effectiveness. In a scaffolded voluntary reading programme children are provided with books that match their reading levels and interests. Over the summer, the children are encouraged to read orally with an adult and practice the comprehension strategies that they have learned at school. White and Kim (2008) posited that for students at risk for summer reading loss, supportive mechanisms should be put in place to ensure the students both read the books, and read them in ways that are likely to build decoding skills, fluency, and comprehension. These mechanisms must be instructional strategies that are supported by research evidence and used by teachers in their classroom literacy programmes, for example guided oral reading and comprehension strategy instruction (White & Kim, 2008).

In the first of Kim and colleagues studies teachers modeled fluent oral reading and comprehension strategies for silent reading immediately prior to the summer vacation. The students then practiced this in pairs and then practiced using five reading comprehension strategies while reading silently on their own. . The five comprehension strategies included rereading, asking questions, making connections, making predictions, and summarising.

Teachers also explained that the children would receive eight packages over the holidays each containing a book, a postcard and a letter to parents. The procedure for completing the reading task and returning the postcard was outlined. The letter asked parents to listen to their child read the book out loud and after listening to the passage twice tell him/her how they had improved in terms of smooth, expressive reading and word knowledge. Once this has been completed, the parent signed the postcard indicating that they had listened to their child read and then returned it by mail. The postcards did not require stamps. The letters were translated into other languages according to the needs of individual schools. Results from this study were promising with estimated treatment effects largest for Black and Hispanic students (Kim, 2006).

The second study replicated the first however it included a different sample of schools, more grade levels, and students with a wider range of reading skills. In addition Kim and White examined whether scaffolding of both oral reading and comprehension strategies is more effective than scaffolding of oral reading only, and whether either form of scaffolding is better than no scaffolding. Teachers followed the same pre-summer scaffolding process as in the 2006 study. Book, postcard and parent letter packages were mailed to the students in each of the three treatment groups throughout the holidays. The content of both the letter and the postcard differed for each treatment group. For students receiving books only, the letter asked parents to encourage their child to read the book and to complete the postcard and mail it back. The postcard for this group included three questions for the child to answer: the title of the book, whether or not the book was finished, and how many times it was read. The child's signature

was requested as the fourth question and there was provision for a comment about the book by the child.

For children in the books and oral reading scaffolding group the letter requested that the parent encourage their child to read and return the completed postcard. In addition, the letter suggested that getting the child to read out loud either to the parent or an older sibling would be beneficial and then after listening to a second reading of the passage comment on how he/she has improved. The postcard also required the parent's signature and there was space for any comments the parent wanted to include on their child's reading, although this was optional. The postcard had the same first three questions as on the books only postcard with the addition of a fourth question that asked the child to indicate whether there was an improvement in their reading the second time. For the children receiving books with oral reading scaffolding and comprehension scaffolding the parent letter was the same as the second group however the postcard had a question on comprehension strategies as well as the fluency question. The child was asked to identify what they did to improve their understanding of the book by selecting one of the five comprehension strategies that the teacher had taught in the end of year lessons (Kim & White, 2008).

Results from the second study indicated that children who received books with oral reading and comprehension strategies scored significantly higher than the control group at posttest on measures of reading comprehension and vocabulary. Also, children who were in the scaffolding groups combined scored higher on the reading

comprehension and vocabulary measure at posttest than children in books only and control groups.

It is unclear from either study whether parents encountered any difficulties implementing the parent scaffolding procedures. In discussing the limitations of his 2006 study, Kim states that there were not sufficient resources to gather information from a range of sources including interviews with parents and students and observations of family literacy activities. He adds that better measures are needed to highlight the quality of social interactions within families “when children are given free books to read at home and encouraged to read with their family members” (Kim, 2006, p. 350).

Socioeconomic and Ethnic Differences

Krashen and Shin (2004) suggested that there is a straightforward explanation for the differences between high and low-income students in reading during the summer. Specifically, high-income students read more because they have more access to books. Students who read more read better and also write better, spell better, have larger vocabularies, and show greater control of complex grammatical constructions.

Krashen, Lee, and McQuillan (2008) argued if it is true that more reading leads to better reading as well as better development of other aspects of literacy then increasing access to books should result in better reading. In order to test this premise, they examined the reading results of fourth grade students from 40 countries using the PIRLS data, specifically focusing on the impact that students’ access to books has on

their PIRLS reading scores. Using multiple regression analysis, Krashen et al. identified that SES was a strong predictor ($\beta = 0.41$) of reading ability, and further, students in countries that utilised more sustained silent reading tended to perform better in the reading assessment. In addition, they found that availability of a school library is a very strong predictor of reading scores ($\beta = 0.34$) and, in fact, this result was nearly as strong as the effect of poverty ($\beta = 0.41$). The amount of formal instruction in reading that students receive in each country was also examined. Results indicated that increased time devoted to instruction was associated with lower fourth grade reading scores ($\beta = -0.19$).

Neuman and Celano (2001) have also examined differentiated access to print and how this affects literacy development. They hypothesised that differences in access could influence the degree of familiarity with book language and the cognitive behaviors associated with reading, thus, helping to explain the substantial educational differences among low and middle income students in beginning formal instruction. In their investigation of access to print in four communities, two low-income and two middle-income, Neuman and Celano gathered data from a wide range of sources. Examples of data included surveying and counting all the reading material in each neighborhood, identifying reading spaces within each neighborhood and observing these areas for 40 hours in total, observing 48 childcare classrooms and rating each for access to books, and visiting both school and public libraries and measuring children's access to books. Data analysis consisted of both semantic feature analysis and analysis of variance (ANOVA). Neuman and Celano found only minor educational differences in access between neighborhoods of similar income. There were, however, major and

striking differences at almost all levels between neighborhoods of different income. Results indicated that students from middle income neighborhoods were likely to be inundated with a wide variety of reading materials. In contrast, students from poor neighborhoods would have to actively search for reading materials.

Constantino (2005) found further evidence of the discrepancies in book access between low and high SES communities. Here, comparisons were made between access to books in the home, classroom library, school library, public library, and bookstores in six communities in Los Angeles, two high-income and four low-income. Results showed that high SES communities had a statistically greater number of books in the home, classroom, and school compared with low SES communities. There were no differences between the groups on public library books. A survey of the number of local bookstores showed that the two high SES communities had a total of 10 bookstores; however, there were no bookstores in any of the four low SES communities.

Differences in access to print may have important implications for children's early literacy development (Neuman & Celano, 2001). As a consequence of this difference, Neuman and Celano claimed children with limited access to print will likely have less opportunity for positive reading practices which will result in them being poorly equipped to acquire reading skills. Following Stanovich's (1986; 1993) *Matthew effects* model, children with easy access to print will be able to practice more and acquire reading skills more readily. Those with limited access to print will practice less and have fewer opportunities to develop their reading skills. Consequently development of

automaticity and speed at the word level are further delayed. Reading for meaning is hindered due to the limited opportunities to practice and a negative spiral of cumulative disadvantage continues (Stanovich, 1993). The result is that those with ready access to literacy resources get “richer” in reading and the “poor get poorer”.

More recent studies have also examined the effect that a lack of access to reading materials might have on students’ reading achievement. For example, Allington et al. (2010) tested the hypothesis that providing low-income students with books over summer could help raise their achievement. From 2001 to 2004 they conducted a longitudinal study that provided 12 paperback books each summer to 842 randomly selected primary grade students. The students all attended one of 17 high-poverty elementary schools and were in either Grade 1 or 2 at the beginning of the study. They self-selected their books at book fairs held in spring and then on the final day of school for the year they were given their books. Students were asked to keep a book log and return it at the end of summer. The programme continued for these students over three consecutive years. At the end of this time, the researchers compared the reading achievement scores of the 842 participants with a control group of 428 low-income students from the same schools who did not receive any books. Results indicated that reading performance of the students who received the summer books for the three years was statistically significantly higher ($p = .015$) than that of the control group. From this, Allington et al. calculated an overall reading achievement effect size of 0.14, which was statistically significant, and a slightly larger effect size ($d = 0.21$) for the poorest students. While the researchers acknowledged that these effect sizes were small, they argued that they were both equivalent to or larger than the effect size of 0.14 found by

Cooper, Charleton, Valentine, and Muhlenbruck's (2000) meta-analysis of 54 studies examining the effects of attending summer school.

A unique aspect of Allington et al.'s 2010 research was that students self-selected their books. According to Allington and McGill-Franzen (2003), extensive successful reading experiences are crucial in the development of reading proficiency, and are a powerful source for world knowledge and core curricular knowledge. Students whose reading skills are not strong and who have not had many successful reading experiences are less likely to voluntarily read and therefore will not improve. McGill-Franzen and Allington (2003) argued that giving students the opportunity to self-select books from a range of titles and at the appropriate reading level will keep them engaged in reading and also help students develop an extensive background knowledge that will scaffold their independent reading. Allington and McGill-Franzen (2009) emphasise the importance of students having easy access during the summer to books they can and want to read.

Kim (2004) surveyed over 1,600 Grade 5 students to explore the relationship between autumn reading achievement and summer book reading, as well as the volume of summer book reading and access to books. The students attended 18 ethnically and socioeconomically diverse elementary schools. The sample included 58% White, 18.9% Asian, 13.1% Latino, and 10.5% African American students. Results highlighted that the volume of summer reading was positively related to autumn reading achievement independent of prior reading and writing skills and students' background characteristics.

The benefits of reading books over the summer were consistent for all ethnic groups. Kim found that reading four to five books had significantly larger effects compared to reading three or fewer books.

In follow-up research, Kim (2006) conducted an experimental study to examine the causal effects of a voluntary summer reading intervention on the reading achievement of 552 fourth grade students. Kim's study aimed to increase summer learning opportunities and improve the reading skills of minority students and less-skilled readers by increasing their access to books, matching books to students' reading levels and interests, and encouraging students to read orally to an adult and practice comprehension strategies learned at school. Students in the treatment group all received eight books matched to their independent reading level and their interests. Books were mailed to the students during the summer holidays. A postcard was included with each book reminding the student to practice oral reading and the comprehension strategies learned prior to the summer holidays. Analysis of the data indicated small but positive effects, particularly for those students who owned fewer books at home and had weaker reading skills. Kim suggests that the range of effect sizes (0.10 to 0.17) indicate that the average student in the treatment group would be expected to outscore the average student in the control group by approximately 4 to 5 percentile ranks. Kim concluded that the effects of a voluntary summer reading intervention could be enhanced by matching appropriately challenging books to students and by instructing students to use comprehension strategies while reading books at home (Kim & Guryan, 2010).

Kim and White (2008) conducted a second experimental study using a different sample of schools and additional grade levels. This study sought to investigate whether similar results to Kim's (2006) previous research could be replicated if students received books matched to their reading preferences and independent reading level without support from parents and teachers, or if they received only oral reading practice without comprehension strategy instruction. Participants consisted of 400 students in Grades 3 to 5 and 24 teachers. Both teachers and students were randomly assigned to one of three treatment groups: participants received either matched books only; matched books and oral reading; or matched books, oral reading, and comprehension strategies instruction. In addition, there was a control group whose participants received books once the posttest assessment had been administered. Results from this study indicated that students in the matched books only group performed similarly to students in the control group, suggesting that simply giving students matched books did not have a significant positive effect on reading achievement. However, students in the full treatment group, specifically, matched books with oral reading and comprehension scaffolding, significantly outperformed students in the control group. White and Kim (2008) argued that the difference in posttest scores of 3.9 points represented a learning advantage of 2.5 months. Students in the matched books with oral reading scaffolding group performed better than students in the control group, and this difference was largest for students who performed below the median score on the fluency pretest. However, none of these differences were statistically significant. White and Kim noted that the results did not provide clear evidence as to whether oral reading scaffolding on its own produces better reading outcomes. Overall, the largest effects were observed amongst African American (average gain of 1.7 months), Hispanic (average gain of 5.1 months), and low-income students (average gain of 4.0 months). White and Kim point

out that this is sufficient to offset 100% of the summer loss shown by low-income students in Cooper et al.'s (1996) meta-analysis of studies of the effect of the summer holiday on achievement.

The important implications of the studies by Kim and White were that the voluntary reading of books over the summer can improve reading achievement and reduce summer loss if the books are closely matched to the reading levels and interests of the students and if teachers and parents provide scaffolding support in oral reading practice and comprehension strategies instruction.

In a recent study, Kim and Guryan (2010) sought to replicate the results from Kim's (2008) earlier research and extend their previous work to include a family literacy component whereby parents were instructed to use comprehension strategies learned at school with their children in their native language. Participants in this study were 370 Grade 4 students, of whom the vast majority (90%) were Latino and came from homes in which Spanish was the primary language spoken by parents. Two hundred and fifteen students were randomly selected to participate in the two experimental groups, where one group received books with oral reading and comprehension scaffolding lessons and the second group received the family literacy intervention. One hundred and ten participants were represented in the control group. Kim and Guryan hypothesised that students in the family literacy intervention would make greater improvements in reading comprehension and reading activities compared with both the treatment group who received books with oral reading and comprehension

scaffolding lessons and the control group. As part of the family literacy intervention, parents and children from this group were invited to attend three 2 hour summer literacy events during which parents were instructed in how to use comprehension strategies with their children. Although students in both the treatment and family literacy intervention experimental groups reported reading more books than the control group, there were no significant effects on reading achievement. Kim and Guryan suggested this might be because students in their previous studies were mainly proficient in English and had better reading skills. In comparison, students in this study were mostly low-income Latino students from language minority families, where English is not their first language, and they may not be proficient in English. The mean reading comprehension score for these students was at the 24th percentile at the end of the fourth grade. Kim and Guryan argued that struggling fourth grade readers are likely to be similar to beginning readers in that they may lack the decoding skills and reading fluency to benefit from a voluntary book reading intervention. The results for students reflected the results of their earlier study (2008), with students in Grades 1-5, which showed minimal benefits for first and second grade students who lacked the decoding skills and fluency to read independently. In comparison to their previous research, in this study the students chose the books at a school book fair. Previously, the researchers had used a computer algorithm that identified books that matched each student's reading level and preferences. The book fair selection process introduced a greater mismatch between students' reading levels and the readability level of their books.

From these findings, Kim and Guryan (2010) suggested four implications for future intervention studies. First, there was the need to improve vocabulary instruction

and English language proficiency in order to prevent summer learning loss among low-income Latino students from language minority backgrounds. Second, the results underscored the importance of encouraging students to read appropriately challenging texts. Third, the number of books read during the summer was positively correlated with reading comprehension, but not vocabulary scores, thus, suggesting that gains in vocabulary may only be seen following substantial exposure to print over more than one summer. Last, given that there was no evidence of effects for family literacy events, they suggested a more effective approach might be to train both parents and children to use teacher directed vocabulary and comprehension lessons in a centre-based summer reading programme.

Summer Learning Loss in New Zealand

While a substantial amount of research on summer learning loss has been conducted internationally, very little has been undertaken in New Zealand. As a result, the following section outlines in detail the two studies to date, that have focused on the issue of summer reading loss within the New Zealand context.

Tiruchittampalam (2006) examined the effectiveness of a summer school reading tuition intervention as a means to offset any summer learning loss in reading. In this experimental study, 72 students from a decile 1 school in South Auckland were the participants. All were of similar reading ability and age. Participants were randomly assigned to either the treatment group ($n = 36$) or the control group ($n = 36$). Students in the treatment group attended a summer school and received daily one-on-one lessons from trained tutors over a three-week period in January. Each lesson lasted for one hour

and consisted of four components: word reading, spelling practice, phonics/decoding, and reading practice. Results indicated that the summer school students maintained their reading achievement; however, non-summer school students fell in their reading achievement by approximately 6 months over the summer holiday period. When chronological age differences were accounted for, participation in the summer school resulted in significant gains being made in reading accuracy as measured by the Burt Word Reading Test. There were no significant differences found between the summer school and non-summer school groups in reading comprehension as measured by the Prose Reading Observation, Behavior and Evaluation (PROBE; Triune, 2002) informal reading test.

In addition to this previous study, McNaughton, Jesson, Kolose, and Kercher (2012) investigated summer learning loss in New Zealand schools and their communities. The focus of their research has been to identify factors that might help overcome summer learning loss in reading in decile 1 schools specifically, those schools that draw their students from areas of most socioeconomic disadvantage. McNaughton et al. posited that there are considerable variations in the pattern of summer learning loss in schools serving Māori and Pasifika communities. Further, they argue that these differences also persist within classrooms, between classrooms within schools, and between schools. Given this, “any attempt to overcome summer learning loss should be contextualised, capitalising on practices already present” (McNaughton et al., 2012, p.2).

In the first phase of their study, McNaughton et al. described the extent and variability of the summer learning loss as well as the related school, family, and student practices in seven decile 1 schools in South Auckland. The southern area of Auckland was targeted given that, in comparison to other areas, it represents the largest proportion of Māori and Pasifika students. Students' STAR reading assessment data for 2009 and the beginning of 2010 was examined. Eight classes with "low" summer learning loss and eight with "high" summer learning loss were identified and a series of teacher, student, and parent interviews were then conducted. Findings identified some common practices. For example, teachers in classes with low summer loss were more likely to encourage their students to visit the library over the holidays and help their students choose suitable books. These teachers also provided guidance to individuals and prepared students in reading strategies, metacognition, engagement, and information sharing with parents/caregivers. Teachers in classes with high summer loss were more likely to provide specific books for parents/caregivers.

Responses from students did not indicate many differences between students or classes with high and low summer learning loss. All students from classes with low summer loss did report that their teachers had given them ideas about reading over summer and in addition all reported that someone at home helped them read. Parents/caregivers of students with high summer loss reported that access to texts influenced their child's summer reading choices. In general, students with low summer loss were supported to access and read engaging high-interest texts.

In the second phase of the study, an intervention that was developed based on the phase 1 findings was implemented. There were three components to the intervention: teacher preparation, parent guidance, and student review. In the last four weeks of the school year, teachers focused on preparing the students for summer by promoting the importance of reading and practicing reading strategies. Teachers also provided specific guidance to parents/caregivers on how best to support engagement over summer. The third component, student review occurred when the students returned to school at the beginning of the new school year. Students completed a review that reported on student and family reading practices over summer.

A comparison was made between the 2009-2010 summer reading performance and the subsequent post-intervention summer (2010-2011), in order to determine whether the intervention had produced a sustained reduction in summer learning loss. Results indicated that there were no significant differences between the two summers. However, two procedural issues might have impacted on these results. First, the poor response rate of teacher surveys (63%) suggested that the intervention had not been fully implemented within participating classrooms. Similarly, there were poor response rates to both the student survey (15%) and the student review (23%). However, McNaughton et al. found an interesting result when comparing students who did complete the survey and those that did not. Specifically, students who had not completed their survey showed a similar summer learning loss pre- and post-intervention (mean effect pretest = -0.8, post = -0.8). However, students who did complete the survey had reduced their summer learning loss (mean effect pretest = -0.8, post = -0.5). McNaughton et al. suggested that these classes and their teachers may have

practices that reduce the summer learning loss. A similar result occurred with the student review. Students who completed the review showed a large reduction in summer loss (mean effect pretest = -0.9, post = 0.0) while those who did not complete the review made a small increase (mean effect pretest = -0.8, post = -0.95). McNaughton et al. argued that the low completion rate was the result of poor implementation by teachers.

Based on the outcomes from this study, McNaughton et al. argued four implications. First, findings suggested that supporting students' reading interests should have positive effects on their reading and that having an understanding of these assists in diminishing summer learning loss. Second, engagement in reading over summer appeared to be dependent on students' selection and enjoyment of texts as part of their perceived leisure activities. Third, providing specific guidance and support to both parents/caregivers and students on how to engage with text seemed more effective than providing general advice. Encouraging parents/caregivers to talk with their child about what they have read and focusing on interest and enjoyment also appeared to be effective. Fourth, teachers finding out about their students' summer reading at the beginning of the school year in order to get to know their learners, particularly their reading interests and out of school reading practices. This also means teachers and students focus on reading right from the start of the school year.

Summary

The research presented in this chapter provides evidence of the summer learning loss phenomenon and the impact that this has on widening the achievement gap between

low-income students and their more advantaged peers. Research has indicated that students from low socioeconomic backgrounds and minority students make less growth than other students over summer and this contributes to the widening gap in achievement (Alexander et al., 2001). This summer loss appears to be cumulative so the achievement deficit gets larger over time (Alexander et. al., 2007). Cooper et al. (1996) have estimated that the summer break creates, on average, an average achievement gap of approximately three months. Alexander et al. (2007) calculated that by the ninth grade more than half of the achievement gap between lower and higher income students can be explained by unequal access to summer learning opportunities during elementary school.

Although there are only a limited number of studies in New Zealand, summer learning loss has been confirmed as a major barrier to ongoing achievement (McNaughton et al., 2012). To date, there are no studies that have examined the effectiveness of voluntary summer reading interventions in New Zealand primary schools as a means of preventing summer reading loss.

CHAPTER THREE

METHODS

Crotty (1998) proposed that four elements should be considered when developing the methodological approach that will be used to answer the questions pertaining to a study, namely, the epistemology, theoretical perspectives, the methodology, and finally the methods that will be adopted. Further, Crotty proposed that there is a distinct interrelationship between the theoretical stance used by a researcher, their epistemological view, and the methodological approaches. Specifically, the epistemological position is the theory of knowledge that provides the justification that the researcher brings into the research, which are closely represented through hypotheses that are devised. It is the theoretical perspective that provides the context, and the research process that will be used, which is embedded in the associated logic and criteria, and informs the methodological approach.

The philosophical stance for this research is positivism/objectivism whereby it is proposed that the construct of summer slide is in and of itself, a meaningful entity or 'object'. Summer slide, as are the other constructs of focus, are deemed to exist objectively, and given this should be measured empirically using an experimental and survey research design approach. From this appropriate methods have been aligned, specifically, sampling, statistical analysis, and survey tools.

This chapter begins with a brief outline of the research problem that the study was designed to investigate. A description of the participants, the treatment conditions, the measures, the research design, and the research procedure follows.

Preview of Study

Research suggests that students from low socioeconomic status (SES) backgrounds lose ground in reading over the long summer holidays (Cooper et al., 1996; Allington et al., 2003; Entwisle et al., 2007). It has been argued that summer reading loss is a critical factor in the widening of the achievement gap between rich and poor children throughout the elementary school years (Allington et al., 2003). Access to books has been cited as an important factor contributing to summer reading setback. To become skilled at reading requires extensive and ongoing practice, which needs to be maintained over the long summer vacation. Easier access to interesting reading material increases the likelihood that individuals will read. As students from low-income backgrounds are likely to have less access to reading material at home than their more advantaged peers, it seems plausible that increasing their access to books over the summer would stimulate reading activity and consequently minimise summer reading loss (Allington et al., 2008). The present study addresses this and investigates whether giving students 25 self-selected books over summer reduces summer reading loss.

From the preexisting research on summer learning loss, as presented in the previous chapter, the following four hypotheses have been developed for this study:

1. Students who have access to reading books matched to their reading levels and interests over the summer vacation will demonstrate greater gains in reading achievement than those students who receive math workbooks over the holidays (Group 3), and those who do not receive any books over the holidays.
2. Students who have access to reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation will demonstrate greater gains in reading comprehension than those students who receive reading books only (Group 1).
3. Students in high and low decile schools who have access to reading books matched to their reading levels and interests over the summer vacation will demonstrate similar gains in reading achievement over the summer holidays.
4. Poor readers who have access to reading books matched to their reading levels and interests over the summer vacation will demonstrate greater gains in reading achievement than good readers who have access to reading books matched to their reading levels and interests.

The following research questions formed the basis for this study:

1. Do students who receive reading books matched to their reading levels and interests over the summer vacation make greater gains in reading achievement than students who receive math workbooks and students who do not receive any books?

2. Do students who receive reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation make greater gains in reading comprehension than students who receive reading books only?
3. Do students in high- and low-decile schools who receive reading books matched to their reading levels and interests over the summer vacation make similar gains in reading achievement?
4. Do poor readers who receive reading books matched to their reading levels and interests over the summer vacation make greater gains in reading achievement than good readers who receive reading books matched to their reading levels and interests?

Participants

In 2011, the researcher invited 10 Auckland primary schools to participate in the study. Including ten schools provided a large enough sample to give power to the analyses given that effect sizes for small intervention periods are typically small. A large sample size would show up a small effect size. These schools were approached because they are located either in the lowest SES communities (deciles 1 and 2) or the highest SES communities (decile 10). Decile 10 schools were included in the sample to provide a perspective on what happens to students from high SES communities over the summer holidays. The inclusion of schools at the middle SES range was not part of this research design as there was interest in examining the extremes between high and low decile students. Previous research overseas suggested that the intervention would work

better for low SES schools than for high SES schools, hence the interest in these contrasting SES schools.

Once approval had been given from principals and board of trustees, parental consent and student assent were sought.

Year 3 students from these 10 schools were the participants. All Year 3 students were invited to participate except for students in bilingual classes where the language of literacy instruction was not English. In selecting the year level of participants, consideration was given to the expectations of the students in order to complete the programme and the required level of literacy skills. As students are expected to be able to use a variety of decoding strategies; automatically read high frequency words; understand basic punctuation; and use their knowledge of synonyms, word families, and sentence structure to find meanings of unknown words (Ministry of Education, 2010) after three years of school, the researcher selected this year level as the most appropriate for the intervention.

Consent was given for 598 students to be involved; however 15 students (2.5 percent) did not complete both pre-and post-assessments. Complete data were gathered on 583 students. Ages ranged from 86 to 108 months with the mean age being 96.16 months. The mean chronological age was 96.5 months for Group 1, 96.2 months for Group 2, 96.3 months for Group 3, and 95.6 months for Group 4. The sample consisted of 304 males and 279 females. A wide range of ethnic groups were represented. The largest groups were New Zealand European (24.2 percent), Samoan (18.7 percent), New

Zealand Māori (18.4 percent), Tongan (12 percent), Cook Island Māori (11.5 percent), Asian (6.2 percent), Indian (5.3 percent), and Niuean (1.7 percent). Table 1 shows the demographics for participants according to ethnicity and gender.

Table 1

Number of Participants According to Ethnicity and Gender

Gender	Frequency	Percent
Male	304	52.1%
Female	279	47.9%
Ethnicity		
NZ European	141	24.2%
NZ Māori	107	18.4%
Samoaan	109	18.7%
Tongan	70	12.0%
Cook Island Māori	67	11.5%
Asian	36	6.2%
Indian	31	5.3%
Niuean	10	1.7%
Middle Eastern	4	0.7%
Tokelauan	3	0.5%
American	2	0.3%
South African	1	0.2%
Other	2	0.3%

School-based numeracy assessment data was provided by each school. This was assessed using the Global Strategy Stage Assessment (GLOSS; Ministry of Education, 2002). GloSS identifies a student's global strategy stage across the operational domains of the numeracy project, that is, addition/subtraction, multiplication/division, and

proportions/ratios. GloSS is not standardised although national performance data are available. Items have been tested for validity, and there is evidence of test-retest reliability.

Class teachers assessed the students' reading levels using Supplementary Tests of Achievement in Reading (STAR; Elley et al., 2011) and either PROBE Reading Assessment (Pool, Parkin, & Parkin, 2002) or PM Benchmark (Price Milburn, 2008) in June and November 2011. These results were used to assign students into groups of four, with students' performance matched as closely as possible on reading level and age. To allow student's performance to be comparable, PM Benchmark Levels 1-17 were converted to a reading age where schools change to PROBE Reading Assessment for students who are reading at Level 18 and higher.

Following this, the researcher randomly assigned each member of the group into one of the four conditions: books only, books and comprehension quizzes, math control, and the control group that received their books early in Term 1, 2012 after post-testing had been completed.

Ethics

Ethical approval for this study was granted by the Massey University Human Ethics Committee on September 27th, 2011, MUHECN 11/055 (See Appendix F). The accompanying documentation outlined the nature of the study and made it clear that participation was voluntary and anonymity was assured. Letters explaining the research and inviting schools and students to participate were sent to the 10 schools involved in

the study. In addition, letters were sent to the schools' principals, Boards of Trustees chairpersons, and parents. Written consent confirming willingness to participate and understanding of the intentions of the study was obtained from each participant. Copies of the school, parent, and student participation and consent forms are included in Appendix A.

Pilot Study

In 2010, a pilot study was conducted in a decile 1 school located in South Auckland (the results of the study are in Appendix B). Ethical approval for this study was granted by Massey University Human Ethics Committee on 25th November, 2010. MUHECN 10/076 (see Appendix G). The purpose of the pilot was to investigate whether giving students from low-income backgrounds 15 self-selected books over the summer holidays would reduce the summer loss in reading achievement. The hypothesis for this study was that providing students with appropriate level books that they want to read would result in additional practice in reading over summer, and therefore the skills acquired during the school year would be maintained.

The pilot study had a total sample size of 81, including both Year 2 and 3 students. The participants were randomly assigned to one of three groups: a books only group, a math control group, and a dot-to-dot control group. The pilot results indicated that there was a significant gain in reading for all groups over summer, but no one group did better than the other groups. Although all groups improved in reading over the summer there was no effect for the books only group. Additionally, there was no

positive effect on math. Parent ratings of the programme were very high across all three groups.

These findings were at odds with some of the overseas research. For example, Allington et al. (2010) reported findings from their study in which students received 15 free books every summer for three consecutive years. The results at the end of the three years showed that the treatment group scored significantly higher on state reading tests than the control group.

Kim and Guryan reported less positive findings from their 2010 study in which low-income second-language Latino students were assigned to one of three groups: a treatment group that received 10 self-selected books, a family literacy group that received 10 books and attended two summer literacy events, or a control group. Results from their study showed that all three groups went backwards over the summer break and that there was no difference between groups. They argued that this result may have occurred because students struggled due to low reading abilities and low levels of vocabulary.

To improve on the pilot study, a number of modifications were made. In the pilot study all three groups gained in reading, and there was no summer loss. This may have been a placebo effect given that all groups received some intervention. In response to this, four groups were incorporated into the main study, including a control group that received nothing until after the post-testing had been completed. The adoption of a

control group as part of the experimental design helped account for placebo effects. The sample size was increased in the main study to include 10 schools and 583 students. A larger sample allowed for greater statistical power. A further change was the inclusion of three decile 10 schools. International studies suggest that students from high-income backgrounds show gains in reading achievement during the summer, (Entwisle & Alexander, 1992), while students from low-income homes tend to lose ground. The researcher was interested to see whether there was a similar pattern in achievement over the summer holidays in the New Zealand context.

Design

This was a pretest-posttest study using an experimental and control group design, and random allocation of students to groups. This type of design is aligned with the positivism/objectivism stance of this research, namely to strive for as much objectivity in the experimental situation. By having an experimental control included in this study, there was an attempt to eliminate any differential influence of extraneous variables. This control is particularly important in multi-group designs where the goal is to have groups the same on all extraneous variables which might have influence on the dependent variable/s (McMillan, 2000). Thus, by having the various groups, and the control group, variation in the experimental stimuli can be tested, e.g., books only, or books and quizzes. From this, results will be able to conclude that any group differences are due to the systematic varying independent variables influencing the dependent variable (degree of summer slide), and not as a results of extraneous variables. A further attempt to control for the influence of extraneous variables was through the random assignment of the students into the experimental groups used in this study.

The control of extraneous variables directly impacts on the internal validity of the research and its findings. Internal validity refers to the attempt to exert control over potential extraneous variables. Obviously, the use of a random assignment itself does not remove all potential threats to internal validity, but this approach does assist in negating the selection bias that occurs in non-randomised research. Specifically, it helps safeguard the impact of extraneous variables that are not systematically related to an intervention or control group, and thus, makes alternative differences beyond the dependent variable/s unlikely (Reichardt, 2000).

The researcher grouped the students into quadruplets matched on reading ability, using PM Benchmark or PROBE Reading Assessment data provided by their schools. All 10 schools used either PM Benchmark or a combination of PM Benchmark and PROBE Reading Assessment. The nine schools that used a combination of both assessments used PM Benchmark until students reached level 18 and then the PROBE Reading assessment was used. One school used PM Benchmark as their main reading assessment tool. Once the students were grouped into quadruplets, the researcher assigned each student in each quadruplet, in random order, to one of four conditions: books only, books and comprehension quizzes, math control, and a control group.

The first group was a treatment group that received 25 self-selected books to read over the summer school holidays. The second group was also a treatment group that received 25 self-selected books to read as well as three vocabulary quiz books to complete. The third group was a control group that received two math workbooks to

complete during the holidays. The fourth group was a control group that received nothing over the holidays but received 25 books in Term 1, 2012.

The purpose of the math control and control groups was to take account of the placebo effects of being given a special treatment. The first control group received something special, a math workbook, while the second control group did not receive anything special until after the post-test assessments had been completed in Term 1, 2012. The reason for having the control groups was to ensure that any gains in reading were due to the treatment and not a placebo effect.

Random Assignment

Students were randomly assigned by the researcher to one of the four conditions. The unit of analysis was the student, in that each student received a treatment. Table 2 shows the distribution of students to each of the treatment groups.

Table 2

Number of Participants According to Group

Group	Frequency	Percentage
Books Only (Group 1)	145	24.9%
Books and Comprehension Quizzes (Group 2)	145	24.9%
Math Control (Group 3)	146	25.0%
Control (Group 4)	147	25.2%
Total	583	100.0%
Missing	15	

Table 3 presents group allocations across the 10 schools based on pretest mean reading ages using results from the PROBE Reading Inventory (Parkin, Parkin, & Pool, 2002) administered by each school in 2011 are included. As mentioned above, PM Benchmark Levels 1-17 were converted to a PROBE reading age given some students were reading at Level 18 and above.

Table 3

Group Allocation Across Schools With Mean Pretest Reading Ages

Decile	School No.	Group No.	<i>N</i>	Mean Reading Age (PROBE)	<i>SD</i>
Low Decile	1	1	7	8.29	0.99
		2	7	7.64	1.25
		3	7	8.21	1.15
		4	8	7.88	1.27
		Total	29	8.00	1.14
	2	1	11	9.75	1.86
		2	12	8.85	2.11
		3	11	9.11	2.60
		4	12	8.60	2.09
		Total	46	9.07	2.15
	3	1	10	8.45	1.48
		2	10	8.25	1.43
		3	11	8.39	1.50
		4	9	8.19	1.74
		Total	40	8.33	1.48
	4	1	18	8.14	1.56
		2	19	7.91	1.31
		3	19	8.42	1.16
		4	19	8.05	1.56
		Total	75	8.13	1.39

Table 3 *Continued*

Decile	School No.	Group No.	N	Mean Reading Age (PROBE)	SD
	5	1	17	8.53	1.66
		2	17	9.29	1.82
		3	17	9.32	1.16
		4	17	8.62	1.55
		Total	68	8.94	1.58
	9	1	15	9.33	0.99
		2	14	9.82	0.85
		3	16	9.22	1.06
		4	14	8.96	0.91
		Total	59	9.33	0.99
	10	1	15	8.50	1.51
		2	14	8.32	1.20
		3	15	8.07	1.29
		4	14	8.54	1.43
		Total	58	8.35	1.34
High Decile	6	1	17	8.46	1.87
		2	15	9.15	1.70
		3	15	8.35	1.56
		4	16	8.75	1.99
		Total	63	8.67	1.78
	7	1	16	7.84	0.81
		2	17	7.85	0.95
		3	17	7.94	0.81
		4	16	7.84	0.70
		Total	66	7.87	0.81

Table 3 *Continued*

Decile	School No.	Group No.	N	Mean Reading Age (PROBE)	SD
	8	1	18	9.24	1.09
		2	18	9.26	0.94
		3	18	9.15	0.94
		4	18	9.61	1.09
		Total	72	9.32	1.01

Analysis of pretest PROBE reading levels across schools and groups revealed there was a significant effect for school, $F(9, 536) = 8.64, p = .000$. However, neither the group effect ($p = .83$) nor the school by group effect ($p = .89$) were significant.

Measures

A range of measures were used to assess reading, word reading, non-word reading, math, motivation to read, and attitude. The assessments ensured that the experimental and control groups were equivalent in reading accuracy, comprehension, and decoding skills at the start of the study, that is at the end of the 2011 school year. Students were assessed again at the beginning of Term 1, 2012, to determine whether the summer books had an effect on these skills. The assessments included are explained below.

Standardised measures

The Burt Word Reading Test (Gilmore, Croft, & Reid, 1981) assesses oral word-reading ability. It is designed for age levels six to twelve years and consists of 110 words in lists. The measure starts with 2-letter words such as *to* before moving on to 3-letter words such as *wet*, then progressing to multi-syllable words such as *emergency* and to multi-affixed words including *autobiography*. According to the test manual, test-retest reliabilities are between 0.96 and 0.97.

The STAR reading tests (Elley, 2011; 2001) are standardised assessment tools each made up of four subtests. These subtests provide reliable information about how well students have mastered some of the measurable skills of three aspects of reading: learning the code of written language, making meaning of texts, and thinking critically about texts. The tests are designed for students from the beginning of Year 3 to the beginning of Year 9. The Years 3-6 tests consist of four short subtests that assess the skills of word recognition, sentence comprehension, paragraph comprehension, and vocabulary knowledge. There are parallel forms, A and B, for each of the STAR tests. Test reliabilities are all between 0.93 and 0.96. The STAR assessment was included in this study as it is commonly used in schools and therefore assessor effects by the assessors used in the study were avoided.

The York Assessment of Reading Comprehension (YARC; Snowling et al., 2009) assesses and monitors students' progress and identifies reading problems. It has been developed to assess the accuracy, rate, and comprehension of oral reading skills in

students aged from five to thirteen years. Each passage is accompanied by a set of comprehension questions which test literal and inferential comprehension skills. Specific reading problems are identified and a miscue analysis is provided. There is a dedicated website for YARC, and scoring can be completed online and detailed reports generated. YARC has equivalent forms and produces standard age scores, percentile ranks, and age-equivalent scores for reading accuracy, rate, and comprehension. Internal reliabilities for this measure are between 0.93 and 0.98. As the YARC is a standardised assessment, including it in the study provided a check on the informal results of both PM Benchmark and PROBE measures.

The fourth edition of the Wide Range Assessment Test: Math (Wilkinson & Robertson, 2006) was used to assess the student's ability to perform basic mathematics computations through counting, identifying numbers, solving simple oral problems, and calculating written mathematics problems. This is a norm-referenced test that measures the basic academic skills of math computation. The administration time of this test varies according to the student's age. The test provides standard scores and stanines. Alternate form reliabilities are all above 0.90

Nonstandardised measures

The Bryant Test of Basic Decoding Skills (Bryant, 1975; reprinted in Nicholson, 2005) is a list of 50 pseudowords graded in difficulty. The words in the list start with 3-letter non-words such as *buf* and then move to more complex patterns such as *bime* and *troob*, and finally to multi-syllable patterns such as *sanwixable*. This measure has alpha

reliabilities from 0.90 to 0.96 (Juel, Griffith, & Gough, 1986). Including the Bryant Test was important at the outset of the study as it measures decoding skills and if the groups were mismatched in decoding at the start this might have had a confounding influence on the results.

Either the PM Benchmark (Price Milburn, 2008) or PROBE Reading Inventory (Parkin et al., 2002) were used to assess reading achievement. Both of these tools assess students' reading accuracy, fluency, behavior, and comprehension using unseen fiction and non-fiction texts. PM Benchmark provides instructional or independent reading levels to Level 14 and reading and reading-age levels from Levels 15 to 30. PROBE Reading Assessment provides an assessment for older readers, generally students in Years 3 to 10. It consists of passages graded in difficulty from 5-6 years to 14.5-15.5 years. PROBE Reading Assessment measures both decoding and comprehension and combine to calculate a reading age. Students are required to score a minimum of 70% on the comprehension questions and 90% for accuracy. The assessor continues testing until either the accuracy or comprehension score drops below the minimum required. The student's instructional level is determined to be the last level where both were within the minimum required. PROBE Reading Assessment measures both decoding and comprehension and combine to calculate a reading age. Students are required to score a minimum of 70% on the comprehension questions and 90% for accuracy. The assessor continues testing until either the accuracy or comprehension score drops below the minimum required. The student's instructional level is determined to be the last level where both were within the minimum required.

Although neither assessment tool is standardised, texts used in both assessments have been leveled through extensive trialing (Ministry of Education, 2014).

Reading Attitude Inventory (Nicholson, 2005) provides an indication of how students feel about different aspects of reading. Students are required to circle the “puppy illustration” that best represents how they feel about reading. They also have the opportunity to write a response to the questions.

Reading logs designed by the researcher for Groups 1 and 2 were used to assess students’ attitudes about the books read. After reading a book, each student completed the reading log by writing the title and then selecting the most appropriate face to describe how they felt about the book: unhappy, neutral, or happy. The numbers chosen for each category were then totaled. This gave an overall picture of the student’s attitude towards reading the books.

Math logs, also designed by the researcher, were distributed to students in Group 3. Students were expected to complete the log daily after completing their math activities. They recorded the page, or pages, of the workbook they had completed, whether or not they had to ask someone for assistance, and the appropriate face to identify how they felt about the activity. Examples of the reading and math logs are included in Appendix C.

The Home Literacy Practices Survey (based on Juel, 1988) consists of 16 questions relating to both student and family reading and writing behaviors at home. It provides an opportunity for parents to elaborate on their responses. As a result of the survey, a general picture emerges of both the amount of time dedicated to literacy activities in the home and the range of resources available.

Procedure

Book Selection

In late Term 3, 2011, students in the books only, books and comprehension quizzes, and control groups selected their books from a wide range of fiction and non-fiction texts. Books were grouped according to reading level, and each student was given a personalised order form indicating the levels they were to choose from. Each student chose 15 books from their instructional reading level and 10 from the next level up. The instructional level refers to the level at which the student could read with between 90 and 94 percent accuracy and was the level students were working on in their class reading programme. Students were required to select a combination of fiction and non-fiction texts. The researcher was present at each school's book selection and monitored that the process for selection was being followed.

Math workbooks (Hughes, Duncan, & Peterson, 2008; Stark, 2007) corresponding to the GloSS stage students were working on in class were purchased for students in the math control group. The Global Strategy Stage (GloSS) assessment is a face-to-face interview between the classroom teacher and a student which is designed to help the

teacher determine which strategy stage on the Numeracy Framework (Ministry of Education, 2008) is the most appropriate for the student. This assessment is intended for use with students in Years 1-8. A number of interviews have been developed each with equivalent overall difficulty and each containing 22 tasks. The interview is organised into nine sections, each focusing on a specific target stage or stages on the Number Framework. The teacher asks all questions in a section and then decides whether or not to continue to the next set of questions based on the responses given. At the end of the interview the teacher records the stage a student is working at for each operational domain. Each student received two math workbooks as well as the appropriate answer booklets. This allowed students to self-monitor their progress through the workbooks.

Towards the end of Term 4, each school sorted the book orders for Groups 1 and 2. Each order was divided into three bags, two containing eight books and one containing nine books. The books were scheduled to be delivered at three intervals: the first in the first week of the holidays, the second in the first week of January, and the third in mid-January. Group 2 students had a quiz book included in each of their bags. The math books were sorted into two bags and delivery of these was scheduled for the first week of the holidays and then either in the first week of January or in mid-January depending on when the student completed the first workbook.

Assessments

Each school nominated a teacher, or teachers, to conduct the pre-and post assessments. All assessors received training early in Term 4. This training was provided

by the researcher, her supervisor, and another doctoral student who had extensive knowledge of the assessments being used. The key element of the training was teaching the assessors how to administer and mark the various tests. The researcher observed a selection of assessments at each school to ensure that correct procedures were being followed. The assessors were blind to who was in each group, but they were not blind to the nature of the study.

Home Visitors

Schools nominated an individual to be the home visitor. All home visitors were either members of the school staff or of the schools' Boards of Trustees and were therefore known to the students and their families. The home visitor's role was to visit the homes of the students in Groups 1, 2, and 3 during the summer holidays. Home visitors were provided with individualised schedules for each student in each group and were required to phone parents the evening before the scheduled visit to set up a suitable time to meet. Parents were also given contact details for the home visitor as well as the researcher so either could be contacted if any issues arose. The home visitor delivered the books to the students' homes at regular intervals throughout the holidays. In addition, students in Groups 1 and 2 were asked to complete a reading log as they read their books. Students in Group 2 also completed vocabulary quizzes. The home visitor's main role was to encourage the reading of the books and to ensure treatment integrity. Home visitors received training from the researcher prior to the programme commencing. The researcher accompanied the home visitors on some of their visits to ensure that correct procedures were being followed. Towards the end of the summer holidays, the home visitors scheduled a final visit to all families to collect the reading

logs and quiz books (if applicable) and distribute a home literacy practices survey and programme evaluation. At the end of the intervention all home visitors met with the researcher to reflect on and share their experiences.

Parent Meetings

Parent information sessions were held in Term 4, 2011. Each school held a meeting with parents and these were attended by the researcher and her supervisor. During these sessions, the programme was explained in-depth and opportunities were made for parents or caregivers to ask questions. Following a general introduction to the programme parents were grouped according to which group their child was in. In this way parents could be given specific guidance on how to support their child over summer. Strategies were outlined on what to do if difficulties arose, for example if their child came to a word they did not know.

Group 1 (Books)

These students received 25 books over the holidays. Students read each day to their parents or caregivers. After reading each book, students were required to complete a reading log by writing the name of the book and rating their opinion of the book according to a predetermined scale. The home visitor checked the reading logs and talked with parents and students about how the book-reading was progressing. A new reading log was delivered with each new set of books and the completed log returned to the researcher for analysis.

Group 2 (Books and Quizzes)

Students in Group 2 received 25 books as well as three vocabulary quiz books, which aimed to extend their vocabulary knowledge and develop comprehension skills. The quiz books consisted of a selection of story précis with each story followed by approximately 10 multichoice questions relating to the meanings of words from the book. Students read the sentence that contained the target word and then selected the word that meant the same as the target word from the four choices presented. An answer booklet was also provided so that progress could be monitored by the child and parent. The quiz books corresponded to the reading levels of the students. Students in Group 2 who were at an emergent-to-early level in reading were given a booklet of high-frequency words to practice reading instead of vocabulary quizzes. The rationale for this was that the most frequent 300 words in English account for more than half of all words that students see in beginning reading books (Nicholson, 2005). It is important that students are able to read these words automatically. Group 2 students also completed the reading log daily. An example of a vocabulary quiz is in Appendix C.

Group 3 (Math)

Students in Group 3 received two math workbooks during the summer holidays. As these books corresponded to the strategy levels the students were working on in class, they provided students with the opportunity to consolidate the numeracy skills and strategies they had developed during the school year. Answer booklets were also provided.

Data Analysis

Analysis focused on the impact that the intervention had on the participants in the study. Using a series of repeated measures analysis of variance (ANOVA), the four standardised assessment measures administered to the participants were analysed to measure the potential effects of the intervention. Given that assessing multiple comparisons amongst the different experimental groups is a focus of this research, appropriate sample size computations were initially conducted to ensure that there was enough statistical power for this type of analysis. This assessment was particularly important given that it was desirable to have a high degree of certainty that where no statistical differences are found between the intervention groups, that there was confidence that there really were no differences. The statistical software G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) was used to compute the power analyses for ANOVAs and in addition, *t* tests, *F* tests, chi-square tests, and *z* tests. The contingency tables produced by this programme showed that with an $N > 400$ would result in high empirical estimation of statistical power (.95).

The main independent variable was the intervention, which has four conditions: books only, books and comprehension quizzes, math activities, and no resources or activities (control group). The aim was to find out which group, if any, benefited from being in the summer programme. Further, within these groups, participants were categorised as being either good or poor readers based on their assessment performance (e.g., stanines). The aim was to find out whether poor or good readers (or both groups) benefited from the summer programme.

In addition, analysis looked at the effect that extreme school decile differences might have on the impact of the reading intervention. Here, the aim was to find out the extent of the summer slide for both high- and low-SES schools, and whether the decile level of the school might moderate the extent of the slide. Analyses of both poor and good readers in high- and low-decile schools were also conducted. The aim was to see if good and poor readers in high-decile schools made different levels of progress compared with good and poor readers in low-decile schools during the summer programme, keeping in mind that the initial selection of participants, based on PM Benchmark and PROBE assessment data supplied by schools, found very few poor readers in the high-decile schools. ANOVAs were also conducted on the gain scores that were achieved by participants over the two time periods, that is, from pre-(Time 1) to post intervention (Time 2), so as to show the effect of the summer slide in reading performance. In addition, the results of the two surveys were analysed. The Reading Attitude Inventory was analysed in terms of total scores at Time 1. Several items from the Parent Literacy Practices Survey given at Time 2 were also analysed.

The method for determining reading level varied according to the assessment being used. For STAR and WRAT, stanines were used. A stanine is a method of scaling test scores on a nine point standard scale with a mean of five and a standard deviation of two. Stanines divide the distribution of results for a year group into nine categories. Most students, when compared with their own year level achieve between stanines four to six. Stanines seven, eight, and nine represent comparatively high achievement for a year group while stanines one, two, and three represent comparatively low achievement.

Students achieving at stanine 4 or below were considered “below-average reading.” Students achieving at stanine 5 or above were considered “not below-average reading.” For PROBE, PM Benchmarks, YARC, and Burt Word Reading Test students scoring six months or more below their chronological age were considered “below-average reading.” Students scoring less than six months below, at, or above their chronological age were considered “not below average”. For The Bryant Test of Decoding, students achieving below the median score of 27 were considered “below-average reading”. The researcher also gathered descriptive statistics on the reading logs and family reading practices surveys.

Summary

This chapter has outlined the method and design of the study. The aim of the study was to investigate the effectiveness of the summer books programme on reading and establish whether there was a summer effect on reading according to reading ability. An additional aim was to establish whether there was a similar pattern in achievement over summer for high- and low-SES students.

The researcher recruited 583 Year 3 students which were from seven decile 1 and 2 schools, and three decile 10 schools. Students were placed them in quadruplets matched according to reading level, and then randomly assigned them to one of four conditions.

The conditions were books only, books and comprehension quizzes, math control, and a control group. Late in Term 3, all students in Groups 1 and 2 selected books at the appropriate reading level. Reading books, vocabulary quizzes, and math workbooks were delivered throughout the summer holidays. Students in these three groups were visited by home visitors, whose role was to provide encouragement and guidance to the students and their families. Reading and math logs were completed daily. A home literacy practices survey was completed by the families at the end of the summer holidays. Pre and post assessments were conducted by trained assessors. Following the completion of the posttests, students in the control group received their reading books.

The researcher analysed the data with repeated measures ANOVA. The main analysis compared the reading progress of the two experimental and two control groups over summer. A further analysis compared the reading progress of below-average and not-below-average readers. Additional analysis compared the reading progress of high- and low-SES schools. The researcher also analysed data from reading logs and parts of the family reading practices survey.

CHAPTER FOUR

RESULTS

Data Analysis

Analysis was conducted to assess the impact that the intervention had on the participants in the study. Using a series of one-way repeated measures analysis of variance (ANOVA), the four assessment measures that were administered to the participants were analysed to measure the potential effects of the intervention. In total, six measures were administered to the participants, specifically, YARC (accuracy and comprehension scales), The Burt Word Reading Test, The Bryant Test of Basic Decoding Skills, PROBE, and the STAR reading tool, at both pre- (Time 1) and postintervention (Time 2). Although participants' performance was collected for all the assessment measures, the STAR reading tool was chosen to be the assessment to analyse the effectiveness of the reading intervention, as it was the only measure that showed significant intervention effects. Thus, beyond the descriptive statistics, a decision was made to only focus on analysis associated with performance on the STAR reading tool's four subtests: word reading, sentence comprehension, blanks (missing words), and vocabulary.

In addition, surveys were administered at different time points to both participants (Motivation to Read – Time 1 and Time 2) and parents (Parent Literacy Survey – Time 2). The independent variables related to participants' intervention groups: specifically, those that received the conditions of books only, books and comprehension quizzes, math activities, and no resources or activities (control group). Further, within these

groups, participants were categorised as being either good or poor readers based on their assessment performance (i.e., stanines). ANOVAs, followed by Bonferroni posthoc tests were also conducted on the gains scores that were achieved by participants over the two time periods pre- (Time 1) and postintervention (Time 2), so as to show the effect of the summer slide in reading performance. Further, analysis was conducted on the effect that the participants' school decile might have on the impact of the reading intervention. Data was also collected on the actual school that each participant was enrolled in; however, when the influence of the school was included as a factor, it did not affect the overall pattern of results on any of the measures. Thus, it was concluded that the results presented here were not the results of a particular school that participated in the study, but rather the schools overall.

For ease of interpretation, the assessment results presented in Part 1 of this chapter are associated with each of the four posited research questions. In Part 2, results relating to the survey measures are reported. All analyses were conducted using SPSS 18.0 (SPSS, 2009).

Descriptive Statistics

With the exception of the STAR measure (see Table 11), the following tables (Table 4 to 10) present the means and standard deviations for the five measures administered to participants where no significant results were found in these measures over both Time 1 and 2.

Table 4

Means and Standard Deviations Across Times 1 and 2 for the YARC, Burt, Bryant, PROBE, and WRAT measures.

Measure	<i>M</i>	<i>SD</i>
1. YARC Accuracy Standard Score – Time 1	100.81	12.96
2. YARC Accuracy Standard Score – Time 2	100.57	12.90
3. YARC Comprehension Standard Score – Time 1	100.07	12.40
4. YARC Comprehension Standard Score – Time 2	100.67	12.36
3. Burt Score – Time 1	48.74	19.09
4. Burt Score – Time 2	52.11	20.19
5. Bryant – Time 1	26.00	14.03
6. Bryant – Time 2	28.90	14.15
7. PROBE – Time 1	8.92	1.27
8. PROBE – Time 2	8.80	1.45
9. WRAT Standard Score – Time 1	98.90	13.45
10. WRAT Standard Score – Time 2	95.79	14.05

Table 5

PROBE Means and Standard Deviations Across the Four Reading Ability Groups Across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
PROBE – Time 1	Books	8.84	1.34	31
	Books and Quizzes	8.90	1.16	29
	Maths Activities	8.68	1.24	32
	No Books	9.29	1.32	29
PROBE – Time 2	Books	8.66	1.40	31
	Books and Quizzes	8.83	1.36	29
	Maths Activities	8.55	1.39	32
	No Books	9.21	1.65	29

Table 6

WRAT Means and Standard Deviations Across the Four Reading Ability Groups across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
WRAT – Time 1	Books	98.27	13.74	143
	Books and Quizzes	99.67	12.33	140
	Maths Activities	99.43	13.07	141
	No Books	98.24	14.64	140
WRAT – Time 2	Books	95.49	13.76	143
	Books and Quizzes	95.51	15.15	140
	Maths Activities	97.01	12.64	141
	No Books	95.16	14.60	140

Table 7

BURT Means and Standard Deviations Across the Four Reading Ability Groups Across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
BURT – Time 1	Books	49.01	19.72	143
	Books and Quizzes	50.28	18.90	141
	Maths Activities	48.37	18.91	142
	No Books	47.26	18.90	139
BURT – Time 2	Books	51.97	20.54	143
	Books and Quizzes	54.09	20.32	141
	Maths Activities	51.59	19.73	142
	No Books	50.77	20.22	139

Table 8

Bryant Means and Standard Deviations Across the Four Reading Ability Groups Across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
Bryant – Time 1	Books	25.82	14.52	143
	Books and Quizzes	26.46	13.95	140
	Maths Activities	25.49	13.92	142
	No Books	26.20	13.82	140
Bryant – Time 2	Books	29.51	14.48	143
	Books and Quizzes	29.48	13.78	140
	Maths Activities	28.57	14.02	142
	No Books	27.90	14.40	140

Table 9

YARC Accuracy Means and Standard Deviations Across the Four Reading Ability Groups Across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
YARC – Time 1	Books	100.48	13.32	143
	Books and Quizzes	101.94	12.62	139
	Maths Activities	100.27	12.82	142
	No Books	100.55	13.11	140
YARC – Time 2	Books	100.52	12.78	143
	Books and Quizzes	100.98	13.18	139
	Maths Activities	100.75	12.29	142
	No Books	100.43	13.31	140

Table 10

YARC Comprehension Means and Standard Deviations Across the Four Reading Ability Groups Across Times 1 and 2.

Measure	Group	<i>M</i>	<i>SD</i>	<i>N</i>
YARC – Time 1	Books	99.64	12.66	143
	Books and Quizzes	100.95	11.82	139
	Maths Activities	99.04	12.63	142
	No Books	100.71	12.48	140
YARC – Time 2	Books	100.52	12.78	143
	Books and Quizzes	100.98	13.18	139
	Maths Activities	100.75	12.29	142
	No Books	100.04	13.31	140

Table 11 shows the means, standard deviations, correlations and reliability coefficients for STAR and STAR subtests, pre-and post intervention.

Overall, the average alpha for the total STAR measure and across each of the measures' subtests was .88, ranging from .87 to .89. This indicated that there was a high degree of reliability for the STAR measure overall and across each of the four subtests that feature within that measure. In relation to the reliability for each of the two time periods, the STAR measure and each of the subtests showed strong stability at both the preintervention baseline (Time 1) and at postintervention (Time 2).

Table 11

Means, Standard Deviations, Correlations, and Reliabilities for the STAR, and STAR Subtests Pre- (Time 1) and Postintervention.

Measure	<i>M</i>	<i>SD</i>	<i>Alpha</i>	1	2	3	4	5	6	7	8	9	10
1. STAR Overall Score - Time 1	30.67	10.87	.88	1.00									
2. STAR Overall Score – Time 2	26.27	10.25	.88	.75*	1.00								
3. STAR Word – Time 1	8.08	1.70	.89	.84*	.63*	1.00							
4. STAR Word – Time 2	7.65	1.02	.88	.75*	.85*	.64*	1.00						
5. STAR Sentence – Time 1	6.78	1.50	.88	.89*	.66*	.73*	.65*	1.00					
6. STAR Sentence – Time 2	6.05	1.93	.88	.62*	.87*	.52*	.68*	.54*	1.00				
7. STAR Blanks – Time 1	9.53	2.05	.87	.93*	.69*	.72*	.67*	.76*	.58*	1.00			
8. STAR Blanks – Time 2	7.82	1.56	.88	.62*	.92*	.52*	.67*	.55*	.72*	.58*	1.00		
9. STAR Vocabulary – Time 1	6.27	1.62	.88	.86*	.65*	.66*	.67*	.70*	.54*	.71*	.52*	1.00	
10. STAR Vocabulary – Time 2	4.75	.86	.88	.65*	.85*	.53*	.67*	.58*	.70*	.60*	.67*	.57*	1.00

Note. Bolded values indicate the correlations between each overall measure and subtest at Time 1 and Time 2.

* $p < .01$

Part 1 – Assessment Results

Based on their STAR assessment performance, participants were defined as either being *at risk* where their stanines were 4 or lower or *not at risk* where stanines were 5 and above. The results are based on STAR data for nine of the ten schools. One school did not administer the STAR measure.

Research Question 1: Do students who receive reading books matched to their reading levels and interests over the summer vacation make greater gains in reading achievement than students who receive math workbooks and students who do not receive any books?

A comparison of STAR scores for the total group of students in the study ($n = 472$) before and after the summer vacation showed the extent of the summer slide.

There was a significant effect of the summer slide on the word reading subtest which measured participants' word decoding ability, $F(1, 471) = 21.04, p < .001$. Results showed that average performance decreased from preintervention ($M = 8.08, SD = 2.19$) to postintervention ($M = 7.65, SD = 2.49$). In addition to the word reading subtest, there was also a significant effect of the summer slide on participants' sentence understanding, $F(1, 471) = 43.38, p < .001$. Here, results of the sentence subtest showed that scores on average decreased from preintervention ($M = 6.78, SD = 2.52$) to postintervention ($M = 6.05, SD = 2.53$).

The fill-in-blanks subtest, which measured paragraph understanding, also showed a significant effect of the summer slide, $F(1, 471) = 82.81, p < .001$. Results indicated

that scores on average decreased considerably from preintervention performance ($M = 9.53, SD = 4.58$) to postintervention ($M = 7.82, SD = 4.33$).

A similar drop in performance was found in participants' performance on the missing word subtest that measured their vocabulary understanding. Results showed that scores on average fell from preintervention ($M = 6.27, SD = 2.86$) to postintervention ($M = 4.75, SD = 2.35$). This decrease in performance was statistically significant, $F(1, 471) = 177.02, p < .001$.

Based on these findings, it was not surprising that there was a significant effect of the summer slide on the overall STAR mean scores. Results showed that mean total scores decreased from preintervention ($M = 30.67, SD = 10.87$) to postintervention ($M = 26.27, SD = 10.25$), $F(1, 471) = 159.86, p < .001$, that is, by an average of 4 points. Similarly, the mean STAR stanine scores also showed a significant effect pre- and postintervention. Results here showed that on average stanines dropped from preintervention performance ($M = 5.30, SD = 2.19$) to performance measured postintervention ($M = 4.41, SD = 1.98$). This decline in overall STAR stanines was statistically significant, $F(1, 471) = 193.57, p < .001$.

In sum, all performance on the STAR measure, whether analysed at the subtest, total, or stanine level, demonstrated that there was a significant summer slide occurring amongst the participants. This decline in performance occurred irrespective of providing

reading books that had been specifically matched to the participants' reading levels and individual interests over the summer vacation.

Research Question 2: Do students who receive reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation make greater gains in reading comprehension than students who receive reading books only?

Using results from performance on the STAR measure, analysis was conducted to analyse the effects of the programme on four groups of participants: namely those that received books only ($n = 118$), books and comprehension quizzes ($n = 120$), math activities ($n = 118$), and the control group who received no resources or activities ($n = 116$). Further, programme effects on *poor* and *good readers* were also analysed. Table 12 shows the numbers of poor/good readers in each group.

Table 12

Numbers of Poor/Good Readers in Each Group

Groups	Poor Readers	Good Readers	N
Books Only	46	72	118
Books and Comprehension quizzes	50	70	120
Math Control	43	75	118
Control	46	70	116

In word reading, the mean scores for all four groups decreased over summer. Results for the *books only* group showed a small decrease in performance from preintervention ($M = 8.00$, $SD = 2.15$) to postintervention ($M = 7.69$, $SD = 2.58$). A similar decrease in performance was found amongst participants who received the *books*

and comprehension quizzes, from preintervention ($M = 8.04, SD = 2.45$) to postintervention ($M = 7.55, SD = 2.63$). Results for the *math control* group showed that participants decreased their word reading performance from preintervention ($M = 8.12, SD = 2.16$) to postintervention ($M = 7.96, SD = 2.16$). Interestingly, similar results were found amongst the *control* group participants, where performance decreased from preintervention ($M = 8.16, SD = 2.00$) to postintervention ($M = 7.42, SD = 2.56$). Given these findings, the group effect was not statistically significant, $F(3, 468), p < 1.0$; however, there was a significant time effect where there was a general decrease in word reading performance over summer, $F(1,468) = 21.24, p < .001$. The interaction of time by group effect was not significant, $F(3, 468) = 1.76, p = .153$. Comparing the mean scores for all four groups showed that the *control* group decreased more than the other groups.

In sentence comprehension, the mean scores for all four groups decreased over summer. Results for the *books only* group showed a small decrease in performance from preintervention ($M = 6.75, SD = 2.50$) to postintervention ($M = 6.19, SD = 2.39$). A similar degree of decrease in performance was found amongst participants who received *books and comprehension quizzes*, from preintervention ($M = 6.82, SD = 2.68$) to postintervention ($M = 6.11, SD = 2.51$). Results for the *math control* group showed the participants decreased their sentence comprehension performance from preintervention ($M = 6.61, SD = 2.69$) to postintervention ($M = 6.24, SD = 2.45$). Similar results were found amongst *control* group participants whose performance decreased from preintervention ($M = 6.97, SD = 2.22$) to postintervention ($M = 5.66, SD = 2.75$).

Based on these findings, the group effect was not significant, $F(3, 468) < 1.0$; however, there was a significant time effect showing an overall decrease in sentence comprehension performance over summer, $F(1, 468) = 44.29, p < .001$. The interaction of time by group was significant, $F(3, 468) = 3.23, p = .022$, showing that the summer books programme did have an effect. Posthoc analysis of gain scores showed that the *control* group decreased significantly more than the *books only* group ($p = .020$), more than the *books and comprehension quizzes* group ($p = .059$), and more than the *math* group ($p = .003$).

In paragraph comprehension, the mean scores for all four groups decreased over summer. Results for the *books only* group showed a decrease in performance from preintervention ($M = 9.37, SD = 4.58$) to postintervention ($M = 7.97, SD = 4.30$). Results for the *books and comprehension quizzes* group showed the participants decreased their paragraph comprehension performance from preintervention ($M = 9.68, SD = 4.69$) to postintervention ($M = 7.81, SD = 4.23$). A similar degree of decrease in performance was found amongst participants in the *math control* group from preintervention ($M = 9.71, SD = 4.48$) to postintervention ($M = 7.87, SD = 4.30$). Results for the *control* group participants showed a decrease in performance from preintervention ($M = 9.34, SD = 4.59$) to postintervention ($M = 7.62, SD = 4.54$). Given these findings, the time effect was significant, $F(1, 468) = 82.39, p < .001$; however, the interaction of time by group was not significant, $F(3, 468) = 0.33, p = .802$.

In vocabulary, the mean scores for all four groups decreased over summer. Results for the *books only* group showed a decrease in vocabulary performance from preintervention ($M = 6.19, SD = 2.97$) to postintervention ($M = 4.81, SD = 2.34$). Results for the *books and comprehension quizzes* group also showed a decrease in participants' performance from preintervention ($M = 6.23, SD = 2.89$) to postintervention ($M = 4.79, SD = 2.40$). A similar degree of decrease in performance was found amongst participants in the *math control* group from preintervention ($M = 6.44, SD = 2.83$) to postintervention ($M = 4.70, SD = 2.24$). Results for the *control* group showed a decrease in performance from preintervention ($M = 6.22, SD = 2.79$) to postintervention ($M = 4.71, SD = 2.45$). There was a significant time effect showing an overall decline during summer, $F(1, 468) = 176.47, p < .001$; however, the interaction of time by group was not significant, $F(1, 468) = 0.48, p = .700$.

Mean STAR total scores for all four groups also decreased over summer. Results for the *books only* group indicated a decrease in performance from preintervention ($M = 30.41, SD = 11.01$) to postintervention ($M = 26.64, SD = 10.19$). The *books and comprehension quizzes* group decreased from preintervention ($M = 30.8, SD = 11.39$) to postintervention ($M = 26.26, SD = 10.38$). Results for the *math control* group showed a decrease in performance from preintervention ($M = 30.86, SD = 10.85$) to postintervention ($M = 26.77, SD = 9.48$). Similar results were found amongst participants in the *control* group where performance decreased from preintervention ($M = 30.63, SD = 10.34$) to postintervention ($M = 25.41, SD = 10.96$). Based on these findings, there was a significant time effect, $F(1, 468) = 159.85, p < .001$; however, the interaction of time by group was not significant ($p = .489$). A posthoc analysis of gain

scores showed that the *control* group decreased more than the *books only* group ($p = .031$), more than the *books and comprehension quizzes* group ($p = .044$), and more than the *math control* group ($p = .007$).

Similarly, the mean STAR stanines for all four groups decreased over summer. Results for the *books only* group showed that the participants' STAR stanines decreased from preintervention ($M = 5.23, SD = 2.23$) to postintervention ($M = 4.47, SD = 1.96$). In a similar manner, STAR stanines for participants who received the *books and comprehension quizzes* also decreased from preintervention ($M = 5.39, SD = 2.31$) to postintervention ($M = 4.41, SD = 2.06$). Results for the *math control* group showed that stanines decreased from preintervention ($M = 5.32, SD = 2.20$) to postintervention ($M = 4.46, SD = 1.84$). Furthermore, results for the *control* group showed stanines decreased from preintervention ($M = 5.25, SD = 2.08$) to postintervention ($M = 4.31, SD = 2.06$). From these findings, the time effect was significant, $F(1, 468) = 192.93, p < .001$; however, the interaction of time by group was not significant, $F(3, 468) = .574, p = .632$.

To summarise, all performance on the STAR measure at the subtest, total, and stanine levels revealed that there was a significant summer slide for all four groups. The only significant time by group interaction occurred in the sentence comprehension subtest, indicating that the summer books programme had a positive effect on this particular skill and that the *control* group decreased more over summer than the other

three groups. There were no significant differences between the *books only* group and the *books and comprehension quizzes* group.

Research Question 3: Do students in high- and low-decile schools who receive reading books matched to their reading levels and interests over the summer vacation make similar gains in reading achievement?

A comparison of STAR scores for the *high-decile* and *low-decile* students before and after the summer break showed the effects of the programme on reading achievement. A series of one-way repeated measures ANOVAs compared the summer slide for 344 *low-decile* and 128 *high-decile* students. A series of one-way gain score ANOVAs compared the summer slide for *high-decile* and *low-decile* groups. There was a significant effect of the summer slide on the word reading subtest for *low-decile* students. Results showed that average performance for participants from low-decile schools decreased from preintervention ($M = 7.61, SD = 2.28$) to postintervention ($M = 7.00, SD = 2.56$). In contrast, results for participants from high-decile schools showed that average performance increased from preintervention ($M = 9.34, SD = 1.28$) to postintervention ($M = 9.41, SD = 1.02$).

Further, the gain score ANOVA was significant, indicating that there was a significant difference in summer slide between the *low-decile* and *high-decile* students. Results showed that *low-decile* students' word reading performance decreased over summer although the performance of *high-decile* students increased, $F(1, 470) = 10.52, p < .001$.

There was a significant effect of the summer slide on the sentence comprehension subtest for both *low-decile* and *high-decile* students. Results showed that average performance for *low-decile* students decreased from preintervention ($M = 6.01, SD = 2.44$) to postintervention ($M = 5.72, SD = 2.69$). The average performance for *high-decile* students also decreased from preintervention ($M = 8.86, SD = 1.25$) to postintervention ($M = 6.93, SD = 1.76$). The gain score ANOVA showed a significant difference between the two groups in the extent of the summer slide, specifically *high-decile* students decreased more than the *low-decile* students, $F(1, 470) = 46.08, p < .001$.

The paragraph comprehension subtest also showed a significant effect of the summer slide for both *low-decile* and *high-decile* students. Results indicated that scores on average for *low-decile* students decreased from preintervention ($M = 8.20, SD = 4.48$) to postintervention ($M = 7.45, SD = 4.49$) and decreased for *high-decile* students from preintervention ($M = 13.11, SD = 2.41$) to postintervention ($M = 8.81, SD = 3.71$). This decrease in performance was greater for the *high-decile* students, $F(1, 470) = 82.41, p < .001$.

Results for the vocabulary subtest also showed a significant effect of the summer slide for both *low-decile* and *high-decile* students. Scores on average for *low-decile* students decreased from preintervention ($M = 5.38, SD = 2.75$) to postintervention ($M = 4.33, SD = 2.40$) and decreased for *high-decile* students from preintervention ($M =$

8.66, $SD = 1.47$) to postintervention ($M = 5.88$, $SD = 1.79$). Once again, the decrease in performance was greater for the *high-decile* students, $F(1, 470) = 50.22$, $p < .001$.

A further significant effect of the summer slide for both *low-decile* and *high-decile* students were evident in the STAR total scores. Results indicated that scores on average for *low-decile* students decreased from preintervention ($M = 27.19$, $SD = 10.43$) to postintervention ($M = 24.50$, $SD = 10.78$) and decreased for *high-decile* students from preintervention ($M = 40.03$, $SD = 4.85$) to postintervention ($M = 31.04$, $SD = 6.65$). The decrease in performance was greater for the *high-decile* students, $F(1, 470) = 74.94$, $p < .001$.

Similarly, the STAR stanine scores showed a significant effect of the summer slide for both *low-decile* and *high-decile* students. On average, the performance of *low-decile* students decreased from preintervention ($M = 4.47$, $SD = 1.86$) to postintervention ($M = 3.78$, $SD = 1.79$) and *high-decile* students decreased from preintervention ($M = 7.52$, $SD = 1.33$) to postintervention ($M = 6.11$, $SD = 1.37$). Again, the decrease in performance was greater for the *high-decile* students, $F(1, 470) = 25.87$, $p < .001$.

These results indicate that in all aspects of the STAR measure the performance of *low-decile* students decreased from preintervention to postintervention. Results for students from *high-decile* schools showed a decrease from pre- to postintervention in all areas of the STAR measure except for word reading. On this subtest, the performance of

high-decile students increased slightly over summer. Overall, the drop in performance over summer was greater for the *high-decile* students than for the *low-decile* students.

Research Question 4: Do poor readers who receive reading books matched to their reading level and interests over the summer vacation make greater gains in reading achievement than good readers who receive books matched to their reading levels and interests?

Students with STAR stanines of 4 or below were classified as the *poor reader* group and those with stanines of 5 or more were classified as the *good reader* group. A one-way ANOVA compared the *poor* and *good readers* on all subtests. The results showed significant differences between *poor* and *good readers* in each aspect of the STAR measure at pretest.

Results for the word reading subtest indicated a significant difference in scores at pretest between participants in the *poor reader* and *good reader* groups, $F(1, 507) = 461.16, p < .001$. The mean score at pre-test for *poor readers* was $M = 6.25, SD = 2.19$, while for *good readers* it was $M = 9.31, SD = 0.97$. In addition to the word reading subtest, there was also a significant difference in scores on sentence comprehension, $F(1, 507) = 589.58, p < .001$. The mean score at pretest for *poor readers* was $M = 4.76, SD = 2.99$ and for *good readers*, $M = 8.26, SD = 1.39$. The results for paragraph comprehension showed the same pattern with a significant difference at pretest between the two groups, $F(1, 507) = 1121.94, p < .001$. The mean score at pretest for *poor readers* was $M = 4.76, SD = 2.99$ and for *good readers*, $M = 12.55, SD = 2.24$. Likewise, the results for the vocabulary subtest highlighted a significant difference, $F(1,$

507) = 653.91, $p < .001$, with a mean score at pretest for *poor readers* of $M = 3.53$, $SD = 2.08$ and for *good readers*, $M = 7.95$, $SD = 1.79$.

Furthermore, there were significant differences in both the mean STAR total scores and STAR stanines between the *poor reader* and *good reader* groups at pretest. The mean STAR total score for *poor readers* was $M = 18.91$, $SD = 6.81$ and for *good readers* $M = 38.14$, $SD = 4.42$, which was significant, $F(1, 507) = 1493.38$, $p < .001$. The mean STAR stanine scores also indicated a significant difference between the two groups, $F(1, 507) = 1173.17$, $p < .001$. The mean stanine for *poor readers* was $M = 3.00$, $SD = 1.04$ and for *good readers* $M = 6.76$, $SD = 1.31$.

What was the extent of summer slide for good readers?

An analysis of STAR scores for *good readers* ($n = 287$) in low-decile ($n = 164$) and high-decile ($n = 123$) schools before and after the summer vacation showed the extent of the summer slide.

There was a significant difference found for the effect of the summer slide on the word reading subtest between *good readers* in low-decile and *good readers* in high-decile schools, $F(1, 285) = 10.54$, $p < .001$. Results showed that average performance for the low-decile *good readers* decreased from preintervention ($M = 9.19$, $SD = 0.88$) to postintervention ($M = 8.60$, $SD = 1.63$) and for high-decile *good readers* from preintervention ($M = 9.47$, $SD = 1.07$) to postintervention ($M = 9.46$, $SD = 0.94$). The

good readers in low-decile schools decreased more than the *good readers* in high-decile schools.

Results for the sentence comprehension subtest revealed a further significant difference between the two *good reader* groups. Scores on average for the low-decile *good readers* decreased from preintervention ($M = 7.73, SD = 1.38$) to postintervention ($M = 7.28, SD = 1.71$), while the scores for high-decile *good readers* decreased considerably more from preintervention ($M = 8.96, SD = 1.07$) to postintervention ($M = 7.04, SD = 1.69$). The high- decile *good readers* dropped more than the low-decile *good readers*, $F(1, 285) = 41.65, p < .001$.

Similar results occurred in the third subtest, paragraph comprehension. Scores on average for low-decile *good readers* decreased from preintervention ($M = 11.95, SD = 2.35$) to postintervention ($M = 10.04, SD = 3.41$) and high-decile *good readers* decreased from preintervention ($M = 13.44, SD = 1.73$) to postintervention ($M = 9.04, SD = 3.58$). The difference in the relative drop between the low-decile and high-decile *good readers* was significant. The high-decile *good readers* dropped more than the low-decile *good readers*, $F(1, 285) = 22.34, p < .001$.

There was also a significant effect of the summer slide on the vocabulary subtest. Results indicated that scores for low-decile *good readers* on average decreased from preintervention ($M = 7.37, SD = 1.90$) to postintervention ($M = 5.69, SD = 2.00$) and high- decile *good readers* decreased from preintervention ($M = 8.79, SD = 1.28$) to

postintervention ($M = 5.97, SD = 1.72$). The difference in drop between the low-decile and high-decile *good readers* was significant. The high-decile *good readers* dropped more than the low-decile *good readers*, $F(1, 285) = 22.34, p < .001$.

Analysis of the mean STAR total raw scores revealed a further significant difference between the two groups. Results for low-decile *good readers* on average decreased from preintervention ($M = 36.32, SD = 4.16$) to postintervention ($M = 31.60, SD = 7.28$), while scores for high-decile *good readers* decreased considerably from preintervention ($M = 40.72, SD = 3.44$) to postintervention ($M = 31.52, SD = 6.23$). High-decile *good readers* dropped significantly more than the low-decile *good readers*, $F(1, 285) = 43.04, p < .001$.

Examining STAR stanine scores also indicated a drop from pre- to postintervention for both low-decile and high-decile *good readers*. Results showed that scores for low-decile *good readers* on average decreased from preintervention ($M = 6.10, SD = 1.03$) to postintervention ($M = 4.90, SD = 1.41$) and for high-decile *good readers* from preintervention ($M = 7.67, SD = 1.11$) to postintervention ($M = 6.21, SD = 1.28$). While both groups' scores dropped over summer, the difference between groups was not significant.

Given these findings, there was a summer effect for both low- and high-decile *good readers*. High-decile *good readers* decreased significantly more than low-decile *good readers* in the sentence comprehension, paragraph comprehension, and vocabulary

subtests as well as in total STAR total raw score. However, low-decile *good readers* decreased significantly more than high-decile *good readers* in the word reading subtest. Both groups decreased in STAR stanines over summer although this difference was not significant.

What was the extent of the summer slide for poor readers?

An analysis of STAR scores for *poor readers* ($n = 185$) before and after the summer vacation showed the extent of the summer slide for this group.

The distribution of *poor readers* between the low- and high-decile schools was unequal. There were far more *poor readers* in the low-decile ($n = 180$) schools compared with the high-decile ($n = 5$) schools. A preliminary analysis showed very little difference between the two groups in the extent of the summer slide, except that scores on average in word reading for the *poor readers* in low-decile schools decreased from preintervention ($M = 6.17, SD = 2.21$) to postintervention ($M = 5.56, SD = 2.40$). In comparison, scores on average for the *poor readers* in high-decile schools increased from preintervention ($M = 6.20, SD = 1.92$) to postintervention ($M = 8.00, SD = 1.87$). This was a significant difference, $F(1, 183) = 4.39, p = .038$. There were no other STAR differences between the two groups in terms of the summer slide.

To look at the extent of the summer slide for *poor readers* in general, the *poor readers* in the high- and low-decile schools were combined. The results indicated that

average performance in both the sentence and paragraph comprehension subtests did not decrease but there was a decline in the word reading and vocabulary subtests.

There was a significant effect of the summer slide on word reading, $F(1, 184) = 8.40, p = .004$. Results showed that scores on average for *poor readers* decreased from preintervention ($M = 6.17, SD = 2.19$) to postintervention ($M = 5.62, SD = 2.42$). In addition to the word reading subtest, there was also a significant effect of the summer slide on vocabulary, $F(1, 184) = 6.60, p = .011$. Here, results of the vocabulary subtest indicated that scores on average for *poor readers* dropped from preintervention ($M = 3.62, SD = 2.08$) to postintervention ($M = 3.11, SD = 2.05$).

Conversely, there was not a significant effect of the summer slide on sentence comprehension, $F(1, 181) = 0.97, p = .326$. While results showed that average performance for *poor readers* did drop from preintervention ($M = 4.50, SD = 2.16$) to postintervention ($M = 4.30, SD = 2.6$), it was not a significant drop. Additionally, results for the paragraph comprehension subtest showed a nonsignificant effect of the summer slide. In this instance, however, scores on average for *poor readers* improved from preintervention ($M = 4.79, SD = 2.96$) to postintervention ($M = 5.04, SD = 4.00$).

Given these subtest results, it was expected that there would be mixed effects on the overall STAR means scores and STAR stanines for *poor readers*. Indeed, results showed that mean total scores dropped slightly from preintervention ($M = 18.99, SD = 6.80$) to postintervention ($M = 18.07, SD = 9.20$); however, this was not a significant

drop, $F(1, 184) = 2.32, p = .129$. On the other hand, the mean STAR stanines showed a significant effect of the summer slide, $F(1, 184) = 5.84, p = .017$. Results indicated that average stanines decreased from preintervention ($M = 3.02, SD = 1.03$) to postintervention ($M = 2.78, SD = 1.45$). While this was a small decrease, it was significant.

Overall, the results for *poor readers* over the summer showed a mixed pattern of effects. There were significant decreases in word reading, vocabulary, and STAR stanines which indicated a summer slide. Results for the sentence comprehension subtest showed a nonsignificant drop over summer, while the results for paragraph comprehension indicated a small, nonsignificant increase over summer. Results for the STAR total scores showed a slight nonsignificant decrease.

Did the programme have more positive effects for poor readers than for good readers?

Using results from performance on the STAR measure for both *poor* and *good readers*, analysis was conducted to compare the effects of the programme on both groups.

In word reading, the mean scores for the *poor readers* decreased over summer. Examining the mean scores for *poor readers* across the four intervention conditions indicated that the *control* group decreased the most (-1.22 points), while the *books and comprehension quizzes* group dropped -0.52 points, the *books only* group -0.37 points,

and the *math control* group -0.05 points. In contrast, it was the *good reader books and comprehension quizzes* group that decreased the most (-0.47), slightly ahead of the *control* group (-0.41), followed by the *books* group (-0.28), and the *math* group (-0.23). Although the books and math groups had the smallest drops in scores over summer, the group effect was not significant $F(3, 464) = 2.30, p = .077$, and neither was the group by ability interaction effect.

In sentence comprehension, the mean scores for the *poor readers* gained slightly over the summer break except for the *control* group. The *math control* group made the biggest gain (0.58 points) while the *books and comprehension quizzes* group gained 0.30 points and the *books only* group gained 0.02 points. The *control* group decreased -1.70 points over summer. Results for the *good readers* indicated that all four groups dropped back over summer. The biggest loss occurred for the *good readers books and comprehension quizzes* group (-1.42 points), followed by the *control* group (-1.04 points) and then similar losses for the *books only* (-0.94 points) and *math control* (-0.92 points) groups. The group effect was statistically significant, $F(3, 464) = 5.36, p < .001$. A posthoc analysis of the group effect showed that the *control* group decreased more than the *books only* group ($p = .004$), the *books and comprehension quizzes* group ($p = .010$), and the *math control* group ($p = .000$). Furthermore, the interaction effect of group by ability was also significant, $F(3, 464) = 5.93, p < .001$. Posthoc analysis of the gain scores for the *poor readers* showed that the *control* group decreased more than the *books only* group ($p < .001$), more than the *books and comprehension quizzes* group ($p < .001$), and more than the *math control* group ($p < .001$). However, an analysis of gain scores for the *good reader* group revealed no significant differences. These results

indicated that the positive effects of the summer books applied to the *poor reader* group rather than the *good reader* group.

Slightly different results were revealed in paragraph comprehension. The mean scores for the *poor readers* gained slightly over the summer break, except for the *control* group. The largest gain was made by the *books only* group (0.74 points), followed by the *math control* group (0.42 points), and then the *books and comprehension quizzes* group (0.15 points). The mean scores for the *poor reader control* group decreased over summer (-0.30 points). In comparison, all four *good readers* groups dropped back over the summer break with the *books and comprehension quizzes* group making the biggest loss (-3.32 points), followed by the *math control* group (-3.14 points), the *books only* group (-2.77 points), and the *control* group (-2.66 points). Neither the group effect nor the group by ability effect were significant; however, there was a significant ability effect, $F(1, 464) = 81.33, p < .001$, showing that the *good readers* dropped more than the *poor readers* over the summer break.

Participants in both the *poor readers* and *good readers* groups decreased in vocabulary performance over summer. The *poor readers books and comprehension quizzes* group experienced the largest drop (-0.66 points), followed by the *control* group (-0.63 points), the *math control* group (-0.54 points), and then the *books* group (-0.17 points). Results for the *good readers* indicated that the *math control* group experienced the largest drop (-2.42 points), followed by the *books only* group (-2.15 points), the *control* group (-2.09 points), and finally the *books and comprehension quizzes* group (-

1.99 points). While the group effect and the group by ability effect were not significant, there was a significant ability effect, $F(1, 464) = 56.37, p < .001$. These findings demonstrated that the *good readers* dropped more in vocabulary over the summer break than the *poor readers*.

Analysis of overall STAR mean total scores revealed that *poor readers* in the *books only* and *math control* groups made slight gains over summer, although those in the *books and comprehension quizzes* and *control* groups dropped. Results showed that mean total scores for the *books only* group increased by 0.24 points and for the *math control* group by 0.48 points; however, they dropped for the *books and comprehension quizzes* group by -0.65 points and for the *control* group by a considerable -3.69 points. Results of mean total scores for the *good readers* present a slightly different picture to the *poor readers*. Mean total scores for all four *good readers* groups dropped back over summer. The *books and comprehension quizzes* group made the largest drop (-7.32 points), followed by the *math control* group (-6.71 points), then the *books only* group (-6.33 points), and the *control* group (-6.23 points).

The posthoc analysis of group interactions within the *poor reader* group showed significant differences between the *books only* group and the *control* group ($p = .033$) as well as the *math control* group and the *control* group ($p = .025$). The difference between the *quizzes* group and the *control* group approached significance ($p = .075$). There was a significant ability effect, $F(1, 464) = 75.62, p < .001$, as well as a significant time by

ability by group effect, $F(3, 464) = 2.645, p = .049$. These results support the claim that the programme had positive effects for the *poor reader* group.

Mean STAR stanine scores for three groups of *poor readers* dropped back over the summer break. Results showed that on average stanines dropped by -0.63 points for the *control* group, -0.22 points for the *books and comprehension quizzes* group, and -0.06 points for the *books only* group. Interestingly, the mean STAR stanine score for the *math control* group maintained over summer (2.88 points). Results for all four groups of *good readers* showed that their mean STAR stanines dropped over summer. The *books and comprehension quizzes* group made the largest drop (-1.53 stanines), followed by the *math control* group (-1.36 stanines), the *books only* group (-1.21 stanines), and the *control* group (-1.14 stanines). There was a significant ability effect, $F(1, 464) = 80.38, p < .001$, and the time by ability by group effect was approaching significance, $F(3, 464) = 2.59, p = .052$. These findings suggest that the *good readers* had a greater drop in mean STAR stanine compared to the *poor readers*, and this drop was significant.

Summary of Results

Part 1 of this chapter reported results for the STAR reading tool. STAR was chosen to be the assessment to analyse the effectiveness of the reading intervention as it was the only measure that showed significant intervention effects. The chapter started with a reliability analysis of STAR, showing that it had high reliabilities. The chapter then reported results for the four main research questions. The following provides a summary of the results for each research question.

Research Question 1:

This research question sought to determine whether students who received reading books matched to their reading levels and interests over the summer vacation made greater gains in reading achievement than students who received math workbooks and students who did not receive any books. The results for the total group of participants showed that, whether analysed at the subtest, total, or stanine level, there was a significant summer slide on the STAR measure of nearly one stanine. This decline in performance occurred irrespective of providing reading books that had been specifically matched to the participants' reading levels and individual interests over the summer vacation.

Research Question 2:

This research question sought to determine whether students who received reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation made greater gains in reading comprehension than students who received only reading books. The results indicated that on all aspects of the STAR measure (subtests, total score, and stanine) there was a significant summer slide for all four groups, except for the sentence subtest where the intervention groups did better than the control group.

Research Question 3:

This research question sought to determine whether students in high and low decile schools who received reading books matched to their reading levels and interests over the summer vacation made similar gains in reading achievement. The results

indicated that on all aspects of the STAR measure the performance of low-decile students decreased over summer. The same pattern was observed for high-decile students except on word reading where they improved. The drop in performance over summer was greater for high- decile than low-decile students.

Research Question 4:

This research question sought to determine whether poor readers who received reading books matched to their reading levels and interests over the summer vacation made greater gains in reading achievement than good readers who received reading books matched to their reading levels and interests. The results indicated that the summer slide was greater for high-decile good readers than for low-decile good readers in comprehension and vocabulary. In contrast, the summer slide was greater for low-decile good readers than for high-decile good readers in the word reading subtest. Both groups decreased in STAR stanines over summer but the difference in stanine slide was not significant.

The results for *poor readers* as a total group over the summer period showed a mixed pattern, with a significant slide in word reading, vocabulary, and STAR stanine level but no significant drop in sentence comprehension and paragraph comprehension. The drop for poor readers as a whole was less than it was for good readers as a whole. These results support the possibility that the summer intervention had positive effects for the *poor reader* group.

Part 2 – Survey Measures

Reading Logs

These results apply to the students who completed the pre- and post-intervention STAR assessments.

Reading logs were delivered to participants in the *books only* group and the *books and comprehension quizzes* group by the home visitors during the summer holidays. A new reading log was included with each delivery of new books; consequently, three reading logs were issued for each participant in these two groups. After reading a book, each student completed the reading log by writing the book's title and then selecting the most appropriate face to describe how they felt about the book: unhappy, neutral, or happy. Based on this 3-point Likert response format, the numbers chosen for each category were then totalled, thus, giving an overall picture of the student's attitude towards reading the books.

After the first delivery, students in the two books groups reported that they read between one and 15 books, with a mean of 7.50 books being read. Students in the *books and comprehension quizzes* group reported that they completed between one and 20 quizzes, with a mean of 13.98 quizzes completed. Students reported reading their books to adults between one and 15 times with a mean of 6.97 times and rated a mean of 1.67 books as *poor*, 2.90 as *OK*, and 4.48 as *great*.

Following the second delivery, students who received the reading books reported that they read between one and nine books, with a mean of 7.13 books read. Students in the *books and comprehension quizzes* group reported completing between one and 28 quizzes, with a mean of 17.85 quizzes completed. Students reported reading their books to an adult between one and nine times, with a mean score of 6.59 times and rated a mean of 1.69 books as *poor*, 2.86 as *OK*, and 4.71 as *great*. These results indicated that by the time students had completed the second delivery of books, students on average had read slightly fewer books than following the first delivery (-0.37); however, students in the *books and comprehension quizzes* group had completed on average nearly four more quizzes (+3.87). There was also a slight drop in the mean number of books read to adults (-0.38). Student rating of books remained similar, although there was a slight increase from the first to second delivery in the mean rating of books as *great* (+.23).

After the third delivery, results dropped for all ratings. Students in the two book groups reported reading between one and 11 books, with an average of 6.89 books read. This represented a drop of -0.61 from the first delivery, which indicated that the quantity of books read dropped by over half a book. Students in the *books and comprehension quizzes* group reported completing between one and 22 quizzes with a mean of 14.02 quizzes. Although this result showed that students completed almost four fewer quizzes on average from the second delivery, there was a slight increase of +.04 from the first delivery. Students reported reading between one and nine books to an adult with a mean of 6.36 and rated a mean of 1.92 books as *poor*, 2.69 as *OK*, and 4.65 as *great*. After the third delivery, students reported reading fewer books to an adult than

after the first delivery (-0.61). In other words, the number of books read to an adult also dropped by over half a book. In addition, the mean number of books rated as *poor* increased by +0.25 points and the mean number rated as *OK* decreased by -0.21 points. However, the mean number of books rated as *great* increased slightly from the first delivery by +0.17 points.

Motivation to Read

This questionnaire was administered at pre- and postintervention and it provided an indication of how students felt about different aspects of reading. Students circled the puppy illustration that best represented how they felt, and they also had the opportunity to give a written response to the questions. Each of the 12 questions had five possible responses: a *very happy* puppy (5 points), a *happy* puppy (4 points), an *okay* puppy (3 points), a *not happy* puppy (2 points), and a *very unhappy* puppy (1 point). The maximum score possible was 60 points, and this represented a very positive attitude to reading, whereas the minimum score of 12 points represented a very poor attitude.

The pretest Motivation to Read questionnaire ($n = 472$) showed a mean score of 48.21 for *poor readers* and 51.08 for *good readers*, $F(1, 470) = 16.47, p < .001$, indicating that the *good readers* had a more positive attitude towards reading at pretest. There was an average summer drop in scores for the total group from 49.97 to 49.27, $F(1, 474) = 3.99, p = .003$. An examination of the four groups on the questionnaire from beginning to end of summer showed no significant time by group interaction effect, indicating no group changed more than another.

Home Literacy Survey

The Home Literacy Practices Survey consisted of 16 questions relating to both the student and family's reading and writing behaviours at home. Analysis of the responses provided a general indication of literacy practices in the home and the range of resources available. In addition both students and parents or caregivers were asked to rate the summer programme between 1 and 5, with 1 representing a low rating and 5 a high rating.

Students rated the programme between 1 and 5 and the average score was 3.73, indicating that the students were generally happy with the programme. Parents or caregivers also rated the programme and their average rating was 4.16. From this result, it is evident that parents rated the summer programme highly.

The parent survey asked how many children's books were in the home. The number ranged from zero to 1,000 with an average of 61.61 books. An examination of *good* and *poor readers* showed that the mean for *poor readers* was 27.23 ($n = 65$) and for *good readers* was 79.00 ($n = 133$). This was a significant difference, $F(1, 196) = 11.19, p < .001$.

Examination of the low-decile students showed that the mean for *poor readers* was 24.92 ($n = 63$) and for *good readers* was 30.17 ($n = 65$), however, there was no significant difference between the two. A check of the high-decile students showed that

the mean for *poor readers* ($n = 2$) was 100.00 books and for *good readers* was 125.68 books ($n = 68$). Again, there was no significant difference between the two groups.

Parents were asked how often their child visited a public library with a family member. Responses for the total group indicated that 24.4% never visit the library, 27.0% visit once or twice a year, 31% visit once or twice a month and 17.6% visit more than once or twice a month ($n = 291$).

Comparing responses made by parents from low- and high-decile schools revealed some differences. Parents in low-decile schools indicated that 36.4% never visit the library, 23.3% visit once or twice a year, 25% visit once or twice a month, and 15.3% visit more than once or twice a month. High-decile school parents responded that 5% never visit the library, 31% visit once or twice a year, 40% visit once or twice a month, and 24% visit more than once or twice a month. These results indicated that over one third of students from low-decile schools never visit a library with their family, compared with just 5% of high-decile students.

In addition to visiting the library, parents or caregivers were asked how much time their child spends on a home computer. Responses for the total group revealed that 11.1% used a home computer for more than an hour each day, 26.0% for approximately one hour, 30.6% for about half an hour, 10.1% for a few minutes, and 22.2% indicated that they do not use a home computer ($n = 288$).

A breakdown of responses by parents from low-decile schools showed that 14.3% spent more than an hour on the home computer each day, 24.0% about an hour, 19.4% approximately half an hour, 7.4% for a few minutes, and 34.9% indicated that they do not use a home computer ($n = 175$). In contrast, parents from high-decile schools commented that 5.8% spent more than an hour on the home computer each day, 29.1% about an hour, 47.7% approximately half an hour, 15.1% a few minutes, and 2.3% do not use a home computer ($n = 86$). The difference between low- and high-decile students' access to a home computer is striking with 34.9% of low-decile students, compared with just 2.3% of high-decile students, not using a home computer. In addition, considerably more low-decile students compared to high-decile students are using the home computer for more than an hour each day.

Summary of Results

This chapter reported results for the STAR reading tool. STAR was chosen to be the assessment to analyse the effectiveness of the reading intervention as it was the only measure that showed significant intervention effects. In addition, the chapter reported results for student reading logs and results for two surveys: one on motivation to read and one on family literacy practices. The chapter started with a reliability analysis of STAR, showing that it had high reliabilities. The chapter then reported results for the four main research questions and the reading logs and surveys.

Research Question 1:

The results for the total group of participants showed that, whether analysed at the subtest, total, or stanine level, there was a significant summer slide on the STAR measure of nearly one stanine. This decline in performance occurred irrespective of providing reading books that had been specifically matched to the participants' reading levels and individual interests over the summer vacation.

Research Question 2:

On all aspects of the STAR measure (subtests, total score, and stanine) there was a significant summer slide for all four groups, except for the sentence subtest where the intervention groups did better than the control group.

Research Question 3:

On all aspects of the STAR measure the performance of *low-decile* students decreased over summer. The same pattern was observed for *high-decile* students except on word reading where they improved. The drop in performance over summer was greater for *high-decile* than *low-decile* students.

Research Question 4:

The summer slide was greater for high-decile *good readers* than for low-decile *good readers* in comprehension and vocabulary. In contrast, the summer slide was greater for low-decile *good readers* than for high-decile *good readers* in the word

reading subtest. Both groups decreased in STAR stanines over summer but the difference in stanine slide was not significant.

The results for *poor readers* as a total group over the summer period showed a mixed pattern, with a significant slide in word reading, vocabulary, and STAR stanine level but no significant drop in sentence comprehension and paragraph comprehension. The drop for poor readers as a whole was less than it was for good readers as a whole. These results support the possibility that the summer intervention had positive effects for the *poor reader* group.

Reading logs

Analysis of data from the reading logs indicated that there was a slight drop in the average number of books read over the summer so that by the end of the programme students were reading on average half a book less than they were at the beginning of the programme. In addition, there was a slight drop in the average number of books read to an adult. The size of this drop also represented half a book, which is consistent with the drop in number of books read. Students' ratings of the books fluctuated slightly and by the end of the programme there were slightly more books rated as *poor* and *great* while the number rated as *OK* dropped.

The pattern of the average number of quizzes completed over the summer showed that there was a considerable increase in the middle of the programme; however, this dropped back towards the end of the programme. By the end of summer, slightly more quizzes on average were being completed than at the beginning of summer.

Motivation to read

There was a change in students' attitudes towards reading. By the end of the summer, the average score for the whole group had dropped, indicating that students were slightly less positive about reading than at the beginning. There was no time by group interaction, no one group dropped more in attitude than another.

Home literacy survey

Overall, parents rated the programme very highly, and the students were generally happy with the programme. Responses indicated a very large difference in the number of books in the homes of *poor* and *good readers*. A large 24% of the total number of respondents commented that they never visit the library with their child. A substantial 36% of low-decile families never visit the library compared with 5% of high-decile families. A large 35% of *low-decile* students do not use or do not have access to a home computer, compared with just 2% of *high-decile* students.

The home literacy data showed a considerable difference in access to print and technology resources between students from low-decile and high-decile backgrounds.

The key findings presented in the chapter were (a) there was a summer slide of approximately one stanine, (b) the intervention had a positive effect on STAR sentence comprehension scores but not on other subtests, (c) high-decile students dropped more over summer than low-decile students, (d) high-decile good readers dropped more in comprehension and vocabulary over the holidays but low-decile good readers dropped more in word reading, (e) poor readers as a group (these were almost all in low-decile

schools) dropped over summer but not as much as good readers as a group, (f) parents liked the intervention, (g) students in general did read the books and do their quizzes, (h) motivation dropped slightly over summer, and (i) low-decile students as a group had substantially less access to print and technology resources at home than high-decile students.

CHAPTER FIVE

DISCUSSION

Chapter Overview

The first section of this chapter provides a summary of the methods adopted and findings from the study in this thesis in relation to the research questions and propositions discussed in Chapter One. It outlines an overview of findings from the pilot study which involved 81 Year 2 and 3 students during the 2010 – 2011 summer holidays and the subsequent main study which was implemented over the 2011 – 2012 summer holidays. The main study involved a much larger sample from a wider range of schools of both low and high decile. The second section will discuss the implications of these findings and suggest future research possibilities. Finally, the contribution made from the research in this thesis will be reviewed.

The Nature of the Study

The research presented in this thesis examined whether providing books for young children to read over the summer holidays helped to prevent loss of reading skills while maintaining motivation to read. Specifically, the intervention involved providing Year 3 children with 25 books matched to their reading levels and interests. The study also looked at intervention effects for high and low ability readers as well as students from low and high decile schools (i.e., high and low SES).

The overarching purpose of the thesis has been to explore issues that relate to the achievement gap that exists between some groups across all levels of the New Zealand schooling system. There is a significant disparity between high and low performing groups with a disproportionate number of Māori and Pasifika students underachieving. Recognition of this disparity is not new and has been documented since the 1930s. Evidence of the achievement gap has also come from cross national studies including the Progress in International Reading Literacy Study (PIRLS) and Programme for International Student Assessment (PISA). Despite decades of reforms and initiatives at the national level, the achievement gap persists and is acknowledged as one of the widest in the OECD (Ministry of Education, 2010). Disparities in achievement between students from low and high socioeconomic backgrounds are not unique to New Zealand and have been the focus of much international research. Researchers, particularly in the United States, have documented the impact of summer learning loss on the reading achievement gap and suggest that it is the cumulative effect of summer learning differences that is the primary cause of the widening achievement gap between students from high and low socioeconomic levels (Terzian et al., 2009). Little is known about the summer effect on student achievement in New Zealand and it is this phenomenon that the present study addressed.

Based on the literature review's findings that there exists scant research examining the effects of summer learning loss on students' reading achievement in New Zealand, this study investigated the effectiveness of voluntary summer reading interventions in 10 New Zealand primary schools as a means of preventing summer reading loss. This research has added to the broader understanding of summer learning loss and tested the efficacy of the intervention to ameliorate this occurrence.

This study sought to replicate, extend, and throw new light on overseas research findings (e.g., Allington et al., 2010; Kim & White, 2011) that showed giving students access to self-selected books and encouraging them to read these over the summer improved their reading skills and prevented summer learning loss. By conducting the present study it was possible to determine what might happen in the New Zealand context.

Pilot Study

Results from a pilot study indicated that there were significant gains in reading accuracy and comprehension for all the children in the study, including both the summer books children and the control group. In addition, all children maintained their level of reading motivation throughout the summer books programme, except that the value students assigned to reading dropped significantly across all groups over summer.

Although the results showed that a summer slide did not occur, this could have been as a result of placebo effects given that all children in the study made similar progress. In addition, results showed that average and above average readers gained during summer but below average readers dropped back slightly. The math treatment control also did not gain in math even though they completed math exercises during summer.

The pilot study showed that a number of changes needed to be made in order to carry out the main study. The changes made included a much larger sample of Year 3

students from a wider range of schools: seven low decile and three high decile schools from across Auckland. This gave more statistical power to the study as well as allowing for comparison of socioeconomic levels. The main study included a control group which did not receive any books until after the posttesting had been completed in the new school year. This provided a control group for the placebo effects. The other three groups included a books only group, a books and comprehension quizzes group, and a math control group. A further difference was that students in the books and books and quizzes groups selected a greater number of books for the main study.

Main Study

From the pre-existing research on summer learning loss and the results of a pilot study, four hypotheses were developed for the main study.

The first hypothesis of this study was that students who have access to reading books matched to their reading levels and interests over the summer vacation will show greater gains in reading achievement than those students who receive math workbooks over the holidays and those who do not receive any books over the holidays.

The second hypothesis was that students who have access to reading books matched to their reading levels and interests with comprehension quizzes over the summer vacation will show greater gains in reading comprehension than those students who receive books only.

The third hypothesis was that students in high and low decile schools who have access to reading books matched to their reading levels and interests over the summer vacation will demonstrate similar gains in reading achievement over the summer holidays.

The fourth hypothesis was that poor readers who have access to reading books matched to their reading levels and interests over the summer vacation will show greater gains in reading achievement than good readers who have access to reading books matched to their reading levels and interests.

The Research Hypotheses

The results did not confirm the first hypothesis. The overall STAR stanine score all groups declined over summer by nearly a stanine. This is consistent with other studies showing that pupil achievement declines over the summer vacation. A check of subtest scores showed that the only break in this pattern was for sentence comprehension where the group that declined least was the math group. The results showed that the control group declined over the summer more than the books-only and math groups. There was no difference between the control and the books/quizzes group, though the books/quizzes group was better and the p value of .059 was close to significance. The overall impression is that on the sentence comprehension subtest the three groups that received some kind of intervention gained more than the control group. The result for the math group is not clear. It may be a placebo effect or it may reflect that the math exercises books did involve some reading of text which may have helped to reduce the decline over the summer vacation. Since the only significant result

was for one subtest of STAR, and it included the math control group, the results are weak and need to be treated with caution. It may be that the groups that received something (books, math) may have improved not because of the summer materials but because of a placebo effect, that is, the psychological effect of special attention.

The results did not confirm the second hypothesis. There were no significant differences in the sentence comprehension and paragraph comprehension subtest results between the books only and books and comprehension quizzes groups. While the *poor reader* group, except the control group, did make slight gains over summer in sentence and paragraph comprehension, all three groups made gains and there were no significant differences between them. The theory was that the quizzes would help build vocabulary and this would help comprehension. The results for STAR showed no difference between the books-only group and the quizzes group. This suggests that quizzes do not add value to books-only. In a short summer programme like this one, the quizzes may not have had time to allow sufficient vocabulary buildup to improve comprehension.

The third hypothesis was not confirmed by the results. The results showed that both groups declined over summer on overall STAR except that the lower SES group did not drop as much. On the STAR subtests the higher SES group dropped more than the lower SES group – except on word reading. The reason for the greater drop of the higher SES pupils could be regression effect in that they scored much higher than the lower SES group.

The results confirmed the fourth hypothesis. The results for overall STAR stanine scores showed that the poorer readers did not slide as much as the better readers – this interaction effect was nearly significant $p = .052$. An analysis of STAR subtest scores showed that the control group of poorer readers slid much more than the control group for the better readers. This was significant. It suggests that among the better readers the summer books did not have a more positive effect than not having any books but for the poorer readers it suggests that the control group who received no books did lose out compared with the other groups. It does give some support for the idea that poorer readers benefit more from summer books, though the result was only for one subtest of STAR, the math control group also benefited (not just the books groups), so the findings should be treated with caution. If there was a positive benefit for the poorer readers it might not be the books so much as a placebo effect, or, as previously mentioned, it might be that the math exercise books provided reading opportunities that helped stop a slide in reading.

Theoretical Implications

The results of the present study provide further insight into research on summer slide theory. It is the first study in New Zealand to examine the effectiveness of voluntary summer reading interventions in New Zealand primary schools as a means of preventing summer slide. The results confirmed that summer slide is evident in the New Zealand context. This supports findings from Tiruchittampalam (2006) that identified a six month slide over the summer break for a group of students from a low decile school.

The present study adds to this by revealing that summer slide occurred for students in high decile schools as well.

This finding is contrary to what some research suggests (Alexander et al., 2007; Allington & McGill-Franzen, 2009; Cooper et al., 1996,). It has been argued that the reading skills of students from high-income backgrounds continue to increase over summer; however, findings from the present study challenge this. One possible explanation for this result could be the ceiling effect of the STAR assessment. All but five of the high decile students in the sample were in the *good reader* group. They were already achieving high reading levels at the start of the programme, which would make it difficult for them to make further gains. Parr, Reddish, and Timperley (2007) identified a marked ceiling effect for the STAR assessment and concluded that in order to measure improvement in reading achievement it is important to plot a trend by using more than two data points. Future replications of the current study might consider including additional measures such as e-asTTle or PAT Reading Comprehension. While these measures are not intended for use with Year 3 students, students who are close to ceiling on STAR would likely have little difficulty completing them. However, it is worth noting that the issue of ceiling effects has been mitigated in STAR's revised edition (2011) which has three tests (A, B, and C) spread over years 3-4, arranged in order of increasing difficulty and a combination of the A, B, and C tests can be administered. The earlier edition of STAR (2001), which was the measure used in this thesis, used only one test form to cover Year 3, and ceiling effects could be shown (C. Darr, personal communication, January 16, 2014).

Further, regression effects also provide a possible explanation for the drop in results by high decile students. This suggests that when a student achieves a high score on a measure it is likely that they will score closer to the mean on a retest of the same measure.

Home Literacy Practices

The present study was similar in purpose to the Kim and Guryan (2010) and Allington et al. (2010) studies in that it aimed to assess the effects of providing students with free books to read over the summer vacation. Allington and McGill-Franzen (2003) argued that many students from low-income families experience a summer learning loss in reading because they do not have easy access to books. Analysis of survey data from the present study provided an insight into home literacy practices of students from low and high income families. It identified a significant difference in access to books. The low decile children on average had 27 books at home, while the high decile children on average had 124.

Accessing resources such as public libraries was also examined. Again, a significant difference between students from low and high decile schools was revealed. Analyses indicated that 36% of low SES parents responded that they never visit a public library with their children (5% for high SES parents), 23% of low SES parents commented they visited the library once or twice a year (31% for high SES), 25% of low SES parents said they visited once or twice a month (40% for high SES), and 15% of low SES parents took their children more than once or twice a month (25% for high SES).

In addition to this analysis, access to a computer at home was also examined. A similar pattern emerged with respect to using a computer at home. Responses from low SES parents indicated that 35% of low SES students did not have access to a computer at home compared with only 2% of high SES students.

These data provide evidence of some of the inequalities that exist between low and high SES families in New Zealand. The data indicated that on average high SES students have 4.5 times more children's books in their homes than low SES students and over a third of low SES students never visit the public library and do not have access to a computer at home. Such differences in home literacy practices can affect literacy development (Nicholson, 1999; Nicholson 2003; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2001) and may account for some of the SES differences in language and literacy outcomes in early and middle childhood (Burchinal & Forestieri, 2011; Kaiser et al. 2011).

Future Research and Practical Implications

A possible summer intervention with Year 1 children might incorporate findings from Sénéchal and colleagues studies (2012, 2006, 2002, 1998, & 1997). A similar method could be used to this thesis however instead of books for the child to read, each parent and child would receive book packs throughout the summer. These book packs would include a book for shared reading, suggestions for discussion points within the story; ideas for fun, interactive follow up activities that promote further literacy enrichment; ideas for developing formal literacy skills for example teaching letter names, sounds, writing child's name and printing or reading words for example the high

frequency words. A parent training component could be built in prior to the summer holidays so they are aware of the procedures and have an opportunity to see a session modeled. Books included would need to be appropriate for young children, reflect their interests and prior knowledge and experiences. A home liaison person would visit regularly throughout the holidays to deliver new book packs and offer support and encouragement to the parent and child. By including both formal and informal literacy activities it would follow from Sénéchal and colleagues findings that long term positive benefits could be seen especially in alphabet knowledge, reading fluency, vocabulary knowledge, reading for pleasure, and reading comprehension.

Funding 25 free books for every low ability reader over the summer vacation may not be a viable option for schools, however, ideas that could help facilitate implementing a summer books programme include having school libraries open regularly throughout the holidays, schools linking up with local libraries, operating a mobile library targeting the low ability readers, or distributing some of the *Duffy Books* (low decile schools only) at the end of the school year instead of throughout the year when the students have ready access to school resources.

While responses to the Home Literacy Survey did indicate that over one third of students from low decile schools never visit a library with their family, what is not clear is the reason why they do not. It is possible that distance from home and transport to and from the library are issues which prohibit these families from visiting them. In this case having the school libraries open over summer would address this issue as most children

attend their neighbourhood primary school. Any future replication of this study might consider expanding the Home Literacy Survey to include asking parents to identify reasons that prevent them from visiting the public library.

Data from McNaughton et al. (2012) showed that parents of students with a high summer learning loss indicated that access to books was a major factor in their child's summer reading habits. Further, data indicated that students in classes with low summer learning loss had been given ideas about reading over the summer by their teachers prior to the end of the school year and all reported that someone at home helped them read. From these results, it appears that to reduce summer learning loss, schools need to provide access to high interest appropriately leveled texts over summer, include revision of comprehension strategies prior to the end of the school year, and provide parents with ideas on how to support their child's reading over summer. Although the present study provided access to books, it did not include a teaching component at the end of the school year. This might be a possibility for a future replication of the present study.

Building on from McNaughton et al.'s (2012) findings as well as those from family literacy research (Lonigan & Whitehurst, 1998; Nye, Turner, & Schwartz, 2006; Sénéchal & Young, 2008) it is evident that parents play a key role in supporting their child's learning, including over the summer vacation. It is important that parents are informed about the importance of maintaining reading over the holidays. They need to be encouraged to support their child's reading through stimulating parent/child interactions and modeling sound comprehension and fluency strategies. Schools need to work alongside parents to ensure they have the skills and confidence to achieve this.

Limitations and Suggestions for Research Design Improvement

A limitation of the study may be that the summer programme was only for six weeks of the school holidays, which made it difficult to assess the effectiveness of the programme and any gains made were likely to be small. In contrast, summer vacation in the United States varies between schools districts but is typically between two and three months. The longer duration may result in larger gains.

A second limitation is that the present study took place over one summer holiday. The Allington et al. (2010) study gave 15 books to the students each summer, over three consecutive years. At the end of the third summer the results indicated that the treatment group was significantly higher in reading, as measured by State reading tests, than the control group. The results were particularly significant for students from the lowest socioeconomic level. Kim and White (2011) suggested that as summer learning loss is cumulative and occurs across the elementary school years, a multiyear intervention is ideal. Future replications of the present study may consider extending the intervention across several summers.

An additional limitation of the study may be the age of the participants. In the first year of the Allington et al. study the participants were in Grades 1 and 2 (6 and 7 years old). In contrast, participants in Kim and Guryan's study were in Grade 4 (9 years old) and in the present study the participants were at the end of Year 3 (8 years old). Allington et al. suggested the positive results from their study could have occurred because the participants were younger; they selected their own books and received them for three years. Downey et al. (2004) argued that the achievement gap between high and

low SES students is apparent at school entry, and as cognitive growth occurs more rapidly among young children, the learning differences associated with family background increase during the early elementary years (Burkham et al., 2004). Given the critical importance of the early years at school to master the foundations of literacy (Ministry of Education, 2012) and the cumulative effect of summer learning loss it seems reasonable to argue that the earlier measures are implemented to address summer learning loss the sooner the achievement gap can be closed. This could be an area for future investigation.

A fourth limitation to the study may be the use of the STAR reading assessment to measure progress in reading achievement. The results from the present study highlighted some issues with the STAR assessment measure. As Parr et al. (2007) suggested there is a notable ceiling effect with STAR which could affect its ability to report progress at the higher levels. This is evident in the results for the high decile *good reader* group which scored above the typical range in each of the four subtests at pretest but at post-test within the typical range for each. Of particular note was the difference in mean scores for paragraph comprehension. At pretest the mean score was above the typical range but at posttest it was below the Year 4 mean as identified in the STAR Teachers' Manual (Elley, 2001). Parr et al. argued that when measuring improvement in reading ability it is important to have more than two data points so that a trend can be established. Given these issues, any future replication may consider using an alternative assessment, for example e-asTTle, or having more than two data points, although this may not be practical given the relatively short length of the New Zealand summer holidays.

A fifth limitation is that the results rely only on the results for the STAR test. Other tests were used in the study, but only the STAR test showed a significant effect for the summer books programme. On the one hand, it could be that there is some error in STAR. On the other hand, it could be that STAR is a group-administered test whereas all other tests in the main study (and in the pilot study) were administered individually. It could be that there was an unconscious assessor effect operating in the individually administered tests that masked changes in attainment from pretest to posttest, whereas in the STAR test, children were tested as whole classes, which precludes assessor effect. Future studies that include individual assessments might want to consider using assessors who do not know the children or the nature of the study.

A sixth limitation is that the study did not follow up the pupils to see if there were long term effects. It could be that good and poor readers spring back from the summer slide very quickly once they have returned to school. Future research could look at this possibility.

Contribution and Conclusion

The achievement gap that exists between different ethnic and socioeconomic groups in New Zealand schools is an area of national concern. This study has investigated one factor, summer learning loss, which has been shown in international research to contribute to the achievement gap between students from economically advantaged and disadvantaged backgrounds. Results from the present study have the

potential to provide schools with ideas for preventing the drop in achievement during the summer vacation.

Despite the limitations of this study, it contributes to the body of literature on summer learning loss and specifically on the effects of a voluntary summer books programme. While there has been a considerable amount of research on the topic conducted internationally, very little has been conducted in New Zealand. The present study contributes to the emerging body of New Zealand research on summer learning loss. There are points of difference between this study and overseas research such as Kim and Guryan (2010) and Allington et al. (2010). Participants in this study were from high and low decile schools and included both low and high ability readers.

Overall the results in this thesis are suggestive but not conclusive. While there was a significant finding in the sentence comprehension subtest of STAR, there were no other significant findings across a number of different assessments suggesting that further research needs to be conducted.

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APPENDIX A

Pilot Study Results

Data Analysis

Analysis was conducted to assess the impact that the intervention had on the participants in the study. Using a series of one-way repeated measures analysis of variance (ANOVA), the four assessment measures that were administered to the participants were analysed to measure the potential effects of the intervention. The three research questions were posited as part of the trial. To assist in interpretation, the results for each of these are presented in relation to each question. All analyses in this chapter were conducted using SPSS 18.0 (SPSS, 2009).

Data was analysed with repeated measures ANOVA. Results for reading and math are reported as these were the only measures that showed significant intervention effects.

Descriptive statistics

Table B1 shows the means, standard deviations, correlations, and reliability estimates for the Neale Analysis of Reading Ability.

Overall, the average alpha for the Neale Analysis of Reading Ability and across each of the measures for reading accuracy and comprehension was .86, ranging from .83 to .87. This indicated that there was a high degree of reliability for the Neale Analysis of Reading Ability. In relation to the reliability for each of the two time periods, the Neale

Analysis of Reading Ability showed strong stability at both baseline (Time 1) and follow-up measure (Time 2).

Table B1

Mean, Standard Deviation, Correlation, and Reliability for the Neale Analysis of Reading Ability

Measure	M	SD	alpha	1	2	3	4	5	6	7	8	9	10	11	12
1. Neale Accuracy Raw Score- Time 1	26.28	15.96	.84	1.00											
2. Neale Accuracy Raw Score – Time 2	27.66	16.88	.85	.96*	1.00										
3. Neale Accuracy Age– Time 1	7.24	1.20	.87	.98*	.92*	1.00									
4. Neale Accuracy Age– Time 2	7.19	1.43	.86	.93*	.97*	.92*	1.00								
5. Neale Accuracy Stanine– Time 1	4.04	1.62	.86	.89*	.86*	.86*	.83*	1.00							
6. Neale Accuracy Stanine– Time 2	2.83	1.50	.87	.82*	.86*	.79*	.85*	.89*	1.00						
7. Neale Comp. Raw Score – Time 1	8.52	6.73	.83	.92*	.90*	.91*	.91*	.77*	.75*	1.00					
8. Neale Comp. Raw Score– Time 2	10.34	7.20	.83	.92*	.94*	.90*	.92*	.81*	.77*	.90*	1.00				
9. Neale Comp. Age– Time 1	7.11	1.34	.87	.90*	.88*	.91*	.93*	.75*	.74*	.98*	.89*	1.00			
10. Neale Comp. Age – Time 2	7.31	1.54	.86	.92*	.91*	.92*	.94*	.79*	.78*	.91*	.98*	.93*	1.00		
11. Neale Comp. Stanine – Time 1	3.66	1.69	.86	.83*	.82*	.81*	.80*	.87*	.83*	.88*	.79*	.84*	.79*	1.00	
12. Neale Comp. Stanine – Time 2	2.89	1.63	.86	.87*	.88*	.84*	.86*	.86*	.85*	.84*	.94*	.82*	.92*	.84*	1.00

Note. Bolded values indicate the correlations between each overall measure and subtest at Time 1 and Time 2.

* $p < .01$.

Table B2 shows the means, standard deviations, correlations, and reliability estimates for Prose Reading Observation, Behaviour, and Evaluation of Comprehension (PROBE).

The average alpha for the PROBE measure was .98 which indicated a very high degree of reliability, and this was consistent at both Time 1 and Time 2.

Table B2

Mean, Standard Deviation, Correlation, and Reliability for the PROBE Measure

Measure	M	SD	alpha	1	2
1. PROBE Reading Age- Time 1	7.71	1.51	.98	1.00	
2. PROBE Reading Age - Time 2	7.87	1.73	.98	.98*	1.00

Note. Bolded values indicate the correlations between each overall measure and subtest at Time 1 and Time 2.

* $p < .01$.

Table B3 shows the means, standard deviations, correlations, and reliability estimates for the Wide Range Assessment Test (WRAT) Math Test.

The average alpha for the WRAT Math Test was .72, ranging from .56 to .72.

This indicated that there was an adequate level of reliability for the WRAT Math Test.

Table B3

Mean, Standard Deviation, Correlation, and Reliability for the WRAT Math Test

Measure	M	SD	alpha	1	2	3	4	5	6
1. WRAT Raw Score- Time 1	20.14	2.28	.72	1.00					
2. WRAT Raw Score - Time 2	19.87	2.31	.72	.78*	1.00				
3. WRAT Standard Score - Time 1	95.96	10.18	.61	.46*	.23*	1.00			
4. WRAT Standard Score - Time 2	90.20	9.30	.56	.32*	.53*	.76*	1.00		
5. WRAT Stanine - Time 1	4.52	1.34	.71	.46*	.23*	.98*	.72*	1.00	
6. WRAT Stanine - Time 2	3.75	1.19	.71	.32*	.50*	.76*	.98*	.73*	1.00

Note. Bolded values indicate the correlations between each overall measure and subtest at Time 1 and Time 2.

* $p < .01$.

Table B4 shows the sample distribution of reading ability across the three groups.

Table B4

Sample Distribution of Reading Ability Across the Three Groups

Groups	Well below	Below	Above	Well above	<i>N</i>
Book Reading	7	4	3	10	24
Math	4	7	8	6	25
Dot-to-Dot	6	6	2	7	21
Total	17	17	13	23	70

Research Question 1: Did the children in the summer books group score higher in reading than did the math and control groups?

Using results from performance on the PROBE reading assessment and the Neale Analysis of Reading Ability Accuracy and Comprehension, analysis was conducted to analyse the effects of the programme on three groups of participants: book reading ($n = 24$), math ($n = 25$), and dot-to-dot (PROBE $n = 21$, Neale $n = 22$). In addition, survey measures were analysed to determine the effect of the intervention on self-concept as a reader and the value assigned to reading.

A comparison of PROBE scores for the total group of students ($N = 70$) before and after the summer vacation showed the effects of the intervention. Results indicated a significant gain in reading for all groups over the break; however, no one group did better than another, and all groups showed similar improvements. Results for the *book reading* group showed that average performance gained from pretest ($M = 7.86$, $SD = 1.80$) to posttest ($M = 7.97$, $SD = 2.06$). Similarly, results for the *math* group indicated an average gain from pretest ($M = 7.65$, $SD = 1.29$) to posttest ($M = 7.87$, $SD = 1.44$).

Further, the *dot-to-dot control* group's results showed scores on average gained from pretest ($M = 7.62$, $SD = 1.46$) to posttest ($M = 7.74$, $SD = 1.69$).

Given these findings, the time effect was significant, which showed there was a general increase over summer, $F(1, 67) = 6.76$, $p = .01$; however, the time by group interaction was not significant, $F(2, 67) = 0.41$, $p = .67$.

Additionally, results for the Neale Analysis of Reading Ability accuracy scores also revealed a significant gain in reading for all groups over the summer. Once again, no one group outperformed another. The *book reading* group's raw scores on average gained from pretest ($M = 27.79$, $SD = 19.37$) to posttest ($M = 28.96$, $SD = 19.27$) as did the scores for the *math* group, from ($M = 26.68$, $SD = 16.17$) to ($M = 28.72$, $SD = 16.93$), and the *dot-to-dot* group, from ($M = 24.18$, $SD = 11.47$) to ($M = 25.05$, $SD = 14.31$). There was a significant time effect, $F(1, 68) = 5.06$, $p = .03$, reflecting the increase over summer; however, the time by group effect was not significant, $F(2, 68) = 0.35$, $p = .71$.

A similar pattern was revealed in the analysis of the Neale comprehension raw scores. All groups gained over summer, but no one group did better than another group. The *book reading* group scores, on average, gained from pretest ($M = 9.63$, $SD = 8.22$) to posttest ($M = 10.67$, $SD = 8.16$) and so too did the scores for the *math* group, from ($M = 8.44$, $SD = 6.85$) to ($M = 10.96$, $SD = 7.17$) and the *dot-to-dot* group, from ($M = 7.41$, $SD = 4.52$) to ($M = 9.27$, $SD = 6.27$). Again, there was a significant time effect, $F(1, 68) = 24.08$, $p < .001$, but the time by group interaction was not significant, $F(2, 68) = 1.40$, $p = .26$.

Examining the survey data revealed that there were no significant changes in self-concept for the groups over the summer break and no significant differences between the groups. Results showed that the mean *book reading* group score dropped slightly from pretest ($M = 18.26, SD = 3.05$) to posttest ($M = 17.43, SD = 2.97$) as did the *math* group scores, from ($M = 18.27, SD = 3.12$) to ($M = 17.86, SD = 3.47$) and the *dot-to-dot control* group, from ($M = 18.53, SD = 3.01$) to ($M = 18.68, SD = 3.06$). Both the *book reading* and *math* groups experienced a slight drop in self-concept, while the *dot-to-dot* group made a slight gain. The time effect was not significant, $F(1, 61) = 0.74, p = .39$, and neither was the time by group effect, $F(2, 61) = 0.45, p = .64$. These results showed that students maintained their prior levels of self-concept as a reader throughout the summer books programme.

In contrast to this, analysis of the value students assigned to their reading revealed a significant drop over the summer break for all groups; however, there were no significant differences between groups. The *book reading* group scores on average decreased from pretest ($M = 20.52, SD = 2.52$) to posttest ($M = 18.78, SD = 2.98$). The *math* group scores decreased from pretest ($M = 20.86, SD = 1.98$) to posttest ($M = 20.27, SD = 2.45$). Results for the *dot-to-dot* group showed scores on average decreased from pretest ($M = 20.89, SD = 2.00$) to posttest ($M = 20.37, SD = 2.11$). There was a significant time effect, $F(1, 61) = 5.20, p = .03$, indicating that there was a significant drop over summer. Results for the time by group effect showed that all groups dropped at a similar rate over this period; however, this was not significant, $F(2, 61) = 1.31, p = .28$.

These results indicated that students improved their reading on the PROBE, Neale accuracy, and Neale comprehension measures over the summer, but there was no effect for the summer books treatment. Students maintained their level of self-concept as a reader over summer; however, the value they placed on reading actually dropped. Interestingly, the results also showed that a summer slide in reading did not occur; however, this may have been in part attributable to a placebo effect as all groups made similar progress.

Research Question 2: Did the math control group gain in math?

To assess the impact of the intervention on the math scores of students in the *math* group, pre- and posttest WRAT Math scores were analysed. Analysis of math raw scores over the summer break revealed there was no significant change from pretest to posttest. Average raw scores for the *book reading* group decreased slightly from ($M = 19.96$, $SD = 2.49$) at pretest to ($M = 19.46$, $SD = 2.08$) at posttest. A similar pattern was shown in the *math* group as the average raw scores dropped from ($M = 20.29$, $SD = 2.12$) at pretest to ($M = 19.90$, $SD = 2.23$) at posttest. Average raw scores for the *dot-to-dot* group also dropped from ($M = 20.21$, $SD = 2.28$) at pretest to ($M = 20.25$, $SD = 2.61$) at posttest. The time effect was not significant, $F(1, 66) = 2.28$, $p = .14$, and neither was the time by group effect, $F(2, 66) = 0.82$, $p = .45$. These results indicated that none of the groups made gains in math achievement over the summer and there were no significant differences between the groups.

Research Question 3: What was the effect of the summer break on reading ability?

For this analysis, students' reading ability was categorised into four distinct groups: specifically, *well above*, *above*, *below*, or *well below* in reading. Students who were considered *well above* had a PROBE reading age one year or more above their chronological age, while students whose reading age was up to one year ahead of their chronological age were categorised as *above*. Students who were *below* had a reading age up to one year below their chronological age and students whose reading age was more than one year below their chronological age were categorised as *well below*.

ANOVAs were conducted to determine the effect of the summer books programme on reading ability. Results for PROBE revealed that there was a significant positive change in reading ages for the groups over summer; however, there were no significant differences between the groups. Scores for the *well below* group on average dropped from pretest ($M = 5.85$, $SD = 0.47$) to posttest ($M = 5.80$, $SD = .52$); however, results for the *below* group showed a mean gain from pretest ($M = 7.15$, $SD = 0.72$) to posttest ($M = 7.21$, $SD = 0.83$). There was also a gain in mean scores for the *above* group from pretest ($M = 7.92$, $SD = 0.59$) to posttest ($M = 8.19$, $SD = 0.65$) and for the *well above* group, from ($M = 9.39$, $SD = 0.75$) to ($M = 9.70$, $SD = 1.12$). There was a significant time effect, $F(1, 66) = 6.67$, $p = .01$, but the group by time interaction was not significant, $F(3, 66) = 2.34$, $p = .08$.

Analysis of WRAT Math scores for the four reading ability groups revealed that there was no change in math scores for the groups over summer, and no one group did better than another group. Scores for the *well below* group on average gained slightly from pretest ($M = 17.94, SD = 1.57$) to posttest ($M = 18.31, SD = 1.62$) and there was a slight decrease for the *below* group from pretest ($M = 20.00, SD = 1.89$) to posttest ($M = 19.40, SD = 2.10$). Results for the *above* group indicated that there was a slight drop in mean scores from pretest ($M = 20.08, SD = 1.38$) to posttest ($M = 19.67, SD = 1.15$), while the *well above* group results showed an increase in mean scores from pretest ($M = 21.68, SD = 1.59$) to posttest ($M = 21.10, SD = 2.11$). The time effect was not significant, $F(1, 61) = 2.61, p = .11$, and neither was the time by group interaction, $F(3, 61) = 1.57, p = .21$. Overall, although there were slight losses and gains in mean scores for the ability groups on WRAT Math from pre- to postintervention, these changes were not significant.

There was a significant effect in the value students assigned to reading for the four reading ability groups. Results for the *well below* group showed mean scores dropped from pretest ($M = 20.33, SD = 2.69$) to posttest ($M = 19.53, SD = 2.29$) and the *below* group dropped from pretest ($M = 20.40, SD = 2.13$) to posttest ($M = 19.00, SD = 3.12$). Results for the *above* group revealed mean scores dropped from pretest ($M = 21.33, SD = 1.61$) to posttest ($M = 19.83, SD = 1.90$) and for the *well above* group from ($M = 21.00, SD = 2.14$) to ($M = 20.52, SD = 2.86$). There was a significant time effect, $F(1, 59) = 7.40, p = .01$, indicating that while the drop in value of reading scores was small, it was significant. The time by group interaction, however, was not significant, $F(3, 59) = .44, p = .73$.

Additional findings were gleaned from analysis of the survey data. This revealed that parents across the three groups rated the summer programme highly (out of five). The parent rating mean score for the *book reading* group was slightly higher than the other two groups, ($M = 4.78$, $SD = 0.48$), followed by the *math* group ($M = 4.64$, $SD = .92$), and then the *dot-to-dot* group ($M = 4.55$, $SD = 1.04$). There were no significant differences between the three groups, $F(2, 38) = 0.29$, $p = .75$.

Further analysis of the survey data indicated the amount of reading done by the *book reading* group. A frequency count of the 17 returned reading logs showed that the number of books read ranged from five to 15 and the mean was 11.24 (73%). These results indicated that most of the students in the *book reading* group read most of the books. The returned reading logs also revealed that 31% of the students rated the books as *great*, 35% as *good*, and 26% as *okay*. Overall, the students rated approximately two-thirds of the books as either *good* or *great*.

In summary, analysis of the PROBE reading measure revealed a significant change in reading ability for all four ability groups over the summer. Despite this, there were no significant differences between the groups. In addition, there was a significant drop in the value students assigned to reading across all four ability groups but, again, there were no significant differences between groups. Parents rated the summer programme highly across all groups, and most of the students in the *book reading* group read approximately three-quarters of their books. Further, analysis of WRAT Math

scores indicated that there were no significant changes from pre- to postintervention for the four ability groups.

Overall, results from the trial intervention indicated that on average all groups made gains over summer on the PROBE reading and Neale Analysis of Reading Ability accuracy and comprehension measures. While all groups gained, there were no significant differences between the groups on any of these measures. Similarly, there were no significant changes between the groups in self-concept as a reader. In contrast, there was a significant drop over summer in the value students assigned to reading. Once again, mean scores for all three groups decreased, and there were no significant differences between the groups. Finally, analysis of WRAT Math results indicated that there was no significant change in scores over summer, and the time by group interaction was not significant.

In conclusion, all groups made similar progress over summer, and there was no evidence of a summer slide. As all three groups improved in reading ability, this indicated the summer books programme had no effect.

APPENDIX B

Math Log

Holiday Math Log Book 2



Name: _____

School: _____

Date	Today I worked on page...	I asked someone to help me	Colour a face that best suits how you felt about doing your math today

- Instructions:**
1. Write the date and which page you worked on
 2. Write YES if someone helped you or NO if you worked by yourself
 3. Colour in the face that represents how you feel about your work

APPENDIX B (continued)

Reading Log

Holiday Reading Log



Name: _____

School: _____

Date	Title	I read my book to an adult	Colour a face that best suits this book
			
			
			
			
			
			
			
			
			

- Instructions:**
1. Write the date and which page you worked on
 2. Write YES if someone helped you or NO if you worked by yourself
 3. Colour in the face that represents how you feel about your work

APPENDIX C

Reading Log Quiz

Holiday Reading Log



Name: _____

School: _____

Date	Title	I have completed my quiz questions	I read my book to an adult	Colour a face that best suits this book
				  
				  
				  
				  
				  
				  
				  
				  
				  

- Instructions:**
1. Write the date and name of the book you have read.
 2. Tick the column after you have read your book to an adult.
 3. Tick the column after you have answered the quiz questions.

APPENDIX D

Reading Log Dolch Word List

Holiday Reading Log



Name: _____

School: _____

Date	Title	I have completed my Dolch Word List	I read my book to an adult	Colour a face that best suits this book
				  
				  
				  
				  
				  
				  
				  
				  
				  

- Instructions:**
1. Write the date and name of the book you have read.
 2. Tick the column after you have read your book to an adult.
 3. Tick the column after you have answered the quiz questions.

APPENDIX E

Vocabulary Quiz

Fagan's Friends

By Damian Morgan

(Box 28)

Here are some words from the story. After you have read the story see if you can pick the best meaning for each word. In Question 1, the best answer is “raised area in a station where you stand to get on or off a train”.

1. Page 2 – “Casey examined the people on the platform but couldn’t see his uncle.”

Platform means _____

- A railway cafeteria
- A railway carriage
- A raised area in a station where you stand to get on or off a train

2. Page 6 – “She pointed around the concourse.”

Concourse means _____

- A place where people gather to talk
- A large open space in a railway station (or other building)
- A road

3. Page 12 – “Don had agreed but Casey now wondered why.”

Wondered means _____

- To be curious and think about why something happens
- To walk across parks or hills
- Something that cannot be understood

4. Page 12 – “The rest of the room was cluttered with broken furniture from the restaurant...”

Cluttered means _____

- Very full but neatly arranged
- Has a nice colour scheme
- Crowded and untidy

5. Page 22 – “You should visit the maritime museum.”

Maritime means _____

- Army and military
- Connected to the sea
- Old or ancient

6. Page 23 – “Defeated, Casey returned to the kitchen and found Bevan looking at a catalogue of model trains.”

Catalogue means _____

- A group or collection
- An encyclopaedia
- A book with a detailed list of items (often for sale)

7. Page 14 – “He pushed against the window and studied the shoes, the clothes, the set faces and sharp hairstyles of the pedestrians hurrying along the footpath.”

Pedestrians means _____

- People who are walking
- People who are running
- women

8. Page 35 – “Mr Smith raised a thin, suspicious eyebrow.”

Suspicious means _____

- Distrusting or doubting
- Very dark (black)
- Hairy

9. Page 39 – “But if anything...anything goes, it will be serious, pizzas or no pizzas.”

Serious means _____

- Reported to the Police
- Delicious or very tasty
- Important, demanding consideration

10. Page 39 “Casey liked Bevan and Bevan made fabulous pizzas.”

Fabulous means _____

- Wonderful or marvellous
- Very spicy
- A lot of

11. Page 40 “Bevan mixed dough with angry thumps of the wooden spoon on the bowl.”

Dough means _____

- Harsh words said in anger
- A thick mixture of flour and water to make bread or pizza bases
- Dishwashing liquid and water

12. Page 41 “Maybe they’d ignored the woman in the pink dress because they’d been casing the restaurant.”

Casing means _____

- Going to eat at
- Distracted at
- Checking out or observing

13. Page 42 “We had this big argument – there were ten of them and only me!”
Argument means _____
- Game involving physical activity
 - Dispute or heated discussion
 - Stealing something from somewhere
14. Page 43 “What do you do with the cutlery you steal?”
Cutlery means _____
- Knives, forks and spoons used for eating
 - Ingredients used in food
 - Money and other valuable items
15. Page 45 “He didn’t want to be ambushed by a dozen Friends to he turned back to the restaurant.”
Dozen means _____
- 4
 - 6
 - 12
16. Page 47 “Your father’s the janitor.”
Janitor means _____
- The caretaker
 - The cook
 - The plumber
17. Page 47 “They left a year ago because of water seepage problems.”
Seepage means _____
- Smells
 - Oozing out (like leaking)
 - Shortage (lack of)
18. Page 54 “Jet leaned forward to whisper but Casey gave a slight but emphatic shake of his head and they waited until the room was plunged into darkness.”
Emphatic means _____
- Moving from left to right
 - Insistent and definite
 - Up and down
19. Page 56 “Tomorrow he would send in the ferrets!”
Ferrets are _____
- The police
 - Smoke to force the people out
 - Small animals used to catch rabbits and rats by driving them from their burrows
20. Page 59 “Casey clenched his fist and took the phone so he could listen to Jet’s father’s directions.”
Clenched means _____
- Closed firmly
 - Punched
 - Opened

ANSWERS

Platform is a raised area in a train station where you stand to get on or off a train (it can be a raised area in other places also).

Concourse is a large open space in a railway station (where people are walking through)

Wondered means to be curious and think about why something happens (Wandered is to have walked across parks or hills).

Cluttered means crowded and untidy.

Maritime means connected to the sea.

Catalogue refers to a book with a detailed list of items (often for sale and with prices).

Pedestrians means people who are walking.

Suspicious means distrusting or doubting. (When Mr Smith raised his eyebrows he doubted that Casey could fix his tomatoes.)

Serious means important or demanding of consideration.

Fabulous means wonderful or marvellous. (The pizzas were very good).

Dough is the thick mixture of flour and water to make bread or pizza bases.

Casing means checking out or observing. (Often thieves case, or watch closely, a building before they steal or rob).

Argument means a dispute or heated discussion.

Cutlery means knives, forks and spoons we use to eat with.

Dozen means 12 (though in this case he might have just meant "many").

Janitor means the caretaker.

Seepage means oozing out (like leaking). The previous tenants had left because water was oozing out into their office.

Emphatic means insistent and definite.

Ferrets are small animals used to catch rabbits or mice by driving them out of their burrows. Casey means he will send in something, not necessarily small animals, to force out and then catch the robbers tomorrow.

Clenched means closed firmly.

APPENDIX F

ETHICS – Pilot Study



MASSEY UNIVERSITY
ALBANY

27 September 2011

Professor Tom Nicholson
College of Education
Massey University
Albany

Dear Tom

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 11/055

The Effects of Book Reading over the Summer Holidays on the Reading Skills and Attitudes to Reading of Year 3 Pupils – Phase 2

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

A handwritten signature in blue ink, appearing to read 'R Bathurst'.

Dr Ralph Bathurst
Chair
Human Ethics Committee: Northern

Te Kōwhiri
ki Pīnchurua

Research Ethics Office
Private Bag 102 904, Auckland, 0745, New Zealand Telephone +64 9 414 0600 ex 9539 humanethicsnorth@massey.ac.nz

APPENDIX G

ETHICS – Main Study



MASSEY UNIVERSITY
ALBANY

25 November 2010

Professor Tom Nicholson
College of Education
Massey University
Albany

Dear Tom

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 10/076

"The effects of book reading over the summer holidays on the reading skills and attitudes to reading of economically disadvantaged Year 3 pupils"

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

A handwritten signature in blue ink, appearing to read 'R Bathurst'.

Dr Ralph Bathurst
Chair
Human Ethics Committee: Northern

Te Kunenga
ki Pūrehuroa

Research Ethics Office
Private Bag 102 904, Auckland, 0745, New Zealand Telephone +64 9 414 0800 ex 9539 humanethicsnorth@massey.ac.nz

