The Effect of Summer School on the Mathematics and Reading Achievement of Low-Performing Second Grade Students

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Submitted to the Graduate Department and Faculty of the School of Education of Baker University in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Leadership

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Date Defended: November 11, 2015

Abstract

The purpose of this study was to examine the difference in second grade math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. The target population for this study was all academically low-performing elementary school students in District X. The sample for this study consisted of 119 students.

Analysis of the performance of students who participated in the summer school program compared to students who did not participate did not establish an overall statistically significant change in student performance in math or reading. In addition, this study examined the differences in student performance of participants and non-participants when considering ELL status and free and reduced lunch status. Two-factor ANOVAS analyzing the effect of ELL status and free or reduced lunch status on the difference in math performance for students who did and did not participate in the summer program were not statistically significant. However, when measuring differences in reading performance, χ^2 tests of independence indicated that participants of ELL status who participated in the program were more likely to score on grade level or below grade level on the QRI than expected by chance. In addition, a statistically significant number of students of free or reduced lunch status who did not participate in the program performed above grade level on the QRI reading assessment than expected by chance. Data analysis did indicate a statistically significant number of students who participated in the program and were of free or reduced lunch status performed on grade level on the QRI compared to the number expected by chance.

Nelson (2006) recommended summer school as an opportunity to support failing students. In addition, Donohue and Miller (2008) stated that access to summer learning experiences have a direct correlation to the potential of a reduced achievement gap. The current study examined the effectiveness of a program designed to support academically low-achieving students. This study sought to determine the effectiveness of the current program and to provide recommendations for action. The current summer program proved to be an effective tool to reduce summer learning loss for participants of ELL status and participants of free or reduced lunch status.

Dedication

This dissertation was written on the soccer and softball fields, waiting for the orchestra and choir concerts to begin, and during family movie night. First, and foremost I would like to thank the three young ladies who agreed to support me in this endeavor. It is my hope that each of you will find something you are so passionate about doing you won't mind the work and that someday you'll share with me your crazy stories of finding a balance in your own lives. Emily, Ren, and Cerise, of all the things I'm proud of, being your mom is at the top of the list.

To Nate, you knew I wanted this before I did. The day I came home and said I wanted to pursue this degree, I'm not sure what I expected, but I know it wasn't to have you say you had expected it all along. It's a rare thing in life to find someone who just gets you; thank you for being my person.

To my Baker Cohort 12 colleagues, thank you for joining me on this crazy journey. Thank you Todd for setting the pace. Thank you Sarah for your friendship, support, and shared love of gum. Thank you Kim for your humor, motivation, support of my chocolate chip habit, and shared love of a good grammar lesson. You are an incredible mentor and friend.

To the educators who made an impact on my life and influenced my decisions throughout my career, thank you. To Kim Thorup for setting a bar of high expectations and always encouraging me. To LuAnn, Dr. B, Dr. Mary, and Mary Jo thank you for your guidance, leadership, and always allowing me to process and think through new learning as we redesigned the summer program. To Dr. Ann Addison and Deb Chappell your support and teaching me that, I really could step out and lead has taught me so much

about who I want to be as a leader. To Mr. Brecheisen, thank you for pushing me to pursue this degree. To Mrs. Owsley, thank you for believing in me and teaching me to believe in myself. I am fairly certain that most of my decisions to push myself and not except less are a direct result of my participation in your class.

Finally, this dissertation is dedicated to Phillis Scorse. Thank you for supporting me as I figured out who I want to be and then encouraging me to become that person. Thank you for setting the bar high and raising me to believe that nothing was ever out of reach. This dissertation and the degree that will follow are a direct result of your support, love, and encouragement. Thank you mom.

Acknowledgements

I would like to acknowledge my doctoral committee for all of their help and support to prepare and complete my dissertation. First, to Dr. Russ Kokoruda, my advisor, thank you for your support, your feedback, your guidance, and encouragement. When I began this program, I expected to learn more than I ever needed about comma placement and dangling modifiers. However, your continued support and guidance also taught me to maintain exceptionally high expectations while keeping a balance between work and life, thank you. Thank you to my research analyst Peg Waterman. Your ability to bring humor into data analysis is so appreciated. To Dr. Sharon Zoellner for serving on my doctoral committee and for sharing your knowledge throughout my coursework. Finally, I would like to extend my sincere appreciation to Dr. Jessica Dain. Thank you for serving as a member of my doctoral committee and for your leadership and support of the T&L department. I so appreciate your commitment to learning all you ever wanted to know about our summer program, thank you.

Table of Contents

List of Tables

Chapter One

Introduction

Summer learning loss is one potential factor contributing to the academic achievement gap that exists between various student groups. Allington and McGill-Franzen (2003) indicated that the difference in academic achievement of second grade students, from high-income compared to low-income homes, is seven months; although student achievement increases at similar rates during the school year, this gap increases to two years and seven months by the time students complete their sixth grade school year. Furthermore, the effects of summer learning loss have a greater impact on students of low socio-economic status and minority students due to the limited learning opportunities available to them during summer vacation (Alexander, Entwisle, & Olson, 2007b; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Donohue & Miller, 2008; Jesson, McNaughton, & Kolose, 2014). Reeves (2006) stated that educators must simultaneously work to reduce the gap in the achievement levels between groups of students while ensuring that all students are being held to the same high academic standards. Additionally, Smith (2011) found that with each passing summer, as the achievement gap increased, instruction the following school year focused more and more on remediation, consequently reducing students' exposure to new curriculum. Therefore, according to Harsh and Mallory (2013), in order to master new curricular standards and to ensure all students attain higher academic performance, schools must examine opportunities to support all struggling learners.

In order to examine possibilities to reduce the achievement gap created by summer learning loss, Borman (2000) recommended that researchers examine the

relationship between participation in summer school and summer learning loss. Moreover, Borman (2000) recommended studies to determine if participation in summer school accelerates academic growth during the school year. Furthermore, Allington and McGill-Franzen (2003) stated that effective summer programs have the potential to reduce the achievement gap between students from high and low-income homes, thus reducing the gap between academically higher and lower achieving students. McCombs et al. (2011) called for research to examine the benefits of summer school stating that, "research on large (summer) programs would provide valuable information to policymakers and practitioners" (p. 74). Furthermore, McCombs et al. (2011) suggested that while all students experience summer learning loss, low-performing students are at a greater disadvantage as this learning loss is cumulative and low-performing students will therefore continue to fall farther behind, if remedial summer school programming is not provided.

This chapter contains background information for the present study; it provides an overview of the significance of summer learning loss to summer school programs and a description of the school district from which the data was collected. This chapter includes a statement of the problem and a description of the purpose and significance of the study. Additionally the delimitations proposed in the design of the study and the assumptions made by the researcher are discussed. Finally, the six research questions examined in this study are specified, definitions of terms are provided, and a brief overview of the methodology is detailed. The chapter concludes with a summary.

Background

Summer school programs and the resulting effect of summer school programs on student achievement have been the focus of research conducted throughout the past three decades (Bell & Carillo, 2007; Cooper, 2001; Cooper et al., 1996; David, 2010; Georges & Pallas, 2010; Haycock, 2001; Johnson, 2000; McCombs et al., 2012; Nelson, 2006; Smink, 2011; Weiss, 2006). The results of these studies have been available to school districts to support the development of summer programs targeted at reducing the achievement gap that exists between academically higher-achieving and lower-achieving students, regardless of race or family income demographics. In particular, District X, a large suburban school district in Kansas, has redesigned its summer school program with the goal of reducing the achievement gap that exists between academically high and low-performing students (Deputy Superintendent, personal communication, November 15 , 2013). The program promotes the continuation of the district goal for summer school, supporting at-risk students and students of ELL status. The revised summer school program, Summer Learning Stars, is an invitation-only program available free of charge to students who meet the eligibility criteria. The summer school eligibility criteria for first grade students included a combination of a score below 62% on the district mid-year math assessment and a reading score between a Rigby Reading Level one and eight on the mid-year assessment during the 2013-2014 school year. These criteria for performance in math and reading were set to identify students who were performing at levels equivalent to one year below grade level (Director of Assessment, personal communication, July 17, 2014).

Background of summer school as a tool to reduce the achievement gap.

Brueckner and Distad (1924), who examined the change in reading abilities of first grade students from June to September, found that summer vacation might have a varied effect on children of different academic abilities. Findings from this foundational summer learning-loss study suggested that summer break might affect students of varied intelligence differently; however, the study did not take into account race, socio-economic status, or the language ability of the student (Brueckner & Distad, 1924). In an analysis of summer school programs Cooper et al. (1996) found that minority students and students of low socioeconomic status were most affected by the summer break and they demonstrated the greatest benefit from summer school participation. Gardner (2007) stated that the historical inequality of per pupil funding has increased the achievement gap between Black and White students, and, as a result, schools today should provide opportunities to reduce that gap. Essentially, numerous achievement gaps exist and summer school is one potential solution to reduce those achievement gaps.

History of summer school in District X. District X has worked to close the achievement gap between high and low-performing students by annually developing and implementing supplemental learning opportunities, including summer school over the past three decades. In 1985, the district created a summer school program to support the academic success of students (Deputy Superintendent, personal communication, March 13, 2014). Although several revisions occurred, the program has operated continuously since the 1980's and served qualifying special education students, ELL students, and general education students, Kindergarten through 12th grade. Enrollment for the district summer school program for 2013 exceeded 1,500 students; this number included students

in special education and ELL programs, in addition to the general education program (Assessment Director, personal communication, March 18, 2014).

One of the most significant enhancements to the district's summer school program occurred in 1986. In collaboration with the University of Kansas Special Education Department, District X worked to include within the program a more effective special education component (Deputy Superintendent, personal communication, March 13, 2013). In addition to enhancing the special education component, District X sought to enhance the remedial reading program to meet the needs of students and to provide research based early literacy instruction. During the 1990s District X, in collaboration with Diane Nielsen, University of Kansas, participated in research that led to the Kansas Accelerated Literacy Learning (KALL) training. The common goal of both District X and Dr. Nielsen was to develop a reproducible system for determining the reading level of individual students. Such a program would also allow teachers to select leveled text matched directly to the abilities of young readers, therefore creating the opportunity for readers to increase their decoding and comprehension skills. Furthermore, a system for leveling beginning-level texts would allow primary grade teachers to ensure the text used with guided reading was matched exactly with the reading abilities of each student, thereby maximizing the benefit of the small group guided reading lessons (Director of General Administration, personal communication, March 25, 2014). The work with District X supported further studies conducted by Dr. Nielsen (1996) to examine the most effective practices to support struggling readers and the corresponding assessments to measure both word accuracy and the comprehension of young readers.

The results of the study conducted by Nielsen, in collaboration with District X, and the development of the KALL program manual led to the formation of the Reading Rally summer school reading program. The KALL program manual, developed by Nielsen (1994), provided a tool for progress monitoring to accelerate first grade struggling readers. The Reading Rally program utilizes the KALL program manual as a guide to ensure the appropriate leveling of text for individual learners. The program provides struggling readers two hours of daily reading instruction, including strategic instructional reading components, throughout the five-week summer program (Language Arts Coordinator, personal communication, March 25, 2014).

The summer school program in District X continued to increase in enrollment, as well as in course offerings, throughout the late 1990s and early 2000s, offering a combination of enrichment and remedial classes including math, reading, writing, science, cooking, drama, physical education, and swimming (Deputy Superintendent, personal communication, March 13, 2014). According to the Deputy Superintendent, the summer school programs varied in content; they included both remedial and enrichment courses. Because some courses were designed for targeted student populations with the primary goal of reducing summer learning loss, while other courses were designed as enrichment and as an opportunity to promote creativity, District X made the decision not to collect student achievement data for participating students (personal communication, March 13, 2014). Although a large scale system for data collection to determine the effectiveness of summer school was not implemented, remedial courses utilized formative assessments during the summer school program and summative progress reports were sent on to each student's home school. Although the summer school

program operated over several decades, no program evaluation was conducted and no data existed to support the program, or to suggest a relationship between participation and increased student achievement.

The student population in District X changed between 2000 and 2014. In addition to increasing from a total enrollment of 22,794 students to over 29,171 students, the demographics have changed as well (Kansas State Department of Education, 2014). The student population in 2003 was comprised of 83.1% Caucasian, 5.8% African-America, 6.1% Hispanic, and 5% students identified as other races. Moreover, 13.2 % of the students were identified as economically disadvantaged and 3.6% of students were classified as limited-English proficient or English Language Learners (Kansas State Department of Education). By 2014, the student population had changed to include 72% Caucasian, 7% African-America, 13% Hispanic, and 8% identified as other races. Furthermore, 16.1% of students in District X were classified as limited-English proficient or English Language Learners and 27% of the students in this school district qualified as economically disadvantaged (Kansas State Department of Education, 2013). Participation in summer school decreased from over 3,000 students in 2008 to nearly 1,500 students in 2013, although summer school maintained enrollment totals that allowed the program to continue. Because of the changing demographics and declining enrollment, district administration decided to examine the summer school program to determine what course of action would best support the students and the district's goals following summer school 2013 (Summer School Coordinator, personal communication, November 7, 2013).

In order to better promote academic success for all students regardless of race or socio-economic status, District X made the decision to redesign the purpose and programming of the summer school program. The goal of summer programming had been to support all learners through fun and engaging activities provided to all interested students through a fee based program. The goal for the redesigned summer program was to address the achievement gap that existed between academically high and low-performing students, regardless of the SES or ELL status of the students (Summer School Coordinator, personal communication, November 7, 2013). While the previous summer programming was available to all students, the new summer school program was limited to the exclusive support of academically low-performing students.

Previously, families had the opportunity to enroll students in both remediation and enrichment courses and invitations were extended to all students. The new process, according to the summer school coordinator, allowed District X to move forward the goal of reducing summer learning loss for low-achieving students and thereby increase the academic achievement of all students (personal communication, November 7, 2013). In 2014 the new summer school program, Summer Stars, replaced the previous summer program and was designed as an invitation-only program for students in Kindergarten through 8th grade who qualified based on their math and reading academic achievement, as determined by student performance on state and district assessments (Summer School Coordinator, personal communication, January 10, 2014). First grade students who scored at or below 62% on the Mid-Year Math Assessment and who were reading below a Rigby Reading Level 8 in December of their first grade school year were invited to attend summer school prior to their second grade school year. The Pearson Rigby

Reading Assessment Program was designed to measure the word accuracy and comprehension of early readers to determine their instructional reading level. According to the Language Arts Coordinator, it was expected that first grade students would achieve proficiency on a Rigby Level 10 by December of their first grade school year. Students who performed two or more levels below level 10 were invited to attend the summer school program (personal communication, November 7, 2014). The Mid-Year Math Assessment was a comprehensive assessment designed to measure mastery of first grade standards taught during the first semester (Math Coordinator, personal communication, November 7, 2014). Admittance into the program was not limited to minority or low-SES students and qualifying students were invited to attend free of charge. Additionally, the district provided breakfast, lunch, and transportation for all students. According to the Language Arts Coordinator (personal communication, November 15, 2013) the course curriculum was developed in alignment with the district-adopted curriculum and all instructional practices were research-based.

Statement of the Problem

Summer learning loss has been examined as a possible cause for the increasing achievement gap between academically higher and lower-achieving students (Alexander, Entwisle, & Olson, 2007a; Cooper et al., 1996; Kerry & Daves, 1998). Specifically, access to reading material has been emphasized as a means to reduce the existing achievement gaps between students of varied socioeconomic status, as well as between students of different races. School districts have continued to explore opportunities to reduce summer learning loss, especially for students who are low-performing academically. Cooper et al. (1996) and Slates, Alexander, Entwisle, and Olson (2012)

recommended that studies be conducted to determine the effectiveness of summer school for early elementary students, including the characteristics of summer programs that demonstrate effectiveness in reducing summer learning loss for specific populations. Additional research is needed to determine the effectiveness of a summer school program which focuses on enhancing both reading and math abilities, and which works to reduce the achievement gap between high and low-performing students, regardless of the students' demographics.

In order to support the mission of the district, to prepare all students for their future, District X has implemented summer school programming. This program was provided exclusively to specific, targeted groups of students with a program goal of reducing summer learning loss for low-performing students. The newly revised summer school program had the potential to support the mission of the school district; however, no research was conducted to determine the effectiveness of this summer school program. Therefore, it is essential that a study to determine the effectiveness of the District X summer school program for academically low-achieving elementary students be conducted. If the summer program could prove to be effective, it could serve as a tool to reduce the achievement gap between high and low-performing students.

Purpose Statement

The purpose of this study was to examine the difference in second grade math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance between the

second grade students who participated in a remedial summer school program and the students who qualified for, but did not participate in the program was affected by the students' ELL status or by their socioeconomic status.

Significance of the Study

In order for a summer school program to serve as an effective tool to close the achievement gap, the program must demonstrate increased student achievement (Cooper, 2001). The research in this study is significant in that the results provide evidence that can be used by decision-making parties to design programming to support academically low-performing students. The results of this study could provide vital data for District X, in particular, as it works to close the achievement gap between high and low-performing students. This research is also significant in that it contributes to the existing body of research regarding the effectiveness of summer school in reducing the achievement gap. Additionally, this study adds to the body of research examining the effects of summer school on specific groups of students, including students of ELL status and of low-socioeconomic status.

Delimitations

"Delimitations are self-imposed boundaries set by the researcher on the purpose and scope of the study" (Lunenburg & Irby, 2008, p. 134). The following are the delimitations that were imposed by the researcher in this study:

1. The study was limited to one large suburban school district in Kansas with 34 elementary schools, including 8 ELL sites, and 10 Title 1 schools. The sample was limited to students who were in first grade during the 2013-14 school year in

the selected school district, and who met set assessment criteria to qualify for the program.

2. The effectiveness of the treatment in this study was based on student performance during the fall of the school year following treatment.
3. The demographic variables were limited to SES and ELL status.
4. The assessment tools used to measure student achievement in this study were the second grade Beginning of Year (BOY) math assessment and the Rigby Benchmark Assessment or Qualitative Reading Inventory (QRI) reading assessment.

Assumptions

According to Lunenburg and Irby "assumptions are postulates, premises, and propositions that are accepted as operational for purposes of the research" (2008, p. 135). This study was conducted with the following assumptions in mind.

1. Students participated and were actively engaged in their learning during the five-week summer school program.
2. The summer school teachers aligned instruction with the curriculum for their specific course.
3. Teachers administered all assessments in a standardized manner.
4. The assessment data was uploaded to the district database in an accurate manner.
5. Students put forth their best effort on all assessments.

Research Questions

"Research questions inquire about the relationships among variables that the investigator seeks to know" (Creswell, 2009, p. 132). Six research questions guided this study to determine the effectiveness of a summer school program, provided between the first and second grade school year, in increasing the academic performance of academically low-performing students.

1. To what extent is there a difference in second grade Beginning of Year (BOY) math assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?
2. To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by ELL status?
3. To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by socio-economic status?
4. To what extent is there a difference in second grade October reading assessment performance between academically low-performing students who participated in a

remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?

5. To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by ELL status?
6. To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by socio-economic status?

Definition of Terms

Ridley (2008) stated the importance of introducing the reader to specific vocabulary and clarifying how those terms will be used in the current research (p. 22). In order to provide the reader with clarity, for the purpose of this study the following terms have been defined as follows:

Achievement Gap. "Achievement gaps occur when one group of students outperforms another group and the difference in average scores of the two groups is statistically significant" (NCES, 2014, para. 1). Traditionally this term has referenced the gap that exists between Black and White students or students of low-SES compared to students of middle to high-SES. In this study, the achievement gap examines the difference in achievement between academically high-performing students and

academically low-performing students, regardless of the students' demographic information.

BOY Math Assessment. The Beginning of the Year Math Assessment (BOY Math) is a district-normed assessment tool that is based on the assessment provided through the Pearson Prentice Hall enVision mathematics program (Director of School Improvement and Assessment, personal communication, July 17, 2014).

ELL. English Language Learner (ELL) defines a student whose first language is not English. ELLs are "students with limited English proficiency, usually students who are in an ESL (English as a Second Language) program**"** (Haynes, 2007, p. 147).

Free and/or Reduced Lunch Eligibility (FRE). Students qualify for FRE based on the family income eligibility guidelines set by the US Department of Agriculture. The guidelines are updated annually and are effective from July 1 of the current year through June 30 of the following year. Section 9 of the Richard B. Russell National School Lunch Act requires the income guidelines; all schools participating in the national school lunch program must adhere to these guidelines (Tribiano, 2014).

NAEP. "The National Assessment of Educational Progress (NAEP) is the largest nationally representative assessment of what America's students know and can do in various subject areas" (NAEP, 2015, para. 1). Assessments in each of the following subject areas are conducted annually at specific grade levels. Assessments at 4th and 8th grade include mathematics and reading given biannually. Additionally, assessments in science, writing, arts, civics, economics, geography, U.S. history, technology and engineering literacy (TEL) are given periodically at 4th, 8th, and 12th grade (NAEP, 2015).

QRI. The Qualitative Reading Inventory (QRI) is an informal reading assessment instrument used to identify the independent, instructional, and frustration reading level for individual students (Leslie & Caldwell, 2006).

Rigby Reading Level. The Rigby Ultra BM Assessment is a tool to measure students' reading comprehension and word accuracy levels. Using that data, teachers can determine a reading level along a set gradient of difficulty based on text length, layout, structure, illustrations, words, literary features, and theme (Pinnell, n.d.). The correlation between a Rigby Reading Level and a QRI level provides teachers the opportunity to monitor student reading progress over the course of multiple school years as students develop from emergent and early readers into readers (Language Arts Coordinator, personal communication, November 26, 2014).

Second Grade QRI Reading Assessment. This assessment is a district normed common assessment to collect district data to report to the State of Kansas. District X assesses all second grade students, using the QRI assessment, during the month of October to determine their instructional reading level. The assessment includes a measurement of word accuracy and comprehension. Students individually read aloud a piece of text and then respond orally to questions provided by the assessor. The Qualitative Reading Inventory (QRI) is the assessment tool chosen by District X to determine individual student-reading performance for both word accuracy and comprehension (Language Arts Coordinator, personal communication, July 17, 2014).

SES. In public schools, free or reduced lunch price (FRE) eligibility is used as a measurement of socioeconomic status (SES). Students who qualify for FRE lunch prices

are considered low-SES while students who do not qualify for FRE lunch prices are considered high-SES.

> Children from families with incomes at or below 130 percent of the poverty level are eligible for free meals. Those with incomes between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals, for which students can be charged no more than 40 cents. (For the period July 1, 2013, through June 30, 2014, 130 percent of the poverty level is $30,615 for a family of four; 185 percent is $43,568. (USDA, 2013, page 2) See Free or Reduced Lunch Eligibility.

Summer Learning Loss. Summer learning loss is the decline in student performance levels in identified subject areas that occurs over the summer break, as measured by the difference in student performance on standardized assessments measured at the end of the preceding school year compared to the student performance on standardized assessments at the beginning of the next school year (Cooper et al., 1996).

Title I. The Title I section of the Elementary and Secondary Education Act calls for a fair and equal high-quality education for all students, including low-achieving students from high-poverty schools, students with limited English proficiency, and students who require reading assistance. Nationwide, schools that qualify as Title I receive additional financial support to close the achievement gap, including local educational agency grants, reading first funding, education of migratory children funding, and at-risk prevention and intervention program funding (USDE, 2004).

Overview of the Methodology

This study was designed as a quasi-experimental quantitative study to determine to what extent academically low-performing first grade students who participated in a remedial mathematics and reading summer school program demonstrated increased academic performance, as compared to the control group, in mathematics and reading after their first grade year. Participants were selected based on their performance on the first grade district mid-year reading and mid-year math assessments during the 2013-2014 school years. One hundred sixty-four second grade students from 18 specific schools in District X were the participants in this study. The data utilized in this study is assessment data from the 2014-2015 school year. Quantitative data from the second grade Beginning of Year (BOY) Math Assessment and the second grade QRI reading assessment were collected and two-factor analyses of variance (ANOVA) and χ^2 tests of independence were used to test the research hypotheses.

Organization of the Study

This chapter provided background information, an overview of the study, and related literature. The following chapter provides a review of scholarly literature related to assessments used to measure student performance, the achievement gap, summer learning loss, and summer school programs. The methodology of this study and the quantitative research design used for this study are discussed in chapter three. Chapter four includes the results of the study and chapter five presents the major findings of the study and discussion of the results. This study closes with a summary, findings related to the literature, conclusions, implications for practice, and recommendations for future research.

Chapter Two

Review of Literature

The purpose of this study was to examine the difference in math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance between students participating in a remedial math and reading summer school program and a control group of peers who did not participate in the program was affected by the students' ELL status and by their socioeconomic status. The following review of literature provides a historical overview that defines the term achievement gap and then explores achievement gaps as they exist between various student groups. Subsequently, literature related to the effect of summer learning loss on the achievement gap is explored and followed by an examination of summer school programs, recommendations for summer school programs targeted at reducing the gap are also presented.

Historical Overview of Achievement Gaps

The focus of the present study, the differences in achievement between high and low-performing students, regardless of any other disaggregating factor, cannot be clearly understood without first having a clear understanding of the history of the achievement gaps that exist within public schools. According to the United States Department of Education, National Center for Educational Statistics, (2014) an achievement gap is the statistically significant difference in scores between two groups of students. The achievement gaps that exist between various student groups have been a focus of

education related legislation, including the Elementary and Secondary Education Act (ESEA) of 1965, and more recently the reauthorization of ESEA as the No Child Left Behind Act (NCLB) of 2001. Studies of the achievement gap date back to the first mass-administered achievement assessments given in the United States, the World War I Army recruits' entrance exams and subsequent results (Gardner, 2007, p 543). The intention of the assessments, given to over 1.5 million recruits, was to determine ability to serve and the most appropriate placement within the military. The results of these assessments indicated a significant gap in achievement between Black and White students, which then led to further investigation to the variances in funding and learning opportunities provided to Black and White students. This research was foundational to successive studies of the achievement gap that have continued over the last century. The discrepancies in student achievement and developing tools used to reduce the resulting achievement gaps have continued to be a topic of discussion and dispute for both educators and politicians. In addition to the Black and White student achievement gap, the achievement gap existing between students from high and low income homes and the achievement gap between Hispanic students and White students have also been a focus of study. Beginning in 2001, in alignment with NCLB, as part of the reauthorization of the Elementary and Secondary Education Act (ESEA) of 1965, two of the most frequently examined achievement gaps were the difference in achievement of students from different socioeconomic backgrounds and students of different races or ethnicities. This overview will explore the history of various achievement gaps in order to provide a basis for the examination of the achievement gap between academically high and low-performing students that is the focus of the present study.

The first achievement gap studied in the United States was the achievement gap that existed between White and Black students. In order to promote equity and ensure adherence to the expectations outlined in the Civil Rights Acts, the differences in the achievement of Black students compared to White students has been a decidedly researched topic (Burns & Welner, 2005; Gardner, 2007; Haycock, 2001). Beginning in 1971, in order to measure student achievement and consequently identify achievement gaps, the National Center for Education Statistics (NCES), began to conduct annual national reading and math assessments. The initial assessments included opportunities to provide racial or ethnic demographic information, but were limited to identifying students as only Black or White; however, since that time additional racial identification options have been added to the assessment (Hemphill, Vanneman, & Rahman, 2011). Educational experts have analyzed the NAEP assessment data results of specific student groups as compared to other groups and as compared to overall student achievement in order to examine trends in the achievement of specific student groups.

The NAEP assessments are administrated to a random sample of fourth and eighth grade public school students nationwide to determine and examine trends in achievement, and the results are examined by grade level. The initial assessments were conducted in 1990 and 1992 for math and reading respectively, with the most recent assessments being conducted in 2015. Data collection for the NAEP assessment occurs by state, thus allowing analysts to examine both national trends and to compare the progress of the students in each state to the progress of students in other states. The assessment is scored on a 0-500 scale and normed at the state and national level. Table 1 outlines the results of the 2007 math and reading assessments (Vanneman, Hamilton, & Anderson, 2009).

Table 1

2007 Black and White Achievement Gap Based on Math and Reading NAEP Assessment Data

Data	Math		Reading	
	Grade 4	Grade 8	Grade 4	Grade 8
# of states reporting 2007	46	41	44	42
# of states where the gap narrowed from 1992-2007	15	4	3	0
# of states where the gap exceeded the national gap/ national gap	5 26	7 31	8 27	1 26
# of states where the gap decreased by more than national gap/ national gap	10 26	12 31	9 27	9 26

Note. Data collected from NAEP, 2007. Where applicable data is represented by both the number of states experiencing the given change and national gap i.e. 5 (number of states experiencing given change), 26 (national gap for given assessment).

While the achievement gap that exists between Black and White students has been studied continuously since the early 1900's, an influx of Hispanic students into American schools beginning in the 1980's presented a need to focus on the difference in average NAEP assessment scores for White students compared with scores for Hispanic students (Hemphill, Vanneman, & Rahman, 2011). Based on the increased Hispanic population, beginning in 1998, the nationally normed NAEP assessment included a Hispanic subgroup, and the subsequent results of the assessment indicated an achievement gap between the Hispanic students' achievement scores and the White students' achievement scores. The percentage of students who identified themselves as Hispanic continued to increase and by 2000, 21% of fourth graders identified themselves as Hispanic. By 2010, Hispanics represented at least 16% of the overall United States population (Hemphill et al., 2011).

Table 2

2007 Hispanic/White Achievement Gap Based on Math and Reading NAEP Assessment Data

Data	Reading	
	Grade 4	Grade 8
# of states reporting/ original year data was collected	21 1992	22 1998
# of states where the gap narrowed from 1992-2007	2	0
# of states where the gap increased from previous data	2	0
# of states where the state gap was smaller than national gap	0	7

Note. Data collected from NAEP, 2007. Where applicable data is represented by both the number of states experiencing the given change and the initial year data was collected for this subgroup i.e. 5 (number of states experiencing given change), 1998 (initial year of data collection).

The data in Table 2 outlines the 2007 NAEP assessment results as they pertain to the achievement gap that exists between Hispanic students and White students and Table 3 outlines the changes in the achievement gap between Hispanic students and White students for the 2007 and 2009 assessments (Hemphill et al., 2011).

Table 3

2007 Hispanic/White Achievement Gap Based on Math and Reading NAEP Assessment Data

	Hispanic Student Achievement Gap	
Data	2007	2009
Change in 4th and/or 8th grade performance in given year compared to 1992 assessment data	Not Significant	Not Significant
National average of 4th grade achievement gap (points)	26	25
National average of 8th grade achievement gap (points)	25	24

Note. Data collected from NAEP, 2007. Although there has not been a statistically significant reduction in the achievement gap, the scores for both Hispanic students and White students have increased.

In addition to the NAEP assessment data, additional research has been conducted to explore the Hispanic and White achievement gap in order to develop opportunities to reduce the gap. Haycock (2001) found that Hispanic students in American schools during the 1970s represented a relatively small percentage of the population and therefore the limited reporting data available concerning the achievement gap between Hispanic students and White students was not a statistically significant gap. Although Hispanic students did not account for a large percentage of the population, when examining the early Hispanic and White achievement data, Haycock (2001) found that the Latino and White achievement gap, as measured by student performance on standardized assessments, had been reduced by one third from 1970-1988. The Equal Educational Opportunities Act (EEOA, 1974) which required schools to eliminate language barriers in schools may have provided increased opportunity and access to quality education for Hispanic students and therefore supported the reduction of the gap during the 1970's and 1980s. However, as the Hispanic population in the United States continually increased

between 1998 and 2001, the Hispanic and White achievement gap also increased, as demonstrated by the results of the NAEP assessments. Although the achievement gap between Hispanic and White students has not been researched to the extent of the achievement gap between Black and White students, as the Hispanic population in America continues to increase, this gap will likely remain a focus of research targeted at reducing the gap.

The third achievement gap addressed in this review of research is the achievement gap that continues to exist based on a student's socioeconomic status (SES). In public schools, students are identified as high or low income by the student's qualifications for free or reduced lunch. This gap in student achievement is the difference in student achievement performance when comparing students from high and low-income homes. To explain the disparities in income across the United States, data from the 2013 U.S. Census Bureau is included in this research review. According to the Census Bureau, 9.6% of non-Hispanic Whites live in poverty compared to 23.5 % of Hispanics and 27.2% of Blacks; of these populations, children under 18 represented 32.3% of the population living in poverty. Furthermore, 14.7 million, or 19.9% of children younger than 18 living in families, live in poverty. For this purpose, in 2014 poverty was defined as a family of four with less than $23,550 total income per year (DeNavas-Walt & Proctor, 2014). As demonstrated in this data, the significance of the achievement gap based on income rests in the fact that it is not limited to one specific racial or ethnic group of students.

Family income dictates the type of housing, healthcare, early childhood education, and after-school and summer school learning opportunities available to

children (Rothstein, 2004). Celano and Nueman (2008) found that for every line of print a low-SES student will read over the summer months, a high-SES student will read three lines of print. Thus, the difference in the reading abilities of students from high-SES homes compared to students from low-SES homes could potentially increase during the summer months. Furthermore, when students from low-SES homes experience increased summer learning loss, they return to school the following school year at an academic disadvantage when compared to their high-income peers.

To examine the impact of the achievement gap related to SES, researchers have examined data over time. John Hopkins University conducted the Beginning School Study in order to determine the significance of the discrepancies in student achievement when comparing students from high and low-SES backgrounds. The study, which began in 1982, tracked each student's educational data from first grade through a student's 22nd birthday, including course work, high school graduation, and post-secondary education of participants (Alexander et al., 2007b). According to the study, 62% of students from high-SES families enrolled in college preparatory courses compared with only 13% of the students from low-SES families. In addition, 60% of high-SES students attended college while only 7% of low-SES students attended college. Furthermore, high-SES students had a high school dropout rate of only 3% compared to a high school dropout rate of 33% for low-SES students (Alexander et al., 2007a).

With the goal of examining cross-sectional, time-series data to synthesize trends related to the achievement gap as it relates to SES, Reardon (2013) examined twelve studies that were conducted between 1943 and 2001. The results of the research conducted by Reardon (2013) indicated that the income achievement gap measured

between 1950 and 1970 was equal to 0.9 standard deviations; however, the difference in the achievement gap that existed based on socioeconomic status between 1970 and 2000 increased to 1.25 standard deviations (Reardon, 2013, p. 11). The result of the Beginning School Study and the work of Reardon demonstrated the impact the achievement gap related to SES status could have on present and future academic achievement.

According to the Education Trust (2013), "gaps between students of color and White students and between low-income and higher-income students exist all along the continuum" (p. 13). Although the achievement gaps which exist between Black and White students, Hispanic and White students, and high and low-income students can each be measured independently of another, there are many connections and commonalities to the three achievement gaps. Reardon (2013) concluded that over the past four decades, as the Black and White achievement gap had decreased, the achievement gap based on SES status had increased. Additionally, Putnam, Frederick, and Snellman (2012), determined the achievement gap based on socioeconomic status, as measured by achievement in mathematics, to be nearly twice the size of the Black and White achievement gap. The results of the 4th grade NAEP math assessment data between 2003-2011 indicated that the percentage of low-performing low-income Black students dropped 13 percentage points, while the percentage of low-performing low-income White students dropped only 7 points (Education Trust, 2013). Additionally, data collected on the 2009 NAEP report indicated that 77% of Hispanic students were considered low-income compared to 30% of White students (Hemphill et al., 2011). A 2013 report published by The Education Trust stated that the achievement gap based on SES has

increased because a larger percentage of Hispanic and Black children are from low-income homes when compared to White students.

The results of studies focused on examining the achievement gap caused by the lack of opportunity available to students from low-SES homes as compared to students from high-SES homes have demonstrated conflicting findings and recommendations. One possible contributing factor to the increased SES achievement gap, according Alexander, Entwisle, and Olson (2007b), is that during the summer months the resources available to students in low-SES homes and communities are inferior to the resources available to students in higher-SES homes and communities. However, during the school year when students have access to both appropriate resources and instruction, low-SES and Black students increase achievement at rates similar to high-SES and White peers Alexander, Entwisle, & Olson, 2007b). On the other hand, the discrepancy in performance levels, according to Gardner (2007), could also be attributed to the fact that students living in poverty are at a higher risk of suffering from lower self-esteem, which could result in poorer performance on assessments. Gardner (2007), in alignment with Rothstein (2004), stated that lower self-esteem could be a result of reduced access to resources, less access to nutritious food, and parents who work multiple jobs and are therefore less actively involved with their children. Regardless of the cause of the achievement gap, Reardon (2013) stated, "historically, low income students as a group have performed less well than high income students on most measures of academic success- including standardized test scores, grades, high school completion rates, and college enrollment and completion rates" (p. 10). As demonstrated through this discussion, all students are not the same, they do not have access to the same resources,

and should not therefore be treated the same (Gardner, 2007). In order to reduce all achievement gaps that exist between groups of students, it is "vitally important that we continue - even accelerate - progress… working hard to make sure initially low-achieving students get the high quality instruction and supports they need to meet standards" (Education Trust, 2013, p. 12). Common to many studies of the achievement gap is the effect of the summer break and the corresponding summer learning loss that occurs during the summer break (Alexander et al., 2007a; Allington & McGill-Franzen, 2003; Celano & Neuman, 2008; Cooper et al., 1996; Jesson et al., 2014; Kerry & Davies, 1998; Reardon, 2013).

Summer Learning Loss

Although numerous researchers have documented evidence of the effects of summer break on the achievement gap, Allington et al. (2010) stated that previous federal initiatives focused on reducing the achievement gap might have failed due to their lack of emphasis on summer learning loss. In a similar study, David (2010) found that participation in summer programs reduced gaps in student achievement as these programs provided an opportunity for learning during the summer months, especially for low-SES students. Although the learning rate of students, regardless of SES, is similar during the school year, during the summer months when low-SES students are without direct instruction, the achievement gap increases (Alexander et al., 2007a). Therefore, the impact of summer learning loss is most significant for students from low-SES families, and as such, academically low-performing students who are also from low-income families are at the greatest risk of falling behind (Allington & McGill-Franzen, 2003; Cooper et al., 1996; Jesson et al., 2014; Kerry & Davies, 1998; Reardon, 2013).

However, the focus of the current study is the reduction in the achievement gap that results from learning loss within all low-performing student groups.

To examine the impact of summer break on students from varied SES, Cooper et al. (1996) analyzed numerous studies of the effects of summer learning loss. The results of the studies indicated only slight differences in the math achievement of mid and low-SES students following the summer break, as all students require direct instruction and instructional support to learn math. Differences in reading achievement, however, appeared to be more significant for low-SES students as they had less access to text and fewer resources to support their reading throughout the summer. Therefore, students from low-SES homes demonstrated losses in achievement while mid-SES students remained constant or increased their reading achievement. In addition, Celano and Neuman (2008) stated the achievement gap increases when students from low-SES homes read text with less print, less information, and with the singular purpose of reading for enjoyment. This increase in the achievement gap for low-SES students is equal to two months of reading achievement (Smink, 2011). The results of the Beginning School Study indicated that more than half of the overall difference in literacy between students from high-income and low-income homes is a result of summer learning loss. The achievement gap between the two student groups was measured by analyzing the participant's ninth grade year assessment data and then analyzing assessment data back to the participants' first grade school year to determine at which points and to what extent the achievement gap grew (Alexander, et al., 2007a). Moreover, Kerry and Davies (1998) stated learning is a continual process and interruption in the process promotes a lack of student growth or regression, which leads to an increased achievement gap. It is,

as indicated by research, the lack of opportunity during the summer months that reduces the achievement of the student during the following school year (Alexander et al., 2007a).

Researchers often begin their analysis of summer learning loss by examining reading and literacy skills of early elementary students. Kim and White (2011) stated that although reading differences begin small, summer learning loss is cumulative and increases over the years. Kim (2004) found that a multiethnic sample of students who read books throughout the summer improved their fall reading proficiency; additionally, the results of the study indicated a statistically significant relationship between spring reading scores and fall reading scores of students who read during the summer compared to those students who did not read during the summer break. Additionally, Jesson et al. (2014) found that students in a multicultural low-SES primary school study who read for enjoyment demonstrated decreased summer learning loss. However, Celano and Nueman (2008) stated that students must have more than access to books; low-SES students must have instruction as to how to locate the right book and then have the strategies to be successful in reading the text. In addition, Kim and White (2011) stated that in order to move the student's literacy scores forward, access to books is not enough; students must have access to text at their reading level. Moreover, students must have an opportunity to try new strategies and approaches. When students find the strategies to be effective, they return to school the following autumn and are able to apply their new knowledge, thus reducing the gap in their achievement (Denton, 2002; Smink, 2011).

While access to text and instruction for reading are critical to reducing summer learning loss, so too is math instruction. According to Smink (2011), students lose approximately two months of math achievement each summer. Similarly, Cooper et al.

(1996) found that math achievement of all students, regardless of SES, was more affected by the summer break than achievement in reading. According to Georges and Pallas (2010), math skills improve only with direct instruction. Therefore, the difference in math achievement following summer break is more pronounced than that of reading achievement. Consequently, the traditional school calendar, with a three-month summer break, has the most significant impact on students who are academically lower performing (Kerry & Davies, 1998). Cooper et al. (1996) theorized that while most students have direct access to at least some form of text, a majority of students do not have direct access to math instruction or the opportunity to apply mathematical thinking throughout the summer months. Moreover, summer learning loss for math, as compared to reading, is also attributable to parent's increased capabilities with reading as compared to math (Cooper, 2001). Furthermore, during the summer months, students from diverse socioeconomic backgrounds are exposed to various opportunities; even if these opportunities would include exposure to math, they likely do not include direct mathematics instruction (Georges and Pallas, 2010).

Smith (2011) identified summer learning loss as one of the top three identifiable hindrances to student reading comprehension performance. Because gaps in achievement increase over the summer months when students are out of school, students in the earliest grades have the potential to gain the most benefit from summer learning because reducing achievement gaps at a younger age provides long-term support (Alexander et al., 2007a; Allington & McGill-Franzen, 2013; Kim & White, 2011; Reardon, 2013, Sandberg Patton & Reschly, 2013). According to Reardon (2013), "achievement gaps are self-perpetuating, the earlier we intervene the more effective we will be at eliminating

them in the long run" (p. 15). Alexander et al. (2007a) stated that the foundational skills students learn during the early elementary years support students throughout their education. Students who lose these skills over the summer are therefore at a significant disadvantage. Although low-SES students attend good schools, they do not have text accessibility during the summer months. This is especially challenging for kindergarten and first graders who are building foundational reading skills (Allington and McGill-Franzen, 2013). Alexander et al. (2007a) stated the achievement of a student at one level of schooling predicts the success of the student at the next level. Furthermore, Kim and White (2011) stated, "even small differences in summer learning accumulate over the years, making the achievement gap substantially larger at the end of elementary school than at the beginning" (p. 64).

The effects of early summer learning loss is evidenced through the work of Alexander et al (2007a) who conducted the Baltimore Beginning School Study. The Baltimore Beginning School Study tracked the academic achievement of participants from first grade through age twenty-two to determine high school and college attendance. The results of the study indicated that by the end of ninth grade two-thirds of the difference in achievement was directly related to summer learning loss during the students' elementary school years (Alexander et al., 2007a). Similarly, Jesson et al. (2014) found that the effect of summer learning loss is greater after five years of school than the difference in achievement that existed between high and low-SES students when they originally entered school. This supports the idea that summer learning loss is cumulative; therefore, as students continue through their education, an increased amount

of time during the school day is spent on remediation and a reduced amount of time on new material (McCombs et al., 2012).

All students typically lose one month of achievement over the summer, while low- SES students typically lose more than one month (McCombs et al., 2012). It is impossible to remove instruction for two months and not expect achievement gaps (Donohue & Miller, 2008). In an effort to counter the effects of the achievement gap, elementary schools could provide failing students learning opportunities, such as summer school (Nelson, 2006). According to Cooper (2001), summer learning loss can be reduced through summer school programs designed to provide remediation, enrichment, or acceleration. Specifically, school districts should provide opportunities and resources for low-SES students during the summer months, so that there is not a break in the intellectual development of a child (Johnson, 2000).

As summer learning reduces the achievement gap, it increases a student's chance at success. Specifically, the summer learning experiences to which a child has access, in addition to the child's academic success during the school year, have a direct correlation to the potential of a reduced achievement gap (Donohue & Miller, 2008). By providing summer learning opportunities to targeted groups of students, school districts have the opportunity to reduce achievement gaps and increase student success.

Summer School Programs

Effective summer school programs focus on reducing summer learning loss and thereby reducing the achievement gap to allow students the opportunity to be successful (Cooper, 2001). Furthermore, programs designed specifically for low-SES students could work to close the educational achievement gap that exists between students from

high and low income homes. In a study focused on a similar idea, Smink (2011) recommended that summer school programs include not only the lowest performing students, but all Title I students, in order to reduce summer learning loss for all low-income students and thus reduce the achievement gap between students from low-income homes and their peers from higher-income homes. In alignment with these concepts, McCombs et al. (2011) stated that summer school has the potential to go beyond remediation and to supplement student knowledge, thereby reducing the gap and increasing student achievement. Furthermore, summer programs targeted at struggling learners have the potential to facilitate a summer literacy gain, thus allowing students to return the following school year at a level similar to their peers (Borman, Benson, & Overman, 2005; Borman & Dowling, 2006; Cooper, Charlton, Valentine, & Muhlenbruck, 2000; Matsudaria, 2008; Schater & Jo, 2005).

Researchers examining the short and long-term effects of summer school programs for all learners have reached similar conclusions. Lauer et al. (2006) compared the academic performance of at-risk students and found that students demonstrated positive effects from participation in activities outside of the regular school day, including summer school programs, compared to peers who did not participate. Similarly, Zvoch (2011) found that academically low-performing students demonstrated increased literacy skills following their participation in summer school. Therefore, summer school provides the opportunity not only for school districts to reduce the achievement gap, but also to provide students the opportunity to make academic gains (McCombs et al., 2012). Specifically, McCombs et al., (2011) stated that students who attend summer school receive a two-year long-term academic benefit. Furthermore, in

order to maximize the effectiveness of summer programs, Smink (2011) recommended developing programs for targeted student groups, specifically kindergarten students, and students transitioning to middle and to high school. Providing programs to students at points where they transition from one school to the next creates the greatest opportunity to reduce the achievement gap.

Cost of summer programs. The cost and financial support for summer school programs is an issue central to school district leaders and program planners. Although there is strong research to suggest the benefits of supporting learners during the summer months school districts must make programming decisions based on the availability of funding. Even with the budget constraints occasionally faced by school districts, Smith (2011) stated that summer school remains cost effective as a tool to reduce the achievement gap. For example, based on the 2002 median per pupil expenditure of $7,000 per year, the average cost to reteach is $1,500 per student, equivalent to an inefficiency exceeding $18,000 by the time a student leaves twelfth grade (Fairchild & Boulay, 2002). To prove economical and increase student achievement by reducing summer learning loss, schools must offer a stable learning environment during the summer months, which provides students the continual support needed to prevent an expansion of the achievement gap (Alexander et al., 2007a).

To support school districts in their work to provide summer learning, Title I of The Elementary and Secondary Education Act (ESEA) of 1965 included provisions for supplemental education to assist low-SES families in the form of additional time for educational activities. The allocations made as part of Title 1 supported the results of multiple studies demonstrating that students from low-income homes are at a greater risk

of failing academically (Lauer et al., 2006). By providing additional instructional time to students from low-income families, students are able to receive instruction and support from trained educators. Section 1116B of No Child Left Behind (2001) specified that school districts must provide extended school opportunities within their school improvement plans, again demonstrating the emphasis of summer school as a tool to reduce the achievement gap (Kochanek, Wan, Wraight, Nylen, & Rodriguez, 2011). The American Recovery and Reinvestment Act (2009) allocated 200 million dollars over two years to support summer school projects (Smink, 2011). These three federal initiatives established an opportunity for schools to research, develop, and implement summer school programs to reduce summer learning loss.

Program focus. The purpose and focus of summer school programs has changed over time. The original purpose of summer school, dating back to the 1920s, was to work to prevent behavior problems. By the 1950s, remedial summer programs worked to address learning deficits (Lauer et al., 2006). By the turn of the 21st century, the focus of summer school programs was academic instruction; however, programs continued to focus on preventing some misbehavior by providing supervision for at-risk students during the summer months (Cooper, 2001). Summer school programs implemented between the late 1990s and the 2010s have incorporated supplemental activities. Examples include enrichment, fine and performing arts courses, physical education, and science courses, in addition to math and reading. These courses have been added to prevent academically low-achieving students from viewing summer school as a punishment or a sign of failure (Alexander et al., 2007b).

In addition to a shift in program focus from preventing misbehavior to increasing academic success, researchers have examined the role of relationships in increased summer program success. To build relationships and thereby increase attendance Weiss (2006) suggested hiring staff with whom the students already have a relationship. McCombs et al. (2012) indicated that the potential for student growth is dependent upon attendance and high-quality programs. Thus, districts must focus on both academic achievement and behavior data to ensure program effectiveness of a summer school program as a means to increase student academic achievement and to continue to provide supervision for at-risk students (Smink, 2011; Weiss, 2006). Synthesis of previous research combined with recent studies indicates that the most effective summer programs are targeted at both reducing achievement gaps as well as creating opportunities to reduce misbehavior, thus leading to increased overall student success.

Summer program development. In order to develop and implement effective programs, researchers have identified several strategic steps to increase the effectiveness and success of summer school programs designed to reduce achievement gaps. A primary step is to define the program goal (Weiss, 2006). Following development of a central goal, Augustine et al. (2011) recommended the development of a timeline, which should include committing to program goals prior to December, selecting site directors in January, and developing curriculum and pacing during the winter and early spring. To ensure effective program implementation, Augustine, McCombs, Schwartz, and Zakaras (2011) defined high-quality summer school programs as programs that included "a clearly outlined instructional structure, courses that lasted at least three hours daily, highly qualified staff, low student to teacher ratios, opportunities for enrichment, and

maintained a focus on high student attendance" (p. 4). It is through a combination of the development of a goal, creation of a timeline, establishment of clearly outlined priorities that summer programs can affect change and reduce summer learning loss.

Following the initial program planning, curriculum for summer school must be developed and prepared and instructional planning must occur. In order to be effective, summer school advocates must be "creative, efficient, and aggressive to ensure initial efforts are sustained" (Smink, 2011, p. 67). Bell and Carrillo (2007) suggested that in order to increase student achievement, summer programs should provide a diverse style of instruction rather than replicate instruction provided during the school year. Instruction provided to small groups, in addition to whole group instruction, allows for maximized instructional time, thus creating a climate for success (Alexander et al., 2007a; Borman & Dowling, 2006; Cooper et al., 2000). Vital to the success of a program, the curriculum should be developed by district curriculum experts to ensure that summer school curriculum aligns with district curriculum and builds upon the skills taught during the preceding school year (Augustine et al., 2011; McCombs et al., 2011). Summer school instruction cannot be a reteach; new instructional strategies and connections to real-life must be incorporated (Denton, 2002). High quality professional learning for summer school staff must be provided so that teachers understand both what to teach and the most effective methods to teach the curriculum (Weiss, 2006). Finally, school districts must ensure alignment between what will be taught during summer school and what will be assessed the following school year to create the opportunity to examine the extent of the benefits of a summer program. To accomplish this, district curriculum specialists should work to ensure alignment between summer school

curriculum and subsequent school year curricular focus areas. Following the work of curriculum specialists, professional learning should be provided to summer school teachers to communicate the curriculum and preferred instructional strategies.

Many researched curricular designs and instructional strategies have proven to be more effective for summer school programs and to increase the achievement of lower performing students. Cooper (2001) identified individual and small group instruction to be a significant benefit to summer school student success. In a study of 35 outside-of-school-time programs, Lauer et al. (2006) found that a majority of summer school programs provided whole group instruction, while after-school programs targeted small group instruction. Similarly, McCombs et al. (2011) also reported a majority of summer school programs utilize whole group instruction, and went on to recommend that summer school programs encourage smaller class sizes to promote the opportunity for differentiated instruction of district curriculum within the whole group instruction. Furthermore, Siddiqui, Gorad, and See (2014) recommended that summer school literacy program structure include small groups. With smaller class sizes, teachers have more opportunity to differentiate learning, both with small groups and with the entire class, based on student need (Augustine et al., 2011). Thus, through a combination of whole group and small group instruction, summer programs could see significant gains in student learning. The most effective summer programs, as stated by McCombs et al. (2012), provided smaller class sizes, individualized instruction, and emphasized attendance policies. Finally, when considering program duration and length, Lauer et al. (2006) found statistically significant effect sizes were larger for outside of school programs, both after-school and summer school programs, with a duration exceeding

forty-five hours. Augustine et al. (2011) stated an effective five to six week program should include a minimum of three to four hours of daily instruction. In summary, a combination of small group instruction, differentiated learning, and appropriate program length is essential to developing a summer school program that will increase student learning and reduce the achievement gap.

The development of summer school programs commonly places a strong focus on literacy, and many programs include emphasis on mathematics instruction. In a 2002 study, Denton suggested that while most academically low-performing students struggle with both math and reading, the reading deficit is central to the achievement gap. Correspondingly, Alexander et al., (2007b) specified that effective summer school programs have a strong curriculum primarily focused on reading, as it is foundational to all other subjects. Therefore, as summer school programs build on the curriculum from the previous school year, and in order to make summer school programs more effective, it is critical to match student text to the reading level of the student and to provide instruction on comprehension and fluency (Kim & White, 2011).

It is essential to consider the methods in which students develop literacy over the summer months and then plan curriculum and instructional strategies to be used for summer school programs to best accommodate the needs of students. Students develop literacy over the summer months using one of three methods; students themselves choose to engage in literacy activities, the school provides literacy instruction, or students receive indirect instruction from influences within their homes and communities (Jesson et al., 2014). By developing programs that provide instruction regarding how to select an appropriate book and direct reading instruction, students will be more likely to read, thus

deepening their literacy during outside-of-school times. In addition, summer programs that "focus one-on-one with student reading for at-risk students" (Lauer et al., 2006, p. 308) demonstrated a positive effect on student achievement. Lauer et al. (2006) also found a high correlation between outside-of-school reading support and increased student achievement; these effects were significant for early elementary students.

As stated, the benefits of academically low-achieving students participating in literacy based summer programs are numerous; however, the probability that students will practice math when they are not in school is so slight, the necessity for remedial summer programs focused on math is significant (Cooper et al., 1996). The same study found that during the summer months students mathematical skills grow at a slower rate than do students reading skills. In addition, Siddiqui et al. (2014) recommended the addition of math programming to literacy-focused remedial summer school programs. Similar to the need for direct reading instruction to build literacy, academically low-achieving students must have access to direct math instruction to prevent summer learning loss. Moreover, to support effective instruction, summer school math programs should include the use of manipulatives (Siddiqui et al., 2014). While a common resource in the classroom, math manipulatives are scarce outside of school, again reinforcing the importance of providing math instruction as a part of summer school programs. Successful summer school programs, developed to support literacy and math instruction, begin with a clear goal and are continually modified and adapted based on student need as determined through systemic evaluation to ensure the program continues to meet the program goals (Denton, 2002).

Once a clear program focus has been outlined, school districts must determine an approach to further program development. Denton (2002) stated proper funding, an emphasis in math and reading, and a plan for the evaluation of program results are all necessary to implement an effective program. In a similar study, Lauer et al. (2006) recommended that policy makers examine program duration, costs, and implementation including program location, and staffing, when planning summer programs. As school districts and policy makers consider funding related to program planning and implementation, one area where resources are well spent is in the hiring of quality staff. It is critical to the success of a program to have the most highly qualified staff serve as summer school teachers (Smith, 2011). The importance of hiring highly qualified staff was previously noted by Denton (2002), who stated summer school could be an effective tool to reduce the achievement gap if the program secures high-quality teachers.

To develop an effective summer school program it is imperative that district leaders offer stakeholders, including site level leaders, teachers, parents, and community members, the opportunity to share ideas and opinions when developing programming (Augustine et al., 2011; Bell & Carrillo, 2007). Furthermore, program planning including record keeping, enrollment deadlines, a plan for parent notification of transportation, and development of class schedules must be developed collaboratively by district and site-level leadership to ensure that theory is able to be carried out into effective practice. Additionally, identification and eligibility of students to be invited to participate in summer programs should be based on standardized criteria (Augustine et al., 2011).

Once developed, summer school programs must have an accountability system to monitor program effectiveness (Alexander et al., 2007b; Sandberg Patton & Reschly,

2013). School districts cannot assume that student achievement during summer school will increase by simply providing the program. Input from teachers, principals, and counselors can provide valuable information to program planners when determining student need and eligibility for summer school (Johnson, 2000). Furthermore, summer school programs must be evaluated on a continual basis; they must prove to be effective in increasing student achievement (Cooper, 2001, p. 3). As a tool to measure the effectiveness of summer school programs, Cooper (2001) recommended both formative and summative program assessment. Furthermore, McCombs et al. (2011) suggested ongoing evaluations, including performance on benchmark assessments during the subsequent school year, to determine the impact of summer school. Similarly, Bell and Carrillo (2007) called for continual program evaluation including data collection shared openly to promote organizational transparency.

Summer School Program Research Samples from 2014

The following section includes an overview of five summer school programs that have been implemented to increase the achievement of targeted groups of students in school districts across the United States. The school districts included represent a wide range of student population as well as student demographics. Each of the summer school programs was developed and implemented with program goals related to increasing student achievement; however, each school district approached program planning and implementation in a manner aligned explicitly with the specific needs of the given school district.

Miami-Dade County Public Schools summer program. The Miami-Dade County Public Schools provided summer school programs at the elementary, middle and

high school level. Two elementary programs were provided to eligible students. Students who were retained in third grade were invited to attend Summer Reading Camp, and incoming third grade students who scored below the 50th percentile on the Stanford Achievement Test (SAT-10) reading comprehension subtest were invited to attend the Literacy Summer Program (Miami-Dade County Public Schools, 2014, p. 3). The focus for both programs was exclusively on literacy instruction. The program operated at central locations, combining between five and 15 elementary schools, depending on the number of eligible students per home school. Student enrollment for the 2014 Summer Reading Camps Programs was 2,700, and the enrollment for the Literacy Camp was 3,600 students (Miami-Dade County Public Schools, 2014, p. 3). Summer Reading Camp and Literacy Summer Programs operated for twenty full days during July and August. The Miami-Dade County Public Schools recommended, but did not require, eligible students to participate in summer school. The Miami-Dade County School District has not released reports regarding program effectiveness for either the Summer Reading Camp or the Literacy Summer Program (Miami-Dade County Public Schools, 2014).

Chicago Public Schools Summer Bridge Program. The Chicago Public School District offered four summer school programs, each provided to targeted student groups (Chicago Public Schools, 2014b). The Summer Bridge Program was provided as a resource to reduce the achievement gap and to support at-risk students in the third, sixth, and eighth grade and included targeted math and reading instruction. The program was developed in response to a board of education policy regarding promotion to the next grade level. Students were invited to attend based on set district criteria. Moreover,

participation was mandatory for some students and strongly recommended for others, this delineation was dependent upon the student's achievement during the preceding school year (Chicago Public Schools, 2014a). Students who did not meet the minimum promotion criteria were required to attend the program. Summer school was required for students who met any one of the following three criteria: students who scored at or above the 24th percentile on both the math and reading district assessment but who were failing math or reading; between the 11th to 23rd percentile on the district assessment and who had a grade below C on the final report card; at or below the 10th percentile on district assessments. Participation did not guarantee promotion; however, it did provide intensive instruction to support struggling learners. The Chicago Public School District does not publicly release reports regarding specific program data for the Summer Bridge Program (Chicago Public Schools, 2014a).

East Allen County School District summer school program. The East Allen County School District is located in northeast Indiana, outside of the Fort Wayne metropolitan area. The school district's summer program is a standards-based curriculum, voluntary remediation program provided at the student's home school location. Although participation is voluntary, eligibility was determined based on student participation on the Indiana Statewide Testing for Educational Progress-Plus; additionally, students who performed below the mean on the NWEA MAP assessment were strongly encouraged to participate in the program. Although the program used a standards-based curriculum, in order to achieve the allocated 15:1 student to teacher ratio, multi-grade-level classes were employed as needed. Additionally, individual classroom instruction was at the discretion of the teacher and included reading, grammar, writing,

and math skills, as well as other skills as determined by each teacher. The East Allen County School District did not maintain a common assessment to measure program effectiveness; however, all students participated in annual fall and spring NWEA MAP assessments (Bakle, 2010).

The East Allen County School District summer program was the focus of a 2010 study that examined data from each of five school years, beginning in 2003 (Bakle, 2010). Bakle (2010) sought to determine whether there was a significant difference in student achievement in math, reading, and language usage for students in grade two through grade five based upon their participation in a summer remediation program. The study examined the effect on academic achievement following participation in a single year, summer remediation program. For language usage, 1,700 participants were included in this study, consisting of 850 matched pairs of summer school participants and non-participants. For reading, 853 matched pairs of students totaling 1706 participants were also included in this study. Finally, the study included 828 matched pairs for math, totaling 1656 students. The study was controlled for gender, socioeconomic status, and ethnicity. The student demographics included 74% White, 17% Black, 4% Hispanic, 3% multi-racial, 2% Asian, and 0.2% Native American. Additionally, 30% of the students qualified for free or reduced lunch status (Bakle, 2010).

The purpose of this study was to evaluate the effects of a remedial summer school program. The methodology used to analyze the pre- and post-test data for summer school participants compared to the control group was an analysis of covariance (ANCOVA) and the probability level was set at .05. The results of the study indicated that at the second grade level there was a statistically significant interaction between summer school

participation and socioeconomic status for math and language usage, indicating that students on free or reduced lunch responded differently to the summer school program than did paid-lunch peers. The same was true for language usage at the third grade level. The results also indicated a significant interaction between summer school participation and gender for language usage at grade four. Specifically, fourth grade females scored higher on assessments than did fourth grade males. This data indicates that regardless of participation in summer school, fourth grade females outperformed fourth grade males. Therefore, a need exists to consider student gender when developing assessments at this grade level. Finally, at grade five there was a statistically significant effect for language usage and gender, ethnicity, and socioeconomic status. Bakle (2010) determined that a student's SES was a significant factor in student achievement and clarified the need for additional academic opportunities for students from low-SES homes. Additionally, results of this study indicated statistically significant effect sizes when comparing students of other ethnicities to White students at certain grade-levels, again indicating a need for additional academic opportunities for low-income students. Finally, Bakle (2010) recommended review, revision, and refinement of the summer program utilized in the school district to maximize the benefit for low-performing students.

Rural Southeast United States Summer School Program. Duffy (2001) examined the effectiveness of a literacy program that was balanced, accelerated, and responsive. The program focused on the reading growth of struggling readers in elementary school in a rural region of the southeast United States. The summer program took place in a school where 43% of students received free or reduced lunch and 96% of students were categorized as being from European-American (non-Hispanic White)

homes. Students who had just completed first or second grade were considered for the study. According to Duffy (2001), ten students who had just completed second grade were included in the treatment group; eight of those students were identified as students who participated in a state-funded program for students with reading difficulties. Prior to the implementation of the summer program, baseline reading data was determined through an informal reading inventory and running record data. The program lasted for 30 days; however, only 21 days involved student instruction, while the other days were for professional learning for staff and pre and post assessment of students. The program included whole group reading and word sorting activities, reading and writing activities matched to student ability levels, book talks and read-alouds, small group instruction, and concluding activities. Throughout the summer program, quantitative and qualitative data were collected and analyzed to determine the effectiveness of the program, as well as to drive instruction. Assessments utilized in this study included the QRI-II, Qualitative Spelling Inventory (QSI), reading interviews, running records, and student writing samples. Based on the data analysis, participants in the program demonstrated growth in word identification, oral fluency, writing fluency, reading comprehension, and increased instructional reading levels. Furthermore, Duffy (2001) stated, "students developed more positive perceptions of themselves as readers [and] more positive attitudes toward reading" (p. 80). Specifically, the word recognition and decoding on the QRI-II word lists increased by an average of one-half of a grade level from an average of pre-program (M=1.2) to post-program (M=1.7) (Duffy, 2001). Students increased from 76.5% of words spelled correctly in a writing sample to 83.5% of words spelled correctly in a writing sample following the program (Duffy, 2001). Additionally, following the

summer program, student interview data demonstrated that students could articulate one or two additional reading strategies they could use to determine unknown words they encountered in text. Duffy stated the program "used Cunnigham and Allignton's five-point 'Simple Fluency Rating Scale' to evaluate students' reading of QRI oral reading passages and running record texts" (2001, p.82). The results of this assessment demonstrated an increase in oral fluency with pre-program mean scores of 2.9 and post-program mean scores of 3.4 on the Cunningham and Allington rating scale. Finally, students' writing increased from an average of 39.5 words per writing sample pre-program to an average of 61.8 words per writing sample post-program. Consequently, "students improved in comprehension monitoring, maintained acceptable levels of comprehension while reading more difficult text, and verbalized more appropriate comprehension strategies post-program than pre-program" (Duffy, 2001, p. 83). At the start of the following school year, third grade beginning-of-the-year assessment data was compared to examine the relationship between program participant's performance and the performance of 10 students with similar performance levels who had not attended the summer school program. To determine changes in performance, the difference in number of points was calculated by determining "the cumulative points (students) earned on a state-mandated reading assessment that emphasized isolated word identification skills and oral reading of graded passages" (Duffy, 2001, p. 90). The results indicated that three of the participants achieved more points on their standardized test scores than the control group, three achieved the same number of points, and four achieved fewer points than the control group on the beginning of third grade assessment. In summary, students demonstrated increased literacy and reading abilities following the summer program;

however, assessment data at the start of the following school year did not reveal a sustained impact of the summer program (Duffy, 2001).

Pacific Northwest Summer School Program. This summer program took place in a moderately sized school district in the Pacific Northwest. The school district had a student population of nearly 6,000 students including student demographics of 75% White, 14% Latino, 3% African American, 3% Asian American, 3% Native American, and 2% other (Zvoch, 2011). Additionally, 43% of students received free or reduced lunch. The summer school program was offered to early elementary students who did not meet a proficiency score on the formative literacy assessment given during the spring of each school year (Zvoch, 2011). The formative assessment used for this study was the Test of Oral Reading Fluency (TORF). The assessment included the timed oral reading of three separate passages; each passage was assessed for one minute. The median correct words per minute from the three passages was used as the students' oral reading fluency rate. Assessment scores were determined through a combination of word accuracy and fluency (Zvoch, 2011).

The program was offered three and one-half hours per day, four days a week, for five weeks during the summer break. The program included a minimum of two hours of literacy instruction on phonemic awareness, alphabetic understanding, fluency, and automaticity of oral reading. The instruction included in this program was focused on conceptual knowledge including phonemic awareness, decoding, and fluency as opposed to procedural skills, such as vocabulary or comprehension strategy instruction. Research has demonstrated that procedural skills are less probable to be retained and do not facilitate early literacy as well as the fundamental, conceptual skills related to literacy

(Cooper et al., 1996; Heyns, 1978). Instruction was provided in whole group, small group, and individual formats.

Zvoch (2011) conducted a study of this Pacific Northwest school district's summer program to determine the short- and long-term changes in student literacy. The goal was to develop a tool to reduce the summer learning loss experienced by at-risk students. Data in this study was measured by analyzing the pre and post-treatment academic achievement of students. Zvoch (2011) tracked student participation in the summer school program spanning the first and second grade school years to examine the selection and effectiveness of the summer school program of the specific Pacific Northwest school district. There were 1,449 students included in the sample for this study over the course of four years, and cohorts ranged in size from 347 to 387 students (Zvoch, 2011). Following the administration of the assessment an invitation, based on the eligibility criteria, was extended to 17% of the sample (n = 260). The remaining students (*n= 1,189)* were, based on their performance on the assessment, considered ineligible for the summer school program. Of the students who were considered eligible for the summer school program (n=162) chose to participate while (n=98) selected not to participate in the summer school program (Zvoch, 2011).

The results of the study indicated a statistically significant change in oral reading fluency of 5.7 words per minute following the summer program. Furthermore, students who participated demonstrated an increase of 5.8 words per minute in oral reading fluency compared to the students who scored just above the eligibility criteria and were therefore not eligible to participate in the summer program. Participants continued to demonstrate growth toward reading proficiency even though their growth occurred at a

slower rate than peers who did not qualify to participate in the program (Zvoch, 2011). In summary, the results demonstrated that a summer program focused on building conceptual knowledge provided to a targeted group of lower achieving students has the potential to increase literacy skills, thereby reducing summer learning loss.

As evidenced in the above listed summer school programs, school districts have the opportunity to reduce the achievement gaps that exist in their school district by addressing summer learning loss through effective summer school programs. However, "there are … challenges to effectively implementing high-quality summer school programs; intentionality, relationships, staff, relationship with home school, relationship with families, engaging the community, and fun and engaging programming" (Weiss, 2006, p.2). These challenges, when considered and addressed, allow for effective programming. In order to increase attendance and participation, programs must be affordable and easily accessible (Augustine et al., 2011; David, 2010). Specifically, summer school programs should include transportation and student meals should be provided (Johnson, 2000; Smink, 2011). In addition, school districts should provide summer school instruction in an engaging "summer-like" climate, including hands-on activities and authentic experiences (Weiss, 2006). Additionally, enrichment is recommended for consideration in program development (Augustine et al, 2011).

Summary

In summary, research has provided evidence that an achievement gap exists between several student groups including between Black and White students, Hispanic and White students and between students from lower and higher income homes. During the summer months, learning loss increases the achievement gap; however, summer

school has the potential to reduce that gap. Furthermore, in order to be effective and to demonstrate increased student achievement, summer school programs must be planned intentionally, and have methods to measure changes in student achievement. This chapter provided a review of literature pertinent to this study. Specifically, the literature addressed the achievement gap, summer learning loss, and summer school program development and design.

A description of the methodology employed in the study, including the research design, population and sample, and sampling procedures is provided in chapter three. The instrumentation and measurement are also described, which includes reliability and validity of each instrument. Additionally, data collection procedures and data analysis are discussed. The chapter concludes with a review of limitations of this study.

Chapter Three

Methods

The purpose of this study was to examine the difference in math performance and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent that the difference in academic performance between students participating in a remedial math and reading summer school program and a control group of peers who did not participate in the program was affected by the students' ELL and socioeconomic status. The methodology used in this study is described in this chapter including research design, population and sample, sampling procedures, instrumentation and data collection procedures, data analysis, and limitations of the study.

Research Design

Creswell (2009) described quasi-experimental research as a comparison between a control group and an experimental group. The assignment of participants to the control and experimental groups is not random in this type of research. Students who qualified for and selected not to participate in summer school were assigned to the control group. Students who qualified for and selected to participate in summer school were assigned to the experimental group. Two independent variables researched in this study were socioeconomic status (SES) and ELL status. The dependent variables used in this study were the Beginning of Year (BOY) Math Assessment scores and the October student

reading levels as determined by the QRI or Rigby Benchmark Reading Level Assessment.

Population and Sample

The target population for this study was all academically low-performing elementary school students in District X. To be considered eligible to participate in the 2014 summer school program, first grade students had to demonstrate a reading level between Rigby Reading Levels 1-8 and score a 62% or below on the mid-year math assessment during the 2013-14 school year. The sample for this study consisted of 119 students who met specific criteria identified below. The treatment group included 70 students who agreed to participate in the summer program. The non-treatment group included 49 students who declined participation in the summer program. The sample group in this study attended second grade at 18 schools in District X during the 2014-2015 school year.

Sampling Procedures

As stated by Lunenburg and Irby (2008), "Purposive sampling involves selecting a sample based on the researcher's experience or knowledge of the group to be sampled" (p. 175). Consequently, nonrandom purposive sampling was used in this study. According to Lunenburg and Irby (2008), "generalizability is the extent to which the results of one study can be applied to other populations" (p. 167). A representative sample, such as the one in the present study, allows for the generalization of results from one sample to the entire population of interest by comparing two groups with similar academic performance levels, who attended similar schools, and who represent similar demographics. As such, the sample serves as representative of a larger population, and

therefore the results of the study can be generalized (Lunenburg and Irby, 2008). The students selected to participate in this study attended first and second grade in District X at one of the eighteen schools that were included in this study. Students from the eighteen schools included in this study were selected because their home schools were all selected to attend a central summer school location, and therefore the students who attended should have received similar instruction throughout the summer school program. The selected participants were chosen based on their grade level attendance at one of the eighteen specific schools in District X, and their eligibility to participate in summer school as determined by the 2013-2014 mid-year math and mid-year reading assessment performance. Selection for participation in this study was, therefore, not limited to a specific student demographic.

Instrumentation

Two instruments were utilized in this study to measure participants' math performance and reading performance. The Beginning of the Year (BOY) Math Assessment is a district normed common math assessment administered to all second grade students at the beginning of the school year to measure retention of first grade math skills. The assessment was developed by Pearson Prentice Hall and modified slightly by District X (Director of School Improvement and Assessment, personal communication, July 17, 2014). The Qualitative Reading Inventory (QRI) assessment was selected by District X as the assessment instrument to measure second grade reading performance as defined by a combination of word accuracy and reading comprehension (Language Arts Coordinator, personal communication, July 9, 2014). The following is a description of

the two instruments used in this study and includes discussion of the measurement, reliability, and validity of each instrument.

The BOY Math assessment is a 20-question multiple-choice pencil and paper assessment. The purpose of the administration of this formative assessment instrument is to measure student retention of knowledge of the standards taught at the previous grade level; for second grade students the assessment measures mastery of first grade math standards (Math Facilitator, personal communication, July 10, 2014). The BOY Math assessment is administered to every second grade student in District X during the second week of school and the scores are submitted to the assessment department using Scantron sheets to record student responses. The Scantron sheets include identification of the student ID number, school, teacher ID and the student name.

The concepts assessed consist of number sense skills, including basic addition and subtraction facts. The problems were written using the traditional algorithm, visual models, and word problem format. Traditional algorithm problems were to be solved using basic arithmetic strategies. Visual model problems provided the opportunity for students to utilize or create pictures to aide in solving the problem. Finally, word problems provided an opportunity to determine what question was being asked in the narrative and to then find the correct answer for the problem.

The format of the test booklet includes space for hand-written mathematical problem solving. The guidelines for the BOY Math assessment recommend the administration take place during one of the following two options: one 60-minute class period, or two shorter class periods on two separate days. Students are expected to use paper and pencil, as well as manipulatives, including shape blocks, rulers, and unifix

cubes, all of which are available for students to self-select as needed. Teachers are tasked with recording student scores from the test booklet onto a Scantron sheet. A scoring protocol is provided in the assessment manual. The completed Scantron sheets are sent to the district for data collection that is used to make instructional and programming decisions. Assessment office staff compiles the assessment data (Assessment Director, personal communication, July 17, 2014). Teachers maintain test booklets as part of the student's portfolio to assist with instruction; additionally, teachers receive data reports with student scores written as a percentage along with the performance category in which the student's score fell. Student performance levels are separated by category. Performance category scoring bands indicate if the score is considered advanced, proficient, basic, or unsatisfactory.

The Qualitative Reading Inventory (QRI), according to Leslie and Caldwell (2006), is an informal reading assessment instrument used to identify the independent, instructional, and frustration reading level for individual students. As students build literacy it is necessary to distinguish the level at which a student can read with independence, the level at which they are challenged but with instruction are able to increase their skills, and the level at which the text is beyond the ability of the student and therefore would result in frustration. These levels, according to Leslie and Caldwell (2006), provide an instructor the necessary information to guide their preparation of instruction, as well as to assist students with text selection for independent reading materials as a means to increase reading comprehension.

The QRI Assessment program begins at the earliest reading levels of pre-primer and extends to upper elementary; therefore, it provides school districts an assessment tool

to measure student-reading achievement for students at all ability levels (Leslie & Caldwell, 2006). This assessment, administered individually to students, measures word accuracy and comprehension. As students read a passage aloud, the instructor assesses the word accuracy, monitoring missed or repeated words, mispronunciations, and inserted words. In order to achieve a proficient score, students must read at least 95% of the text correctly. Comprehension is measured through a series of explicit and implicit comprehension questions that a student answers orally without referring back to the text. Proficiency in comprehension is achieved when a student correctly answers at least 90% of the comprehension questions. A student's instructional reading level is determined as the most challenging text a student can read with at least 95% word accuracy and 75% comprehension.

The assessment scoring materials include the printed text that the instructor codes based on the student's word accuracy during the reading of the passage and the comprehension questions where the student response is scribed, by the instructor, verbatim and is then scored by the instructor. The word accuracy score is calculated by finding the percentage of words spoken accurately divided by the total number of words in the passage. Proper nouns do not count as missed words if they are not pronounced correctly. Student comprehension was calculated by counting the total number of correct responses divided by the total number of questions. Students who answer at least 75% of questions correctly were considered proficient. Following the assessment, the instructor determines the word accuracy and comprehension percentages to determine if the student has reached the proficient level of 95% on the assessment.

Measurement. In research question one, both a dependent and an independent variable were addressed. The dependent variable, the BOY Math assessment score, was calculated based on the number of correctly solved problems out of twenty. The independent variable identified students who participated in and who did not participate in the summer school program. The variable was coded using a P, for students who participated, and a NP, for students who did not participate. This information was stored on a district database housed in the assessment department.

Research question two involved the independent variable, ELL status, in addition to the two variables addressed in research question one, as described above. ELL status, as determined by student enrollment status, was categorized as ELL or non-ELL on a spreadsheet that is housed in the district student information system (ELL Coordinator, personal communication, July 25, 2014).

Research question three included the independent variable, SES, in addition to the two variables addressed in research question one, as described above. The SES of each participant was determined by parent income as reported on the District X Food Service 2013-14 Child Nutrition Application. Based on the reported parent income, students may qualify for free or reduced lunch prices. This information is stored as free lunch, reduced lunch, and full-pay lunch, on a district database and stored in the assessment department, therefore when analyzed for the current study student names were removed and assigned non-identifiable participant numbers. Individual student SES data remained anonymous throughout the current study. For this study, the three categories were collapsed to free or reduced lunch, coded using FR, and full-priced lunch, coded using FP.

Research question four measured both a dependent and independent variable, which were categorical. The dependent variable, the QRI assessment, was scored using a reading level label, pre-primer, primer, or level one, two, three, four, five, or six. The QRI level was determined through a combination of word accuracy and comprehension. A score of 95% word accuracy and 90% comprehension indicated the student had mastered the given level of the QRI assessment. The independent variable identified students who participated in and who did not participate in the summer school program. The data were labeled using a P, for students who participated, and a NP, for students who did not participate. This information was stored on a district database housed in the assessment department.

Research question five included the independent variable, ELL status (ELL) or Non-ELL status (NELL), in addition to the two variables contained in research question four, as described above. ELL status, as determined by student enrollment status, was categorized as ELL or non-ELL on a spreadsheet that is housed in the district student information system (ELL Coordinator, personal communication, July 25, 2014).

Research question six included the independent variable SES that was categorized as free or reduced lunch (FR) or full price lunch (FP), in addition to the two variables contained in research question four, as described above. As described in detail above, the SES of each participant was determined by parent income as reported on the District X Food Service 2013-14 Child Nutrition Application. Individual student SES data remained anonymous throughout the current study. For this study, the three categories were collapsed to free or reduced lunch, coded using FR, and full-priced lunch, coded using FP.

Validity and reliability. The second grade BOY Math Assessment is used to assess mastery of 1st grade math standards. The content validity of the second grade BOY Math Assessment was analyzed by the District X Assessment Director, math coordinator, instructional coaches, and a committee of teachers who collaboratively examined all test questions to ensure alignment to the district curriculum and that the assessed standards were equally represented. (See Appendix A).

To ensure the validity of the assessment the district followed a protocol that included ensuring that each assessment item was aligned to the district curriculum and state curriculum. Additionally, the math assessment development team examined assessment items to determine if the question and answer choices were reflective of the instructions students would have received (Director of Assessment, personal communication, March 9, 2015). Subsequent to ensuring the correlation between assessment items and standards, the math assessment team worked to ensure the assessment questions were written using terms and verbiage that would be appropriate and comprehendible by second grade students (Assessment Director, personal communication, July 17, 2014). All of the recommendations and modifications for the assessment items, as suggested by the math assessment team, were taken into account by the Director of Assessment. The Director of Assessment then created the new assessment instrument using the above listed information to support the revision process. Following revision the assessment tool was normed by the Director of Assessment to ensure validity of the assessment for use in District X (Assessment Director, personal communication, July 17, 2014). Furthermore, the Assessment Director clarified that construct, content,

and criterion-related validity were conducted by the assessment department (personal communication, March 9, 2015).

It was reported that the reliability was tested using test-retest reliability and standard error of measurement (personal communication, February 3, 2015). The reliability of the second grade BOY Math Assessment has been determined through multiple measures including examining the clarity of directions, ambiguity and arrangement of items, identifiable patterns of answers, length of the assessment, and alignment of items to curriculum scope and sequence (Director of Assessment, personal communication, August 27, 2014). According to the District X Director of Assessment, the data from these measurements was taken into account to determine the impact on the data (personal communication, August 27, 2014). Following the scoring of the assessment, identification and analysis of poorly constructed items and the possible human error in administration and scoring of the assessment were taken into account (Director of Assessment, personal communication, August 27, 2014). According to the Director of Assessment, outliers were determined and removed from the scoring of the assessments (personal communication, February 2, 2015). Through a combination of tests of validity and reliability, it was determined by District X that the second grade BOY Math Assessment was an effective tool to measure student achievement in mathematics (Director of Assessment, personal communication, August 27, 2014). To provide a more consistent test of reliability for the assessment instrument, a Cronbach's alpha was utilized during the data analysis of this study. The Cronbach's alpha provides the reader with "a measure of internal consistency, that is, how closely related a set of items are as a group" (UCLA Statistical Consulting Group, 2015, p. 1). Furthermore, a

Cronbach's alpha reliability coefficient at or above .7 will demonstrate high internal consistency, and therefore provide evidence that the assessment tool is reliable (UCLA Statistical Consulting Group, 2015).

With regard to the QRI, Leslie and Caldwell (2006) stated, "the purpose of the instrument should guide the author and user to determine the relevant reliability and validity data for the instrument's purpose" (p. 465). To determine the validity of the QRI assessment both content validity and criterion-related validity were used. Content validity for the QRI was determined by utilizing prior research as a foundation on which to build. Specifically, based on research Leslie and Caldwell (2006) selected assessment measures of prior knowledge, oral reading accuracy, and comprehension for the QRI.

In order to determine the criterion-related validity of student performance on the QRI, Leslie and Caldwell (2006) utilized correlational analyses of QRI scores and standardized test scores, focusing on correlations between QRI scores on a student's instructional level and reading comprehension scores on standardized tests. The results of the analyses indicated statistically significant correlations between a QRI instructional level and the standardized test scores of .85 at first grade, .65 at second grade, .55 at third grade, .66 at fourth grade, and .44 at the fifth grade (Leslie and Caldwell, 2006). Each analysis was statistically significant at .05.

Measure of reliability included alternate-form, inter-scorer and internal-consistency reliability. Alternate-form reliability was used as a means to establish consistency. Leslie and Caldwell (2006) stated, "If the major purpose [of an assessment] is to determine an instructional level, then it is important to have consistency in that level" (p. 468). Alternate-form reliability provides "evidence that the test is scored

consistently across examiners" (p. 465). To determine alternate-form reliability Livingston's K^2 was used as "this index reflects the magnitude of the discrepancy of misclassification in judging reliability of the decision" (p 471). The data from this analysis indicated that the reliabilities for comprehension at all levels of the QRI-4 were above .80, with 75% being greater than or equal to .90 (Leslie & Caldwell, 2006).

To determine the reliability of scoring student word accuracy and student response to comprehension questions on the QRI-4, several analyses were conducted. One hundred twenty-two readings were assessed "to estimate inter-scorer reliability of total miscues, acceptable miscues, and explicit and implicit comprehension" (Leslie & Caldwell, 2006, p, 466). From the 122 readings, 49 were conducted orally and were therefore considered valid responses from which tests of reliability could be run. The 49 samples were used to determine inter-scorer reliability using Cronbach's alpha analysis (Leslie & Caldwell, 2006). The data analysis indicated reliability estimates to be .99 for total miscues, including all mispronunciations, missed words, or added words. For meaning-change miscues the reliability estimate was .99, which included all miscues where the word the student mispronounced changed the meaning of the sentence. A reliability estimate of .98 for explicit comprehension including student responses where the answer to the question could be found directly in the text and a reliability estimate of .98 for implicit comprehension, where the answer had to be inferred based on what had been read were also indicated. This data indicated reliability in that a trained instructor could accurately assess a QRI, regardless of the level of expertise of the instructor (Leslie & Caldwell, 2006).

A second test of reliability, internal consistency reliability, "examines how reliable the score is as an estimate of the true score" (Leslie & Caldwell, 2006, p. 466). Furthermore, through the standard error of measurement (SEM) researchers are able to measure the variability of the actual scores around the true score. Evidence of reliability is provided when the SEM is a small number. For example, on the primer level passages the SEM for the proportion of comprehension questions correct out of the total comprehension scores ranged between .12 and .22 (Leslie & Caldwell, 2006). Table four includes the range of the SEM for grades one through five.

Table 4

Internal Consistency Reliability

QRI Level	Lowest SEM	Highest SEM
Pre-Primer	.13	.22
Primer	.12	.21
First	.14	.21
Second	.13	.17
Third	.12	.18
Fourth	.14	.23
Fifth	.15	.17

Note. Data collected from Table 16.12 Means and Standard Deviations and Standard Error of Measurement of Proportional Comprehension Scores for Each Passage on the *QRI-4* (Leslie & Caldwell, 2006, p. 469).

The validity and reliability of the QRI were assessed using a variety of analyses to ensure the effectiveness of the assessment as a tool to accurately measure and report student reading performance levels. The assessment was piloted with 1,000 students to ensure the progression of difficulty of text and content of passages and questions were

appropriately aligned by Lexile level to provide an effective tool to determine the reading level of a student (Leslie & Caldwell, 2006).

Finally, student demographics, including socioeconomic status (SES) as measured by Free and Reduced Lunch status (FRE), as well as ELL status, were additional variables measured in this study. Both SES and FRE are concrete variables; however, data is self-reported, and therefore there is a potential for some error in the reporting. Tests of validity or reliability were not necessary and therefore not conducted for these variables.

Data Collection

Prior to beginning the research for this study, the researcher sought permission to use archival data by completing a District X Research Application Request (see Appendix B). The completed research proposal form was electronically mailed to the Director of School Improvement and Assessment in District X. The Research Application Request was approved and the researcher was granted permission to use archival summer school invitation and attendance data, second grade BOY math assessment data, and second grade QRI reading assessment data on July 30, 2015**.** (A copy of the email granting permission is in Appendix C). Following approval from District X, the researcher submitted a request to conduct the study to the Baker University Institutional Review Board (IRB) on August 7, 2015 (see Appendix D). On August 31, 2015, Baker University approved the research request. (A copy of the letter granting permission is in Appendix E). The data was stored in an electronic excel spreadsheet that was provided by District X to the researcher in person on August 26,

2015. The spreadsheet was arranged in columns representing demographic designations and individual assessment data for each participant in the study.

Data Analysis and Hypothesis Testing

The research questions used for this study addressed the effect of participation in summer school on the math and reading achievement of academically low-performing second grade students. Additionally, the research questions used for this study examined to what extent the difference in academic performance was affected by the students' ELL status or by their socioeconomic status. The analyses utilized in this study were two-factor ANOVAs and χ^2 tests of independence. The following contains the research questions, hypotheses, and a description of the analysis used to test individual hypotheses. Additionally, information regarding the variables and level of significance for each analysis is provided.

RQ1. To what extent is there a difference in second grade Beginning of Year (BOY) math assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?

H1. There is a statistically significant difference in the second grade BOY math assessment data between low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program.

To test H1 a two-factor analysis of variance (ANOVA) was conducted to analyze the difference in second grade math assessment data. The two categorical variables used

to group the dependent variable, second grade BOY math assessment data, were summer school attendance status and ELL status. The two-factor ANOVA can be used to test three hypotheses including a main effect for summer school attendance status, a main effect for ELL status, and a two-way interaction effect (summer school attendance x ELL status). The main effect for summer school attendance was used to test H1. The level of significance was set at .05.

RQ2. To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by ELL status?

H2. The difference in second grade BOY math assessment data between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program is affected by ELL status.

The first two-factor analysis of variance (ANOVA) used to test H1, was also conducted to test H2. The two categorical variables used to group the dependent variable, second grade BOY math assessment data, were summer school attendance status and ELL status. The interaction effect for summer school status by ELL status was used to test H2. The level of significance was set at .05.

RQ3. To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing

students who did not participate in a remedial math and reading summer program affected by socio-economic status?

H3. The difference in academic performance in math between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program was affected by SES status.

A second two-factor analysis of variance (ANOVA) was conducted to test H3. The two categorical variables that were used to group the dependent variable, the second grade BOY math assessment data, were summer school status and SES. The two-factor ANOVA can be used to test three hypotheses, including a main effect for summer school attendance status, a main effect for SES, and a two-way interaction effect (summer school status x SES). The interaction effect for summer school attendance by SES was used to test H3. The level of significance was set at .05.

RQ4. To what extent is there a difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?

H4. There is a statistically significant difference in the second grade October reading assessment level between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program.

A χ^2 test of independence was conducted to test H4. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ5. To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by ELL status?

H5. The difference in academic performance in reading between academically low-performing students who participated in in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program was affected by ELL status.

Two χ^2 tests of independence were conducted to test H5 and the data was disaggregated based on ELL status. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The first χ^2 test of independence examined the 2nd grade QRI reading assessment data of students who attended summer school and were not of ELL status compared to students who did not attend summer school and were not of ELL status. A second χ^2 test of independence examined the second grade QRI reading assessment data of students who attended summer school and were of ELL status compared to students who did not attend summer school and were of ELL status. The observed frequencies were compared to those expected by chance. The level of significance was set at .05

RQ6. To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated

in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program affected by socio-economic status?

H6. The difference in academic performance in second grade October reading assessment data between academically low-performing students who participated in summer school and academically low-performing students who did not participate in summer school was affected by SES status.

Two χ^2 tests of independence were conducted to test H6. The data was disaggregated based on socioeconomic status. A χ^2 test of independence was conducted for each group. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The first χ^2 test of independence examined the 2nd grade QRI reading assessment data of students who attended summer school and were of full-price lunch status compared to students who did not attend summer school and were of full-price lunch status. A second χ^2 test of independence examined the second grade QRI reading assessment data of students who attended summer school and were of free or reduced lunch status compared to students who did not attend summer school and were of free or reduced lunch status. The observed frequencies were compared to those expected by chance. The level of significance was set at .05

Limitations

The limitations of a study are "factors that may have an effect on the interpretation of the finding or on the generalizability of the results" (Lunenburg & Irby, 2008, p. 133). This study included the following limitations

1. The demographics and population of any school district continuously change; therefore, data cannot be assumed to remain over time.
2. Variables outside the control of the researcher such as student motivation, physical and emotional health, and attitude could affect student outcomes.
3. The summer school program operates at one central location where students from across the district are grouped together, working with unfamiliar peers and teachers. This could affect student outcomes and levels of student participation.

Summary

The purpose of this study was to examine the difference in second grade math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance between these two groups of students was affected by the students' ELL status and by their socioeconomic status. Nonrandom purposive sampling of District X second grade students was used to select participants. Additionally, this chapter included a description of the assessment instruments used, as well as a discussion of validity, reliability, and measurement of the instruments. The procedures for data collection and the analyses used to address each of the research questions were also described in this chapter. The following chapter provides the detailed results of the data analysis.

Chapter Four

Results

The purpose of this study was to examine the difference in second grade math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance between these two groups of students was affected by the students' ELL status and by their socioeconomic status. Chapter four contains the results of the data analysis and hypothesis testing related to the BOY Math Assessment and QRI. The results of the hypothesis tests are presented.

Descriptive Statistics

The sample for this study included 119 academically low-performing second grade students who attended elementary school in District X. Of the sample, 70 students participated in the summer school program. The 49 students comprising the control group represent students who selected not to participate in the summer school program. The number of participants (n = 34) and non-participants (n = 24) of ELL status are presented in Table 5. In addition, the number of participants (n = 44) and non-participants (n = 35) of free or reduced lunch status are also presented. To analyze the data for this study the IBM® SPSS® Statistics Faculty Pack 22 for Windows statistical program was used.

Table 5

Participant Data by ELL Status and SES

Characteristic	Attended	% Attend	Did Not Attend	% Did Not Attend
ELL Status				
ELL	34	28.571	24	20.168
Not ELL	36	30.252	25	21.008
SES				
F&R Lunch	44	36.974	35	29.411
Full Lunch	28	23.529	14	11.764

Hypothesis Testing

Data from District X was downloaded and imported into IBM® SPSS® Statistics Faculty Pack 22 for Windows. The analysis focused on six research questions. Each research question is delineated below with the corresponding hypothesis and the method and results of the statistical analysis.

RQ1: To what extent is there a difference in second grade Beginning of Year (BOY) math assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?

H1: There is a statistically significant difference in the second grade BOY math assessment data between low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program.

A two-factor analysis of variance (ANOVA) was conducted to test H1. This two-factor analysis of variance (ANOVA) was also conducted to test H2. The data analysis related to H1 examined the second grade BOY math assessment data of summer school participants compared to non-participants. There were two categorical variables, summer school attendance status and ELL status, used to group the dependent variable, the second grade BOY math assessment data. Summer school attendance is addressed in H1 and the interaction effect of ELL status will be discussed in H2. The two-factor ANOVA can be used to test three hypotheses including a main effect for summer school attendance status, a main effect for ELL status, and a two-way interaction effect (summer school attendance x ELL status). The main effect for summer school status was used to test H1. The level of significance was set at .05. The results of the analysis indicated there was not a statistically significant difference between the two means, $F = .190$, $df = 1, 115$, $p = .663$. See Table 6 for the means and standard deviations for this analysis. A follow up post hoc was not warranted.

Table 6

Descriptive Statistics for the Results of the Test for H1

Attendance Status	*M*	*SD*	*N*
Attended	68.357	16.675	70
Did Not Attend	66.939	19.494	49

RQ2: To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing

students who did not participate in a remedial math and reading summer program affected by ELL status?

H2: The difference in second grade BOY math assessment data between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program is affected by ELL status.

The first two-factor analysis of variance (ANOVA) used to test H1 was also conducted to test H2. To address H2 the second grade BOY math assessment data was analyzed and then disaggregated based on student ELL status. The two categorical variables used to group the dependent variable, second grade BOY math assessment data, were summer school attendance status and ELL status. The interaction effect for summer school attendance by ELL status was used to test H2. The level of significance was set at .05. The results of the analysis indicated there was not a statistically significant difference between at least two of the means, $F = .298$, $df = 1, 115$, $p = .586$. See Table 7 for the means and standard deviations for this analysis. A follow up post hoc was not warranted.

Table 7

Descriptive Statistics for the Results of the Test for H2

Attendance Status	ELL Status	*M*	*SD*	*N*
Attended	Not ELL	64.583	18.454	36
	ELL	72.353	13.720	34
Did Not Attend	Not ELL	61.400	19.339	25
	ELL	72.708	18.296	24

RQ3: To what extent is the difference in second grade BOY math assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by socio-economic status?

H3: The difference in academic performance in math between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program was affected by SES status.

A second two-factor analysis of variance (ANOVA) was conducted to test H3. The second grade BOY math assessment data was analyzed and then disaggregated based on student socioeconomic status. The two categorical variables that were used to group the dependent variable, the second grade BOY math assessment data, were summer school attendance and SES. The two-factor ANOVA can be used to test three hypotheses, including a main effect for summer school attendance status, a main effect for SES, and a two-way interaction effect (summer school attendance x SES). The interaction effect for summer school attendance by SES was used to test H3. The level of significance was set at .05. The results of the analysis indicated there was not a statistically significant difference between at least two of the means, $F = .000$, $df = 1, 117$, $p = .982$. See Table 8 for the means and standard deviations for this analysis. A follow up post hoc was not warranted.

Table 8

Descriptive Statistics for the Results of the Test for H3

Attendance Status	SES	*M*	*SD*	*N*
Attended	Full Price Lunch	68.036	16.741	28
	Free or reduced Lunch	69.091	16.645	44
Did Not Attend	Full Price Lunch	66.071	27.678	14
	Free or reduced Lunch	67.286	15.593	35

RQ4: To what extent is there a difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program?

H4: There is a statistically significant difference in the second grade October reading assessment level between academically low-performing students who participated in in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program.

A χ^2 test of independence was conducted to test H4. QRI assessment performance was compared between students who participated in the summer school program and students who did not participate. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the χ^2 test of independence indicated no difference between the observed and expected values, $\chi^2 = 4.422$, $df = 2$, $p = .110$. See Table 9 for the observed and expected frequencies.

Table 9

Observed and Expected Frequencies for H4

QRI Performance Level		Attendance	
		Attended	Did Not Attend
Below	Observed	43	33.0
	Expected	44.0	32.0
On	Observed	31	15.0
	Expected	26.6	19.4
Above	Observed	7	11.0
	Expected	10.4	7.6

RQ5: To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer school program and academically low-performing students who did not participate in a remedial math and reading summer program affected by ELL status?

H5: The difference in academic performance in reading between academically low-performing students who participated in in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program was affected by ELL status.

Two χ^2 tests of independence were conducted to test H5. The data was disaggregated by ELL status and then the data was analyzed using the two χ^2 tests of independence. The first χ^2 test of independence compared the second grade QRI reading assessment data between participants of ELL status and students of ELL status who did not participate. The second χ^2 test of independence compared the second grade QRI

reading assessment data between participants not of ELL status and students not of ELL status who did not participate. For both tests the observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the first χ^2 test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2 = 7.539$, $df = 2$, $p = .023$. See Table 10 for the observed and expected frequencies. The observed frequency for students of ELL status who attended summer school and scored below grade level on the QRI ($n = 23$) was higher than the expected frequency ($n = 21.1$). The observed frequency for students of ELL status who attended summer school and scored on grade level on the QRI ($n = 18$) was higher than the expected frequency ($n = 15.7$). The observed frequency for students of ELL status who did not attend summer school and scored above grade level on the QRI ($n = 9$) was higher than the expected frequency ($n = 4.8$).

Table 10

Observed and Expected Frequencies for Students of ELL Status for H5

		Attendance	
QRI Performance Level		Attended	Did Not Attend
Below	Observed	23.0	12.0
	Expected	21.1	13.9
On	Observed	18.0	8.0
	Expected	15.7	10.3
Above	Observed	3.0	9.0
	Expected	7.2	4.8

The results of the second χ^2 test of independence indicated that for students not of ELL status there was not a statistically significant difference between the observed and

expected values, $\chi^2 = 1.793$, $df = 2$, $p = .408$. See Table 11 for the observed and expected frequencies. Because of sample size issues, two of the six cells from the analyzed table contained expected counts fewer than 5. This could have affected the quality of the results of the analysis.

Table 11

Observed and Expected Frequencies for Students Not of ELL Status for H5

		Attendance	
QRI Performance Level		Attended	Did Not Attend
Below	Observed	20.0	21.0
	Expected	22.4	18.6
On	Observed	12.0	7.0
	Expected	10.4	8.6
Above	Observed	3.0	1.0
	Expected	2.2	1.8

RQ6: To what extent is the difference in second grade October reading assessment performance between academically low-performing students who participated in a remedial math and reading summer program and academically low-performing students who did not participate in a remedial math and reading summer program affected by socio-economic status?

H6: The difference in academic performance in second grade October reading assessment data between academically low-performing students who participated in summer school and academically low-performing students who did not participate in summer school was affected by SES status.

Two χ^2 tests of independence were conducted to test H6. The data was disaggregated by SES and then the data was analyzed using the two χ^2 tests of independence. The first χ^2 test of independence compared the second grade QRI reading assessment data between students who attended summer school and were of free or reduced lunch status and students who did not attend summer school and were of free or reduced lunch status. The second χ^2 test of independence compared the second grade QRI reading assessment data between students who attended summer school and were of full-price lunch status and students who did not attend summer school and were of full-price lunch status. For both tests, the observed frequencies were compared to those expected by chance. The level of significance was set at .05.

The results of the first χ^2 test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2 = 6.297$, $df = 2$, $p = .043$. See Table 12 for the observed and expected frequencies. The observed frequency for students of free or reduced lunch status who attended summer school and scored on grade level on the QRI ($n = 23$) was higher than the expected frequency ($n = 18$). The observed frequency for students of free or reduced lunch status who did not attend summer school and scored above grade level on the QRI ($n = 9$) was higher than the expected frequency ($n = 5.9$).

Table 12

Observed and Expected Frequencies for Students of Free or Reduced Lunch Status for H6

QRI Performance Level		Attendance	
		Attended	Did Not Attend
Below	Observed	27.0	26.0
	Expected	28.9	24.1
On	Observed	23.0	10.0
	Expected	18.0	15.0
Above	Observed	4.0	9.0
	Expected	7.1	5.9

The results of the second χ^2 test of independence indicated that for students of full-priced lunch status there was not a statistically significant difference between the observed and expected values, $\chi^2 = .325$, $df = 2$, $p = .850$. See Table 13 for the observed and expected frequencies. Because of sample size issues, three of the six cells contained expected counts less than five. This could have affected the quality of the results of the analysis.

Table 13

Observed and Expected Frequencies for Students of Full-Priced Lunch Status for H6

		Attendance	
QRI Performance Level		Attended	Did Not Attend
Below	Observed	16.0	7.0
	Expected	15.1	7.9
On	Observed	8.0	5.0
	Expected	8.6	4.4
Above	Observed	3.0	2.0
	Expected	3.3	1.7

Summary

Chapter four included the descriptive statistics, hypothesis testing, and results of the data analysis related to the effectiveness of the District X summer school program as a tool to increase the achievement of academically low-performing students. The results of the two, two-factor ANOVAS and five χ^2 tests of independence conducted to determine the effectiveness of the summer school program in reducing the achievement gap between academically low-performing students and their academically higher-achieving peers were presented. Results related to the research questions revealed that participation in the summer school program did not demonstrate a statistically significant change in student performance when the entire sample was analyzed. The students of ELL status who attended summer school tended to score on or below grade level on the QRI. Students of ELL status who did not attend summer school scored above grade level on the QRI. There was not a statistically significant finding for students of non-ELL status on the QRI. The students of free or reduced lunch status who attended summer

school tended to score on or below grade level on the QRI. Students of free or reduced lunch status who did not attend summer school scored above grade level on the QRI. For full-price lunch status students, the hypothesis test was compromised because three of the six cells contained expected counts less than five.

Chapter four contained the results of the data analysis, hypothesis testing, and descriptive statistics related to the effectiveness of a math and reading summer school program designed for academically low-performing students. The results of the two-factor ANOVAS and the χ^2 tests of independence were presented. A summary of the research study, major findings, connections to the literature, implications for action, recommendations for further study, and conclusions are included in chapter five.

Chapter Five

Interpretation and Recommendations

Chapter five provides a summary of the study. A restatement of the problem, the purpose statement and research questions, the methodology, and the major findings of the study are presented. A discussion of the findings related to the literature is also included. The chapter concludes with implications for action for District X, followed by recommendations for future research. Concluding remarks serve as a final section of this chapter.

Study Summary

The following section provides a summary of the current study. The summary includes an overview of the problem concerning the effectiveness of a math and reading summer school program. The subsequent section states the purpose of the study and includes the research questions. A review of the methodology and the major findings of the study complete the summary. This study increased the body of research related to the effectiveness of summer school as a support for academically low-performing students.

Overview of the Problem. Summer learning loss has been examined as a possible cause for the increasing achievement gap between academically higher and lower-achieving students (Alexander, Entwisle, & Olson, 2007a; Cooper et al., 1996; Kerry & Daves, 1998). School districts have continued to explore opportunities to reduce summer learning loss, especially for students who are low-performing academically. Cooper et al. (1996) and Slates, Alexander, Entwisle, and Olson (2012) recommended that studies be conducted to determine the effectiveness of summer school for early-

elementary students, including the characteristics of summer programs that demonstrate effectiveness in reducing summer learning loss for specific populations.

In order to support the mission of the district, to prepare all students for their future, District X implemented a summer school program. This program was provided exclusively to specific targeted groups of students with a program goal of reducing summer learning loss for low-performing students. The newly revised summer school program had the potential to support the mission of the school district; however, no research plan had been developed to determine the effectiveness of this summer school program. Therefore, it was essential that a study be conducted to determine the effectiveness of the District X summer school program for academically low-achieving elementary students. If the summer program could prove to be effective, it could serve as a tool to reduce the achievement gap between academically high and low-performing students.

Purpose Statement and Research Questions. The purpose of this study was to examine the difference in second grade math and reading performance between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance in math and reading between participant and non-participant groups of students was affected by the students' ELL status. This study also examined to what extent the difference in academic performance in math and reading was affected by socioeconomic status. Six research questions were posed.

Review of the Methodology. The target population for this study was all academically low-performing elementary school students in District X. The sample for this study consisted of 119 students. The sample group in this study attended second grade at 18 schools in District X during the 2014-2015 school year. Nonrandom purposive sampling was used in this study.

The two instruments utilized in this study to measure participants' math performance and reading performance were the Beginning of the Year (BOY) Math Assessment and the Qualitative Reading Inventory (QRI). The BOY Math assessment is administered to every second grade student in District X during the second week of school and the scores are submitted to the assessment department using Scantron sheets to record student responses. The QRI assessment, administered individually to students during the month of October, measures word accuracy and comprehension. Teachers report individual student scores to the assessment department of District X. The student achievement data from the BOY Math and QRI assessments were imported into IBM® SPSS® Statistics Faculty Pack 22 for Windows for analysis. The statistical tests utilized in this research study included two-factor ANOVAS to analyze differences between two or more variables and χ^2 tests of independence to compare observed proportions to those expected by chance.

Major Findings. Results related to the research questions revealed that for math and reading there was not an overall statistically significant difference in student performance between students who participated in the summer school program and students who did not participate. However, results related to the research questions examining the difference in reading performance for students of ELL status and students

of free or reduced lunch status did reveal a statistically significant difference in student performance between students who participated and students who did not participate in the summer school program.

With regard to a difference in mathematics performance between all participants and non-participants, study results indicated no statistically significant differences. The same was true when examining mathematics performance for students of ELL status who participated in the summer school program and students of ELL status who did not participate. The results related to the difference in performance for students of free or reduced lunch status who did participate in summer school compared to students of free or reduced lunch who did not participate was not statistically significant.

Results related to reading performance as measured by the QRI assessment indicated contrasting findings. Overall, participation in summer school did not demonstrate statistically significant differences in student performance. For students not of ELL status, there was not a statistically significant difference in performance between participants and non-participants. For students of ELL status, the data indicated a statistically significant number of ELL status students who participated in summer school scored below or on grade level on the QRI when compared to non-participants of ELL status. For students of full-price status there was not a statistically significant difference in performance between participants and students who did not participate in summer school. Finally, the study revealed that a statistically significant number of students of free or reduced lunch status who participated in the summer school program performed on grade-level on the QRI assessment.

Findings Related to the Literature

Cooper et al. (1996) and Slates, Alexander, Entwisle, and Olson (2012) recommended that studies be conducted to determine the effectiveness of summer school for early elementary students, including the characteristics of summer programs that demonstrate effectiveness in reducing summer learning loss for specific populations. The findings from this study are related to the literature focused on the effectiveness of summer school programs as an opportunity to decrease summer learning loss for academically low-performing students. The current study adds to the body of research focused on supporting academically low-performing students. Additionally, the current study begins to fill the void of research focused on benefits of summer school for ELL students. The research provides data related to the benefits of a summer school program for students of ELL status, as well as potential opportunities for future studies. The results presented in chapter four and explained in the major findings section of this chapter identify both consistencies and variances related to the literature.

Nelson (2006) recommended summer school as an opportunity to support failing students. Furthermore, Donohue and Miller (2008) stated that access to summer learning experiences have a direct correlation to the potential of a reduced achievement gap. The current study examined the effectiveness of a program designed to support academically low-achieving students. The findings from the current study did not identify statistically significant differences in the overall number of students who improved in either math or reading following participation in the program. Moreover, analyses of post-program math assessment performance of both the participating students and the non-participating students of both ELL status and free or reduced lunch status were not statistically significant. In contrast, the χ^2 tests of independence utilized to determine differences in

post-program reading achievement indicated findings similar to those presented in the literature for students of ELL status and those of free or reduced lunch status. Thus, the results of the current study were discrepant from the literature when examining overall student achievement, and achievement in math. However, the results of the current study indicated findings similar to previous research on the effectiveness of reading-focused summer school programs provided to students of ELL status and of free or reduced lunch status.

The results of the current study revealed contrasting findings when compared to other studies focused on reducing the achievement gap for low-performing students. Cooper (2001) suggested summer school programs designed to provide remediation could reduce summer learning loss. The findings of the current study revealed that there was not a statistically significant difference in the reading performance of academically low-performing students following participation in a remedial summer reading program. In fact, qualifying students who did not participate in the summer school program actually scored higher on the QRI than students who did participate in the summer school program.

The results of the current study were discrepant to the literature when examining the literacy growth of the overall participant group. The findings of earlier studies indicated that summer programs designed to support struggling learners have the potential to facilitate a summer literacy gain (Borman, Benson, & Overman, 2005; Borman & Dowling, 2006; Cooper, Charlton, Valentine, & Muhlenbruck, 2000; Matsudaria, 2008; Schater & Jo, 2005). Additionally, Zvoch (2011) found that academically low-performing students demonstrated increased literacy skills following

participation in summer school. In the current study, the data did not indicate statistically significant differences in the performance of participants when compared to those expected by chance.

When considering students from low-SES homes, McCombs et al. (2012) stated that while all students lose approximately one month of achievement during the summer months, the impact is more significant for students from low-SES homes. In a prior study, Johnson (2000) recommended school districts provide summer learning opportunities for low-SES students to decrease the likelihood of a break in the intellectual development of a child. The results of the current study indicated similar findings. The overall effectiveness of the summer school program in District X did not demonstrate a statistically significant effect. However, when examining the effectiveness for free or reduced lunch status students, the results indicated more students performed on grade level post-program than expected by chance.

Allington and McGill-Franzen (2013) found that low-SES students do not have summer access to text, a critical key to sustaining literacy and especially important to early readers. In addition, Celano and Nueman (2008) found that one potential cause of summer learning loss is that for every line of print a low-SES student reads over the summer, a high-SES student reads three lines of print. The results of the current study validated the findings of these studies. The data collected in the current study indicated that a statistically significant number of students of free or reduced lunch status and of ELL status performed on grade level on the QRI. Thus, participation in a summer reading program with access to print could reduce summer learning loss for free or reduced lunch status and ELL status students.

Conclusions

This section includes conclusions from the current study of the effectiveness of a summer school program for academically low-performing students to determine opportunities for District X to enhance the summer school program. Implications for action and recommendations for future research are included. The section closes with concluding remarks.

Implications for Action. The results of this study have implications for the work of District X to enhance and foster the development of the Summer Learning Stars summer school program. The results of the data analysis suggest future areas of focus for the district including summer program participant selection, summer math and reading program curriculum development, and pre-program professional learning for staff.

Because the overall results of the study did not reveal statistically significant differences between participants and non-participants, District X should examine student selection procedures to ensure that the students who are invited to participate in summer school are indeed the students who stand to benefit from the program. Using only a single data point, as was utilized in this summer program, can lead to the inclusion of students who otherwise would not have been selected, and also have the opposite effect of excluding students who should have been invited to participate. To ensure the limited number of seats available for the program are provided to the students who demonstrate the most need, District X could consider determining a more effective method for selecting participants, perhaps through examination of multiple-data points. This would provide greater assurance that the participants are those students who have the potential

to receive the maximum program benefit, as opposed to selecting potential participants who performed poorly on an isolated assessment data point.

The findings related to the effectiveness of the math and reading summer school program indicated no statistically significant differences in performance for participants compared to non-participants. The summer school math program did not lead to increased student achievement. Modifications to the structure of the summer school math program to operate in a rotation similar to the structure of the summer school reading program could provide opportunities to better meet student needs. The reading program utilized for District X summer school, Reading Rally, was developed as a tool to support at-risk students. Future action for leaders in District X include sustaining the Reading Rally program and examining the format to determine if the program design could be modified and replicated for the summer school math program to increase overall program effectiveness.

With regard to increased achievement in reading, the results of the current study revealed contrasting findings. Results related to the research questions revealed that participation in the summer school program did not demonstrate a statistically significant change in student performance when the entire sample was analyzed. However, analysis of the results for students of ELL status and students of free or reduced lunch status indicated that participants in summer school were more likely to perform on-grade level post-program than non-participant peers of ELL status and peers of free or reduced lunch status. Therefore, while participation in summer school could be of benefit to all students, it is essential to provide support for academically low-performing students of ELL status and of free or reduced lunch status.

The District X Teaching and Learning Department leadership could use the data presented in this study to examine both program participation criteria and to develop more intensive training for summer school teachers. Enhanced pre-program professional learning for staff could promote an increased understanding of the curriculum and better alignment of instructional strategies with the curriculum. Overall, the current study indicated the summer school program as it existed in 2014 did not have a substantial impact on student learning. However, if the recommendations noted above were implemented, they would support the work of the district to enhance the program, thus better supporting academically low-performing students.

Recommendations for Future Research. This study adds to the body of research focused on reducing summer learning loss for academically low-performing students. The results of this study reveal a continued need to explore additional opportunities to support low-performing students, especially students of ELL status and students of low-SES. Smink (2011) recommended that summer school programs include not only the lowest performing students, but also all Title 1 students. The data from the current study supports the need for continued research of this topic.

The following are possible topics for future research:

1. Replicate the current study over multiple years to determine differences in program effectiveness when participants attend summer school over the course of multiple summers.
2. Replicate the current study but focus on measurable, value added growth on the appropriate indicators. The study would then compare the numerical

growth demonstrated by participants for each indicator in comparison to the numerical growth of students who did not participate.

3. Conduct studies to examine summer school programs that last longer than four hours each day or are provided over the course of more days than the current study.
4. Analyze the post-program assessment data for a summer school program that utilized multiple-data points to select program participants.

Concluding Remarks. School districts have been working to decrease the achievement gap that exists between academically high-performing and low-performing students for many years. Summer school is one opportunity to support work to reduce this gap by reducing summer learning loss. Researchers have examined the effectiveness of summer school programs targeted at low-performing students and students belonging to a specific demographic group. Additionally, summer school program studies have examined the benefits of a focus on remediation, enrichment, and non-content instruction. The current study examined the effectiveness of remedial math and reading programs designed to support all academically low-performing students who attended school in District X.

Beginning in the 1980s, District X has worked to establish and maintain an effective summer school program. Continual program revision based on growth, need, and community feedback has occurred annually. Over the past several years, school budgets have decreased and many school districts across the nation have had to reduce programs. Thus, a significant revision of the District X summer school program occurred prior to summer 2014. This study sought to determine the effectiveness of the Summer

Learning Stars program and to provide recommendations for action. Overall, the results of the current study did not indicate statistically significant increases in student achievement post-program. However, the current summer program proved to be an effective tool to reduce summer learning loss for participants of ELL status and participants of free or reduced lunch status.

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Appendices

Appendix A: District X 1st Grade Math Standards

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Math Standards for 1st Grade

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for an express regularity in repeated reasoning.

The student will:

Operations and Algebraic Thinking	**Represent and solve problems involving addition and subtraction.**	
	1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.1	**1.OA.A.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
	Understand and apply properties of operations and the relationship between addition and subtraction.	
	1.OA.B.3 Apply properties of operations as strategies to add and subtract.2 Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)	1.OA.B.4 Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.
	Add and subtract within 20.	
	1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).
	Work with addition and subtraction equations.	
	1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	1.OA.D.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = _ – 3, 6 + 6 = _.
Number & Operations in Base Ten	**Extend the counting sequence.**	
	1.NBT.A.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	
	Understand place value.	
	1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: **1.NBT.B.2a** 10 can be thought of as a bundle of ten ones — called a "ten." **1.NBT.B.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. **1.NBT.B.2c** The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	**1.NBT.B.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
Number & Operations in Base 10	**Use place value understanding and properties of operations to add and subtract.**	
	1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	**1.NBT.C.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
	1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	
Measurement & Data	**Measure lengths indirectly and by iterating length units.**	
	1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.	**1.MD.A.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
	Tell and write time	
	1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks.	
	Represent and interpret data.	
	1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	
Geometry	**Reason with shapes and their attributes.**	
	1.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	**1.G.A.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.1
	1.G.A.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	

Appendix B: District X Research Request

Internal

[redacted]

[redacted] Public Schools Research Proposals

The Board of Education encourages research projects for the purpose of improving educational practice. All research projects will be approved by the Superintendent and/or his designee prior to implementation.

ADMINISTRATIVE PROCEDURE

All individuals wishing to conduct research in [redacted] must follow these designated procedures.

1. The research proposal with the completed Research Application Request (starting on page 2 of this document) is submitted to [redacted]

2. Each application is reviewed at the district level, by gaining input from various personnel, to determine alignment with district philosophy, the district strategic plan and participant responsibilities. This process will take at least two (2) weeks.

3. After review, the research will be approved, not approved, or approved with restrictions. At the conclusion of the study, a copy of the results of the research will be provided to the district.

Each proposal should meet the following criteria:

- Show evidence of careful planning, including a review of current literature, if appropriate.
- Be planned in advance as to minimize interruptions in the regular school program.
- Make no undue demands upon the time of students and staff.
- Respect the rights of privacy of personal data concerning students and staff.
- Include informed consent statements from parents when necessary.
- Provide for the protection of human subjects under the law (45-CFR 46).
- Respect the right of individuals to refrain from participation in research studies.

Administrative Responsibility: Teaching and Learning Department

Added: April 1, 1999 [redacted] Board of Education Policies Section IL

[redacted]

[redacted]

Research Application Request-Internal

INSTRUCTIONS:

Please provide the following information so that your project can be considered in relation to district criteria. Allow a minimum of two (2) weeks for completion of the review process.

PLEASE NOTE: Your final application should include submission of the following requirements:
(1) the on-line application,
(2) a copy of your Human Experimentation Committee project review and approval (if applicable), and
(3) a letter from your academic advisor/committee indicating that your research project has been reviewed and approved.

Requirements #2 and #3 can be scanned and sent through email to [redacted] inserted into the on-line application in word format, or sent in hard copy format to [redacted]

1. **Applicant(s) Name:** Liz Harrison

2. **Position:** Instructional Resource Teacher

3. **School/Location:** IRC

4. **Telephone:** [redacted]

5. **Email address:** [redacted]

6. **Project Title:** The Effectiveness of Summer School on the Achievement of Low-Performing Second Grade Students in Math and Reading

7. **The proposed research is for:** Doctoral Disseration, Baker University

8. **Anticipated Dates:**

   Beginning Date: August, 2014 Ending Date: May, 2016 Date Final Report Available: June, 2016

9. **Participant Description:**

   Number of schools and names involved in the study: [redacted]

   Number of teachers involved in the study: 0

   Number of students involved in the study: 162

10. Has the project been submitted to a Human Experimentation Committee? Respond Yes or No. No

11. If no, please explain why your project has not been submitted to a committee on human experimentation. This study will be submitted to the Baker Instructional Review Board following approval from [redacted]

12. Either paste a copy of the letter from the Human Experimentation Committee regarding your study (Word format) below, email a scanned copy to matthewm@olatheschools.org, or send a hard copy to [redacted] at the [redacted]

13. Brief review of the literature:

Summer learning loss is one potential factor contributing to the academic achievement gap that exists between various student groups. A study by McCombs et al. called for research to examine the benefits of summer school stating that, "research on large programs would provide valuable information to policymakers and practitioners" (2011, p. 74). Summer school programs developed to support low-performing students decrease the amount of time students spend without instruction. Additionally, according to Allington and McGill-Franzen (2003), effective summer programs have the potential to reduce the achievement gap between specific student groups. In order to examine possibilities to reduce the achievement gap created by summer learning loss, Borman (2000) recommended studies to examine the relationship between participation in summer school and summer learning loss; in addition, he recommended a study to determine if participation in summer school accelerates academic growth during the school year. In their 2003 study, Allington and McGill-Franzen indicated that the difference in academic achievement between high and low poverty second grade students is seven months; although student achievement increases at similar rates during the school year, this gap increases to two years and seven months by the time students complete their sixth grade school year. Similarly, studies examining summer learning loss have indicated that students of low socio-economic status and minority students were most impacted by the limited learning opportunities available during summer vacation (Alexander, Entwisle, & Olson, 2007b; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Donohue & Miller, 2008; Jesson, McNaughton, & Kolose, 2014). Smith (2011) found that with each passing summer, as the achievement gap increases, instruction the following school year focuses more and more on remediation consequently reducing student's exposure to new curriculum. Reeves (2008) stated that educators must simultaneously work to reduce the gap in the achievement levels between groups of students and ensure that all students are held to the same high academic standards. According to Harsh and Mallory (2013), in order to master new curricular standards and to ensure all students attain higher academic performance; schools today must examine opportunities to support all struggling learners.

14. Major research questions:

1. To what extent is there a difference in 2nd grade math assessment performance between academically low performing students participating in a remedial math and reading program and academically low performing students not participating in a remedial math and reading program?
2. To what extent is the difference in academic performance in math between students participating in a remedial math and reading summer school program and a control group of peers not participating in the program affected by ELL status?
3. To what extent is the difference in academic performance in math between students participating in a remedial math and reading summer school program and a control group of peers not participating in the program affected by socio-economic status?
4. To what extent is there a difference in 2nd grade reading assessment performance between academically low performing students participating in a remedial math and reading program and academically low performing students not participating in a remedial math and reading program?
5. To what extent is the difference in academic performance in reading between students participating in a remedial math and reading summer school program and a control group of peers not participating in the program affected by ELL status?
6. To what extent is the difference in academic performance in reading between students participating in a remedial math and reading summer school program and a control group of peers not participating in the program affected by socio-economic status?

15. Methodology:

This study was designed as a quasi-experimental investigation to determine the benefits of summer school, based on the redisgned program that was implemented summer 2014. Participants were selected based on their school of attendance, current grade level, and performance on the MY math assessment and their MY reading level.

Quantitative assessment data included participants BOY math assessment and fall QRI level. Data was analyzed based on the research questions to determine the level of effectiveness of the summer school program in reducing the achievement gap.

16. Method Summary:

This study was a quasi-experimental study. Two-factor ANOVAs were used to test the six hypotheses.

17. Research Design/Data Analysis:

Creswell (2009) described quasi-experimental research as a study that compares a control group and an experimental group. Additionally, selection for participation is not random in this type of research. This study used a quasi-experimental research design to examine archival data. The independent variables in this study were student participation in summer school, student socio-economic status, and English Language Learner status. The dependent variables of this study were the scores of the participants on the district beginning of year math assessment and on the Qualitative Reading Inventory.
The research questions used for this study addressed the effect of participation in summer school on the math and reading achievement of academically low-performing second grade students. Research questions 1 and 4 addressed the extent of the difference in math and reading assessment performance of low-performing students who participated in summer school compared to students who had not participated in summer school. Research questions 2 and 4 addressed the extent of the relationship between ELL status and the difference in math and reading assessment performance of low-performing students who participated in summer school compared to students who had not participated in summer school. Research questions 3 and 6 addressed the extent of the relationship between SES and the difference in math and reading assessment performance of low-performing students who participated in summer school compared to students who had not participated in summer school. Two-factor ANOVAs were conducted to address the research questions. The level of significance was set at .05.

18. Perceived Benefits of the Project:

The goal of this study is to determine the level of effectiveness of summer school in reducing the achivement gap that exists between high and low-performig students. The data from this study could be used to make future decisions regarding summer school programming, invitation criteria and procedures, and summer school curriculum.

19. Project Dissemination Plan:

The results of this study will be shared with summer school administration following the completion of the study. Additionally, the data from this study will be shared with district personnel as needed.

20. Briefly describe how this research project supports [redacted] District curriculum, a district goal, and/or individual school's improvement plan.

The goal of this reearch is to assist [redacted] in determining the effectiveness of the summer school program. Summer school, as redesigned in 2014 targets solely the low-performing students in an effort to reduce their knowledge gap, offset the summer learning slide, and to prepare them for success in the upcoming school year. Additionally, results of this study could assist curriculum leaders in determining summer school curriculum that best supports this students participating in the program. Finally, this study could support the need for formative assessment at the end of summer school to measure student progress.

21. Please provide a letter from your faculty advisor/committee indicating that the research project has been reviewed and the researcher has met all requirements necessary to conduct the proposed research. You can paste an electronic copy of the letter (Word format) into this section, email a scanned copy to [redacted] or send a hard copy to [redacted] at the [redacted]

22. Any other comments regarding your application?

Appendix C: District X Permission to Conduct Research/ Data For Study

August 27, 2015

To whom it may concern:

Liz Harrison has been given permission to conduct research for her dissertation at Baker University. Liz has followed our District Board of Education policy and is in compliance for this process.

[redacted]

[redacted]

[redacted]

Director of Assessment and School Improvement

[redacted]

[redacted]

[redacted]

Appendix D: IRB

BAKER UNIVERSITY

SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

Date: July 28, 2015
IRB PROTOCOL NUMBER _____
(IRB USE ONLY)

IRB REQUEST
Proposal for Research
Submitted to the Baker University Institutional Review Board

I. Research Investigator(s) (Students must list faculty sponsor first)

Department(s) **School of Education Graduate Department**

Name	Signature	
1. Dr. Russ Kokoruda	_____,	Major Advisor
2. Margaret Waterman	_____,	Research Analyst
3. Dr. Sharon Zoellner		University Committee Member
4.		External Committee Member

Principal Investigator: _Elizabeth Harrison__
Phone: [redacted]
Email: [redacted]
Mailing address: [redacted]

Faculty sponsor:
Phone:
Email:

Expected Category of Review: ___Exempt ___ Expedited _ __Full

II: Protocol: (Type the title of your study)

The Effect of Summer School on the Math and Reading Achievement of Low-Performing Second Grade

Summary

In a sentence or two, please describe the background and purpose of the research.

The purpose of this study was to examine the difference in performance on math and reading assessments between second grade students who participated in a remedial summer school program during the summer following their first grade school year and students who qualified for, but did not participate in the program. Furthermore, this study examined to what extent the difference in academic performance between these two groups of students was affected by the students' ELL status and by socioeconomic status of the students.

Briefly describe each condition or manipulation to be included within the study.

This is a quasi-experimental study. Students who qualified for and selected not to participate in summer school were assigned to the control group. Students who qualified for and selected to participate in summer school were assigned to the experimental group. Two additional independent variables researched in this study were socioeconomic status (SES) and ELL status.

What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.
Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

The dependent variables used in this study were the [redacted] Beginning of Year (BOY) Math Assessment scores and the student reading levels as determined by the Qualitative Reading Inventory (QRI-4) or Rigby Benchmark Reading Level Assessment.

Will any stress to subjects be involved? If so, please describe.
Subjects will not experience stress as a result of this study.

Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.
Subjects will not be deceived or misled in any way as a result of this study.

Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.
This study will not involve a request for personal or sensitive information.

Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.
Subjects will not be presented with materials which might be considered to be offensive, threatening, or degrading.

Approximately how much time will be demanded of each subject?
This study examines data already collected from student assessment. No additional time is required, as the assessments will occur during regular school time

Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.
Subjects included in this study were second grade students during the 2014-2015 school year. The assessment data from [redacted] will be utilized following approval from the school district.

What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?
Participation in the assessments is required for all students in the district. Participation in the summer school program is voluntary. Qualifying students must returned a signed parental consent to participate.

How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not
No consent is needed as all data collected results from assessments required from all students in the district.

Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.
No aspect of the data will be made part of any permanent record in a manner that it could be identified to the subject.

Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.
No, students will remain anonymous.

What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with it after the study is completed?

Prior to using the data all identifying information will be removed from the data. The only data that will remain will be SES and ELL status. Name, school, age, race, gender will be removed. The data will be stored on a district jump drive. The data will be stored until this study is complete. Following the completion of this study the jump drive will be returned to the assessment department in the [redacted]

If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?
There are no risks involved in this study.

Will any data from files or archival data be used? If so, please describe.

The data used in this study will be the 2014-15 BOY Math Assessment data and the 2014-15 2nd grade QRI assessment data. This data is kept in the assessment department in the [redacted] in the office of the Director of Assessment and School Improvement.

Appendix E: IRB Acceptance Letter

Baker University Institutional Review Board

August 31, 2015

Dear Elizabeth Harrison and Dr. Kokoruda,

The Baker University IRB has reviewed your research project application and approved this project under Expedited Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.

Please inform this Committee or myself when this project is terminated or completed. As noted above, you must also provide IRB with an annual status report and receive approval for maintaining your status. If you have any questions, please contact me at CTodden@BakerU.edu or 785.594.8440.

Sincerely,

Chris Todden EdD
Chair, Baker University IRB

Baker University IRB Committee
Verneda Edwards EdD
Sara Crump PhD
Erin Morris PhD
Scott Crenshaw