The Impact of Summer Intervention on Reading Regression as Measured by Student Normal Curve Equivalent Scores when Grouped by Grade Level and Socioeconomic Status for 2013, 2014, and 2015

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Abstract

The purpose of this study was to determine if the type of summer intervention program makes a difference in student reading regression, or learning loss, when disaggregated by grade level and socioeconomic status. Also investigated was reading score regression disaggregated by grade level across all implementation years. For this study, a quantitative research design was used.

The sample for this study consisted of students entering grades 1, 2, 3, and 4 in the target school district during the summers of 2013, 2014, and 2015 who had STAR Reading or STAR Early Literacy scores below the 30th percentile during the winter assessment window, which consistently occurred during December before the summer intervention programs. The sample was organized into three groups: students who qualified for and attended Smart Start for 7-12 days, students who attended traditional summer school, and non-attending students who were eligible for Smart Start and did not attend or attended minimally for six days or less. Initially, 842 students entering grades 1, 2, 3, and 4 during the summers of 2013, 2014, and 2015 were included in this study. After removing student scores without matching pre- and post-test NCE reading achievement scores, 689 students remained in the sample. Of the 689 students, 213 students participated in Smart Start, 371 students participated in traditional summer school, and 105 students did not participate or minimally participated in Smart Start (0-6 days).

Findings revealed statistically significant regression between pre- and post-test reading scores for students entering grades 2, 3, and 4. However, students entering grade 1 consistently had statistically significant reading score gains between pre- and post-test

scores. The main effects and interactions between and among the type of summer intervention program and socioeconomic status were also disaggregated by grade level. Differences were not identified when examining the main effects and interactions between and among the type of summer intervention program and socioeconomic status. However, students entering grades 1 and 2 who attended Smart Start or traditional summer school had less reading score regression than did their non-attending peers. The same did not hold true for students entering grades 3 and 4. This research supports the reality of summer reading score regression and the importance of early intervention but encourages school district leaders to continue evaluating summer intervention programs in order to reduce summer reading score regression.

Dedication

To my grandma, whose unwavering work ethic and compassion continue to motivate and guide me. With a heart of sincerity and love, she gave me the confidence to achieve this goal.

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Chapter One

Introduction

The need to identify effective summer intervention frameworks and program structures to support young learners is essential, as doing so elevates learners to achieve their potential. For some children, summer provides the opportunity for learning experiences that extend beyond the walls of the classroom: vacations, museum exhibits, and library visits. For other children, exposure to educational opportunities and literacy materials ends when summer vacation begins. In a meta-analysis of the effects of summer vacation on achievement scores, "middle-class students appeared to gain on grade-level equivalent reading recognition tests over summer while lower-class students lost on them" (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996, p. 227). This discrepancy in summer reading regression between economically advantaged and economically disadvantaged students was linked to the availability of occasions to reinforce reading skills and access to literacy materials (Cooper et al., 1996). Results of the National Assessment of Educational Progress, compiled in *The National Report Card: Reading*, highlighted the pervasive achievement gap between students eligible and not eligible for free or reduced-price lunch (Perie, Grigg, & Donahue, 2005). Despite a slight narrowing of the achievement gap, students who are economically disadvantaged continue to face barriers in increasing achievement at a rate that would eliminate the discrepancy.

When examining the learning rates of children, one's socioeconomic status appears to have little influence. Achievement trends throughout the school year have appeared nearly uniform across social lines (Alexander, Entwisle, & Olson, 2007). With

equitable rates of learning during the school year and clear evidence of prevalent and significant reading regression amongst children who are economically disadvantaged, the summer months can be identified as the crucible of the achievement gap (Allington et al., 2010). Given the reduced exposure to learning opportunities and access to literacy materials of economically disadvantaged children, summer academic supports offer the best possibility to reduce the achievement gap.

The need to assist students with reduced access to educational resources during the summer months is obvious; "attempting to close the gap after it has opened wide is a rear guard action" (Alexander et al., 2007, p. 168), considering the educational gap increases the most during the elementary years. While traditional summer school has been presented as a method to help academically propel learners, its effects do not significantly alter a child's achievement (Hattie, 2008). If the desire is to close the achievement gap through academic summer supports, an intervention designed to elevate learning beyond the maintenance stage is necessary.

A variety of summer academic supports has been offered to increase student learning and reduce summer regression. From summer library programs to books sent to children via mail during the summer months, the most impactful academic supports have demonstrated tight alignment to student need (Hattie, 2008). When building a summer academic intervention, Cooper (2003) recommended three steps to increase impact: students should be serviced in small groups with individualized instruction, parents should be involved in the process to reinforce instruction and learning, and the early grade levels should be targeted to prevent a widening of the achievement gap.

Background

While many believe the modern nine to ten month school year is reflective of the needs of the once dominating agrarian society, its history is far more premeditated. In the 1800s, children in rural schools frequently attended school during the summer, as agricultural responsibilities demanded their presence during the spring for planting and the fall for harvesting (Gold, 2002). At the same time, children in urban schools had the option to attend school nearly year-round, as schools were open during the summer months (Gold, 2002). However, this option was not favored by wealthy and middle-class families, as the city heat and lack of air-conditioning reduced the appeal of summer schooling. Reform in the late 1800s produced a common school year calendar. This calendar provided students with a break from instruction and allowed teachers time for professional development and training (Gold, 2002).

Because the school year calendar was not devised with student achievement at the center, educational institutions have been developing structures and supports to combat summer academic regression. Unfortunately, traditional summer school has had little impact on remedying the loss of learning (Hattie, 2008). Outside of traditional summer school, intervention-based programs have been designed to serve specific populations of students. With a variety of formats and instructional approaches, results amongst summer academic intervention programs vary immensely. Programs designed to respond directly to students' instructional needs at the primary level have shown the greatest effectiveness and demonstrate the greatest potential for eliminating summer regression (Entwisle, Alexander, & Olson, 2001; Hattie, 2008).

The school district in which the study was conducted is a moderate-sized, Midwestern, suburban district featuring ten elementary schools, three middle schools, two high schools, and one day school. Over time, the number of students eligible for free or reduced-price lunch has continually increased, reaching 29.5% in 2015 (Missouri Department of Elementary and Secondary Education, 2015). Additionally, student mobility continues to increase, requiring added attention to consistencies between district schools to ensure equitable education. District elementary schools utilize a tiered approach to instruction, with Tier 1 being core content and instruction, Tier 2 being small group support, and Tier 3 being intense support. Beyond differentiated academic support within the school day, qualifying students also have access to after-school reading support, provided in groups of three to four students. Outlined in Table 1 are student enrollment numbers and free or reduced-price lunch percentages within the target school district during the years of this study.

Table 1

2012-2015 District Demographic Data

Year	Students	Percent Free or Reduced-Price Lunch
2012-2013	10,448	28.6
2013-2014	10,504	28.9
2014-2015	10,713	29.5

Note. Adapted from School District X. (2015). *Demographic profile: 2014-2015*. Kansas City, MO: Business Services Department of the School District X & Business Information Services, LLC.

During June, the suburban school district in the current study offers traditional summer school to incoming kindergarten through twelfth grade students. In 2014, the

traditional summer school model switched from a half-day program to a full-day program. The traditional summer school program began at the conclusion of the traditional school year and continued for four weeks. Several curricular models have been utilized in the past, including district-developed curriculum. District-created curricula were used during the summer of 2013. The following year, when traditional summer school transitioned to a full-day program, packaged summer school curricula were used. During the summer of 2015, district-created curricula based on the Missouri Learning Standards were developed for summer school instruction. During the summers of 2013, 2014, and 2015, traditional summer school contained two focus areas: an academic focus on reading, writing, and mathematics and an enrichment focus on art, music, and movement. Transportation and lunch were provided, and attendance for elementary students was not required. Both certified teachers and non-certified staff taught summer school. Non-certified staff were hired to teach summer school because of a lack of certified applicants.

While the district utilized multiple supports to ensure student success, including tiered instruction during the school year, after school tutoring, and traditional summer school, some students required additional summer support. To lessen summer regression for first through fourth grade students, the target school district utilized Smart Start, a short-duration, district-developed summer intervention, to support learners identified as academically at-risk, as indicated by STAR Early Literacy, STAR Reading, and teacher feedback. In the Smart Start program, students were provided 36 hours of direct literacy and supplemental mathematics instruction through 12 half-days over the course of three weeks during the month of July, following the conclusion of traditional full-day summer

school. A centrally located school was selected for the site of Smart Start, promoting easy access for students traveling across the district. Students were provided with breakfast and transportation to increase participation. Students were ability-grouped in classes averaging 10-15 students, and a direct-instruction framework was used to elevate student performance. Certified teachers who received specific training regarding the instructional framework for Smart Start served as the instructors. Because Smart Start served struggling learners, recruiting certified teachers ensured the staff was equipped to meet individual needs and possessed the appropriate pedagogical content knowledge. Smart Start began in 2010 and has consistently occurred during July. Since its inception, Smart Start was organized and supervised by a district assistant principal.

Statement of the Problem

The problem addressed in this study was the identification of a summer intervention structure to lessen summer reading regression, specifically for students who were economically disadvantaged or academically at-risk. This summer reading regression cycle limits a student's ability to achieve throughout the student's educational career. During the summer months, students' reading achievement regresses due to a lack of direct instruction and literacy exposure. Students in poverty experience increased academic regression, which adds to the achievement gap (Allington et al., 2010). Because of this regression, there is a need for academic intervention during summer months for targeted students who are academically at-risk to maintain their achievement and allow for maximum growth throughout their schooling. A core responsibility of educational institutions is to provide educational opportunities that enable learners to operate at peak performance. Since demographic factors may influence a child's access

to opportunities beyond the school setting, schools focusing on educational equity offer supports for students who are at risk for academic regression. Without targeted reading support during the summer, students experience a loss of skills, which impacts learning opportunities children experience at the beginning of a school year, due to reteaching and a reduction in rigor. Unfortunately, traditional summer school does not significantly impact student learning or alter a child's academic trajectory (Hattie, 2008). Summer intervention programs focusing on supporting elementary students living in poverty or at risk of academic failure have demonstrated contradictory findings.

Purpose of the Study

The purpose of this study was to determine if the type of summer intervention program (Smart Start, traditional summer school, and non-attendance) makes a difference in summer reading regression when disaggregated by grade level and socioeconomic status. Grade level was examined as a variable because early intervention is essential to alter a student's academic trajectory. Examining grade level as an independent variable aided in determining if Smart Start and traditional summer school were more impactful toward certain grade levels. Finally, as the target school district continues to experience shifts in student socioeconomic status, it was crucial to identify ways to support these students. Although Smart Start was designed to serve students in grades 1, 2, 3, and 4 with academic deficits, many of these students also lived in poverty. Examining the independent variable of socioeconomic status might assist in determining the impact it had on reading achievement. Additionally, the interaction of type of summer intervention program and socioeconomic status was studied.

Significance of the Study

Past research related to the effectiveness of summer academic interventions has yielded mixed results. While summer education programs exist to extend learning opportunities for students beyond the traditional school year to prevent academic regression, there is a wide scope of programming. The results of this study are of importance to school districts seeking to provide academic supports during the summer months for students who are academically at-risk. District administrators can use the results of this study to guide decision-making related to supporting at-risk learners, specifically summer academic programming design. Beyond the practical application of this research, these results could add to the body of knowledge relating to summer academic interventions for elementary learners identified as economically disadvantaged and academically at-risk. As educators continue to explore methods to reduce academic regression during the summer months, results of this study can help further the pursuit for effective summer academic programming.

Delimitations

To ensure this study focused on measuring the impact of a summer academic intervention designed to elevate reading achievement of elementary learners, the following delimitations were imposed to provide organization:

1. The data were collected from one suburban public school district in the Midwest.
2. The data were collected from the summers of 2013, 2014, and 2015.
3. Only data for students who met the qualifications for Smart Start were used in the study.

4. Reading achievement was measured using STAR Early Literacy and STAR Reading.
5. Although students attending Smart Start received six hours of direct mathematics instruction, only reading achievement was reported in this study.
6. This study only included those students not labeled as students with special needs.
7. STAR Early Literacy and STAR Reading assessments were administered in accordance with the target district's assessment program. Pre-test scores were gathered in April, two months before the beginning of traditional summer school and three months before the beginning of Smart Start.
8. STAR Early Literacy and STAR Reading assessments were administered in accordance with the target district's assessment program. Post-test scores were gathered in August, two months after the ending of traditional summer school and one month after the ending of Smart Start.

Assumptions

To assist the reader in comprehending the breadth of this study, the following assumptions were set:

1. Smart Start teachers had a thorough understanding of the Smart Start instructional framework and implemented it with fidelity.
2. STAR Early Literacy and STAR Reading normal curve equivalent (NCE) scores properly represent reading achievement.
3. Students put forth their best effort on STAR Early Literacy and STAR Reading assessments.

4. STAR Early Literacy and STAR Reading assessments were administered with the same proctoring procedures.

Research Questions

Three groups of students were utilized in this study: students who qualified for and attended Smart Start for 7-12 days, students who attended traditional summer school, and students who were eligible for Smart Start and did not attend or attended minimally for six days or less. Two summer intervention programs were examined in this study: Smart Start and traditional summer school. This study spanned the summers of 2013, 2014, and 2015. Students entering grades 1, 2, 3, and 4 were eligible to attend Smart Start, so this study focused exclusively on that grade level span. Socioeconomic status is related to economic and social standing. Within this study, socioeconomic status was measured by free or reduced-price lunch status. For students entering grade 1, STAR Early Literacy NCE scores were used to measure reading achievement. For students entering grades 2, 3, and 4, STAR Reading NCE scores were used to measure reading achievement. The regression between pre- and post-test scores was used to assess the impact of summer intervention on student reading achievement. The following research questions were used to guide the study:

RQ1. Was there reading score regression between pre- and post-test scores for first, second, third, and fourth grade students for the implementation years of 2013, 2014, and 2015?

RQ2. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Early Literacy NCE reading score regression for first grade students?

RQ3. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Reading NCE reading score regression for second, third, and fourth grade students?

Definition of Terms

To aid the reader in understanding the content and results of this research, terms specific to this study have been acknowledged and defined. For these reasons, clarity is provided on the following terms:

Achievement gap. The achievement gap is the separation in academic performance between learners. The gap may be attributed to socio-economic status, race, ability, or gender (Allington et al., 2010).

Academically at-risk learners. Academically at-risk learners are students whose behavior, learning disabilities, or socioeconomic status may create a barrier to academic achievement and thus increase their chances of failing to succeed (Natriello, 2002).

Comprehension. Comprehension is defined as the intentional process by which meaning is developed through an interchange between the text and the reader (National Institute of Child Health and Human Development, 2000).

Direct instruction. Direct instruction combines seven key steps, including explicit learning goals, defined criteria for achieving success, the presence of engagement, explicit instruction regarding the lesson, guided practice, closure, and independent practice (Hattie, 2008).

Economically disadvantaged. A student who is economically disadvantaged is eligible for free or reduced-price lunch. Socioeconomic status can serve as a barrier to

achievement (U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Performance Information Management Service, 2012).

Fluency. Fluency is the ability to read text with speed, accuracy, and appropriate expression (National Institute of Child Health and Human Development, 2000).

Free or reduced-price lunch eligibility. Children are eligible for free or reduced-price lunch under the National School Lunch Program if their household income is at or below the federal poverty guidelines (U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Performance Information Management Service, 2012).

Grade level. The students participating in this study were entering grades 1, 2, 3, and 4 during the summers of 2013, 2014, and 2015.

Guided reading. Guided reading is an instructional approach used in which small groups of students receive differentiated reading instruction and problem-solving support while focusing on a teacher-selected text chosen for its ability to elevate and challenge students' current reading skills (Fountas & Pinnell, 2001).

Instructional framework. A structured outline of instructional areas and allocation of instructional time defines the instructional framework. This form of organization helps provide a common language and promotes collaboration (Fountas & Pinnell, 2001).

Missouri Learning Standards. Missouri Learning Standards are grade level and course-level expectations, aligned with Common Core State Standards, that "define the knowledge and skills students need in each grade level and course for success in college,

other post-secondary training, and careers" (Missouri Department of Elementary and Secondary Education, n.d., para. 1).

Phonemic awareness. Phonemic awareness is the ability to identify and manipulate sounds or phonemes in oral words (Ehri, 2004).

Phonics. Phonics instruction is a type of training that "teaches students correspondences between letters in written language and phonemes in spoken language and how to use these correspondences to read and spell words" (Ehri, 2004, p. 167).

Regression. Regression is learning loss, as measured by the reduction in students' achievement scores (Cooper et al., 1996). In the current study, regression was measured by finding the difference between pre- and post-test NCE reading achievement scores, collected in the spring and fall.

Research-based intervention. Research-based interventions are instructional approaches based on dependable and reliable evidence that positively impacts student learning (U.S. Department of Education**,** Institute of Education Sciences**,** National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse, n.d.).

Shared reading. Shared reading is an instructional approach in which students partake in the reading of a text with guidance from the teacher. During shared reading, the teacher models skills, such as fluency and comprehension (Fountas & Pinnell, 2001).

Smart Start. Smart Start is a supplemental summer intervention in the target school district to support students entering grades 1, 2, 3, and 4. The three-week, half-day intervention featured class sizes of approximately 10-15 students and was taught by certified teachers.

Socioeconomic status. Socioeconomic status is referred to "as the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation" (American Psychological Association, 2016, para.1).

STAR Early Literacy. STAR Early Literacy is a standards-based assessment and is intended to provide educators with an understanding of students' abilities along a continuum of development (Renaissance Learning, 2012). As a computer-adaptive assessment, content and difficulty adjust based on each student's responses.

STAR Reading. The STAR Reading assessment is a tool designed to measure reading achievement in the areas of foundational skills, reading information text, reading literature, and language (Renaissance Learning, 2015). For students with a sight word vocabulary of at least 100 words, this assessment is standards-based and is intended to provide educators with an understanding of students' reading achievement along a continuum of development (Renaissance Learning, 2015).

Traditional summer school. Traditional summer school is a full-day 4-week summer program open to all students in which the morning is spent on academic content and the afternoon is focused on exploratory content, such as art, music, and movement.

Word study. Spelling instruction can occur through word study, an instructional approach based on orthographic layers of alphabetic, pattern, and meaning, rather than memorization (Williams, Phillips-Birdsong, Hufnagel, Hungler, & Lundstrom, 2009).

Overview of the Methodology

For this study, a quantitative quasi-experimental nonequivalent pre- and post-test control-group design was used to investigate the research questions. Through this research design, the researcher assessed the impact of Smart Start, traditional summer

school, and non-attendance on the reading score regression of academically at-risk students entering grades 1, 2, 3, and 4 during the implementation years. Because students could not be randomly assigned, a quasi-experimental design was ideal (Creswell, 2014). Three groups of students were used in this study: students who qualified for and attended Smart Start for 7-12 days, students who attended traditional summer school, and students who were eligible for Smart Start and did not attend or attended minimally for six days or less (referred to throughout the study as non-attending). The independent variables of type of summer intervention program and socioeconomic status were used to break down student NCE scores into small subgroups using the dependent variable of STAR Early Literacy NCE scores for first grade students, and STAR Reading NCE scores for second through fourth grade students during 2013, 2014, and 2015. These reading achievement tests were administered in the spring and fall, serving as pre- and post-tests. In the current study, a paired-samples *t* test was conducted to determine the extent of regression between pre- and post-test reading scores. Also, one- and two-way ANOVAs were conducted to determine the extent of any main effects of the independent variables of the type of summer intervention program and socioeconomic status on the dependent variables of STAR Early Literacy NCE scores for students in grade 1 and STAR Reading NCE scores for students in grades 2, 3, and 4. Students who moved or did not have matched pre- and post-test scores were removed from the study.

Organization of the Study

Chapter one served as an introduction to this study, which focused on the need for and rationale of summer academic interventions for students who are economically disadvantaged or academically at-risk to reduce academic regression during the summer

months. The emphasis of this study was the examination of a short-duration summer academic intervention focused on preventing reading score regression of first through fourth grade learners. In chapter two, a review of literature is presented, providing information regarding the achievement gap, academic regression, and approaches utilized to assist students who are economically disadvantaged or who are academically at-risk. In chapter three, a description of the methodology of the study is provided, and the research design, population and sample, instrumentation, measurement, data collection, and hypothesis testing procedures and limitations are presented. The results of the study are presented in chapter four, including descriptive statistics, testing of the hypotheses, and results of the data analysis. In chapter five, a summary of the study, major findings, findings related to the literature, conclusions, implications for action, and recommendations for further research are provided.

Chapter Two

Review of the Literature

The purpose of this study was to determine if the type of summer intervention program made a difference in student reading achievement when disaggregated by grade level and socioeconomic status. This review of the literature focused on the elements of effective reading intervention, summer reading regression, and effective structures for summer academic supports. The review of literature provided legitimacy for the research at the epicenter of this study.

In this review of the literature, components of effective reading intervention were identified to provide a foundation in which to examine summer programming. Understanding the elements of effective reading intervention assists in identifying successful summer reading supports for struggling learners. Sound practices span terms, whether they are utilized during the school year or during intervals when students do not traditionally attend school. An examination of the historical evidence related to summer reading regression and its impact on aggregating the achievement gap assisted in highlighting the need for summer academic programming, as the necessity for academic interventions during the summer months was compounded for students living in poverty. A strong connection was fostered between the achievement gap and summer vacation, which acts as a detriment to students who are economically disadvantaged. Summer academic supports have taken a variety of formats. The full historical scope of summer academic programming is presented. Following this chronological picture, ineffective summer learning practices were juxtaposed to effective summer structures and supports. Common components of effective summer academic supports were identified, and an

alignment to the principles of effective reading intervention was demonstrated. These commonalities offer a filter to understand the results of this study.

Effective Reading Intervention

Acquiring the skill of reading is a complex process, necessitating explicit instruction, modeling, and frequent exposure. Students enter elementary school with varying levels of reading experience. While some enter kindergarten with the ability to decode unknown words, others lack basic alphabetic principles. This immediate discrepancy in skills supports the need to assist students requiring further instruction. Students struggling with reading acquisition typically fall into two categories: children with sufficient oral language proficiency but inadequate phonological skills and children with poor oral vocabularies and lacking basic prereading skills, often from families living in poverty (Allington, 2011; Torgesen, 2004). Regardless of the need for differentiated support and instruction, five skill domains have been identified as necessary to develop the ability to read (National Institute of Child Health and Human Development, 2000; Torgesen, 2004). A deficit in one area impacts broad reading ability as a whole. Phonemic awareness, phonics, fluency, vocabulary, and comprehension skills all blend to enable students to decode and process text for meaning. A solid understanding of these foundational domains must be possessed before examining effective principles of intervention.

Essential components of reading. Phonemic awareness and phonics are essential to understanding the relationship between oral language and text. When a student possesses proficient phonemic awareness skills, he can identify and manipulate sounds, or phonemes, in oral language (National Institute of Child Health and Human

Development, 2000). Without this skill, decoding text lacks logic. With the ability to hear, identify, and manipulate sounds in spoken language, phonics instruction helps learners apply their understanding to written language, enabling them to decode words through the recognition that written letters correspond to oral sounds (Allington, 2013). Phonics instruction teaches students to connect phonemes, or units of sound, to graphemes, the text-based representations of these sounds. With this ability, students learn to decode words while reading and encode words while writing. Explicit phonics instruction and interventions are more effective than instruction lacking a phonics base (Foorman & Torgesen, 2001). Denton, Fletcher, Anthony, and Francis (2006) further highlighted the importance of this idea, recognizing that intervention must include "explicit, systematic phonics instruction and a high level of active student involvement" (p. 464). In Hattie's (2008) meta-analysis of learning structures, phonics instruction was recognized as significantly impactful on student learning, with an effect of $d = 0.60$. With reading instruction rooted in assisting students in developing phonemic awareness and phonics skills, learners develop a base by which to focus on the intention of text: meaning development.

While an inability to decode text through lacking phonemic awareness and phonics skills is gravely limiting, failing to ground reading instruction in the purpose of text, idea communication, is detrimental (Allington, 2013). Fluency, vocabulary, and comprehension proficiencies further aid learners in developing broad reading ability. Often, fluency is merely associated with speed. While speed is an element, fluency is far more comprehensive, involving accuracy and expression while reading (National Institute of Child Health and Human Development, 2000). When a child struggles to read

fluently, piecing together the meaning of text becomes difficult because the effort is aimed at the decoding level, rather than the meaning within and beyond the text. Comprehension is the ultimate goal of reading. Without this aim, the text remains a compilation of meaningless symbols. Students develop understanding from text using the following progression: the meaning of the word is identified by the learner, he "processes the syntax of clauses and sentences, relates clauses and sentences to one another to build local coherence, and relates larger pieces of text to build global coherence, in the end building a situation model of the text" (Duke & Carlisle, 2011, p. 200). Instruction grounded in helping students foster this skill is significantly impactful on student learning, yielding an effect of d =0.58 (Hattie, 2008). Comprehending text involves understanding the vocabulary utilized in the text. The National Reading Panel concluded,

> As a learner begins to read, reading vocabulary encountered in texts is mapped onto the oral vocabulary the learner brings to the task. That is, the reader is taught to translate the (relatively) unfamiliar words in print into speech, with the expectation that the speech forms will be easier to comprehend. A benefit in understanding text by applying letter-sound correspondences to printed material only comes about if the resultant oral representation is a known word in the learner's oral vocabulary. If the resultant oral vocabulary item is not in the learner's vocabulary, it will not be better understood than it was in print. (National Institute of Child Health and Human Development, 2000, pp. 4-15)

Vocabulary instruction assists students in developing a wider scope of language, allowing them to access this stored material while reading. Fluency, comprehension, and

vocabulary abilities build on a foundation of phonemic awareness and an understanding of phonics to enable learners to decode text fluently and understand its meaning.

Principles of prevention and intervention. Although core instruction in the general classroom is effective for helping the majority of students read proficiently, some students might require additional support. Effective reading intervention begins with the mindset of prevention before intervention. Graham and Harris (2000) identified five key principles of prevention and intervention essential to bolstering the reading achievement of all students:

1. Provide exemplary reading instruction to all children.
2. Tailor reading instruction to meet the individual needs of children who experience difficulty learning to read.
3. Intervene early, providing a coherent and sustained effort to improve the literacy skills of children who experience reading difficulties.
4. Expect that each child will learn to read.
5. Identify and address academic and nonacademic roadblocks to reading and school success. (p. 44)

When prevention and intervention revolve around these principles, educational institutions cultivate settings in which all students can learn. While these overarching principles are foundational to meeting the diverse needs of students, there are key practices that enhance these principles.

Practices to enhance the effectiveness of reading interventions. Just as the needs of students are unique and diverse, so to must be the interventions developed to assist those students. Allington (2013) recognizes no single intervention or approach

remedies the deficits of all struggling readers. Intervention must be approached from a prescriptive perspective. However, across this diversity in practice lie commonalities rooted in effectiveness.

Trained interventionists. Frequently, schools utilize any and all available staff, including specials teachers, administrative assistantants, recess staff, and paraprofessionals, to assist students. While this practice may seem beneficial in theory, in reality, it often pairs those with the least amount of training with students having the greatest need (Allington, 2011; Allington, 2013; DuFour, DuFour, Eaker, & Carhanek, 2009). When students are performing below expectations, their best chance for growth occurs when they receive support from educators with the background knowledge and training to propel learners forward (Graham & Harris, 2000). Reading specialists and classroom teachers who receive targeted professional development and have access to literacy support can diagnose and remedy students' reading difficulties, as opposed to paraprofessionals, who only slightly advance student progress (Allington, 2013).

Coherence with regular classroom instruction. While some academic interventions occur within the regular classroom, some students receive supplemental support outside the regular classroom. This practice offers multiple advantages, but may create disjointed instruction, which limits students' application of knowledge across separate locations. Effective reading interventions feature instruction that supports the regular classroom, allowing students to easily transfer knowledge and skills (Graham & Harris, 2000). To enable this process, schools can eliminate disjointed instruction with the use of common instructional frameworks. The use of instructional frameworks

allows educators to communicate with a common language, promote collaboration, and ease student transitions within the school (Fountas & Pinnell, 2001).

Small group instruction. When regular classroom instruction does not eliminate a child's academic deficits and intervention is required, small group delivery increases its impact. Children at risk of academic failure "will learn more rapidly under conditions of greater instructional intensity than they learn in typical classroom settings" (Foorman & Torgesen, 2001, p. 209). Intensity increases as group sizes are reduced because students receive more direct support and guidance. For students struggling academically, this is essential. Hattie (2008) explains that student learning is significantly impacted when group sizes remain small and feature collaboration and cooperation amongst the group members. Ideal intervention groups range from one-on-one instruction to groups no larger than three to five students (Allington, 2011; Torgesen, 2004).

Targeted population. Effective intervention is direct and prescriptive, providing students with explicit instruction based on their skill deficits to enable them to achieve academic success. Because no broad instructional activity meets the needs of every learner, intervention must be specific and individualized (Torgesen, 2004). Small group settings are ideal for targeted, differentiated support. While intervention assists in boosting academic achievement, Graham and Harris (2000) contend educators should not hesitate in targeting and assigning intervention to learners in the primary grades to prevent their difficulties from intensifying. Directing reading support to kindergarten and first grade students serves as an investment.

Direct instruction. After struggling learners are grouped for instruction aligned with the regular classroom, direct instruction serves as an extremely effective method by

which to guide learners. Hattie (2008) recognized direct instruction has a strong effect on student learning and defines direct instruction through the presence of: (a) explicit learning goals, (b) defined criteria for achieving success, (c) engagement, (d) explicit instruction regarding the lesson, (e) guided practice, (f) closure, (i) independent practice. Direct instruction "integrates [the] cognitive, motivational, and social dimension" (Baker, Dreher, & Guthrie, 2000, p. 2) of learning, ensuring students find relevance and purpose in their work.

High-success reading. To make reading advancements, struggling students must engage in high-success reading, or reading in which students have a 98% or higher accuracy rate (Allington, 2013). Too often, struggling readers are exposed to texts that frustrate them. When students are unable to read passages fluently, comprehension cannot occur. Intervention and classroom instruction utilizing texts at an appropriate complexity level ensure students can successfully engage in learning.

Effects of Summer Vacation on Student Learning

The modern school year calendar has been greatly shaped and molded by decisions rooted in the late 1800s. Following the American Revolution in the late 1700s, the education of youth became a focal point in the United States. As schools became established, their practices and calendars were largely driven by needs of those they served (Association of California School Administrators, 1988; Cooper, 2004; Gold, 2002). As the needs of communities varied, educational consistency across the nation was not a priority.

Schools serving students in rural communities operated around agricultural needs, economic restraints, and seasonal transportation limitations (Gold, 2002). Up until the

1890s, the school year in rural areas ranged from three to seven months, with shorter lengths being connected to greater farm acreage per district (Kaestle & Vinovskis, 1981). While some rural schools were only open during the summer months because of seasonal transportation limitations, others hosted school sessions during the winter and summer months to allow children to assist with planting and harvesting responsibilities in the spring and fall (Gold, 2002; Odell, 1930).

Children living in urban communities experienced entirely different educational settings. From 1841-1842, the Commissioner of Education gathered reporting data on school year length. The cities of Brooklyn, Baltimore, and Cincinnati hosted 11-month school sessions while Buffalo went 12 months (Odell, 1930). As a whole, urban communities featured schools that operated during the summer months. With optional attendance requirements, children of middle-class and wealthy families frequently fled the city to escape the summer heat (Gold, 2002).

The region, age of the child, occupation of the parents, and season influenced the length of the school year. Because of discrepancies between schools, the years between 1840 and 1890 gave way to the movement of calendar reform and the desire to blend the urban and rural realities. The creation of the standard 180-day, nine-month school year was sold as a compromise, but driven by the social elite's desire to maintain summer escapes (Cooper, 2004; Gold, 2002). Fear of sickness derived from too much schooling further influenced this decision (Gold, 2002). Although statistics indicating summer terms in urban schools were beneficial, both rural and urban leaders "recognized the pervasiveness of the idea that summer vacation was needed to recharge weary school children and adults . . . [and] was meant to be used to achieve individual and social

purposes" (Gold, 2002, p. 74). The modern-day school year calendar was a response to the desire to create consistency amongst districts, ensure schools did not inhibit wealthy families during the summer months, and protect the physical and mental health of students and educators.

Academic regression during summer. One's perspective dictated the view held about the movement toward a common school year calendar. For children in urban areas, the 180-day, nine-month academic year severely shortened their exposure to academic instruction. However, for children in rural areas, this movement increased schooling. While initial energy toward this educational compromise was partially rooted in fear of sickness accrued through too much schooling, the early 1900s led to concern over academic regression during summer months.

The beginning of the 1900s gave birth to the first study of summer regression. White (1906) conducted a study of learning loss in math, noting students' computational fluency decreased. In 1914, it was acknowledged that 85% of children were at home during the summer without mental stimulation and "much that was learned in school at previous sessions is forgotten. Many of the children become criminals, and still more form habits of idleness" (U.S. Bureau of Education, 1914, pp. 408-409). A 1919 study of 747 fifth, sixth, and seventh graders demonstrated students who maintain an active mind and engage in work, rather than play, regressed less mathematically than those who engaged only in play (Garfinkel, 1919).

Brueckner and Distad (1924) examined the reading scores of 315 first graders. Although no significant learning loss was noted, variation between children with different abilities was observed, making this study the first of its kind to examine learning loss by

ability. Throughout the remainder of the 1920s, interest in summer regression remained high, as seven additional studies were conducted, but findings were inconsistent. Noonan (1926) found minimal loss in mathematics computation and spelling, but no regression in reading. Elder (1927) noted a discrepancy in reading regression between achieving and struggling readers, creating a gap between the two groups. Kramer (1927) indicated stronger regression amongst academically achieving students than struggling students. Nelson (1928) found mathematics losses for students entering grades 3, 5, and 7. Recovering from regression took an average of two to six weeks (Nelson, 1928). Bruene (1928) discovered reading gains and mathematics regression in upper elementary students. However, the average gains were linked with students who had high IQ scores (Bruene, 1928). Inconclusive results were reported by Irmina (1928), indicating inconsistent gains and losses across content areas. Morgan (1929) reported regression in both mathematics and reading comprehension.

During the 1930s and 1940s, interest in summer regression waned. While six new empirical studies were conducted, attention on the issues of summer learning loss was not a priority (Cooper et al., 1996). When observed on a closer level, studies involving students with higher levels of intelligence or students from middle or upper-class homes demonstrated growth in reading achievement, whereas children with lower levels of intelligence or from impoverished socioeconomic groups exhibited a steady loss of reading skills. Of the six studies that occurred during these decades, Kolberg (1934), Schrepel and Laslett (1936), Lahey (1941), and Cook (1942) all concluded intelligence impacted the retention of learning during the summer.

Following the 1940s, interest in summer learning regression continued to decrease. The 1960s and 1970s led to a resurgence of studies with increased validity due to improved assessment tools and the use of inferential statistics (Cooper et al., 1996). These studies demonstrated gender and intelligence had no consistent influence, but socioeconomic status steadily played a role in summer learning loss across subject areas (Cooper et al., 1996).

With increasing interest in learning loss, studies became more specified and extensive. Beginning in the fall of 1976, data from 120,000 elementary students in a nationally representative sample was collected as part of the Sustaining Effects Study (Carter, 1984). Although this study was conducted primarily to assess the effects of compensatory education, an evaluation of summer regression was included because the data was available (Carter, 1984). The Sustaining Effects Study received special attention because its results indicated a child's socioeconomic status and summer learning loss had no correlation (Carter, 1984). The data used in the Sustaining Effects Study served as a source of controversy and as the basis for further studies that sought to refute its claims.

Heyns (1978) conducted one of the most widely cited studies on learning loss. She examined the school-year achievement gains and summer loss of 2,978 students in grades 6 and 7 in Atlanta (Heyns, 1978). Using a subtest of the Metropolitan Achievement Test and home interviews, Heyns demonstrated the strong influence school has on achievement. As summer vacation continued, the achievement gap between socioeconomic and racial groups widened. For underperforming groups, the results of

Heyns' study demonstrated higher intelligence did not remedy the influence of socioeconomic status or race.

Entwisle and Alexander (1992) refined Heyns's work and further examined learning loss in relation to the influence of school. Their study, referred to as the Beginning School Study, began in 1982. It was a longitudinal study of academic and social growth extending from first grade through age 22 and followed 790 first graders from across 20 schools in Baltimore throughout their development. Entwisle and Alexander (1992) concluded students of varying racial and socioeconomic groups gained at similar levels during the school year, but economically disadvantaged children suffered from learning loss over the summer. Poverty became the overpowering factor, overriding minority status, which was previously thought to correlate to learning loss.

In their synthesis of 39 summer learning loss studies, Cooper et al. (1996) concluded that achievement levels of lower income children were consistently lower in the fall than the previous spring, whereas middle and upper-income children began school in the autumn with slight gains. Of the 39 studies included, 13 studies were integrated using meta-analytic procedures. The results of this work indicated gender, race, and intelligence quotient (IQ) scores had no moderating effects on summer learning loss (Cooper et al., 1996). However, socioeconomic status was isolated as the differential factor. Cooper et al. (1996) theorized that income discrepancies impacted the opportunity to exercise learned skills during the summer months.

Examination of summer learning loss in the 2000s continued to build on Cooper et al.'s (1996) meta-analysis. Downey, Hippel, and Broh (2004) used data from the Early Childhood Longitudinal Study-Kindergarten Cohort collected from 1988 to 1999. Cohort

data was nationally representative and included approximately 22,000 students. Downey et al. (2004) determined schools served as an equalizing force during the academic year but recognized unequal home environments significantly impacted a child when school was not in session. To remedy this inequality, Downey et al. (2004) recommended "improv[ing] disadvantaged children's non-school environments, or increas[ing] their exposure to schooling through summer school or increase school days per year" (p. 32). Continued study of summer learning loss identified socioeconomic status as the defining element, determining children's academic position when returning to school in the fall. Consistently, every child suffers mathematics regression, but lower income children additionally suffer reading loss while middle and higher income children experience gains (Cooper et al., 1996; Entwisle et al., 2001; Hattie, 2008).

Academic interventions provide students with the supports necessary to increase their academic achievement. As the school year concludes and academic exposure for certain students dwindles, summer learning loss becomes a concern. The start of summer vacation creates a dichotomy. For some students, the summer months are filled with unique and varied learning experiences only available beyond the walls of a classroom. For other students, access to literacy materials and experiences comes to a drastic halt when summer begins. These students often transition from a combination of general education instruction and small group support to the absence of literacy support. With over 96% of school districts in the United States operating under a traditional nine-month academic year and 22% of children in the United States living below the federal poverty level and an additional 22% of children living in low-income families, nearly half of all

children are at risk of experiencing regression in the academic skills accrued during the school year (Jiang, Ekono, and Skinner, 2015; Skinner, 2014).

Learning rate during the school year. As the study of summer learning loss evolved, learning rates during the school year became a point of consideration. If disparities in learning rate occurred during the school year, logic would dictate disparities would continue during summer. However, if contributions to the achievement gap were minimized during the school year and compounded during the summer, summer would become a season of added value over a child's academic career. Regardless of minority status, gender, or socioeconomic status, research revealed students learn at relatively the same rate during the school year (Alexander & Entwisle, 1996; Bracey, 2002). Entwisle et al. (2001) noted, "children's ability to learn during the school year seems little impaired by scarce family resources" (p. 15). Furthermore, despite the varying quality of schools, they "provide all children with comparable cultural knowledge and skills, compensating for some children's lack of cultural capital at home" (Burkam, Ready, Lee, & LoGerfo, 2004, p. 6).

Socioeconomic achievement gap. With consistent rates of learning occurring during the school year, the learning loss of children living in poverty can reasonably be connected to the overall socioeconomic achievement gap that accrues throughout a child's educational career. Since the 1950s, achievement disparities between low-income families and high-income families have continued to rise (Reardon, 2013). The Matthew effect, the faucet theory, and the opportunity gap all contribute to this increasing discrepancy (Bracey, 2002; Entwisle et al., 2001; Miller, 2007; Stanovich, 1986).

Matthew Effect. The Matthew Effect references Matthew 25:29 (New American Standard Version), which states "for to everyone who has, more shall be given, and he will have an abundance; but from the one who does not have, even what he does have shall be taken away." The Matthew Effect, as applied to reading, refers to the idea that students who begin with success will continue to find success, and those who struggle are unlikely to close the gap (Stanovich, 1986). Children who began school with proficient vocabularies and prereading skills were likely to continue succeeding, while those who began school with deficits were likely to continue experiencing difficulty (Stanovich, 1986). Despite the common skills learned in school, there is differential use of these skills outside of school, thus limiting achievement (Stanovich, 2000). While Stanovich's application was broad and not specific to summer learning loss, there is direct relevance. As Entwisle et al. (2001) continued their study of learning loss, they credited Stanovich, recognizing the idea that those who are experiencing success are likely to continue experiencing success.

Faucet theory. The faucet theory, termed by Entwisle et al. (2001), describes a contributor to the socioeconomic achievement gap:

> When school was in session, the resource faucet was turned on for all children, and all gained equally; when school was not in session, the school resource faucet was turned off. In summers, poor families could not make up for the resources the school had been providing and so their children's achievement plateaued. Middle-class families could make up for the school's resources to a considerable extent and so their children's growth continued, though at a slower pace than during the school year. (p. 12)

Conducted by Entwisle, Alexander, and Olson (2014), the Beginning School Study, a longitudinal study of academic and social growth extending from first grade through age 22, followed 790 individuals throughout their development. Disadvantaged and advantaged children made similar achievement gains during the school year. Despite this equality, the achievement gap present when disadvantaged children began school was compounded by summer learning loss throughout their educational careers. The faucet of resources schooling provides significantly benefit students, but disparate economic circumstances can override the equalizing force of schools.

Opportunity gap. Economically imbalanced home environments have created unequal opportunities. During the summer, many children in middle and upper-class homes are privileged to travel, visit libraries, attend camps, and participate in activities that further academic and social skills, while children in poverty have less access (Bracey, 2002). This occurrence is referred to as the opportunity gap. While the opportunity gap is diminished during the school year, factors such as cost and transportation greatly hinder children living in poverty from participating in activities mirroring their advantaged peers (Miller, 2007). Impacting children before they begin schooling and throughout their summers away from the school setting, the opportunity gap furthers the achievement gap because children with restricted access to experiences have limited opportunity to build background knowledge. Blazer (2011) acknowledged "the effect of summers without meaningful learning opportunities is cumulative and the achievement gap between economically advantaged and disadvantaged students grows wider and wider with every passing year" (p. 9). The impact of the opportunity gap is powerful and limits the potential of students as,

> Summer shortfall over the five years of elementary school accounts for more than half the [achievement gap] difference, a larger component than that built up over the preschool years. Moreover, too, these learning differences from the early years that present themselves in 9th grade reverberate to constrain later high school curriculum placements, high school dropout, and college attendance. (Alexander et al., 2007, p. 175)

Limited experiences beyond the school setting lead to limited background knowledge. Background knowledge increases connections and aids students in understanding new content. Restricted opportunities hinder the academic progression of learners throughout their school careers.

Responding to Summer Regression

With the reality of summer regression, which is specifically impactful to those students who are economically disadvantaged, the need to provide academic supports is undeniable. Since the adoption of the common nine-month school year calendar, a variety of structures has been utilized to remedy summer learning loss. A history of summer school from the 1800s through present-day is provided. Finally, the summer school and summer intervention literature are synthesized, and common traits of both effective and ineffective practices are identified.

History of summer school. As the 1800s concluded and school year calendars operated with consistency across regions, leaving summer vacation as a time away from traditional schooling, disparities in the use of this time arose between social classes. Wealthy Americans spent the summers vacationing, while economically disadvantaged families had little leverage. Gold (2004) noted, “philanthropists and educators feared the

extent and consequences of this particular social cleavage and sought to mute it through vacation schools, which would mimic the leisure activities available to more wealthy children" (p. 116). Vacation schools, aimed at servicing children residing in urban areas, worked to eliminate the "twelve weeks in which there was no place for the children of the poor but to remain in the narrow tenements or roam the streets" (Curtis, 1904, p. 3). Vacation schools were operated by civic and religious groups before the twentieth century, but as urban school leaders began to cease control of vacation schools by the early 1900s, nearly all cities' housing populations greater than 100,000 hosted vacation schools (Curtis, 1904). As school districts began to fund and operate vacation schools, the agenda of schools shifted from moral and enrichment-based instruction to academic instruction (Odell, 1930). By the 1920s, summer school replaced the vacation school, but with summer programming mimicking the regular school programming, "they lost the many qualities that made them distinct from the regular schools: flexible organization, an eclectic collection of teachers, relaxed discipline, and warm interpersonal relations" (Gold, 2004, p. 208). Additionally, decreased summer school expenditures during the Great Depression of the 1930s curtailed summer offerings. During this time, the federal government began to influence the work of summer schools. New Deal work programs provided summer vocational opportunities and summer school programs of the 1940s shifted from academic to enrichment to provide an enjoyable setting for children of families involved in wartime efforts (Gold, 2004). The 1950s brought about a radical refocus on mathematics, science, and foreign languages, as prompted by the National Defense Education Act (Clowse, 1981). As the 1960s began and the civil rights movement continued, the federal government continued to increase support for summer

programming, particularly for economically deprived children. This support came under Title I of the Elementary and Secondary Education Act (Cooper, Charlton, Valentine, & Muhlenbruck, 2000; Gold, 2004).

In 1979, the United States District Court recognized that the Pennsylvania Department of Education was required to provide extended school year learning opportunities to children with disabilities under the Individuals with Disabilities Education Act (Cooper, 2001). This ruling further cemented the reality of summer regression and represented a national movement to minimize summer learning loss. The 1990s brought about stronger support for summer school structures. As the American family unit evolved and single-parent families became more prevalent, the need for school-based supports outside the regular school year increased (Cooper et al., 2000; Cooper, 2001). Additionally, higher academic standards and global competitiveness caused increased summer school momentum (Cooper, 2001). Summer education in the 2000s continued to be refined, and programs specific to the needs of learners were developed. As the research on summer learning demonstrated quality programs impact summer learning, the refinement of summer academic supports continued (Denton, 2002).

Present-day summer school structures. While summer school programming is different district to district, there are four general structures in which all programs align. General competency-based programs serve all students and assist students in meeting universal academic expectations. These traditional programs mimic the regular school day in structure, focus, and class size. Secondly, summer programming at the secondary level may be credit-based and provide students with the option to retake coursework or

move at an expedited pace. The third structure is derived from the Individuals with Disabilities Education Act, which ensures Extended School Year support for qualifying students. Finally, the Elementary and Secondary Education Act of 1965 provided authorization for summer programming under Title I. This support is focused toward students who are economically disadvantaged and varies in structure, focus, and class size. Because of the flexibility, it may be more prescriptive and intervention-based (Cooper, 2004). Although there are four overarching summer school structures, the impact of a traditional summer school program serving elementary students and an intervention-based summer program for elementary students were compared in this study.

Traditional summer schools. Summer school programs mimicking the regular classroom are common and used by school districts to extend the learning season. Traditional summer school programs are not designed to target a particular population of students, as all students may attend summer school (Alexander et al., 2007). Traditional summer school programs have operated with a history of mixed results (Heyns, 1987; Karweit, 1993). Heyns (1987), author of the landmark 1978 study of summer learning involving 2,978 students, noted traditional summer school programs did not seem to improve academic progress. Hattie (2008) noted summer school programs were ineffective in significantly elevating student achievement "although the effects were more positive for middle-class than students from disadvantaged backgrounds" (p. 77). Given the evidence of summer academic regression amongst children who are economically disadvantaged, programming that further creates academic gaps works in opposition of minimizing the achievement gap.

While summer school has not served as a tool to significantly elevate student learning, it may work to prevent reading loss (Cooper et al., 1996). Summer school provides continued engagement in literacy-based activities, which assist in reducing skill loss. Daly (2014) noted a summer school program serving 213 elementary students in an urban setting in the northwestern United States prevented learning loss but did not increase the achievement of children coming from economically disadvantaged families. Daly (2014) noted a disconnect between the curriculum used in summer school and the curriculum used during the school year. Across studies, summer school programs reduce learning loss, but fail to elevate learning significantly. Entwisle et al. (2001) recognized that "the summer school gains for students of all socioeconomic levels is quite small, roughly one month on average or a few test points on standardized tests" (p. 23).

Although traditional summer schools may visually appear similar to schools during the academic year, with comparable class sizes and structures, traditional summer school programs operate with far more flexibility and freedom than schools during the regular school year. Cooper (2001) recognized,

> The existence of summer learning loss cannot *ipso facto* be taken to mean summer educational programs will be effective remedial interventions. Summer school might not change the educational trajectory of students who took part in such programs. The impact of summer educational programs has to be evaluated on its own merits. (p. 3)

Tremendous variance exists between summer school programs, making it difficult to generalize impact.

Curtis, Doss, and Totusek (1982) highlighted summer school programs typically result in little educational benefit due to ten common factors:

- Short duration
- Loose organization
- Little time for advanced planning
- Low academic expectations by both teachers and students
- More emphasis on "fun" than during the regular school year
- Discontinuity between the curriculum of the regular year and summer school
- Time wasted as new teachers assess, get to know, and establish expectations with students
- Teacher fatigue from the regular school year
- Low student attendance
- Homogeneous classes, mainly composed of low-income, low-achieving students, which are known to correlate with low achievement. (p. 2)

Given results of traditional summer schools vary on a program-by-program basis and many are afflicted by common woes that limit their impact, it is clear these programs are not the solution to closing the achievement gap that occurs because of the summer months.

Summer interventions and effective summer reading supports. With the specific intent to remedy the problem of the growing achievement gap impacted by summer learning loss, prescriptive summer programming may offer the best chances of increasing summer achievement (Heyns, 1978). As schools design programs to meet the needs of at-risk learners, "quality summer programs for struggling students are essential to closing

the gaps, and any school that does not offer such programs essentially gives up on some pupils. Summers without meaningful learning doom some students to failure" (Denton, 2002, p. 12). There is an obligation to guarantee students receive the support they need for long-term success. Bell and Carrillo (2007) recognize effective summer learning programs feature,

1. Intentional focus on accelerating learning
2. Firm commitment to youth development
3. Proactive approach to summer learning
4. Strong, empowering leadership
5. Advanced, collabortive planning
6. Extensive opportunities for staff development
7. Strategic partnerships
8. Rigorous approach to evaluation and commitment to program improvement
9. Clear focus on sustainability and cost-effectiveness. (p. 46)

The design and implementation of summer programming are central to its effectiveness. A willingness to adjust from the universal approach and embrace creative measures of design offers the best chance to assist children who are academically at-risk (Gold, 2004).

Barr-Cole (2004) investigated the impact of a summer reading intervention program on 120 students entering upper elementary in the Pacific Northwest. Students who participated in the summer reading intervention program were identified based on performance within the bottom quartile of the Stanford 9 test. For three hours five days per week for six weeks, students received instruction in decoding, reading fluency, and

writing. For participating students, statistically significant post-test results were indicated. Barr-Cole (2004) emphasized the importance of a data-monitored program.

Schacter and Jo (2005) conducted a study to "evaluate the impact of a research-based summer reading day-camp intervention on the reading performance of students who were economically disadvantaged" (p. 160). In their study of 72 first graders in south Los Angeles, California, an eight-week summer day camp structure with two-hour daily reading small group instruction not only prevented summer regression, participating students experienced significantly elevated reading achievement (Schacter & Jo, 2005). The importance of program duration and time was highlighted in Schacter and Jo's (2005) study.

Seward (2009) investigated the impact of summer intervention on 189 first grade students struggling with phonological awareness and word reading in Ontario, Canada. Seward's study was unique because she developed three groups: summer intervention participants, summer intervention participants with parent education, and non-participants. Results indicated students participating in the summer intervention with parent education outperformed their peers in measures of phonological awareness and word reading, indicating the value of parent support.

Pechous (2012) studied the effectiveness of a three-week direct instruction summer intervention program in a Midwestern suburban school district on 182 kindergarten through third grade students identified in the bottom quartile based on the AIMSweb Reading Curriculum-Based Measurement and the AIMSweb Test of Early Literacy. The results of this three-year study indicated less reading regression amongst participating students in comparison to their non-participating peers. Participating

students received instruction utilizing a research-based, explicit phonics curriculum from teachers who received precise training. Pechous highlighted the importance of phonics instruction, research-based curriculum, and highly trained teachers.

Similar intensive summer supports have demonstrated similar effects. Zvoch and Stevens's (2013) depicted the benefit of a five-week intensive summer literacy intervention for at-risk kindergarten and first grade students, which elevated student performance by the beginning of the school year. Their study, conducted in a moderately sized city in the Pacific Northwest, assessed the performance of 93 kindergarten and first grade students. The results of Zvoch and Stevens's study demonstrated "that targeted summer instruction can be an effective strategy to support student learning over the summer months" (p. 30).

Effective summer supports possess definitive structures and intentional purposes, which lead to increased student achievement (Bell & Carrillo, 2007). In addition to the nine features of effective summer programs outlined by Bell and Carrillo (2007), there are seven elements of structure that boost student learning during the summer months and assist in reducing summer reading regression. Purposeful program design positively impacts student performance, as dynamic summer programming accelerates learning (Bell & Carrillo, 2007).

Population. While many summer programs offer universal supports, effective interventions target disadvantaged students because equal progress is not made through broad programming (Alexander et al., 2007). In addition to targeting efforts toward students who are disadvantaged, whether economically or academically, beginning these interventions early is essential (Cooper, 2004). While students, regardless of

socioeconomic status, learn at similar rates during the school year, the onset of summer causes students with few resources to regress academically while their peers maintain or add to their learning. By intervening in the preschool and primary grades, the differential gap that begins developing early is reduced as "the trajectory of children's long-term educational careers is being established" (Entwisle et al., 2001, p. 15). With an understanding that the achievement gap in kindergarten predicts the achievement gap throughout a child's schooling, summer supports during early childhood serve as a tremendous investment in a child's continuing education (Alexander et al., 2007; Reardon, 2013). Although "no single approach is likely to close the academic gap between low- and high-income children, but summer programs bracketing first grade especially, for disadvantaged children alone, could help" (Entwisle et al., 2001, p. 15).

Intervention design and activities. Hattie's (2008) meta-analysis recognized summer programs have little overall impact on student learning. However, programs specifically designed around the needs of students demonstrated greater effect sizes (Hattie, 2008). Because of the opportunity gap between students of varying socioeconomic status, children who are economically advantaged frequently have access to literacy resources and experiences during the summer months (Entwisle et al., 2001). By reducing the opportunity gap, the achievement gap can be positively impacted. Providing access to books is essential in summer programming design (Allington et al., 2010). Beyond increasing accessibility to literacy resources, effective summer interventions allow extensive time for reading. Time spent reading leads to higher academic achievement (Anderson, Wilson, & Fielding, 1988; Crowell & Klein, 1981; Culliman, 2000; Lundstrom, 2006; Miller, 2007). To impact positively the reading

achievement of students who are economically disadvantaged, acknowledging the gap in summer opportunities between socioeconomic groups and intentionally designing programs around these activities is essential. Although being purposeful in allotting time for literacy experiences is necessary, student engagement must be intertwined, as **"**engagement is key to learning, and engagement can be difficult to achieve if summer programs are perceived as punitive" (Entwisle et al., 2001, p. 15).

Parent involvement. Although parents of disadvantaged students may lack resources, their participation in summer programs is of tremendous value. When parents are involved in summer interventions, they help bolster the effects on student achievement (Cooper, 2004). Educating students is only one facet of successful summer programs. Providing parents with direction and guidance for the support of their children assists them in the reinforcement of skills (Lundstrom, 2006).

Time. Summer programs operating for a minimum of 45 hours offer the best chance to increase student achievement (Lauer et al., 2006; Schacter, 2003). Filling this time with purposeful learning and prescriptive instruction is essential. Zvoch and Stevens (2013) evaluated the impact of a five-week intense summer program that provided small groups of students with 3.5 hours of daily literacy instruction. This program duration elevated the reading achievement of at-risk students by the beginning of the school year.

Small program. Universal summer programs have little effect on student achievement because they are not designed to meet prescriptively the needs of struggling students (Hattie, 2008). Effectual summer programming that directly aligns with the needs of students features a small number of schools or classes (Cooper, 2003; Cooper,

2004). Zvoch and Stevens (2013) focused on a program designed for kindergarten and first grade students that tailored whole and small group instruction to the particular needs of the students. Because fewer than 100 students were served, administrators and teachers were able to modify instruction easily and hone in on the students' unique needs. Flexibility to design a summer instructional program in response to the needs of the learners is essential (Harrington-Lueker, 2000).

Small groups. Linking back to the foundations of effective reading intervention, small group instruction is an essential element of intervention. Within summer reading programs, instruction occurring in small group settings positively impacts students learning (Cooper, 2004). Aiming for class sizes of approximately 10 students encourages teachers to adapt the pace of instruction to the needs of the students and allows for one-on-one instruction and support (Harrington-Lueker, 2000).

Data monitored. Curtis, Doss, and Totusek (1982) recognized loose organization negatively influences summer supports and is commonplace among broad-based programs. If summer interventions aim to target students' needs, their progress and growth must be closely monitored (Cooper, 2004; Harrington-Lueker, 2000; Lauer et al., 2006); this data provide educators a tool to target directly areas in which students are demonstrating difficulty.

Summary

The study of summer academic regression has a rich history, but until the achievement gap between children of varying socioeconomic status has been eliminated, summer learning loss will continue to possess immense relevance and importance. Summer programs attempting to eliminate regression have yet to pinpoint an ideal

configuration. Lauer et al. (2006) called for continued documentation of effective characteristics of summer programs.

The review of the literature has served to provide legitimacy of and justification for the research at the center of this current study. When responding to learners with reading deficits, an understanding of the elements of effective reading intervention is crucial. These elements retain their effectiveness regardless of season and are of immense value when aiming to bolster the reading achievement of an underperforming population. Additionally, this review retraced the history of the school year calendar and clarified its often misunderstood past. With little variation in the school year calendar from the late 1800s, the response to summer regression throughout the 20th century was outlined, providing a place for the results of this current study in a continuing line of attempts made to eliminate summer academic regression of children who are economically disadvantaged. Chapter three expands on the methods utilized to address the research questions specified in chapter one.

Chapter Three

Methods

The rationale for this study was to determine if the type of summer intervention program makes a difference in student reading achievement when disaggregated by grade level and socioeconomic status. Chapter three includes methodology utilized for the study, including the research design, population and sample, sampling procedures, and instrumentation. Additionally, this chapter includes the data collection procedures, data analysis and hypothesis testing, and the limitations of the study.

Research Design

This study was conducted using a quantitative quasi-experimental nonequivalent pre- and post-test control-group design. This approach was appropriate to compare the impact of two summer intervention programs on the reading achievement of selected at-risk students entering grades 1, 2, 3, and 4. With quantitative research, statistical procedures are used to analyze quantifiable data associated with the variables to assist with examining relationships (Creswell, 2014). This study was developed to examine the impact of traditional summer school and Smart Start on NCE scores when grouped by attendance, socioeconomic status, and grade during 2013, 2014, and 2015. In this study, students had to meet designated criteria, therefore preventing the option of random assignment. Included in this study were the following independent variables: type of summer intervention program (Smart Start, traditional summer school, and non-attending) and socioeconomic status in 2013, 2014, and 2015. Dependent variables included first grade STAR Early Literacy spring and fall NCE scores and second, third,

and fourth grade STAR Reading spring and fall NCE scores. Results were disaggregated by grade level.

Population and Sample

This study was focused on a population and sample of the target school district, which was located in a Midwest suburban school district. Included in Table 2 is the population of students entering grades 1, 2, 3, and 4 during the years included in this study.

Table 2

Population of Students Entering Grades 1, 2, 3, and 4 at the End of the School Year

Year	Grade 1	Grade 2	Grade 3	Grade 4	Total	Percent Free or Reduced-Price Lunch
2012-2013	881	934	878	849	3542	28.9
2013-2014	884	929	906	894	3613	36.0
2014-2015	945	938	958	925	3766	36.2

Note. Adapted from Data Systems Analyst, personal communication, November 18, 2015.

The target population for the current study included elementary students entering grades 1, 2, 3, and 4 in the target school district identified as academically at-risk, as determined by STAR Reading and STAR Early Literacy scores, during the 2012-2013, 2013-2014, and 2014-2015 school years. Additionally, a subsection of these students attending the four lowest-performing elementary schools in the target school district was invited to participate in the summer intervention, Smart Start. Students included in the population were also required to have pre- and post-test NCE reading achievement scores, as measured by STAR Reading or STAR Early Literacy. Purposive sampling was used to identify the students in the current study because they were not randomly drawn from the

population (Lunenburg & Irby, 2008). The sample consisted of students entering grades 1, 2, 3, and 4 in the target district during the summers of 2013, 2014, and 2015 who had STAR Reading or STAR Early Literacy scores below the 30th percentile during the winter assessment window, which consistently occurred during December before summer school. Students in this sample, excluding students who qualified for and had in place an Individualized Education Plan, were organized into three groups: students who qualified for and attended Smart Start for 7-12 days, students who attended traditional summer school, and students who were eligible for Smart Start and did not attend or attended minimally for six days or less. Students in all three groups had STAR Reading or STAR Early Literacy scores under the 30th percentile during the winter assessment window, which consistently occurred during December before summer school.

Sampling Procedures

For this study, purposive sampling was utilized. Lunenburg and Irby (2008) recognize that purposive sampling focuses on the group to be sampled based on the researcher's familiarity with the focus of the study. Puposive sampling allows for criteria to be used for identifying the sample. To create the Smart Start group and non-attending Smart Start group, four elementary schools with the lowest overall STAR Early Literacy and STAR Reading scores were identified during the 2012-2013, 2013-2014, and 2014-2015 school years. Students entering grades 1, 2, 3, or 4 were identified based on their December STAR Reading or STAR Early Literacy scores. The students' names and scores, excluding students receiving special education services, were provided to the principal of the Smart Start program. Additional classroom data, including running records and anecdotal notes, were compiled to ensure the students who were invited were

academically at-risk. During April of the 2012-2013, 2013-2014, and 2014-2015 school years, invitations and parent permission slips were provided to parents for participation in Smart Start. Students within the Smart Start group and non-attending Smart Start group had to qualify for Smart Start, have parent permission to attend, and been entering grades 1, 2, 3, or 4 during the summers of 2013, 2014, or 2015. Following Smart Start, attendance information was collected to determine the Smart Start group and non-attending group.

The traditional summer school sample was identified by filtering the traditional summer school attendance rosters by designated criteria to mirror the demographics and qualifying measures of the Smart Start and non-attending Smart Start groups. These students' STAR Reading or STAR Early Literacy scores from the December assessment preceding summer were identified and narrowed to the 30th percentile. Students remained in the sample if they had a notation of "free," "reduced," or "paid," in reference to free or reduced-price lunch. Across all groups, the same criteria were used.

Instrumentation

Two reading assessment measures were utilized for this study: STAR Early Literacy and STAR Reading. All students in the sample completed STAR Early Literacy or STAR Reading in accordance with the district assessment calendar. Because this study was conducted to examine the impact of a summer academic achievement, STAR Early Literacy and STAR Reading NCE scores from spring and fall served as the pre- and post-assessments. STAR Early Literacy was used to measure the achievement of students entering grade 1, and STAR Reading was used to measure the achievement of students entering grades 2, 3, and 4.

STAR Early Literacy. STAR Early Literacy is a standards-based assessment and is intended to provide educators with an understanding of students' abilities along a continuum of development (Renaissance Learning, 2012). As a computer-adaptive assessment, content and difficulty adjust based on each student's responses. This adaptive assessment utilized test items from an item bank of approximately 2,100 items (Renaissance Learning, 2012). STAR Early Literacy features graphics and audio directions to aid students in completing the assessment independently. The assessment contains 27 multiple-choice items and is completed in approximately 10 minutes (Renaissance Learning, 2012).

Measurement. The STAR Early Literacy assessment is a tool designed to measure early literacy and early numeracy skills throughout the primary grades (Renaissance Learning, 2012). STAR Early Literacy is designed to be an age- and content-appropriate assessment tool. This assessment tool is used to measure achievement in three broad domains, including word knowledge and skills, comprehension strategies and constructing meaning, and numbers and operations (Renaissance Learning, 2012). Within these major domains, STAR Early Literacy is used to assess competency in 10 sub-domains, including "alphabetic principle, concept of word, visual discrimination, phonemic awareness, phonics, structural analysis, vocabulary, sentence-level comprehension, paragraph-level comprehension, and early numeracy" (Renaissance Learning, 2012, p. 2). STAR Early Literacy is used to measure four of the five critical areas identified by the National Reading Panel: phonemic awareness, phonics, vocabulary, and comprehension (National Institute of Child Health and Human Development, 2000). Although fluency is not explicitly assessed, estimates

of students' oral reading fluency are determined based on the amount of time students spend on each item (Renaissance Learning, 2012). During the implementation years of the current study, STAR Early Literacy was consistently used to assess the literacy achievement of kindergarten students and low-performing students in grade 1 in the target district. STAR Early Literacy provides criterion-referenced scores, including scaled scores, sub-domain and skill set scores, literacy classification, estimated oral reading fluency, and student growth percentile. For the current study, NCE scores were examined because of their comparability with NCE scores from STAR Reading, which ensured consistency across the study. For research question 1, NCE scores from STAR Early Literacy were used as the dependent variable to assess reading score regression of students entering grade 1. For research question 2, NCE scores from STAR Early Literacy were used as the dependent variable to assess the impact of the type of summer intervention program and socioeconomic status on reading score regression of students entering grade 1.

Validity and reliability. Large samples were used across 21 states to study the criterion-related validity of STAR Early Literacy. According to Lunenburg and Irby (2008), an effect size of .50 is regarded as moderate, and effect size of .80 is regarded as large. With adequate coefficients, STAR Early Literacy is a moderately valid testing instrument (National Center for Response to Intervention, n.d.-a). The evidence available comparing STAR Early Literacy to other measures of reading achievement provides moderate support that STAR Early Literacy measures literacy and early numeracy achievement. Displayed in Table 3 are the concurrent analyses for STAR Early Literacy.

Table 3

STAR Early Literacy Validity Test Results

Validity	Grade	Criterion	*n*	Coefficient	
				Range	*Mdn*
Concurrent	K	Brigance	21		0.640
Concurrent	3	Canadian Achievement	19		0.880
Concurrent	2	Child Observation Record	83		0.670
Concurrent	K	Developing Skills Checklist	72		0.700
Concurrent	1 – 3	ITBS	13-80	0.46-0.72	0.535
Concurrent	K	Metropolitan (MKIDS)	14		0.880
Concurrent	1 – 3	SAT	26-62	0.50-0.79	0.575
Concurrent	K	TOPA	11		0.680

Note. Adapted from *STAR Early Literacy* (n.d.-a), National Center for Response to Intervention. Retrieved from http://www.rti4success.org/star-early-literacy

Reliability is understood as the dependability of a test to measure what it purports to measure (Lunenburg & Irby, 2008). A coefficient of .80 is generally considered to have good reliability, and a coefficient of .90 is generally regarded as highly reliable (Garson, 2009). Split-half reliability is a correlation between two comparable halves of a test. A high correlation, of at least .80, indicates good split-half reliability (Garson, 2009; Lunenburg & Irby, 2008).

Table 4

STAR Early Literacy Reliability Test Results

Type of Reliability	Grade	Coefficient
Split-half Retest	Pre-K – 3	0.91
General Readiness Split-half	Pre-K – 3	0.86
Graphophonemic Knowledge Split-half	Pre-K – 3	0.92
Phonemic Awareness Split-half	Pre-K – 3	0.92
Phonics Split-half	Pre-K – 3	0.92
Comprehension Split-half	Pre-K – 3	0.92
Structural Analysis Split-half	Pre-K – 3	0.92
Vocabulary Split-half	Pre-K – 3	0.91

Note. Adapted from *STAR Early Literacy* (n.d.-a), National Center for Response to Intervention. Retrieved from http://www.rti4success.org/star-early-literacy. Coefficient values reflect the median.

Because all median coefficients were greater than .86, there is strong evidence for the reliability of STAR Early Literacy. Displayed in Table 4 is the split-half reliability using a sample of 9,146 students in pre-kindergarten through grade 3 (National Center for Response to Intervention, n.d.-a).

STAR Reading. STAR Reading is a computer-adaptive assessment. As such, content and difficulty adjusts based on each student's responses. Computer-adaptive assessments, which utilize adaptive branching, aid in student motivation and reduce testing time, as students are only exposed to assessment items based on their unique performance (Renaissance Learning, 2015). This adaptive assessment pulled test items from an item bank of approximately 5,000 items (Renaissance Learning, 2015). Both

past and present performance on STAR Reading impact the test items students are presented. The STAR Reading interface is simple, featuring one test item at a time with four possible responses. Students can interact with the program via mouse or keyboard. The assessment features 34 multiple-choice items and is completed in approximately 15 minutes (Renaissance Learning, 2015). For students without accommodations, which include those utilized in this study's sample, item time limits exist. Students in grades 1, 2, and 3 are allowed 60 seconds per test item and students in grade 4 and beyond are allowed 45 seconds per test item (Renaissance Learning, 2015). Unanswered items and timed-out items are marked incorrect.

Measurement. The STAR Reading assessment is a tool designed to measure reading achievement in the areas of foundational skills, reading information text, reading literature, and language (Renaissance Learning, 2015). For students with a sight word vocabulary of at least 100 words, this assessment is standards-based and is intended to provide educators with an understanding of students' reading achievement along a continuum of development (Renaissance Learning, 2015). STAR Reading features items that include a "traditional reading passage followed by sets of literal or inferential questions, previously published extended selections of text followed by open-ended questions requiring student-constructed answers, and several cloze-type procedures for passage presentation" (Renaissance Learning, 2015, p. 3). Because STAR Reading is an assessment designed to track growth over time, it is a preferred assessment for a study intended to assess the impact of a summer academic intervention on the reading achievement of participating and nonparticipating students. During the implementation

years of the current study, STAR Reading was consistently used to assess the reading achievement of students at or above grade 1 in the target district.

STAR Reading provides both criterion-referenced scores and norm-referenced scores, including scaled scores, Rasch scores, universal scores, grade equivalents, percentile ranks, NCE scores, instructional reading levels, estimated oral reading fluency, zone of proximal development, Lexiles, and the Lexile zone of proximal development range. For the current study, NCE scores were examined because of their comparability with NCE scores from STAR Early Literacy, which ensured consistency across the study. For research question 1, NCE scores from STAR Reading were used as the dependent variable to assess reading score regression of students entering grades 2, 3, and 4. For research question 3, NCE scores from STAR Reading were used as the dependent variable to assess the impact of the type of summer intervention program and socioeconomic status on reading score regression of students entering grades 2, 3, and 4.

Validity and reliability. Large samples were used to study the criterion-related validity of STAR Reading. With moderate to strong coefficients, STAR Reading is a valid testing instrument (National Center for Response to Intervention, n.d.-b). The evidence available comparing STAR Reading to other measures of reading achievement provide strong support that STAR Reading measures reading achievement (Renaissance Learning, 2015). Displayed in Table 5 are the concurrent and predictive validity analyses for STAR Reading.

Table 5

STAR Reading Validity Test Results

Validity	Grade	Criterion	*n*	Coefficient	
				Range	*Mdn*
Predictive	3-6	SAT9 and CST	1,000+	0.81-0.83 0.78-0.81	0.82 0.80
Predictive	2-6	SAT9	44-389	0.66-0.73	0.68
Concurrent	1-8	Suffolk Reading Scale	2,694	0.78-0.86	0.82
Construct	3, 5, 7, 10	DRP	273-424	0.76-0.86	0.82
Concurrent	1-4	DIBELS ORF	12,220	0.71-0.87	0.81

Note. Adapted from *STAR Reading* (n.d.-b.), National Center for Response to Intervention. Retrieved from http://www.rti4success.org/star-reading

Split-half reliability is a correlation between two comparable halves of a test. A high correlation indicates good split-half reliability (Lunenburg & Irby, 2008). Test-retest reliability refers to the consistency of scores over time on the same instrument (Lunenburg & Irby, 2008). Displayed in Table 6 are the split-half reliability and test-retest reliability coefficients using a sample of 15,754 students in grades 1, 2, 3, 4, and 5 from Arkansas, Delaware, Illinois, Kansas, Michigan, and Mississippi (National Center for Response to Intervention, n.d.-b).

Table 6

STAR Reading Reliability Test Results

Type of Reliability	*n*	Coefficient	
		Range	*Mdn*
Split Half	7,523-10,476	0.88-0.89	0.89
Test-Retest	296-300	0.82-0.89	0.83

Note. Adapted from *STAR Reading* (n.d.-b), National Center for Response to Intervention. Retrieved from http://www.rti4success.org/star-reading

Garson (2009) coefficients of .80 are generally considered to have good reliability, and coefficients of .90 are generally considered to be highly reliable. Because all median coefficients were greater than .83, there is strong evidence for the reliability of STAR Reading.

Data Collection Procedures

A proposal for research (see Appendix A) was submitted on February 17, 2016 to the Baker University Institutional Review Board (IRB) before beginning the current study. Within this proposal, an outline of the current study was provided. The IRB granted approval on February 24, 2016 (see Appendix B). Following this approval, a Research Checklist and Approval application was submitted to the target district's Director of Research, Evaluation, and Assessment on February 29, 2016 (see Appendix C). The target district's IRB Proposal and Approval request was approved on April 12, 2016 (see Appendix D).

To qualify for Smart Start, STAR Early Literacy and STAR Reading scores of students in grades K, 1, 2, and 3 were collected from the winter assessment window

during December 2012, 2013, and 2014. Students with scores below the 30th percentile were selected to begin the process of identifying invitees. Student names were then provided to classroom teachers during the spring of 2013, 2014, and 2015 to offer informal reading assessment data, including running record levels and anecdotal notes regarding reading strengths and challenges. If a student scored above the 30th percentile on STAR Early Literacy or STAR Reading, but the classroom teachers possessed informal reading assessment data indicating the student was performing below grade level expectations, the student was invited to participate in Smart Start. Families of qualifying students were contacted to seek permission for their child to attend Smart Start. Within this study, data from both attending and non-attending students were included. Students entering grades 1, 2, 3, and 4 who attended traditional summer school during the summers of 2013, 2014, and 2015 were filtered based on STAR Early Literacy and STAR Reading scores collected from the winter assessment window during December 2012, 2013, and 2014. The same criterion of scoring below the 30th percentile was used.

STAR Early Literacy and STAR Reading were both part of the regular school year assessment program, and scores were archived in a secured online storehouse managed by Renaissance Learning's (2012, 2015) website. Archived data was provided for STAR Early Literacy and STAR Reading for the years examined in this study by the target district's Director of Research, Evaluation, and Assessment. STAR Early Literacy and STAR Reading results were available in Renaissance Learning's online score repository (Renaissance Learning, 2012, 2015). The principal of the Smart Start program provided a spreadsheet of qualifying students from 2013, 2014, and 2015, as well as daily

attendance information for students who had enrolled in Smart Start. The daily attendance information was then used to group students into two categories: attending and non- or minimally-attending. Students categorized as attending participated in Smart Start for 7-12 days and non- or minimally-attending students did not participate in Smart Start or participated 1-6 days. The target district's Director of Research, Evaluation, and Assessment provided demographic data and traditional summer school attendance information. These pieces of information were then organized in Microsoft Excel, pairing qualifying students with their corresponding demographic data, summer academic treatment, attendance, spring STAR Early Literacy or STAR Reading scores, and fall STAR Early Literacy or STAR Reading scores. Following the organization of the quantitative data in a Microsoft Excel worksheet, the information was reviewed for accuracy. The data were then imported into JASP (Love et al., 2015).

Data Analysis and Hypothesis Testing

Quantitative methods of data analysis were utilized for this study. This quantitative analysis focused on three research questions. Each question and hypothesis are presented, along with the hypothesis testing method.

RQ1. Was there reading score regression between pre- and post-test scores for first, second, third, and fourth grade students for the implementation years of 2013, 2014, and 2015?

***H1*.** There was reading regression between pre- and post-test scores for first grade students for the implementation years of 2013, 2014, and 2015.

***H2*.** There was reading regression between pre- and post-test scores for second grade students for the implementation years of 2013, 2014, and 2015.

***H3*.** There was reading regression between pre- and post-test scores for third grade students for the implementation years of 2013, 2014, and 2015.

***H4*.** There was reading regression between pre- and post-test scores for fourth grade students for the implementation years of 2013, 2014, and 2015.

A paired-sample *t* test was conducted to address RQ1. The two sample means were compared. The level of significance was set at .05.

RQ2. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Early Literacy NCE reading score regression for first grade students?

***H5*.** The type of summer intervention had an effect on STAR Early Literacy NCE reading score regression for first grade students.

***H6*.** The interaction between the type of summer intervention and socioeconomic status influenced STAR Early Literacy NCE reading score regression for first grade students.

A one-way analysis of variance (ANOVA) was conducted to test H5. The categorical variable used to group the dependent variable name was summer intervention (Smart Start and non-attending). The level of significance was set at .05. A two-way analysis of variance (ANOVA) was conducted to test H6. The two categorical variables used to group the dependent variable name were summer intervention (Smart Start and non-attending) and socioeconomic status (free or reduced-price and full-pay). The two-way ANOVA can be used to test three hypotheses including a main effect for the type of summer intervention, a main effect for socioeconomic status, and a two-way interaction effect (type of summer intervention x socioeconomic status). The main/interaction

effect for the type of summer intervention/socioeconomic status/type of summer intervention by socioeconomic status was used to test H6. The level of significance was set at .05. Additionally, these analyses were conducted to determine the extent of any interactions between any combination of the independent variables of type of summer intervention program and socioeconomic status on the dependent variable of STAR Early Literacy NCE scores for students in grade. The Tukey's Honestly Significant Difference (HSD) procedure was chosen as the follow-up test to be conducted if any statistically significant main effects or interactions occurred in the analyses. To control for Type I error, this procedure was used to evaluate any pairwise differences among the means of the independent variables.

RQ3. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Reading NCE reading score regression for second, third, and fourth grade students?

H7. The type of summer intervention had an effect on STAR Reading NCE reading score regression for second grade students.

H8. The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for second grade students.

H9. The type of summer intervention had an effect on STAR Reading NCE reading score regression for third grade students.

H10. The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for third grade students.

H11. The type of summer intervention had an effect on STAR Reading NCE

reading score regression for fourth grade students.

H12. The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for fourth grade students.

A one-way analysis of variance (ANOVA) was conducted to test H7, H9, and H11. The categorical variable used to group the dependent variable name was summer intervention (Smart Start, traditional summer school, and non-attending). The level of significance was set at .05. A two-way analysis of variance (ANOVA) was conducted to test H8, H10, and H12. The two categorical variables used to group the dependent variable name were summer intervention (Smart Start, traditional summer school, and non-attending) and socioeconomic status (free or reduced-price and full-pay). The two-way ANOVA can be used to test three hypotheses including a main effect for the type of summer intervention, a main effect for socioeconomic status, and a two-way interaction effect (type of summer intervention x socioeconomic status). The main/interaction effect for the type of summer intervention/socioeconomic status/type of summer intervention by socioeconomic status was used to test H8, H10, and H12. The level of significance was set at .05. Additionally, these analyses were conducted to determine the extent of any interactions between any combination of the independent variables of type of summer intervention program and socioeconomic status on the dependent variable of STAR Reading NCE scores for students in grades 2, 3, and 4. The Tukey's Honestly Significant Difference (HSD) procedure was chosen as the follow-up test to be conducted if any statistically significant main effects or interactions occurred in the analyses. To control for Type I error, this procedure was used to evaluate any pairwise differences among the means of the independent variables.

Limitations

Limitations exist when the researcher has no control over factors in relation to the study (Lunenburg & Irby, 2008). The following limitations may have impacted the interpretation of data or may influence its generalizability in external settings:

1. Although test administration procedures were established with STAR Early Literacy and STAR Reading, the settings in which these assessments were administered varied depending upon the student's home school and teacher.
2. Teacher efficacy and fidelity to the Smart Start instruction framework and traditional summer school curriculum was an inherent limitation.
3. Teachers of traditional summer school did not all possess a Missouri teaching certificate, unlike teachers of Smart Start.
4. Students in the traditional summer school group were only identified based on winter STAR Reading or STAR Early Literacy scores and socioeconomic status. Teacher feedback for inclusion in the sample was not sought, unlike for those invited to participate in Smart Start.
5. The instructional format of traditional summer school varied over the three years examined in this study. In 2013, traditional summer school was a half-day 4-week program following a district-developed curriculum. Transportation was not provided. In 2014, traditional summer school was a full-day 4-week program following an adopted summer academic curriculum. Transportation was provided for all students. In 2015, traditional summer school was a full-day 4-week program following a district developed-curriculum curriculum. Transportation was provided for all students.

6. Students may have participated in supplemental summer instruction or tutoring outside of what was provided through the target district. Participation in external academic supports may have influenced post-test scores.

Summary

An overview of the methodology used in the study of a summer academic intervention for elementary students was presented in this chapter. The research design, population and sample, sampling procedures, instrumentation, data collection procedures, data analysis and hypothesis testing, and limitations were presented. Presented in chapter four are the data collected and a discussion of the results of the hypothesis testing and data analysis.

Chapter Four

Results

Addressed in the current study were three research questions and twelve hypotheses related to the purpose of the study, which was to determine if the type of summer intervention program made a difference in student reading achievement when disaggregated by grade level and socioeconomic status. Included in chapter four are the descriptive statistics for the sample and the results of the data analysis for the hypotheses accompanying the research questions proposed within the current study. To test the research hypotheses, a paired-samples *t* test and one- and two-way ANOVA tests were utilized.

Descriptive Statistics

Initially, 842 students entering grades 1, 2, 3, and 4 during the summers of 2013, 2014, and 2015 were included in this study. To analyze summer reading regression, students were required to have a valid pre- and post-test NCE reading achievement score. Students entering grade 1 were assessed using STAR Early Literacy, and students entering grades 2, 3, and 4 were assessed using STAR Reading. If a student was initially identified as part of the sample but did not complete STAR Early Literacy or STAR Reading during District X's assessment window, they were removed from the sample. If a student was initially identified as part of the sample, but moved out of the school district before the beginning of the new school year, thereby not completing STAR Early Literacy or STAR Reading during District X's assessment window, they were removed from the sample. After removing student scores without matching pre- and post-test NCE reading achievement scores, 689 students remained in the sample. Of the 689

students, 105 students did not participate or minimally participated in Smart Start (0-6 days), 371 students participated in traditional summer school, and 213 students participated in Smart Start. Of the students entering grade 1, there were no students who participated in traditional summer school with matching pre- and post-test NCE reading achievement scores. For hypotheses 1-3, summer intervention is limited to non-attending and Smart Start. Table 7 displays the summer intervention descriptive statistics of the students within the current study's sample.

Table 7

Summer Intervention Descriptive Statistics

Summer Intervention	*n*	% of Sample
None	105	15.2
Traditional Summer School	371	53.8
Smart Start	213	30.9
Total	689	100.0

Of the 689 students, 175 students participated in a summer intervention during the summer of 2013, 320 students participated in a summer intervention during the summer of 2014, and 284 students participated in a summer intervention during the summer of 2015. Table 8 displays the implementation year descriptive statistics of the students within the current study's sample.

Table 8

Implementation Year Descriptive Statistics

Implementation Year	*n*	% of Sample
Summer 2013	175	25.4
Summer 2014	230	33.4
Summer 2015	284	41.2
Total	689	100.0

Of the 689 students, 54 students were entering grade 1, 231 students were entering grade 2, 207 students were entering grade 3, and 197 students were entering grade 4. Table 9 displays the grade descriptive statistics of the students within the current study's sample.

Table 9

Grade Level Descriptive Statistics

Grade Level	*n*	% of Sample
Grade 1	54	7.8
Grade 2	231	33.5
Grade 3	207	30.0
Grade 4	197	28.6
Total	689	100.0

Of the 689 students, 480 students were eligible for free or reduced-price lunch and 209 students were full pay. Table 10 displays the socioeconomic descriptive statistics of the students within the current study's sample.

Table 10

Socioeconomic Status Descriptive Statistics

Socioeconomic Status	*n*	% of Sample
Free or Reduced-Price Lunch	480	69.7
Full Pay	209	30.3
Total	689	100.0

The descriptive statistics calculated for the current study provided explicit information about the sample. The following section contains the results of the hypothesis testing that involved inferential analysis in drawing conclusions with regard to the impact of summer interventions on student reading achievement.

Hypothesis Testing

To determine the impact of the independent variables of summer intervention, grade level, and socioeconomic status on the dependent variable of STAR Early Literacy NCE reading achievement scores for students in first grade and STAR Reading NCE reading achievement scores for students in second, third, and fourth grade, data were collected from District X's Director of Research, Evaluation, and Assessment. Pre- and post-test scores for students who were identified for the sample, along with demographic information, including socioeconomic status was provided. After calculating regression scores between pre-test scores from the post-test score, the data were organized in an Excel spreadsheet and imported into JASP so statistical analyses could be performed (Love et al., 2015). The analysis focused on three research questions and addressed twelve hypotheses. The research questions from the study are listed below, along with the corresponding hypotheses. Paired-sample *t* tests and one- and two-way ANOVAs were used to challenge the hypotheses. After each stated hypothesis, the results of the

statistical analysis are explained. The statistical significance level of .05 was utilized to determine the probability of supporting the hypothesis.

RQ1. Was there reading score regression between pre- and post-test scores for first, second, third, and fourth grade students for the implementation years of 2013, 2014, and 2015?

***H1*.** There was reading regression between pre- and post-test scores for first grade students for the implementation years of 2013, 2014, and 2015.

A paired-samples *t* test was conducted to examine if mean regression differences existed between pre- and post-test reading scores for first grade students for all implementation years, regardless of summer intervention type. The results of the paired-samples *t* test indicated there was a statistically significant difference between the two means, $t = -6.576$, $df = 53$, $p < .001$. Table 11 displays the *t* test, degrees of freedom, *p*-value, mean difference, and standard error difference for hypothesis 1.

Table 11

Summary Paired-Samples t Test Analysis Results for H1: Reading Regression in Grade 1

	t	*df*	*p*	Mean Difference	SE Difference
Spring Pre-Test – Fall Post-Test	-6.576	53	< .001	-16.24	2.470

The average spring pre-test reading scores ($M = 29.92$, $SD = 15.46$) for first grade students were significantly lower than the average fall post-test scores ($M = 46.16$, $SD = 15.14$) for first grade students for all implementation years. These results suggested that the summer months had a positive impact on mean differences between pre- and post-test reading scores for first grade students for the implementation years of 2013, 2014, and

2015. First graders had significantly higher post-test scores than pre-test scores, indicating there was no regression between spring and fall, as shown in Figure 1.

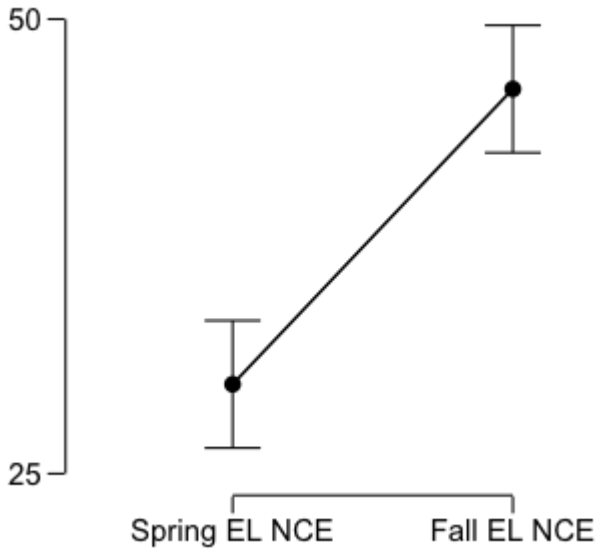

Figure 1. Grade 1 spring STAR Early Literacy NCE mean scores and fall STAR Early Literacy NCE scores for all implementation years, regardless of summer intervention. The x-axis indicates both spring and fall STAR Early Literacy NCE scores for students entering grade 1. The y-axis indicates the range of mean spring and fall STAR Early Literacy NCE scores for students entering grade 1. The error bars surrounding the plots indicate that, even with the potential for error, the standard error of the mean differences between spring and fall STAR Early Literacy NCE scores are statistically significant because they do not overlap.

***H2*.** There was reading regression between pre- and post-test scores for second grade students for the implementation years of 2013, 2014, and 2015.

A paired-samples *t* test was conducted to examine if mean regression differences existed between pre- and post-test reading scores for second grade students for all implementation years, regardless of summer intervention type. The results of the paired-samples *t* test indicated there was a statistically significant difference between the two means, $t = 7.075$, $df = 230$, $p < .001$. Table 12 displays the *t* test, degrees of freedom, *p*-value, mean difference, and standard error difference for hypothesis 2.

Table 12

Summary Paired-Samples t Test Analysis Results for H2: Reading Regression in Grade 2

	t	*df*	*p*	Mean Difference	SE Difference
Spring Pre-Test – Fall Post-Test	7.075	230	< .001	6.656	0.941

The average spring pre-test reading scores ($M = 32.32$, $SD = 17.39$) for second grade students were significantly higher than the average fall post-test scores ($M = 25.67$, $SD = 17.46$) for second grade students for all implementation years. Second graders had lower post-test scores than pre-test scores, indicating there was significant regression between spring and fall, as shown in Figure 2. Hypothesis 2 was supported because second grade students demonstrated significant regression in reading scores between spring and fall.

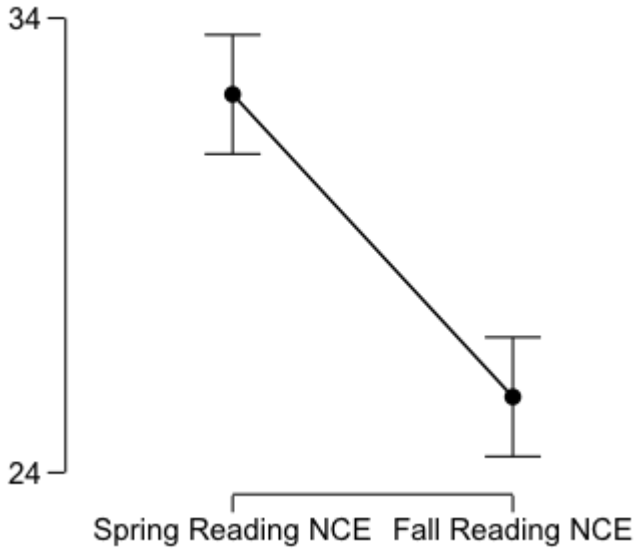

Figure 2. Grade 2 spring STAR Reading NCE mean scores and fall STAR Reading NCE scores for all implementation years, regardless of summer intervention. The x-axis indicates both spring and fall STAR Reading NCE scores for students entering grade 2. The y-axis indicates the range of mean spring and fall STAR Reading NCE scores for students entering grade 2. The error bars surrounding the plots indicate that, even with the potential for error, the standard error of the mean differences between spring and fall STAR Reading NCE scores are statistically significant because they do not overlap.

***H3*.** There was reading regression between pre- and post-test scores for third grade students for the implementation years of 2013, 2014, and 2015.

A paired-samples *t* test was conducted to examine if mean regression differences existed between pre- and post-test reading scores for third grade students for all implementation years, regardless of summer intervention type. The results of the paired-samples *t* test indicated there was a statistically significant difference between the two means, $t = 5.948$, $df = 206$, $p < .001$. Table 13 displays the *t* test, degrees of freedom, *p*-value, mean difference, and standard error difference for hypothesis 3.

Table 13

Summary Paired-Samples t Test Analysis Results for H3: Reading Regression in Grade 3

	t	*df*	*p*	Mean Difference	SE Difference
Spring Pre-Test – Fall Post-Test	5.948	206	< .001	4.457	0.749

The average spring pre-test reading scores ($M = 26.43$, $SD = 15.23$) for third grade students were significantly higher than the average fall post-test scores ($M = 21.97$, $SD = 15.44$) for third grade students for all implementation years. These results suggest that summer has an impact on mean differences between pre- and post-test reading scores for third grade students for all implementation years. Third graders had lower post-test scores than pre-test scores, indicating there was significant regression between spring and fall, as shown in Figure 3. Hypothesis 3 was supported because third grade students demonstrated significant regression in reading scores between spring and fall.

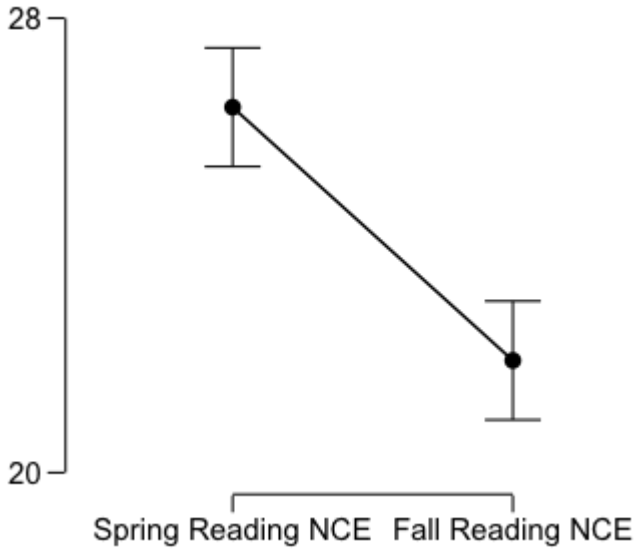

Figure 3. Grade 3 spring STAR Reading NCE mean scores and fall STAR Reading NCE scores for all implementation years, regardless of summer intervention. The x-axis indicates both spring and fall STAR Reading NCE scores for students entering grade 3. The y-axis indicates the range of mean spring and fall STAR Reading NCE scores for students entering grade 3. The error bars surrounding the plots indicate that, even with the potential for error, the standard error of the mean differences between spring and fall STAR Reading NCE scores are statistically significant because they do not overlap.

H4. There was reading regression between pre- and post-test scores for fourth grade students for the implementation years of 2013, 2014, and 2015.

A paired-samples *t* test was conducted to test if mean regression differences existed between pre- and post-test reading scores for fourth grade students for all implementation years, regardless of summer intervention type. The results of the paired-samples *t* test indicated there was a statistically significant difference between the two means, $t = 4.515$, $df = 196$, $p < .001$. Table 14 displays the *t* test, degrees of freedom, *p*-value, mean difference, and standard error difference for hypothesis 4.

Table 14

Summary Paired-Samples t Test Analysis Results for H4: Reading Regression in Grade 4

	t	*df*	*p*	Mean Difference	SE Difference
Spring Pre-Test – Fall Post-Test	4.515	196	< .001	4.124	0.913

The average spring pre-test reading scores ($M = 29.32$, $SD = 16.14$) for fourth grade students were significantly higher than the average fall post-test scores ($M = 25.20$, $SD = 15.14$) for fourth grade students for all implementation years. These results suggest that summer had an impact on mean differences between pre- and post-test reading scores for fourth grade students for all implementation years. Fourth graders had lower post-test scores than pre-test scores, indicating there was significant regression between spring and fall, as shown in Figure 4. Hypothesis 4 was supported because fourth grade students demonstrated significant regression in reading scores between spring and fall.

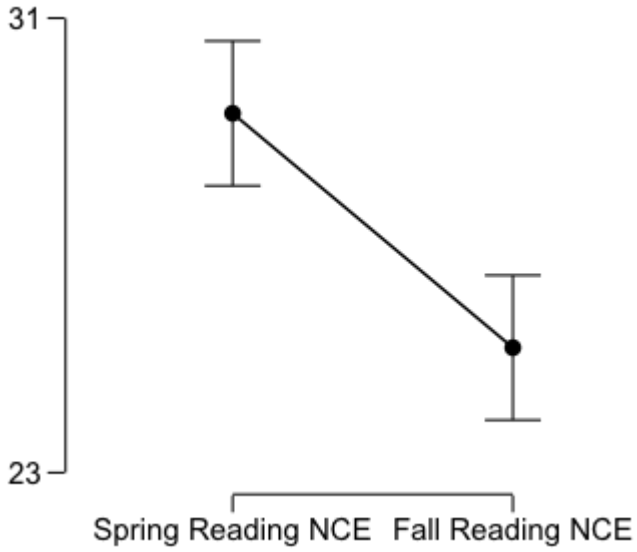

Figure 4. Grade 4 spring STAR Reading NCE mean scores and fall STAR Reading NCE scores for all implementation years, regardless of summer intervention. The x-axis indicates both spring and fall STAR Reading NCE scores for students entering grade 4. The y-axis indicates the range of mean spring and fall STAR Reading NCE scores for students entering grade 4. The error bars surrounding the plots indicate that, even with the potential for error, the standard error of the mean differences between spring and fall STAR Reading NCE scores are statistically significant because they do not overlap.

RQ2. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Early Literacy NCE reading score regression for first grade students?

***H5*.** The type of summer intervention had an effect on STAR Early Literacy NCE reading score regression for first grade students.

To test the effect of the summer intervention (Smart Start and non-attending) on the NCE reading achievement scores of students in first grade, NCE regression scores were analyzed using a one-way ANOVA. Within the current study's sample, there were no first grade students who attended traditional summer school. The results were not significant, $F = 1.658$, $df = 1, 52$, $p = .204$. Table 15 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 5.

Table 15

Summary ANOVA Analysis Results for H5: Summer Intervention Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 1 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	539.3	1	539.3	1.658	0.204
Score Differences	1,6917.0	52	325.3		

A follow-up post hoc was not conducted because summer intervention did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for first grade students. First grade students in the current study's sample experienced negative regression between the pre- and post-test, indicating reading score growth between spring and fall. The mean difference between pre- and post-STAR Early Literacy NCE reading achievement scores for first grade students were: non-

attending, 12.12 and Smart Start, 18.66. Although first grade students who attended Smart Start had greater mean differences between pre- and post-STAR Early Literacy NCE reading achievement scores, there was not a statistical significance between the two groups, as shown in Figure 5. Thus, these findings did not support hypothesis 5.

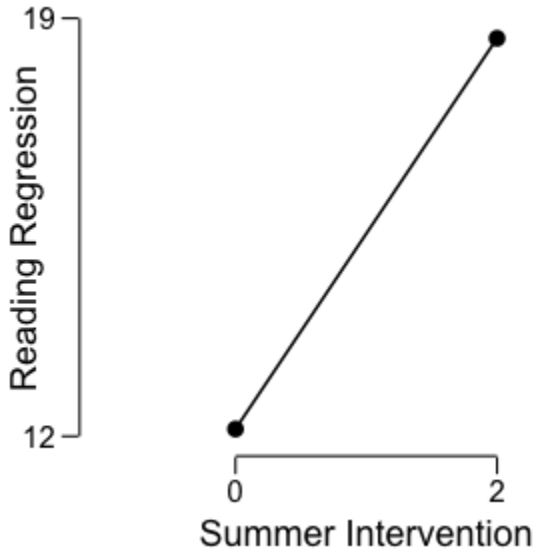

Figure 5. Grade 1 mean differences of pre- and post-STAR Early Literacy NCE reading achievement scores when grouped by summer intervention: 0 = non-attending; 2 = Smart Start. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Early Literacy NCE regression scores for students entering grade 1.

H6. The interaction between the type of summer intervention and socioeconomic status influenced STAR Early Literacy NCE reading score regression for first grade students.

To test the interaction of the summer intervention and socioeconomic status on the NCE reading achievement scores of students in first grade, NCE regression scores were analyzed using a two-way ANOVA. The first main effect was summer intervention (Smart Start vs. non-attending) between subjects, and the second main effect was socioeconomic status (free and reduced-pay vs. full pay) between subjects. There was no significant main effect of summer intervention, $F = 1.928$, $df = 1, 50$, $p = .171$. There was no significant main effect of socioeconomic status, $F = .661$, $df = 1, 50$, $p = .420$. The interaction between summer intervention and socioeconomic status was not significant, $F = .741$, $df = 1, 50$, $p = .741$. Table 16 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 6.

Table 16

Summary ANOVA Analysis Results for H6: Summer Intervention and Socioeconomic Status Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 1 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	643.68	1	643.68	1.928	0.171
Socioeconomic Status	220.78	1	220.77	0.661	0.420
Summer Intervention and Socioeconomic Status	36.78	1	36.78	0.110	0.741
Score Differences	16,695.94	50	333.92		

A follow-up post hoc was not conducted because summer intervention and socioeconomic status did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for first grade students. The mean difference

between pre- and post-STAR Early Literacy NCE reading achievement scores for first grade students who indicated free or reduced-price lunch status were: Smart Start, 19.858 and non-attending, 13.499. The mean difference between pre- and post-STAR Early Literacy NCE reading achievement scores for first grade students who indicated full-pay lunch status were: Smart Start, 16.961 and non-attending, 6.607. Although first grade students indicating free or reduced-price lunch who attended Smart Start had greater mean differences between pre- and post-STAR Early Literacy NCE reading achievement scores, there was not a statistical significance between the two socioeconomic groups, as shown in Figure 6. Thus, these findings did not support hypothesis 6.

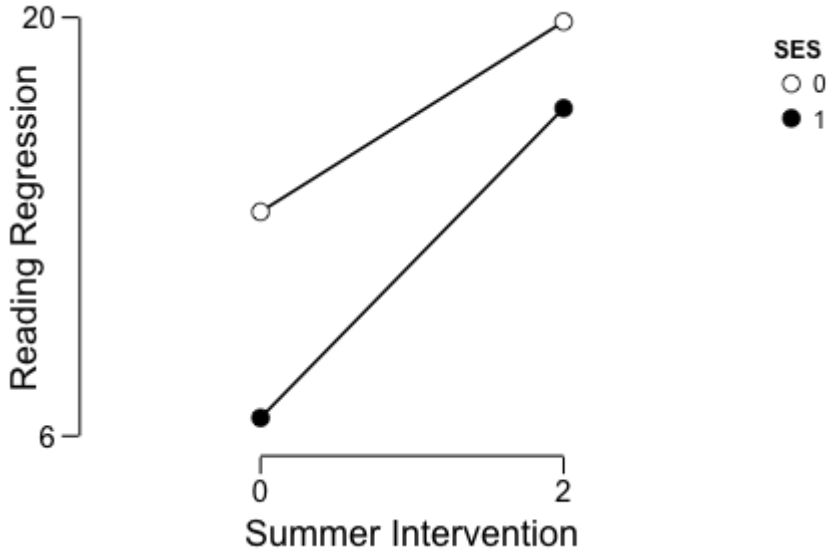

Figure 6. Grade 1 mean differences of pre- and post-STAR Early Literacy NCE reading achievement scores when grouped by summer intervention: 0 = non-attending; 2 = Smart Start, and socioeconomic status: 0 = free or reduced-price lunch, 1 = full pay. Grade 1 mean differences of pre- and post-STAR Early Literacy NCE reading achievement scores when grouped by summer intervention. 0 = non-attending; 2 = Smart Start. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Early Literacy NCE regression scores for students entering grade 1. The two plot lines indicate STAR Early Literacy NCE regression scores disaggregated by socioeconomic status.

RQ3. What are the main effects and interactions between and among the type of summer intervention and socioeconomic status on STAR Reading NCE reading score regression for second, third, and fourth grade students?

H7. The type of summer intervention had an effect on STAR Reading NCE

reading score regression for second grade students.

To test the interaction of the summer intervention (Smart Start, traditional summer school, and non-attending) on the NCE reading achievement scores of students in second grade, NCE regression scores were analyzed using a one-way ANOVA. The results were not significant, $F = 0.227$, $df = 2, 228$, $p = .797$. Table 17 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 7.

Table 17

Summary ANOVA Analysis Results for H7: Summer Intervention Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 2 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	93.25	2	46.63	0.227	0.797
Score Differences	4,6932.88	228	205.85		

A follow-up post hoc was not conducted because summer intervention did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for second grade students. The mean difference between pre- and post-STAR Reading NCE reading achievement scores for second grade students were: Smart Start, -5.758; traditional summer school, -6.866; and non-attending, -7.694. Although second grade students who attended Smart Start had less mean regression differences between pre- and post-STAR Reading NCE reading achievement scores than those who were non-attending or attended traditional summer school, there was not a statistical significance between the three groups, as shown in Figure 7. These findings did not support hypothesis 7.

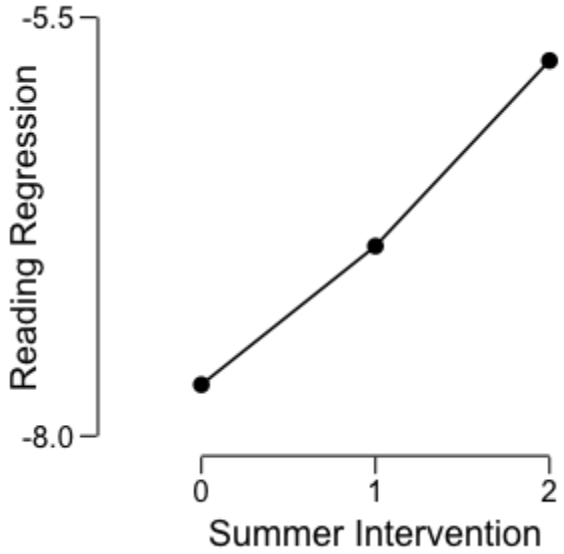

Figure 7. Grade 2 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending; 1 = traditional summer school; 2 = Smart Start. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 2.

***H8*.** The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for second grade students.

To test the interaction of the summer intervention and socioeconomic status on the NCE reading achievement scores of students in second grade, NCE regression scores were analyzed using a two-way ANOVA. The first interaction was summer intervention

(Smart Start, traditional summer school, and non-attending) between subjects, and the second interaction was socioeconomic status (free and reduced-pay vs. full pay) between subjects. There was no significant main effect of summer intervention, $F = 0.254$, $df = 2, 225$, $p = .776$. There was no significant main effect of socioeconomic status, $F = .077$, $df = 1, 225$, $p = .782$. The interaction between summer intervention and socioeconomic status was not significant, $F = 1.330$, $df = 2, 225$, $p = .267$. Table 18 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 8.

Table 18

Summary ANOVA Analysis Results for H8: Summer Intervention and Socioeconomic Status Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 2 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	104.41	2	52.20	0.254	0.776
Socioeconomic Status	15.78	1	15.78	0.077	0.782
Summer Intervention and Socioeconomic Status	547.20	2	273.60	1.330	0.267
Score Differences	46,286.73	225	205.72		

A follow-up post hoc was not conducted because summer intervention and socioeconomic status did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for second grade students. The mean regression between pre- and post-STAR Reading NCE reading achievement scores for second grade students who indicated free or reduced-price lunch status were: Smart Start, -3.808; traditional summer school, -6.518; and non-attending, -9.216. The mean

difference between pre- and post-STAR Reading NCE reading achievement scores for second grade students who indicated full-pay lunch status were: Smart Start, -8.023; traditional summer school, -7.966; and non-attending, -1.350. Although these results were not statistically significant, second grade students who indicated free or reduced-price lunch status experienced the least reading regression when participating in either traditional summer school or Smart Start, as shown in Figure 8. These findings did not support hypothesis 8.

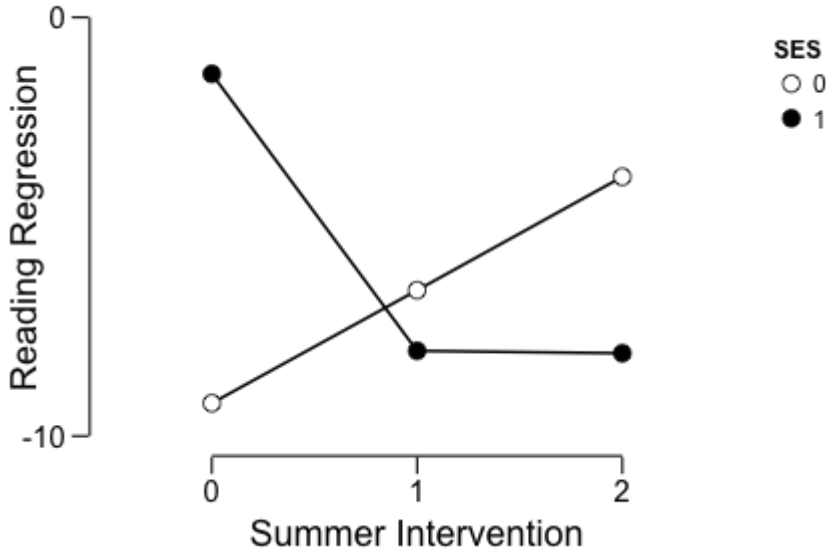

Figure 8. Grade 2 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending, 1 = traditional summer school, and 2 = Smart Start, and socioeconomic status: 0 = free or reduced-price lunch, 1 = full pay. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 2. The two plot lines indicate STAR Reading NCE regression scores disaggregated by socioeconomic status.

H9. The type of summer intervention had an effect on STAR Reading NCE reading score regression for third grade students.

To test the interaction of the summer intervention (Smart Start, traditional summer school, and non-attending) on the NCE reading achievement scores of students in third grade, NCE regression scores were analyzed using a one-way ANOVA. The

results were not significant, $F = .947$, $df = 2, 204$, $p = .390$. Table 19 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 9.

Table 19

Summary ANOVA Analysis Results for H9: Summer Intervention Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 3 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	220.3	2	110.2	0.947	0.390
Score Differences	2,3728.9	204	116.3		

A follow-up post hoc was not conducted because summer intervention did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for third grade students. The mean difference between pre- and post-STAR Reading NCE reading achievement scores for third grade students were: Smart Start, -4.643; traditional summer school, -4.961; and non-attending, -1.819. Although third grade students who attended Smart Start had slightly less mean regression differences between pre- and post-STAR Reading NCE reading achievement scores than those who attended traditional summer school, non-attending students had the least regression, as shown in Figure 9. These findings did not support hypothesis 9.

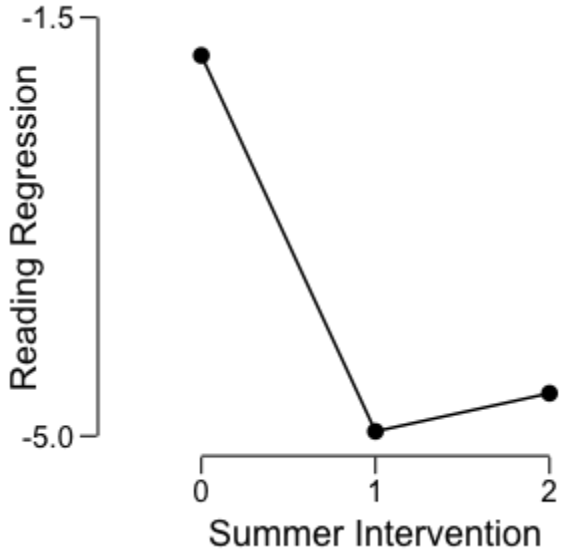

Figure 9. Grade 3 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending; 1 = traditional summer school; 2 = Smart Start. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 3.

H10. The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for third grade students.

To test the interaction of the summer intervention and socioeconomic status on the NCE reading achievement scores of students in third grade, NCE regression scores were analyzed using a two-way ANOVA. The first interaction was summer intervention (Smart Start, traditional summer school, and non-attending) between subjects, and the

second interaction was socioeconomic status (free and reduced-pay vs. full pay) between subjects. There was no significant main effect of summer intervention, $F = .547$, $df = 2, 201$, $p = .580$. There was no significant main effect of socioeconomic status, $F = 1.879$, $df = 1, 201$, $p = .172$. The interaction between summer intervention and socioeconomic status was not significant, $F = .528$, $df = 2, 201$, $p = .590$. Table 20 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 10.

Table 20

Summary ANOVA Analysis Results for H10: Summer Intervention and Socioeconomic Status Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 3 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	127.4	2	63.72	0.547	0.580
Socioeconomic Status	219.0	1	219.02	1.879	0.172
Summer Intervention and Socioeconomic Status	123.2	2	61.61	0.528	0.590
Score Differences	23,424.6	201	116.59		

A follow-up post hoc was not conducted because summer intervention and socioeconomic status did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for third grade students. The mean regression between pre- and post-STAR Reading NCE reading achievement scores for third grade students who indicated free or reduced-price lunch status were: Smart Start, -4.581; traditional summer school, -4.348; and non-attending, -0.205. The mean difference between pre- and post-STAR Reading NCE reading achievement scores for second grade

students who indicated full-pay lunch status were: Smart Start, -4.707; traditional summer school, -6.703; and non-attending, -5.650. Although these results were not statistically significant, third grade students who indicated free or reduced-price lunch status experienced the least reading regression when not attending traditional summer school or Smart Start, as shown in Figure 10. Students who indicated full-pay lunch status benefited from Smart Start with lessened reading score regression than their full-pay lunch status peers who did not attend, but these results were not significant. These findings did not support hypothesis 10.

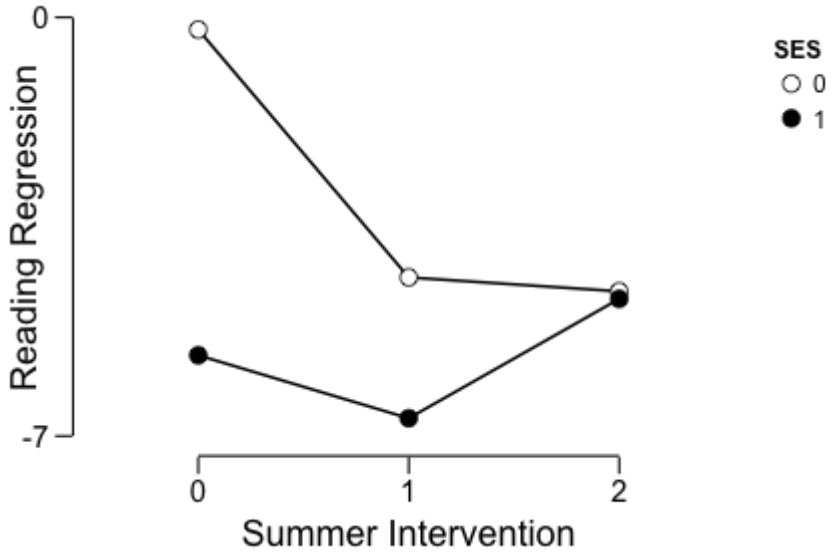

Figure 10. Grade 3 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending, 1 = traditional summer school, and 2 = Smart Start, and socioeconomic status: 0 = free or reduced-price lunch, 1 = full pay. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 3. The two plot lines indicate STAR Reading NCE regression scores disaggregated by socioeconomic status.

H11. The type of summer intervention had an effect on STAR Reading NCE reading score regression for fourth grade students.

To test the interaction of the summer intervention (Smart Start, traditional summer school, and non-attending) on the NCE reading achievement scores of students in fourth grade, NCE regression scores were analyzed using a one-way ANOVA. The

results were not significant, $F = .058$, $df = 2, 194$, $p = .944$. Table 21 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 11.

Table 21

Summary ANOVA Analysis Results for H11: Summer Intervention Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 4 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	19.30	2	9.649	0.058	0.944
Score Differences	3,2192.32	194	165.940		

A follow-up post hoc was not conducted because summer intervention did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for fourth grade students. The mean difference between pre- and post-STAR Reading NCE reading achievement scores for fourth grade students were: Smart Start, -4.396; traditional summer school, -4.177; and non-attending, -3.374. Non-attending fourth grade students had the least regression between spring and fall, as shown in Figure 11. These findings did not support hypothesis 11.

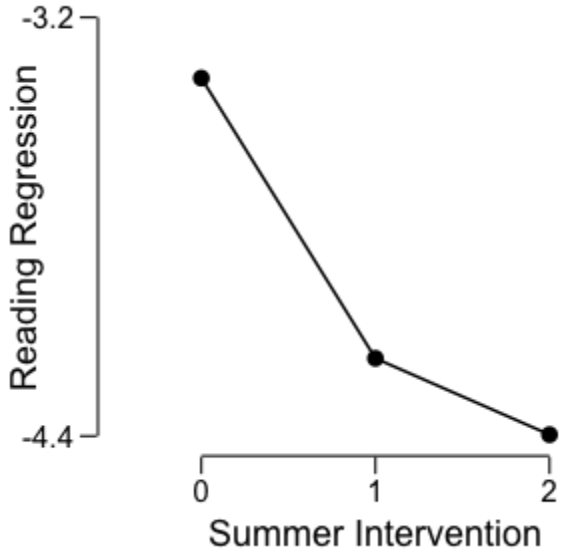

Figure 11. Grade 4 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending; 1 = traditional summer school; 2 = Smart Start. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 4.

H12. The interaction between the type of summer intervention and socioeconomic status influenced STAR Reading NCE reading score regression for fourth grade students.

To test the interaction of the summer intervention and socioeconomic status on the NCE reading achievement scores of students in fourth grade, NCE regression scores were analyzed using a two-way ANOVA. The first interaction was summer intervention (Smart Start, traditional summer school, and non-attending) between subjects, and the

second interaction was socioeconomic status (free and reduced-pay vs. full pay) between subjects. There was no significant main effect of summer intervention, $F = .038$, $df = 2$, 191, $p = .963$. There was no significant main effect of socioeconomic status, $F = 1.093$, $df = 1$, 191, 225, $p = .297$. The interaction between summer intervention and socioeconomic status was not significant, $F = .015$, $df = 2$, 191, $p = .985$. Table 22 displays the sum of squares, degrees of freedom, mean square, *F*-ratio, and *p*-value for hypothesis 12.

Table 22

Summary ANOVA Analysis Results for H12: Summer Intervention and Socioeconomic Status Influence on STAR Early Literacy NCE Reading Achievement Scores for Grade 4 Students

Variables	*SS*	*df*	*MS*	*F*	*p*
Summer Intervention	12.667	2	6.333	0.038	0.963
Socioeconomic Status	182.054	1	182.054	1.093	0.297
Summer Intervention and Socioeconomic Status	4.867	2	2.433	0.015	0.985
Score Differences	31,801.219	191	166.499		

A follow-up post hoc was not conducted because summer intervention and socioeconomic status did not have a significant influence on the regression between pre- and post-NCE reading achievement scores for fourth grade students. The mean regression between pre- and post-STAR Reading NCE reading achievement scores for fourth grade students who indicated free or reduced-price lunch status were: Smart Start, -3.027; traditional summer school, -3.390; and non-attending, -3.065. The mean

difference between pre- and post-STAR Reading NCE reading achievement scores for fourth grade students who indicated full-pay lunch status were: Smart Start, -6.352; traditional summer school, -6.736; and non-attending, -5.150. Although these results were not statistically significant, regardless of socioeconomic status, students who attended Smart Start had less regression than those who attended traditional summer school, as shown in Figure 12. These findings did not support hypothesis 12.

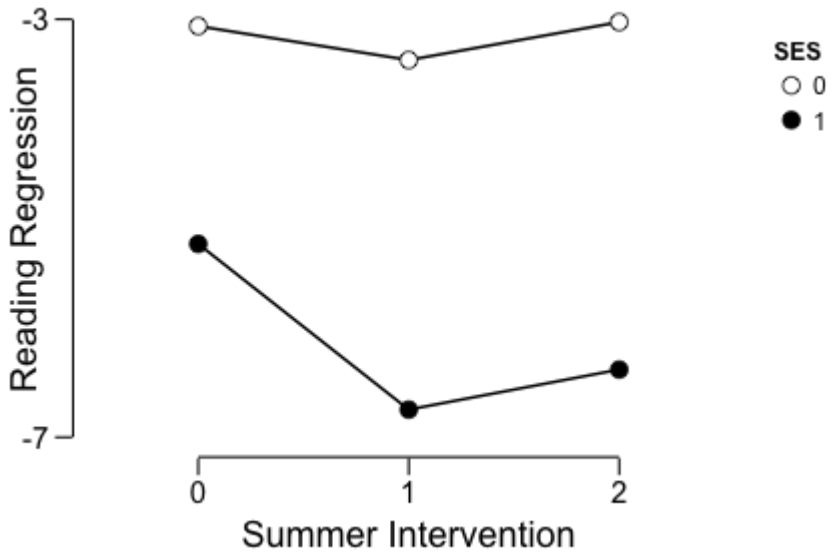

Figure 12. Grade 4 mean regression of pre- and post-STAR Reading NCE reading achievement scores when grouped by summer intervention: 0 = non-attending, 1 = traditional summer school, and 2 = Smart Start, and socioeconomic status: 0 = free or reduced-price lunch, 1 = full pay. The x-axis indicates the type of summer intervention. The y-axis indicates the range of mean spring and fall STAR Reading NCE regression scores for students entering grade 4. The two plot lines indicate STAR Reading NCE regression scores disaggregated by socioeconomic status.

Summary

Chapter four contained the results of the data analysis and hypothesis testing related to the impact of summer intervention on NCE reading score regression when grouped by grade level and socioeconomic status. The results of the paired-samples *t* test, one-way, and two-way ANOVAs were presented. Chapter five contains a summary of the study, major findings, connections to the literature, implications for action, recommendations for further study, and conclusions.

Chapter Five

Interpretation and Recommendations

As a school year concludes and summer begins, explicit instruction and learning, for most students, ends. For children whose summer experiences include trips to the library, vacations, and museum visits, reading regression is not a concern (Cooper et al., 1996). On the other hand, children with limited resources and opportunities, experience reading regression, underscoring the persistent achievement gap between students eligible and not eligible for free or reduced-price lunch (Perie, Grigg, & Donahue, 2005). Regardless of social lines, consistent learning rates have been identified throughout the traditional school year (Alexander et al., 2007). With consistent learning occurring during the school year, regardless of socioeconomic status, and summer bringing about opportunity and learning gaps, the summer months are an ideal time to target students at risk for academic regression.

This chapter contains a summary of the study, which includes an overview of the problem, purpose statement, and research questions, and a review of the methodology. Additionally, the major findings of the study are connected to the related literature. Chapter five concludes with implications for action, as well as recommendations for future research.

Study Summary

This study was conducted to examine the impact of the type summer intervention (Smart Start, traditional summer school, and non-attending) on student NCE reading scores when grouped by grade level and socioeconomic status and assess reading score regression. The following section summarizes the current study. An overview of the

problem, the purpose of the study and research questions, review of methodology, the study's major findings, conclusions, and recommendations for future research are provided.

Overview of the problem. The problem addressed in this study was the identification of a summer intervention structure to lessen summer reading regression, specifically for students who are economically disadvantaged or academically at-risk. As students learn at relatively equal rates throughout the school year, the summer months provide grounds for the achievement gap to expand, as children of varying socioeconomic status experience varying opportunities and learning experiences (Alexander et al., 2007; Perie et al., 2005). This cycle of summer reading regression limits a student's ability to achieve throughout the student's educational career, as reading achievement for students living in poverty regresses due to a lack of direct instruction and literacy exposure in the summer (Cooper et al., 1996). Deprived of explicit reading instruction and support during the summer, students facing poverty experience reading regression. While children of varying socioeconomic status may learn equally during the traditional school year, summer creates a divide that remains throughout the years to follow. Summer regression literature suggests traditional summer school does not considerably impact student learning or alter a child's academic trajectory (Hattie, 2008). Given the negligent effect of traditional summer school, it is also crucial to examine the effect of summer academic intervention. The research concerning summer intervention programs focusing on supporting elementary students living in poverty or at risk of academic failure demonstrates inconsistent findings.

Purpose statement and research questions. The purpose of this study was to determine if the type of summer intervention program made a difference in student reading achievement when disaggregated by grade level and socioeconomic status. Grade level was studied as a variable because early intervention is essential to adjusting a student's academic trajectory. Examining grade level as an independent variable also assisted in determining if Smart Start and traditional summer school were more impactful on certain grade levels. Finally, as the target school district continued to experience shifts in student socioeconomic status, it was crucial to identify ways to support these students. Although Smart Start was designed to serve students in grades 1, 2, 3, and 4 with academic deficits, many of these students also lived in poverty. Examining the independent variable of socioeconomic status assisted in determining the impact it has on reading achievement. Additionally, the interaction of type of intervention and socioeconomic status was studied. Three research questions were developed to address the purposes of the study.

Review of the methodology. A quantitative quasi-experimental nonequivalent pre- and post-test control-group design was used to address the problem posed in this study. This approach allowed for the comparison of the impact of Smart Start, traditional summer school, and non-attendance on the reading score regression of at-risk students entering grades 1, 2, 3, and 4 during the implementation years. Because of the quantitative nature of this study, statistical procedures were used to analyze quantifiable data associated with the variables to assist with examining relationships (Creswell, 2014). Three groups of students were used in this study: students who qualified for and attended Smart Start for 7-12 days, students who attended traditional summer school, and students

who were eligible for Smart Start and did not attend or attended minimally for six days or less. The independent variables of type of summer intervention program and socioeconomic status were used to further disaggregate student NCE scores into small subgroups using the dependent variable of STAR Early Literacy NCE scores for first grade students, and STAR Reading NCE scores for second through fourth grade students during 2013, 2014, and 2015. In the current study, a paired-samples *t* test was conducted to determine the extent of regression between pre- and post-test reading scores. Also, one and two-way ANOVAs with two independent variables and one dependent variable were conducted to determine the extent of any main effects of the independent variables of the type of summer intervention program and socioeconomic status on the dependent variables of STAR Early Literacy NCE scores for students in grade 1 and STAR Reading NCE scores for students in grades 2, 3, and 4.

Major findings. The presence of reading score regression amongst the students included in the current study was examined in hypotheses 1-4. A paired-samples *t* test was used to assess for regression between spring and fall NCE reading scores. Reading regression was statistically significant amongst students entering grade 2, grade 3, and grade 4 for all implementation years of the study. Regardless of the type of summer intervention implemented (Smart Start, traditional summer school, and non-attending), reading scores regressed. The reading scores of students entering grade 1 experienced negative regression. Scores were significantly higher in the fall than in the spring, indicating growth over the summer. However, students entering grade 1 utilized STAR Early Literacy, as opposed to STAR Reading, for students entering grades 2, 3, and 4.

The main effects and interactions between and among the type of summer intervention and socioeconomic status on reading score regression when isolated by grade level were analyzed in hypotheses 5-12. Although statistical significance was not identified, the reading scores of students entering grade 1 during all implementation years of the current study experienced the least reading regression if they participated in Smart Start for 7-12 days. In the sample studied, there were no students entering grade 1 who participated in traditional summer school. When the independent variable of socioeconomic status was examined, students entering grade 1 who did not indicate free or reduced-price lunch status had lower mean reading regression scores than those who indicated free or reduced-price lunch status. Regardless of socioeconomic status, non-attending students had the greatest reading score regression.

Although statistical significance was not identified, students entering grade 2 during all implementation years of the current study experienced the least reading regression if they participated in Smart Start for 7-12 days. Students entering grade 2 who participated in traditional summer school had reduced reading regression scores compared to those who were non-attending. Students entering grade 2 who did not indicate free or reduced-price lunch status experienced reduced reading score regression if attending traditional summer school or Smart Start. Conversely, students entering grade 2 who indicated free or reduced-price lunch status and attended traditional summer school or Smart Start had increased reading regression scores compared to their non-attending peers.

When the main effects and interactions between and among the type of summer intervention and socioeconomic status on reading score regression was examined for

students entering grades 3 and 4 for all implementation years, there was no statistical significance. Upon closer inspection, the type of summer intervention program and socioeconomic status had little impact on reading score regression, as non-attending students in both grade levels had less reading score regression than their attending peers. The only exception occurred in grade 3 amongst students who indicated free or reduced-price lunch status and attended Smart Start. This group had less reading score regression than did their non-attending peers.

Findings Related to the Literature

A review of the literature was conducted related to the components of effective reading intervention, summer regression, and approaches used to lessen summer regression. A review of the existing literature regarding the impact of socioeconomic status on summer regression was also conducted. While the literature documenting the realities of summer regression was abundant, the results of summer intervention programs to remedy reading regression were mixed (Hattie, 2008; Heyns, 1987; Karweit, 1993). Lauer et al. (2006) called for continued documentation of effective characteristics of summer programs, as the best possibility for reducing or eliminating summer reading regression lies in prescriptive and intervention-based programming (Cooper, 2004).

Alexander et al. (2007) identified that achievement trends throughout the school year appear nearly uniform, regardless of socioeconomic status. Cooper et al.'s (1996) meta-analysis regarding summer regression found economically advantaged students' reading achievement increased over the summer months, while economically disadvantaged students' reading achievement regressed. With equitable rates of learning during the school year and clear evidence of prevalent and significant reading regression

amongst children who are economically disadvantaged, the summer months can be identified as the crucible of the achievement gap (Allington et al., 2010). The results of the current study support the realities of summer regression, as all students included in the sample except for students entering grade 1, experienced statistically significant reading score regression. In contrast with the research, socioeconomic status was not a statistically significant variable impacting reading score regression in any of the grade levels studied. While socioeconomic status did not impact reading score regression in the current study, it must be noted that all students included in the sample were considered academically at-risk and performing below grade level. Although the opportunity gap between socioeconomic groups is a reality, the results of this study indicate at-risk academic status and reading below grade level may prevail over socioeconomic status discrepancies (Alexander et al., 2007; Blazer, 2011; Bracy, 2002; Miller, 2007).

The research related to reading intervention focuses heavily on foundation skills, including prereading, phonological, and vocabulary skills (Allington, 2011; Allington, 2013; Torgesen, 2004). To best support struggling readers, explicit phonics instruction and intervention has demonstrated the greatest impact on student achievement and skill growth (Denton et al., 2006; Foorman & Torgesen, 2001; Hattie, 2008). As foundational skill work and phonics instruction are more heavily addressed in the early years, it is easy to understand why early intervention is critical and most effective (Graham & Harris, 2000). Graham and Harris (2000) indicated intervention and support during the primary grades helps prevent the intensifying of reading difficulties. Additionally, the research related to reading regression and summer intervention echoes the ability of early intervention to alter a child's academic trajectory when support begins in preschool or the

primary grades (Alexander et al, 2001; Entwisle et al., 2001; Pechous, 2012; Reardon, et al., 2013; Seward, 2009).

The results of the current study support the literature, indicating explicit summer intervention targeted toward the primary grades is most beneficial (Pechous, 2012; Schacter & Jo, 2005; Seward, 2009; Zvoch & Stevens, 2013). In the current study, reading scores for the two youngest groups of students, those entering grade 1 and grade 2, experienced the least reading regression when they attended Smart Start. Students in this age group who attended traditional summer school had less regression among their reading scores than their non-attending peers, but more than their Smart Start attending peers. Although these results were not statistically significant, they serve as evidence that early, targeted intervention is more beneficial than traditional summer school or non-attendance, confirming the research related to the differences between explicit summer intervention and traditional summer school (Bell & Carrillo, 2007; Denton, 2002; Gold, 2004; Heyns, 1978; Schacter, 2003; Zvoch & Stevens, 2013).

When the results of students entering grades 3 and 4 were examined, no conclusive patterns could be identified in relation to Smart Start or traditional summer school participation. In both grade levels, non-attending students had less reading score regression, although not statistically significant, than those who attended either Smart Start or traditional summer school. These results reflect the importance of early intervention in altering a student's academic trajectory and indicate that even middle and upper elementary schoolers do not respond as readily to support as students in the primary grades (Alexander et al, 2001; Entwisle et al., 2001; Graham & Harris, 2000; Reardon, et al., 2013).

Conclusions

This study provided results regarding the impact of a type of summer intervention program on student NCE reading regression scores, as measured by pre- and post-tests, when disaggregated by grade level and socioeconomic status. School leaders should carefully examine summer intervention structures and their impact on student achievement to determine their effectiveness. While reducing reading score regression is important, it is difficult to develop structures and interventions that successfully eliminate regression. Results of this study provided little evidence to support the positive impact of summer intervention on eliminating reading regression, but do indicate the importance of summer intervention in reducing reading regression, especially in the primary grades. Implications for action and recommendations for future research are included in the following section of this study.

Implications for action. The research related to learning rates indicates students learn at relatively the same rate during the school year (Alexander & Entwisle, 1996; Bracey, 2002). Given the equality of learning occurring during the school year, summer creates a barrier for disadvantaged students. Blazer (2011) recognizes that when students are not exposed to learning opportunities during the summer, the achievement gap between advantaged and disadvantagesd students increases each year. Since this study indicated the realities of reading score regression in grades 2, 3, and 4 during the summer months, school district leaders should continue exploring programs to support students and reduce reading regression in order to help reduce the achievement gap.

Because students entering grades 1 and 2 benefited from tradtional summer school and Smart Start, it should remain a priority of school districts to continue

supporting like programs. The results of the current study mirror similar studies conducted by Barr-Cole (2004), Schacter and Jo (2005), Seward (2009), and Zvoch and Stevens (2013). While the results of research questions 2 and 3 were not statistically significant, school distict leaders should appreciate the growth indicated through summer supports and continue refining summer curriculum and intervention design. Additionally, because of the growth made by students entering grade 1 and the lessened regression of students entering grade 2, school district leaders should consider broadening their target audience. If it is possible to identify incoming kindergarteners in need of academic support, the results of this study, along with the review of literature, support targeting children in early childhood and the early grades.

Although the results of students entering grades 3 and 4 indicated mixed results, school district leaders should not disregard supports for students in middle and upper elementary. Rather, refining current summer intervention practices could alter the outcomes of studies approached in a similar way. Examining the curriclum used within the target school district's Smart Start program and traditional summer school programs for the upper grades indicates explicit phonics instruction is present in grades 1 and 2, but not in grades 3 and 4. Research indicates explicit phonics instruction is more effective than instruction lacking a phonics base (Denton et al., 2006; Foorman & Torgesen, 2001). Pechous's (2012) study, featuring a summer intervention program mirroring Smart Start, demonstrated growth amongst students entering grades 3 and 4 when an explicit phonics program was utilized. Because the current study focused on students struggling to attain grade level reading expectations, integrating explicit phonics instruction into the

curriuculum for students in middle and upper elementary could have a positive effect on reducing reading score regression.

During the traditional school year, students academically at-risk in the area of reading receive additional support in a small-group setting from a trained reading specialiast. If these students attend traditional summer school, this differentiated support is not offered. Plus, they may receive instruction from a non-certified teacher. When organizing traditional summer school, at-risk learners should be placed with certified teachers. Certified teachers have received targeted professional development and have access to literacy support to diagnose and remedy students' reading difficulties, as opposed to paraprofessionals, who can only slightly advance student progress (Allington, 2013). In addition to ensuring classroom instruction is provided by a certified teacher, school district leaders should consider providing continued small-group support for identified students by trained reading specialists. To enhance the academic growth of struggling learners, group sizes must remain small, ranging from one-on-one instruction to groups no larger than three to five students (Allington, 2011; Hattie, 2008; Torgesen, 2004). Reading specialists during traditional summer school could provide continuity for students who receive additional small-group support during the traditional school year and offer the small-group environment ideal for struggling readers.

Recommendations for future research. An evaluation of the impact of summer on the reading score regression of students entering grades 1, 2, 3, and 4 was conducted. Additionally, the main effects and interactions between and among the type of summer intervention program and socioeconomic status on reading score regression when disaggregated by grade level were examined within the current study. The following

recommendations are intended for others interested in designing a study to investigate the impact of summer intervention on the reading score regression of economically and academically disadvantaged students.

1. Replicate the current study using a broader range of grade levels, including kindergarten, grade 5, and grade 6. Because of the discrepancy between students entering grades 1 and 2 and those entering grades 3 and 4, expanding the grade levels studies may validate the importance of intervening in the early grades.
2. Replicate the current study in a different setting. The current study took place in a suburban school district and focused on economically disadvantaged and academically struggling learners. Replicating the study in a rural or urban setting may provide greater understanding of the impact of summer on the achievement gap.
3. Modify the current study using adjusted curriculum in grades 3 and 4 that integrates explicit phonics instruction. Because of the research validating the importance of phonics instruction for struggling readers, an altered instructional approach may alter the results achieved.
4. Modify the current study and integrate parent education as an element of summer intervention. With research indicating the importance of parent involvement during the summer months, parent education may alter reading score regression.
5. Modify the current study by adding in comparison groups of students who are performing on grade level. Because all students in the current study were academically struggling, the socioeconomic element did not appear to be a contributing factor in reading score regression. Integrating a group of students

achieving grade level reading expectations may allow for greater clarity related to the impact of socioeconomic status.

Concluding remarks. Given the trend of school districts continuing to operate with a traditional school year calendar and the importance of closing the achievement gap, developing summer supports to reduce reading score regression is essential. Acknowledging the common learning rates during the school year and the regression that occurs over the summer must reinforce the importance of increasing and strengthening summer learning opportunities, especially for economically disadvantaged and academically struggling learners. The current study supports this desire and encourages those charged with developing summer academic structures to continue modifying and seeking to make improvements to existing supports in order to better enhance student achievement.

References

Alexander, K. L., & Entwisle, D. R. (1996). Schools and children at risk. In A. Booth & J. F. Dunn (Eds.), *Family-school links* (pp. 67-88). Mahwah, NJ: Lawrence Erlbaum Associates.

Alexander, K. L., Entwistle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review, 72*(2), 167-180. doi:10.1177/000312240707200202

Allington, R. L. (2011). What at-risk readers need. *Educational Leadership, 68*(6), 40-45. Retrieved from http://www.ascd.org/publications/educational_leadership/mar11/vol68/num06/What_At-Risk_Readers_Need.aspx

Allington, R. L. (2013). What really matters when working with struggling readers. *Reading Teacher*, *66*(7), 520-530. doi:10.1002/TRTR.1154

Allington, R. L., McGill-Franzel, A., Camilli, G., Williams, L., Graff, J., Zeig, J., . . . Nowak, R. (2010). Addressing summer reading setback among economically disadvantaged students. *Reading Psychology, 31*(5), 411-427. doi:10.1080/02702711.2010.505165

American Psychological Association. (2016). *Socioeconomic status*. Retrieved from http://www.apa.org/topics/socioeconomic-status/

Anderson, R. C., Wilson, P. T., & Fielding, L. G. (1988). Growth in reading and how children spend their time outside of school. *Reading Research Quarterly*, *23*(3), 285-303.

Association of California School Administrators. (1988). *A primer on year-round education*. Sacramento, CA: Association of California School Administrators.

Baker, L., Dreher, M. J., & Guthrie, J. T. (2000). Why teachers should promote reading engagement. In L. Baker, M. J. Dreher, & J. T. Guthrie (Eds.), *Engaging young readers: Promoting achievement and motivation* (pp. 43-67). New York: Guilford Press.

Barr-Cole, D. O. (2004). *An evaluation of an intense summer reading intervention program* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (UMI No. 3131123)

Bell, S. R. and Carrillo, N. (2007). Characteristics of effective summer learning programs in practice. *New Directions for Youth Development*, *2007*(114), 45-63. doi:10.1002/yd.212

Blazer, C. (2011). Summer learning loss: Why its effect is strongest among low-income students and how it can be combated. *Information Capsule, 1011*. Miami, FL: Research Services, Miami-Dade County Public Schools. Retrieved from ERIC database. (ED536514)

Bracey, G. W. (2002). What students do in the summer. *Phi Delta Kappan*, *83*(7), 497-498. doi:10.1177/003172170208300706

Brueckner, L. J. & Distad, H. W. (1924). The effect of the summer vacation on the reading ability of first-grade children. *The Elementary School Journal*, *24*(9), 698-707.

Bruene, E. (1928). Effect of the summer vacation on the achievement of pupils in the fourth, fifth, and sixth grades. *Journal of Educational Research*, *18*(4), 309-314.

Burkam, D. T., Ready, D. D., Lee, V. E., & LoGerfo, L. F. (2004). Social-class differences in summer learning between kindergarten and first grade: Model specification and estimation. *Sociology of Education, 77*(1), 1-31.

Carter, L. F. (1984). The sustaining effects study of compensatory and elementary education. *Educational Researcher, 13*(7), 4-13.

Clowse, B. B. (1981). *Brainpower for the Cold War: The Sputnik crisis and National Defense Education Act of 1958*. Westport, CT: Greenwood Press.

Cook, R. C. (1942). Vacation retention of fundamentals by primary-grade pupils. The *Elementary School Journal, 43*(4), 214-219.

Cooper, H. (2001). *Summer school: Research-based recommendations for policymakers*. Greensboro, NC: Regional Educational Laboratory Southeast.

Cooper, H. (2003). *Summer learning loss: The problem and some solutions*. Champaign, IL: ERIC Clearinghouse on Elementary and Early Childhood Education. Retrieved from ERIC database. (ED475391)

Cooper, H. (2004). Assessing the effectiveness of summer reading programs. In G. Borman & M. Boulay (Eds.), *Summer learning: Research, policies, and programs* (pp. 122-161). Mahwah, NJ: Erlbaum.

Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research, 66*(3), 227-268. doi:10.3102/00346543066003227

Cooper, H., Charlton, K. Valentine, J. C., & Muhlenbruck, L. (2000). *Making the most of summer school: A meta-analytic and narrative review*. Washington, DC: Society for Research in Child Development.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE Publications, Inc.

Crowell, D. C., & Klein, T. W. (1981, February). Preventing summer loss of reading skills among primary children. *The Reading Teacher, 34*(5), 561-564.

Cullinan, B. E. (2000). Independent reading and school achievement. *American Library Association School Library Media Research*, *3*, 1-24. Retrieved from http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol3/SLMR_IndependentReading_V3.pdf

Curtis, H. S. (1904). Vacation schools, playgrounds, and settlements. In U.S. Bureau of Education (Ed.), *Report of the US Commissioner of Education of 1903* (pp. 2-38). Washington, DC: Government Printing Office.

Curtis, J., Doss, D., & Totusek, P. (1982). *Improving achievement for pupils of low socioeconomic strata: The gamble we must take.* Paper presented at the 1982 Annual meeting of the American Educational Research Association, New York City, NY.

Daly, C. J. (2014). *The effectiveness of summer school in halting summer learning loss and increasing student achievement: A mixed-methods study* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (UMI No. 3643056)

Denton, C. A., Fletcher, J. M., Anthony, J. L., & Francis, D. J. (2006). An evaluation of intensive intervention for students with persistent reading difficulties. *Journal of Learning Disabilities*, *39*(5), 447-466.

Denton, D. R. (2002). *Summer school and summer learning, 2002: Progress and challenges*. Atlanta, GA: Southern Regional Education Board.

Downey, D. B., von Hippel, P. T., & Broh, B. A. (2004). Are schools the great equalizer? Cognitive in equality during the summer months and the school year. *American Sociological Review*, *69*(5), 613-635.

DuFour, R., DuFour, R., Eaker, R., & Carhanek, G. (2009). *Raising the bar and closing the gap: Whatever it takes*. Bloomington, IN: Solution Tree.

Duke, N. K., & Carlisle, J. (2011). The development of comprehension. In M. L. Kamil, P. D. Pearson, E. B. Moje, & P. P. Afflerbach (Eds.), *Handbook of reading research* (pp. 199-228). New York, NY: Routledge.

Ehri, L. (2004). Teaching phonemic awareness and phonics. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 153-186). Baltimore, MD: Paul H. Brookes Publishing Co.

Elder, H. E. (1927). The effect of the summer vacation on silent-reading ability in the intermediate grades. *The Elementary School Journal*, *27*(7), 541-546.

Entwisle, D. R., & Alexander, K. L. (1992). Summer setback: race, poverty, school composition, and mathematics achievement in the first two years of school. *American Sociological Review*, *57*(1), 72-84. doi:10.2307/2096145

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2001). Keep the faucet flowing: Summer learning and home environment. In R. D. Kahlenberg (Ed.), *A notion at risk: Preserving public education as an engine for social mobility* (pp. 9-30). New York, NY: Century Foundation Press.

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2014). *The long shadow: Family background, disadvantaged urban youth, and the transition to adulthood.* New York, NY: Russell Sage Foundation.

Foorman, B. R., & Torgesen, J. K. (2001). Critical elements of classroom and small-group instruction promote reading success in all children. *Learning Disabilities Research and Practice, 16*(4), 202–211.

Fountas, I. C., & Pinnell, G. S. (2001). *Guiding readers and writers grade 3-5: Teaching comprehension, genre, and content literacy*. Portsmouth, NH: Heinemann.

Garfinkel, M. A. (1919). The effect of the summer vacation on ability in the fundamentals of arithmetic. *Journal of Educational Psychology, 10*(1), 44-48. doi:10.1037/h0072168

Garson, D. (2009). *Reliability analysis*. Retrieved from http://tx.liberal.ntu.edu.tw/~purplewoo/Literature/!DataAnalysis/Reliability%20Analysis.htm

Gold, K. (2002). *School's in: The history of summer education in American public schools*. New York, NY: Peter Lang International Academic Publishers

Graham, S., & Harris, K. R. (2000). Helping children who experience reading difficulties: Prevention and intervention. In L. Baker, M. J. Dreher, & J. T. Guthrie (Eds.), *Engaging young readers: Promoting achievement and motivation* (pp. 43-67). New York: Guilford Press.

Harrington-Lueker, D. (2000). Summer learners: Can summer school make a difference in student achievement? *American School Board Journal*, *187*(3), 20–32.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Heyns, B. (1978). *Summer learning and the effects of schooling*. New York, NY: Academic Press, Inc.

Heyns, B. (1987). Schooling and cognitive development: Is there a season for learning? *Child Development*, *58*(5), 1151-1160.

Irmina, S. M. (1928). The effects of summer vacation upon the retention of the elementary school subjects. *Educational Research Bulletins*, *3*(66), 9.

Jiang, Y., Ekono, M., & Skinner, C. (2015). *Facts about low-income children* [Fact sheet]. Retrieved from http://www.nccp.org/publications/pdf/text_1099.pdf

Kaestle, C. F., & Vinovskis, M. A. (1981). Education and social change. *American Journal of Education*, *89*(2), 234-237.

Karweit, N. L. (1993). *Summer achievement growth and the effectiveness of summer school*. Baltimore, MD: Johns Hopkins University Center for Research on Effective Schooling for Disadvantaged Students.

Kolberg, O. W. (1934). A study of summer-time forgetting. *The Elementary School Journal*, *35*(4), 281-287.

Kramer, G. A. (1927). Do children forget during the vacation? *Baltimore Bulletin of Education*, *6*, 56-60.

Lahey, M. F. (1941). Permanence of retention of first-year algebra. *The Journal of Educational Psychology*, *32*(6), 401-413.

Lauer, P. A., Akiba, M., Wilkerson, S. B., Apthorp, H. S., Snow, D., & Martin-Glenn, M. L. (2006). Out-of-school-time programs: A meta-analysis of effects for at-risk students. *Review of Educational Research*, *76*(2), 275–313.

Love, J., Selker, R., Marsman, M., Jamil, T., Dropmann, D., Verhagen, A. J., . . . Wagenmakers, E.-J. (2015). *JASP (Version 0.7.5*) [Computer software].

Lundstrom, M. (2006). Stop the summer slide. *Instructor*, *114*(8), 20-26.

Lunenburg, F. C., & Irby, B. J. (2008). *Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences*. Thousand Oaks, CA: Corwin Press.

Miller, B. M. (2007). *The learning season*. Quincy, MA: The Nellie Mae Education Foundation.

Missouri Department of Elementary and Secondary Education. (n.d.). *Questions on Missouri learning standards*. Retrieved from http://www.missourilearningstandards.com/faq/

Missouri Department of Elementary and Secondary Education. (2015). *Missouri comprehensive data system: District report card*. Retrieved from http://mcds.dese.mo.gov/guidedinquiry/School%20Report%20Card/District%20Report%20Card.aspx?rp:SchoolYear=2015&rp:SchoolYear=2014&rp:SchoolYear=2013&rp:SchoolYear=2012&rp:DistrictCode=083005

Morgan, L. D. (1929). How effective is specific training in preventing loss due to the summer vacation? *The Journal of Educational Psychology*, *20*(6), 466-471.

National Center for Response to Intervention. (n.d.-a). *STAR Early Literacy*. Retrieved from http://www.rti4success.org/star-early-literacy

National Center for Response to Intervention. (n.d.-b). *STAR Reading*. Retrieved from http://www.rti4success.org/star-reading

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

Natriello, G. (2002). At-risk students. In D. Levinson, P. Cookson, & A. Sadovnik (Eds.), *Education and sociology: An encyclopedia* (pp. 49-54). New York, NY: RoutledgeFalmer.

Nelson, M. J. (1928). How much time is required in the fall for pupils of the elementary school to reach again the spring level of achievement? *Journal of Educational Research*, *18*, 305-308.

Noonan, K. M., & Powell, M. (1926). Achievement gains or losses during the academic year and over the summer vacation period: A study of trends in achievement by sex and grade level among students of average intelligence. *Genetics Psychology Monographs*, *66*, 285-342.

Odell, C. W. (1930). *Summer work in public schools*. Urbana, IL: University of Illinois Press

Pechous, D. J. (2012). *Minimizing reading regression through a direct instruction summer reading program* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (UMI No. 3504119)

Perie, M., Grigg, W., & Donahue, P. (2005). *The nation's report card: Reading 2005* (NCES 2006–451). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Reardon, S. F. (2013). The widening income achievement gap. *Educational Leadership, 70*(8), 10-16.

Renaissance Learning. (2012). *STAR Early Literacy Technical Manual*. Wisconsin Rapid, WI: Renaissance Learning.

Renaissance Learning. (2015). *STAR Reading Technical Manual*. Wisconsin Rapid, WI: Renaissance Learning.

Schacter, J. (2003). Preventing summer reading declines in children who are disadvantaged. *Journal of Early Intervention, 26*(1), 47-58.

Schacter, J., & Jo, B. (2005). Learning when school is not in session: A reading summer day-camp intervention to improve the achievement of exiting first-grade students who are economically disadvantaged. *Journal of Research in Reading, 28*(2), 158-169.

School District X. (2015). *Demographic profile: 2014-2015*. School District X: Business Services Department of the School District X & Business Information Services, LLC.

Schrepel, M., & Laslett, H. R. (1936). On the loss of knowledge by junior high-school pupils over the summer vacation. *The Journal of Educational Psychology, 27*(4), 299-303.

Seward, C. (2009). *Evaluating the effectiveness of a short-duration reading intervention on grade one phonological awareness and word reading* (Doctoral dissertation, Wilfrid Laurier University). Retrieved from http://scholars.wlu.ca/cgi/viewcontent.cgi?article=2070&context=etd

Skinner, R. R. (2014). *Year-round schooling: In brief*. (CRS Report No. R7-5700). Washington D.C.: Congressional Research Service. Retrieved from https://fas.org/sgp/crs/misc/R43588.pdf

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*(4), 360-407.

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundation and new frontiers*. New York, NY: Guilford Press.

Torgesen, J. K. (2004). Lessons learned from research on interventions for students who have difficulty learning to read. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 153-186). Baltimore, MD: Paul H. Brookes Publishing Co.

U.S. Bureau of Education. (1914). *Report of the commissioner of education*. Washington, D.C.: U.S. Government Printing Office

U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. (n.d.). *About the WWC*. Retrieved from http://ies.ed.gov/ncee/wwc/aboutus.aspx

U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Performance Information Management Service. (2012). *Free and reduced-price lunch eligibility data in EDFacts: A white paper on current status and potential changes*. Washington, DC: U.S. Government Printing Office.

White, W. F. (1906). Reviews before and after vacation. *American Education, 10*(3), 185-188.

Williams, C., Phillips-Birdsong, C., Hufnagel, K., Hungler, D., & Lundstrom, R. P. (2009, April). Word study instruction in the K-2 classroom. *The Reading Teacher, 62*(7), 570-578. doi:10.1598/RT.62.7.3

Zvoch, K., & Stevens, J. J. (2013). Summer school effects in a randomized field trial. *Early Childhood Research Quarterly, 28*(1), 24-32.

Appendices

Appendix A: Baker University Proposal for Research

BAKER UNIVERSITY

SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

Date: 2-16-16
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. Sharon Zoellner	_____	_____, Major Advisor
2. Dr. Phillip Messner	_____	_____, Research Analyst
3. _____		University Committee Member
4. Dr. Jim Singer		External Committee Member

Principal Investigator: Jessica L. Morgan
Phone: (Cell) 816-797-1138, (Work) 816-359-6417
Email: jessicalmorgan@stu.bakeru.edu
Mailing address: 5017 N Merrimac Ave, Riverside, MO, 64150

Faculty sponsor: Dr. Sharon Zoellner
Phone: 913-344-1225
Email: Sharon.Zoellner@bakeru.edu

Expected Category of Review: __X__Exempt ___ Expedited _ __Full

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

An Investigation of the Impact of Smart Start on Student Normal Curve Equivalent Reading Scores when Grouped by Attendance, Socioeconomic Status, and Grade Level During 2013, 2014, and 2015

Will any stress to subjects be involved? If so, please describe.

No stress to any subjects will be involved, as archived data will be used.

Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

No subjects will be deceived or misled in any way, as archived data will be used.

Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.

There will be no request for personal or sensitive information, as archived data will be used.

Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.

The subjects will not be presented with materials which might be considered to be offensive, threatening, or degrading, as archived data will be used.

Approximately how much time will be demanded of each subject?

There is no time commitment demanded of each subject, as archived data will be used.

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.

Archival data for students in grades 1, 2, 3, and 4 who qualified for the academic summer intervention, Smart Start, or who met designated criteria and participated in summer school in the target school district during the summers of 2013, 2014, and 2015 will be used.

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?

Consent was not needed for the current study because archival data was used.

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.

Consent was not needed for the current study because archival data was used.

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 the permanent record that can be identified with 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.

Whether a subject did or did not participate in this study will not be made part of any permanent record available to a supervisor or teacher.

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?

No names or personal identifiers will be used within the data; this will ensure confidentiality. A random numerical value will be assigned to each student included within the sample to assist in identification of applicable variables; this random numerical value will be assigned after the data is amalgamated into one set. The target school district's Director of Research, Evaluation, and Assessment will provide the data to the researcher. Data will be stored on a password-protected computer. The data will be stored for 5 years following the conclusion of the study. After five years, the data will be deleted.

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 the study.

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

Archival data from the target school district will be used for this study. STAR Early Literacy score and STAR Reading scores from spring 2013, fall 2013, spring 2014, fall 2014, spring 2015, and fall 2015 will be utilized. Smart Start attendance records and summer school rosters for 2013, 2014, and 2015 will also be included within the study.

Summary

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

The purpose of this study is to determine if the variables of year, grade level, level of attendance, type of summer intervention program, or socioeconomic status individually impact reading achievement normal curve equivalent (NCE) scores, as measured by STAR Early Literacy for students in grade 1 and STAR Reading for students in grades 2, 3, and 4. Additionally, the interaction of any combination of year, grade level, level of attendance, type of summer intervention program, and socioeconomic status will be studied. This study will be conducted in a moderate-sized Midwestern school district. The estimated number of students in the study will be 800.

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

During the years of this study, the instructional framework of Smart Start and traditional summer school was modified; examining the independent variable of year will assist in determining if these year-to-year changes impacted reading achievement. Grade level will be examined as a variable because early intervention is essential to altering a student's academic trajectory; examining grade level as an independent variable will aid in determining if Smart Start and traditional summer school are more impactful toward certain grade levels. The independent variable of participation rate will help determine if the amount of time a student participated in Smart Start impacted his or her reading achievement. Examining the independent variable of socioeconomic status will assist in determining the impact it has on reading achievement. In this study, two summer academic programs, Smart Start and traditional summer school will be examined. Additionally, the interaction of any combination of year, grade level, the level of attendance, socioeconomic status, and type of summer intervention program will be studied. The dependent variable of STAR Early Literacy and STAR Reading NCE pre- and post-test scores will be used to determine the impact the independent variables have on reading achievement.

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.

Archival assessment data will be utilized for the current study. No subjects will encounter the risk of psychological, social, physical, or legal stress because the study does not involve human subjects. No questionnaire or other instrument will be used other than archival data.

Appendix B: Baker University IRB Approval

Baker University Institutional Review Board

02/24/2016

Dear Jessica Morgan and Dr. Zoellner,

The Baker University IRB has reviewed your research project application and approved this project under Exempt 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

Appendix C: School District X Research Checklist and Approval Application

[redacted]

Research Checklist and Approval

Date: February 26, 2016

Submitted to: Director of Research, Evaluation & Assessment

Submitted by: Jessica Morgan

Research Proposal Title: An Investigation of the Impact of Smart Start on Student Normal Curve Equivalent Reading Scores when Grouped by Attendance, Socioeconomic Status, and Grade Level During 2013, 2014, and 2015

Principal Investigator(s): Jessica Morgan

Checklist

☒ Completed "Application to Conduct Research in [redacted]

N/A Copy of "Informed consent" letter to study population/parents

N/A Copies of measurement instruments

☒ Approval from university human subjects committee (IRB) if applicable

☒ Copy of your complete application package

Approval of this research is contingent on adherence to district procedures as outlined in the document entitled "Application to Conduct Research" and the information provided with the application. The district must be notified of any substantive changes to the information contained in the application. The district reserves the right to withdraw approval of research if the research is deemed to no longer be in the best interests of the [redacted] students, staff, or the district.

Research Application: ☐ Approved ☐ Denied Date: _____

Signatures

_____
Director of Research, Evaluation, and Assessment

[redacted]
Principal

_____
Principal

2/29/2016

Application to Conduct Research in [redacted]

Name Jessica Morgan	[redacted]	[redacted] Elementary- Intervention Specialist	
Address [redacted]	City Kansas City	State MO	Zip Code 64151
Phone Numbe[redacted]	Fax Number 816-359-4369	[redacted]	

I have read and understand the process of application to conduct research in the [redacted] District. I also verify that the information provided in this application is accurate to the best of my knowledge.

2-29-16
Signature Date

Is this study part of your work for a degree?
☒ Yes ☐ No
If Yes, complete the following:
☐ Ph.D. ☒ Ed.D. ☐ M.A./M.S
☐ Undergraduate ☐ Other
University or College Baker University
Date of IRB Approval (or date of application if pending) 2-24-2016
Advisor's Name Dr. Sharon Zoellner
Advisor's Telephone Number 913-344-1225

Attach a concise, yet thorough, response to each of the following items.

1) **Title and purpose of study**
2) **Timeline**
When do you plan to start your study? What is the estimated total length of time?
3) **Benefits to the district**
How will this study benefit the [redacted]
4) **Research Design Summary**
Give specific information on the methods to be used during the course of the study. Please include your research questions, instruments, sampling and data collection methodologies, and proposed analyses. Samples of instruments may include survey questions, observation forms, and interview questions. Finally, describe any tasks students or staff will be asked to complete. Describe procedures you will use to secure and acknowledge informed consent of all participants, including active or passive consent. If passive, please provide a rationale. Please attach copies of any letters. Outline how subjects will be identified and criteria used for recruitment, who will make the initial contact with subjects, and whether or not inducements will be used to secure participation.
5) **Assurance of anonymity [redacted]students & staff**
How will the anonymity of Park Hill students and staff be protected?
6) **Risks of the research**
List any known risks of the proposed investigation to students, staff, or the district.
7) **District involvement**
What request are you making of th[redacted] and the Director of Research, Evaluation, and Assessment? Spe[redacted] and staff to be involved, length of time, and time line for completion of your investigation.
8) **Funding Sources**
9) **IRB approval**
If applica[redacted]py of IRB approval letter, or application if IRB review is in process. [redacted] will not allow study to begin until we have an approval letter on file.

2/29/2016

1) **Title and purpose of study**
   a. *Title*: *An Investigation of the Impact of Smart Start on Student Normal Curve Equivalent Reading Scores when Grouped by Attendance, Socioeconomic Status, and Grade Level During 2013, 2014, and 2015*
   b. *Purpose*: The purpose of this study is to determine if the variables of year, grade level, level of attendance, type of summer intervention program, or socioeconomic status individually impact reading achievement normal curve equivalent (NCE) scores, as measured by STAR Early Literacy for students in grade 1 and STAR Reading for students in grades 2, 3, and 4. Additionally, the interaction of any combination of year, grade level, level of attendance, type of summer intervention program, and socioeconomic status will be studied. This study will be conducted in a moderate-sized Midwestern school district. The estimated number of students in the study will be 800.
2) **Timeline**
   a. This study uses archival data from 2013, 2014, and 2015. STAR Early Literacy and STAR Reading scores from spring and fall will be used to assess the impact of Smart Start, summer school, and a group of non-attenders. The planning of this study originated in March 2015 and is anticipated to conclude in August 2016.
3) **Benefits to the district**
   a. Summer programming decisions are essential for the academic maintenance and growth [redacted] students, especially those identified as academically at-risk. As the [redacted] School District plans for future summer programming, the results of this study will provide evidence to assist with programming decisions.
4) **Research Design Summary**
   a. *Research Questions*:
      i. Does the type of summer intervention program make a difference in student reading achievement NCE scores when broken down by year, grade level, the level of attendance, and socioeconomic status?
      ii. Does the interaction of any combination of year, grade level, the level of attendance, socioeconomic status, and type of summer intervention program make a difference in student reading achievement NCE scores?
   b. *Instruments*: Two reading assessment measures were utilized for this study: STAR Early Literacy and STAR Reading. All students in the sample completed STAR Early Literacy or STAR Reading in accordance to the district assessment calendar. Because this study was conducted to examine the impact of a summer academic achievement, STAR Early Literacy and STAR Reading NCE scores from spring and fall served as the pre- and post-assessments. STAR Early Literacy was used to measure the achievement of students exiting kindergarten, and STAR Reading was used to measure the achievement of students exiting grades 1, 2, and 3.
   c. *Sampling and Data Collection Methodologies*:
      i. *Sampling*: The sample consisted of students exiting grades K, 1, 2, and 3 in the target district during the summers of 2013, 2014, and 2015 that had STAR Reading or STAR Early Literacy scores below the 30th percentile during the winter assessment window, which consistently occurred during December before summer school. The sample was organized into three groups: students who qualified for and attended Smart Start for 7-12 days, students who were eligible for Smart Start and did not attend or attended minimally for 6 days or less, and students who attended traditional summer school.
      ii. *Data Collection*: STAR Early Literacy and STAR Reading were both part of the regular school year assessment program, and scores were archived in a secured online storehouse managed by Renaissance Learning's (2012, 2015) website. Archived data was provided for STAR Early Literacy and STAR Reading for the years examined in this study by the target district's Director of Research, Evaluation, and Assessment. STAR Early Literacy and STAR Reading results were available in Renaissance Learning's (2012, 2015) online score repository. The principal of the Smart Start program provided a spreadsheet of qualifying students from 2013, 2014, and 2015, as well as daily attendance information for students who had enrolled in Smart Start; the daily attendance information was then used to group students into two categories: attending and non- or minimally-

attending. Students categorized as attending participated in Smart Start for 7-12 days and non- or minimally-attending students did not participate in Smart Start or participated 1-6 days. The target district's Director of Research, Evaluation, and Assessment afforded demographic data and traditional summer school attendance information. These pieces of information were then organized in Microsoft Excel, pairing qualifying students with their corresponding demographic data, summer academic treatment, attendance, spring STAR Early Literacy or STAR Reading scores, and fall STAR Early Literacy or STAR Reading scores.

d. *Proposed Analyses*: For research questions 1 and 2, n-Way ANOVAs research design with five independent variables and one dependent variable was conducted to determine the extent of any main effects of the independent variables of the type of summer academic treatment, year, grade level, level of attendance, and socioeconomic status on the dependent variables of STAR Early Literacy NCE scores for students in grade 1 and STAR Reading NCE scores for students in grades 2, 3, and 4. Additionally, these analyses were conducted to determine the extent of any interactions between any combination of the independent variables of type of summer academic treatment, year, grade level, level of attendance, and socioeconomic status on the dependent variables of STAR Early Literacy NCE scores for students in grade 1 and STAR Reading NCE scores for students in grades 2, 3, and 4. The Tukey's Honestly Significant Difference (HSD) procedure was chosen as the follow-up test to be conducted if any statistically significant main effects or interactions occurred in the analyses. To control for Type I error, this procedure was used to evaluate any pairwise differences among the means of the independent variables.

e. *Tasks and Participation*: Students and staff will not be asked to complete any tasks. Consent is not needed because archival data will be used and student names and identifying information will be removed.

f. *Contact*: Consent was not needed for the current study because archival data was used.

5) Assurance of anonymity of [redacted] students & staff

a. No names or personal identifi[redacted]e used within the data; this will ensure confidentiality. A random numerical value will be assigned to each student included within the sample to assist in identification of applicable variables; this random numerical value will be assigned after the data is amalgamated into one set. The target school district's Director of Research, Evaluation, and Assessment will provide the data to the researcher. Data will be stored on a password-protected computer. The data will be stored for 5 years following the conclusion of the study. After five years, the data will be deleted.

b. Th[redacted]will not be named in the study; the district will be referred to as School District X to protect anonymity.

6) Risks of the research

a. There are no known risks of the proposed investigation to students, staff, or the district.

7) District involvement

a. *Request*: The researched will contact the Director of Research, Evaluation, and Assessment to gather student assessment data, summer school attendance information, summer school demographic data, Smart start attendance information, and Smart Start demographic data.

b. *Number of Students*: There will be approximately 800 students involved in this study over the course of the years being examined.

c. *Length of Time*: This study spans the summers of 2013, 2014, and 2015.

d. *Timeline for Completion*: This study is anticipated to be completed the summer of 2016.

8) Funding Sources

a. No funding sources are needed for the execution of this study.

9) IRB approval

a. If applicable, give the date and copy of IRB approval letter, or application if IRB review is in process [redacted]will not allow study to begin until we have an approval letter on file.

b. A copy of the IRB approval letter is attached. Approval for the study was granted on 2-24-2016.

2/29/2016

c. A copy of the IRB Proposal for Research is attached. The proposal was submitted on 2-16-2016.

2/29/2016

Appendix D: School District X Research Approval Letter

April 12, 2016

Dear Ms. Morgan:

Pe[redacted]oard Policy, external agencies or individuals desiring to conduct research studies involving either students or staff members during the school day must submit a written prospectus to the Superintendent, or designee, for approval prior to initiation of the study. To be approved, all such research proposals must demonstrate that the projected findings will have value to either the District as a whole or to a unit within the District, and not be unduly disruptive or time consuming to the normal educational process.

The P[redacted]gnizes the importance of research as a means of improving the instru[redacted]trict's students and also recognizes the need to monitor and control the amount of time and energy expended by both staff and students on research projects.

I have had the opportunity to review the prospectus for the research project entitled *An Investigation of the Impact of Summer Intervention on Student Normal Curve Equivalent Reading Scores when Grouped by Grade Level, Socioeconomic Status and Implementation Year* as well as speak to the principal at the school regarding the project. It is my pleasure to approve the project *An Investigation of the Impact of Summer Intervention on Student Normal Curve Equivalent Reading Scores when Grouped by Grade Level, Socioeconomic Status and Implementation Year* and the use of relevant [redacted]a, classrooms and students within the project. I find the project[redacted] support the goals of the district, and not be unduly disruptive or time consuming to the educational process.

Please contact me if you have any questions.

Cordially,

[redacted]

Director of Research, Evaluation, & Assessment

[redacted]