

**Problem Behaviors and Attention Concerns as Predictors of Reading Achievement
in Second through Fourth Grades**

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Abstract

Schools continue to face increasing accountability for ensuring student achievement in reading. Concurrently, the prevalence of problem behaviors and attention concerns among students has increased. Although numerous studies have examined the influence of prior reading performance, problem behaviors, and attention concerns upon achievement, findings have been relatively mixed. For schools to make informed decisions about instruction and programming that lead to high performance in reading by their students, additional research examining the influence of prior reading performance, problem behaviors, and attention concerns is needed. The present study was conducted to examine whether the variables of fall and winter reading performance (as measured by the Scholastic Reading Inventory [SRI]), time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level are predictors of spring reading achievement on SRI. Fall and winter reading scores, problem behaviors, attention concerns, and grade level were found to have a significant relationship with spring reading achievement. However, only winter reading scores, attention concerns, and grade level were found to be predictors of spring reading scores. The need exists for further examination of the predictive nature of these factors in other samples and as they relate to student reading proficiency.

Dedication

This dissertation is dedicated to my incredible family. They inspire my journey as a person and an educator every day. My parents, John and Sue Hofmann, have modeled and taught me from a young age that love, generosity, and hard work were keys to making a difference in this life. I am in awe of the example they set for the world and those of us in it. To my mother, who has been my greatest teacher of what it means to be a “Hoover Girl” and face this world with strength and positivity. And to my father, who will always be a “gentleman, jock, and a scholar” in my book and my champion. I love you both beyond measure. You are my heroes. Thank you for always believing in me. To my brother, for teaching me the importance of recognizing there are many roads that lead to success and happiness in life instead of just one traditional path. And to my nieces, nephews, and Godson, from each of whom I learn so much every day. They remind me that we, as educators, must always ensure we are the best, most compassionate, and most knowledgeable we can be for the children we serve.

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Chapter One

Introduction

Schools in the United States continue to be held accountable at the national, state, and local levels for ensuring the high academic achievement of all students. For decades, researchers have investigated what school-, classroom-, and student-level factors affect achievement in various subjects as well as the degree to which each variable influences learning (Hattie, 2008; Marzano, 2003). A growing body of literature also indicated how student behavior and attention relate to student achievement, yet findings have been mixed (Akey, 2006; Castle, 2011; Duncan et al., 2007; Finn, Pannozzo, & Voelkl, 1995; Flynt, 2008; Georges, Brooks-Gunn, & Malone, 2012; Spira, 2005).

National reports indicate the number of children with behavioral and attention concerns continues to increase (Melillo, 2009; National Institute of Mental Health [NIMH], 2014). The National Institute of Child Health and Human Development: Early Childhood Care Research Network (NICHD ECCRN) (2004) found children who demonstrated a trajectory of aggressive behavior in early years were more likely to have lower academic achievement by third grade. Duncan et al. (2007) found attention concerns were predictive of later struggles in reading achievement. Georges et al. (2012), in a longitudinal study of over 14,000 children, concluded that those with low attention, as well as those with combined low attention and aggressive behavior, made less academic progress than their peers. Teachers have also reported spending more time on behavior, citing that it detracts from their instructional time (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). With prior success in reading predictive of later achievement and school attainment (Annie E. Casey Foundation, 2011, 2014), a

continuing examination of the role behavior and attention play in regard to academic achievement is critical. The purpose of the current study was to examine the extent to which fall reading performance, winter reading performance, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict student achievement in reading, as measured by the spring administration of the Scholastic Reading Inventory (SRI).

Background

Melillo (2009) estimated that approximately one out of every six 5- or 6-year-old children would be diagnosed with a neurological disorder (e.g., Attention Deficit Hyperactivity Disorder [ADHD/ADD] or other behavior disorders) that affects their ability to learn and behave in school. In a recent survey of more than 10,000 public school teachers conducted by Scholastic, Inc. and Bill and Melinda Gates Foundation (2012), 62% of the teachers reported that they had more students with behavioral problems that interfered with teaching, as compared to when they began their careers. According to the NIMH (2014), the number of children diagnosed with attention concerns specifically is increasing without known cause, with the onset of symptoms typically occurring between the ages of three and six, leading up to school entry age. As many as 9% of children in the United States between the ages of 13 and 18 have been diagnosed with some form of ADHD, with boys being at four times greater risk than girls (NIMH, 2014). A growing body of research has examined how problem behaviors or the lack of attention affects student achievement, yet research designs and findings have provided differing results (Akey, 2006; Castle, 2011; Duncan et al., 2007; Finn et al., 1995; Flynt, 2008; Georges et al., 2012; Spira, 2005).

Federal amendments to the Elementary and Secondary Education Act of 1965 under Title I legislation (U.S. Department of Education [USDOE], 2004) reiterate its purpose to ensure that schools provide all students the opportunity to obtain a high-quality education and reach proficiency on state academic standards and assessments. The USDOE (2004) purports that schools must meet the needs of low-achieving students and particularly those in need of reading assistance. In a continued commitment to ensure academic achievement for all students, schools must continue to examine the effect problem behaviors and attention concerns have upon the reading achievement of students.

School demographics. This study took place in an elementary school, which is henceforth referred to as “Anytown School,” located in a suburban district in the Midwest. The district is henceforth referred to as “Anytown District.” The district itself is comprised of six lower elementary schools, two upper elementary schools, one middle school, one high school, one alternative high school, and one early childhood site. During the 2013-2014 school year, district enrollment was approximately 6,000 students with an estimated 450 students enrolled in Anytown School. As of February 2014, approximately 36% of students at Anytown School qualified for free or reduced-price lunch. Of the students attending Anytown School, 82% of students were white and 18% were other ethnicities (Department of Elementary and Secondary Education [DESE], 2013). The current study included data from students in second, third, and fourth grades enrolled at the school during the 2013-2014 school year.

Statement of the Problem

Like districts all over the nation, Anytown District works to ensure the academic achievement of each child it serves. Early reading proficiency was associated with later reading achievement and educational success in the majority of literature (Annie E. Casey Foundation, 2011; Duncan et al., 2007; Evers, 1998; Juel, 1988; Musen, 2010), although Duncan and Magnuson (2009) found persistent early reading deficits did not predict successful high school attainment. Additionally, many U.S. students are not proficient in reading (National Center for Education Statistics [NCES], 2011, 2014). Evers (1998) stated that reading problems occur with equal frequency among boys and girls, and Knutson, Scholastic Research, and MetaMetrics (2011) offered that the amount of reading growth declines as students progress into higher grade levels. Teachers report facing an increase in reading struggles, behavior issues, and inattention among students, the latter two of which many have reported detract from their instructional time and relate to poor achievement (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). The literature indicates a growing number of children have been diagnosed with behavioral and attention issues (Melillo, 2009; NIMH, 2014; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). While many researchers found behavior problems at various ages to be associated with lower academic performance (Brennan, Shaw, Dishion, & Wilson, 2012; Castle, 2011; Finn et al., 1995; Flynt, 2008; Georges et al., 2012; Hinshaw, 1992; NICHD ECCRN, 2004), others identified no relationship between behavior and later achievement (Duncan et al., 2007; Fergusson & Horwood, 1995).

Much of the literature examines not only behavior, but also attention as it relates to achievement. The literature largely supports the conclusion that attention concerns are

associated with later reading achievement (Duckworth & Schoon, 2010; Duncan et al., 2007; Fergusson & Horwood, 1995; Finn et al., 1995; Georges et al., 2012; Hinshaw, 1992; Razza, Martin, & Brooks-Gunn, 2012; Spira, 2005). However, Brennan et al. (2010) suggested inattention among toddlers may not be a useful indicator of later academic achievement in elementary school, and Duncan and Magnuson (2009) found that attention problems at school-entry age were not predictive of high school completion. Given the varied findings reflected in the literature, the degree to which prior reading performance, problem behaviors, and attention concerns are related to subsequent reading achievement is critical to examine further.

Purpose Statement

The overall purpose of this study was to determine how prior reading achievement, problem behaviors, attention concerns, gender, and grade level are associated with student achievement in reading. Specifically, the purpose of the study was to determine the extent to which fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring reading achievement on SRI among students in second through fourth grades.

Significance of the Study

The results of the study could provide school administrators and teachers with information about which variables (i.e., fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level) predict spring reading achievement on SRI. With such knowledge, school officials could design an appropriate system of prevention

and support for students demonstrating one of the variables found to be a significant predictor of subsequent reading achievement and mitigate the effect. This, in turn, would better equip districts with the strategies necessary to meet federal, state, and local accountability requirements for proficient performance in reading among all students.

Delimitations

According to Calabrese (2006), delimitations are the boundaries set by the researcher to narrow the scope of the study. This study was delimited in the following ways:

- The sample was limited to second, third, and fourth grade students.
- The sample was limited to a single suburban elementary school.
- The sample only included students who participated in each of the fall, winter, and spring SRI assessments.
- Reading achievement was limited to a single measure, the SRI.
- Only achievement in reading was examined.
- Demographic variables were limited to gender and grade level.
- Time out of class was calculated as the total number of minutes per school year and did not identify whether that time was consecutive.

Assumptions

According to Calabrese (2006), assumptions guide the inquiry process during research, stating “well-constructed assumptions add to the study’s legitimacy” (p. 14).

This study included the following assumptions:

- Teachers were knowledgeable in effective classroom management strategies and positive behavior supports. Teachers had participated in behavior management training for a minimum of one year.
- Teachers administered the SRI assessment in a standardized manner.
- Teachers entered data about problem behaviors into the Protabula database accurately.
- Teachers determined problem behaviors in a manner consistent with training and building expectations.
- Parents reported accurately the attention concerns of their child.
- Students put forth their best effort on all the SRI assessments.

Research Question

Research questions should guide the direction of the study, give it focus, and, according to Lunenburg and Irby (2008), serve as the “directional beam for the study” (p. 126). This study sought to identify the variables predictive of student achievement in reading. The following research question provided the basis for this study:

- RQ.** To what extent do the fall SRI score, winter SRI score, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring student achievement in reading, as measured by the SRI?

Definition of Terms

In the field of education, practitioners, researchers, legislators, and the public may refer to similar concepts by utilizing different titles and acronyms. The following section includes clarification of terminology central to this study.

Attention concerns. Attention concerns are defined as parent-reported attention concerns including, but not limited to, ADHD/ADD, or medications for such conditions listed on the Health Inventory Form (see Appendix A), Medication Order and Consent Form (see Appendix B), or via a letter from a physician submitted by the parent to the school nurse (Centers for Disease Control and Prevention, 2010). Such information is housed in the health section of the Tyler Student Information System (SIS) or in the health files maintained by the school nurse.

Parent reported. Parent reported is defined as the process by which parents report attention concerns (Centers for Disease Control and Prevention, 2010). The current study includes any report of attention concerns submitted by parents on the Health Inventory Form and the Medication Order and Consent Form as required by the district during the annual registration and enrollment process or subsequently updated by the parent. Also included in this definition is any other relevant information received from a medical physician or submitted by a parent to the school nurse.

Problem behaviors. Problem behaviors are defined as behaviors determined by the classroom teacher to be disruptive or hurtful to the extent the child must spend time out of class as the least restrictive environment to stop the behaviors and maintain an environment conducive to learning for others (Behavior Intervention Support Team [BIST], 2014).

Time out of class. Time out of class is defined as the total or collective minutes a child spends out of the classroom during the school year due to problem behaviors.

Teachers report this through the Protabula database (BIST, 2014; Moss & Poblete, 2014).

Overview of the Methodology

Archival data were used for this study. Data regarding problem behaviors from the 2013-2014 school year were retrieved from the third party database Protabula, in which teachers reported time students spent out of their classroom due to problem behaviors (Moss & Poblete, 2014). Data retrieved reflect the total minutes each child spent out of the classroom during the school year. Parent-reported attention concerns data from 2013-2014 were retrieved in the fall of 2014 from the student health records kept by the school nurse. Fall, winter, and spring reading achievement scores on the SRI from 2013-2014 were retrieved from the student information system in the fall of 2014, as well as students' grade level and gender.

The research question concerning the extent to which fall SRI scores, winter SRI scores, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring student achievement in reading, as measured by the SRI, was investigated using a stepwise multiple regression analysis to find the most parsimonious subset of the independent variables for predicting student achievement in reading. The population included students in second, third, and fourth grades at Anytown School enrolled during the 2013-2014 school year. Students not participating in each of the annual SRI benchmark assessments in fall, winter, and spring were excluded from the sample.

Organization of the Study

This chapter began with an introduction of the study as an investigation of the extent to which prior reading achievement, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring reading achievement. Chapter one also included background information about the district, the statement of the problem, and the purpose and significance of the study. Delimitations and assumptions were explained in a detailed manner to provide the reader with clear parameters of the study. The research question, definitions of terms, and a brief overview of the methodology were explained. Chapter two includes a review of the current literature examining the effects of early reading struggles upon later achievement, national and international performance among U.S. students in reading, the prevalence of problem behaviors and attention concerns among students, and whether prior reading achievement, problem behaviors, attention concerns, gender, and grade level are associated with subsequent reading achievement. In chapter three, the methodology used to conduct the study is presented along with a description of the research design, population and sample, sampling procedure, measurement, data collection procedures, data analysis and hypothesis testing, and the limitations of the study. The results of the data analysis and hypothesis testing are explained in chapter four. Chapter five includes the interpretation of the findings and provides recommendations for the field and suggestions for future areas of study.

Chapter Two

Review of the Literature

Schools encounter a myriad of challenges in successfully educating students. Educators are responsible for ensuring the academic achievement of all students according to increasingly rigorous standards and accountability measures, yet they must accomplish this while mitigating the effects of a growing rate of problem behaviors and attention concerns among students in their classrooms (Melillo, 2009; NIMH, 2014; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). With research pointing to early reading proficiency as predictive of later reading achievement and success (Annie E. Casey Foundation, 2011; Duncan et al., 2007), national and international statistics indicate performance among young students is only modestly improving at best with many students still not proficient in reading (Layton, 2013; NCES, 2011, 2014; Organisation for Economic Co-operation and Development [OECD], 2014). Additionally, some data show boys performing lower than their female counterparts in reading (NCES, 2011, 2014). Early reading struggles are correlated with lower reading achievement later (Annie E. Casey Foundation, 2011, 2014; Duncan et al., 2007; Evers, 1998; Juel, 1988; Musen, 2010), yet identifying problems early and applying effective interventions can mitigate the effect (Snow, Burns, & Griffin, 1998). Duncan and Magnuson (2009) suggested persistent reading struggles were not related to high school completion or college attainment.

Research examining how behavior and attention are related to reading achievement is mixed (Duncan et al., 2007). While some studies have found behavior to be predictive of lower academic performance (Brennan et al., 2012; Castle, 2011; Finn et

al., 1995; Flynt, 2008; NICHD ECCRN, 2004), other studies indicate only a small relationship or no association at all (Duncan et al., 2007; Fergusson & Horwood, 1995; Georges et al., 2012). Studies offer relatively consistent evidence that attention concerns have a correlation to later reading achievement (Brennan et al., 2012; Duckworth & Schoon, 2010; Duncan et al., 2007; Fergusson & Horwood, 1995; Finn et al., 1995; Georges et al., 2012; Hinshaw, 1992; Razza et al., 2012; Yen, Konold, & McDermott, 2004). However, Duncan and Magnuson (2009) concluded that attention concerns (at school-entry or those that persist through schooling) may not matter as much for later high school completion or college attainment. With the rate of problem behaviors and attention concerns among students increasing, the extent to which each factor predicts predict reading achievement in the elementary years is critical to further explore so that schools may be better prepared to respond to ensure reading success.

Reading Achievement of Students

Students who demonstrate reading success at school-entry age and throughout elementary school have a better chance of achieving high academic outcomes later (Annie E. Casey Foundation, 2011; Duncan et al., 2007; Musen, 2010; Snow et al., 1998). Studies have examined the association between reading skills in primary grades and outcomes in upper elementary grades. Juel (1988) followed 54 students attending one elementary school in a largely diverse and low socioeconomic community to examine their reading progress from first through fourth grades. Students who were identified as poor readers at the end of first grade were found to be unlikely to catch up by the end of fourth grade (Juel, 1988). Specifically, Juel (1988) found children who entered first grade with poor early literacy skills in phonemic awareness continued to

exhibit struggles at the end of fourth grade, particularly in the area of decoding, as compared to their peers who exited first grade reading proficiently. Juel (1988) concluded that nearly nine out of 10 students who struggled to read in first grade remained poor readers in fourth grade.

A decade later, Evers (1998) found results similar to Juel (1988) when examining data from various research projects commissioned by the NICHD ECCRN to study the reading development of nearly 35,000 students throughout the United States. Evers (1998) concluded that 74% of students who read poorly in third grade were still behind in reading by ninth grade.

To specifically examine early reading skills at school-entry age and the effect on later reading success, Duncan et al. (2007) conducted a meta-analysis of six longitudinal data sets comprising representations of children in the United States, Canada, and Great Britain. Specifically examined were how school readiness skills and behaviors at age five were associated with subsequent teacher ratings of achievement and actual test scores in reading and math between the ages of 7 and 14. Findings showed that reading skills at school-entry age had a strong, positive correlation with later reading achievement in first through eighth grades, and results were similar for both boys and girls (Duncan et al., 2007).

Not only is early reading success at school-entry and elementary grades associated with continued achievement in reading, but some research suggests it is also predictive of later educational attainment such as high school graduation. Snow et al. (1998) found that students who were not proficient in reading at the end of their third grade year were also unlikely to graduate high school, a finding confirmed by research

conducted more than a decade later (Annie E. Casey Foundation, 2011). However, Duncan and Magnuson (2009) concluded the opposite. Using a regression analysis of data sets from the National Longitudinal Survey of Youth (NLSY), the National Longitudinal Study of Youth – Child Supplement, and the Entwisle-Alexander Baltimore Beginning School Study (BSS), Duncan and Magnuson (2009) examined whether reading skills at school-entry age were related to later high school completion. Findings indicated a small relationship at best. However, in the same study, Duncan and Magnuson (2009) also examined the impact of academic, attention, and behavior problems that persisted at ages six, eight, and 10 upon subsequent high school completion and the pursuit of college. Findings indicated that patterns of persistent problems in reading were not a significant predictor of high school completion and pursuit of college (Duncan & Magnuson, 2009).

In a longitudinal study of nearly 4,000 students, born between 1979 and 1989, bi-annual reading progress using the Peabody Individual Achievement Test (PIAT) Reading Recognition subtest was examined for correlation with persistence to timely graduation (Annie E. Casey Foundation, 2011). Consistent with Snow et al. (1998), the Annie E. Casey Foundation (2011) concluded that students who do not demonstrate proficient reading skills by third grade were four times more likely to not graduate than their peers who are reading on grade level. While only one-third of students were found to be struggling readers by third grade, they represented nearly 60% of those who failed to graduate on time (Annie E. Casey Foundation, 2011). Only 4% of proficient readers in third grade failed to graduate, but 16% of struggling readers did not finish high school on time (Annie E. Casey Foundation, 2011). Thus, the majority of findings indicate that

early reading success is associated with later academic achievement in reading as well as educational attainment such as high school completion. To determine the scope of how many students may be underperforming in reading, various studies have examined current trends in reading achievement among students in the United States on both international and national measures.

International reading performance by U.S. students. Various international and national reports have asserted that students in the U.S. are falling behind their international counterparts in academics and purport the nation is at risk of becoming less competitive globally (NCES, 2011). In 2001, the International Association for the Evaluation of Educational Achievement, an international group of governmental research departments and national research organizations, launched its initial Progress in International Reading Literacy Study (PIRLS) to gauge the literacy skills of fourth grade students around the world (NCES, 2011). Of the 53 countries completing the assessment, the U.S. ranked 13th in literacy performance (NCES, 2011). Students from the U.S. also held a higher scale average than the international average. When compared against their own historical performance, the average score of U.S. students rose 14 points from 2001 to 2011 (NCES, 2011). In 2011, U.S. female students outperformed their male counterparts in reading on the PIRLS (NCES, 2011). U.S. Hispanic and Black students scored lower in reading on average than other ethnicities (NCES, 2011). While PIRLS indicated fourth grade students in the U.S. were performing modestly well compared to other nations in 2011, and at higher rates than in 2001, the disparity among males and females is noteworthy as are the findings of other national and international studies that point to concerns regarding the levels of reading proficiency among U.S. students.

The OECD is a non-profit international agency with representatives from governments around the world researching and working together to identify solutions to common problems including those for which education is a related factor. In response to member countries' calls for regular and reliable data on the knowledge and skill level of their students and to assess the overall performance of their education systems, the OECD developed and officially launched the Programme International for Student Assessment (PISA) in 1997 and administered its first survey in 2000. More than 70 countries have participated in PISA, which is given every three years to 15-year-olds, enabling each nation to track the progress of their students (OECD, 2014). Of the 65 countries and education systems participating in the 2012 PISA assessment, the U.S. ranked between 14 and 20 in reading compared to other PISA participants (Heitin, 2013; OECD, 2014). The greatest concern was the lack of significant change or growth in performance since 2009 (Heitin, 2013; OECD, 2014).

Layton (2013), in an interview of Jack Buckley, commissioner at the National Center for Education Statistics, offered:

That pattern has not changed much since the PISA test was first given in 2000. Our scores are stagnant. We're not seeing any improvement for our 15-year-olds. But our ranking is slipping because a lot of these other countries are improving.
(p. 1)

Similar to PIRLS, U.S. 15-year-old female students outperformed their male counterparts on the 2012 PISA reading literacy assessment (OECD, 2014). In addition to these international studies, national assessments have also shed light on the academic performance of U.S. students in reading.

Performance by U.S. students on national assessments. NCES, a facet of the USDOE, developed the National Assessment of Educational Progress (NAEP) to assess student performance in 12 academic areas, including reading (NCES, 2014). The NAEP reading assessment is administered every two years and measures what U.S. students in fourth, eighth, and twelfth grades know and can do in reading. NAEP measures students' ability to read informational and literary texts and respond to those texts by answering questions, with student performance reported as a combined composite scale score ranging from 0 to 500. Representative samples of 190,000 fourth grade students, 172,000 eighth grade students, and 46,000 twelfth grade students across the U.S. participated in the 2013 NAEP assessment in reading. Similar to the stagnant results by U.S. 15-year-olds on the 2012 PISA reading literacy assessment, the 2013 NAEP data indicated the average score for fourth grade students remained the same with no measurable difference from 2011 (221 composite scale score) to 2013 (222 composite scale score) (NCES, 2014). However, fourth grade scores were significantly higher in 2013 as compared to the original assessment year in 1992 (217 composite scale score) (NCES, 2014). Eighth grade students demonstrated improvement over time, with higher scaled scores in 2013 (268 composite scale score) as compared to 2011 (265 composite scale score) and 1992 (260 composite scale score) (NCES, 2014). However, the reading results of twelfth grade students demonstrated an overall decline (NCES, 2014). While no measurable difference was found in the average score for students in twelfth grade in 2013 (288) as compared to the previously tested year in 2011, scores decreased since an all-time high of 292 composite score on the original assessment in 1992 (NCES, 2014).

The percentage of twelfth grade students performing at or above proficient on the 2013 NAEP dropped from 40% to 38% as compared to the first assessment in 1992 (NCES, 2014). Reflecting a similarly concerning result, only 34% of fourth and eighth grade students were at or above proficiency in reading in 2013 (NCES, 2014). Additionally, proficiency rates in reading on NAEP were inconsistent among states, ranging from 17% to 48% (NCES, 2014).

The gender of students may play a role in their performance on national assessments in the area of reading. On the 2013 NAEP, female students in both fourth and eighth grades outperformed their male counterparts in reading (NCES, 2014). Specifically, 38% of girls in those grades scored at or above proficiency as compared to 32% of boys (NCES, 2014). This discrepancy in reading performance according to gender mirrored that found on the international PIRLS and PISA assessments (NCES, 2011, 2014; OECD, 2014).

While NAEP longitudinal trends indicated some increase in the average score among fourth and eighth grade students, roughly 60% of students still were not achieving proficiency in 2013 (NCES, 2014). This NAEP finding, alongside the decline in twelfth grade reading performance and lower performance by male students, added to the concerning trends of achievement in reading among U.S. students previously identified in international studies (Heitin, 2013; NCES, 2011, 2014; OECD, 2014).

Prevalence of Students with Reading Difficulty

Schools continue to examine which factors underlie the stagnant trends and low levels of proficiency in reading that have emerged as well as what variables are specifically associated with reading achievement. One factor may be related to changes

in the level of text to which students are exposed in school (Williamson, 2008). In recent years, the complexity level of texts used as early as elementary has increased (Fountas & Pinnell, 2012; Heibert & Mesmer, 2013; Shepard & Smith, 1988). Additionally, the post-secondary text demands upon the adult nation of readers are now higher on average than those which exiting high school students have previously been required to read (Smith, 2014). In light of these findings, coupled with the research about the predictive nature of early reading skills upon later achievement, further investigation of which variables are associated with reading achievement is warranted.

Educators contend the number of students who struggle with reading is rising (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). Scholastic, Inc. and Bill and Melinda Gates Foundation (2012) jointly conducted a study in which teachers with five or more years of teaching experience in the same school were surveyed about their educational experiences and perceptions. When asked about the incidence of students who struggle with reading, teachers in preschool through fifth grade reported that 31% more students struggle with reading as compared to when they began teaching five or more years prior; 43% of middle school and 42% of high school teachers reported the same (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012).

National and international assessment results demonstrate concerning trends regarding reading in the United States. In addition, reports from teachers around the nation lend credence to concerns regarding student reading achievement (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). Researchers have continued to examine what factors, besides early reading skills, influence students' reading achievement.

Problem Behaviors and Attention Concerns in Schools

Research findings reflect overall changes that have occurred in the makeup of students over the past several years (Crouch & Zakariya, 2012). This has necessitated continuing research into which of those changes or factors have the potential to impact student achievement in reading. Among the many student-level characteristics examined in the research, the prevalence of problem behaviors and attention concerns among students in schools has been the subject of numerous studies.

In a survey of more than 10,000 public school teachers in the U.S., 62% reported an increase in the percentage of students with behavioral problems that interfere with teaching (Scholastic, Inc. & the Bill and Melinda Gates Foundation, 2012). This increase can translate to less time spent on instruction and therefore increased risk to academic achievement (Georges et al., 2012; Ladd, Birch, & Buhs, 1999; Raver, 2002). According to Little, Hudson, and Wilks (2000), an estimated 6% of students exhibited problem behaviors deemed severe enough to require intervention of some kind. Greene (2008) concluded the presence of challenging behaviors in schools impact teaching. Examining how teachers responded to such behaviors, Westling (2010) stated “Results indicated that most teachers did not use many effective strategies or receive sufficient support, and viewed challenging behavior as having an adverse effect on them and their students” (p. 48). These findings supported the perception by teachers that behavior problems interfere with instruction in the classroom and have the potential to impact achievement (Georges et al., 2012; Greene, 2008; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012; Westling, 2010).

The increase in attention concerns among students in the classroom has been the topic of examination in the research. The most prevalent childhood diagnosis throughout the world, ADHD/ADD, is affecting students at an increasing rate (Melillo, 2009). Children with ADHD/ADD have been found to often exhibit superior verbal and initial word reading skills early in life, yet they begin to struggle academically around fourth grade (Melillo, 2009). According to the NIMH (2014), children with ADHD/ADD struggle to remain focused and pay attention, have difficulty controlling behavior, and exhibit hyperactivity. NIMH (2014) found that the average onset of ADHD/ADD occurs by seven years of age with nearly 10% being diagnosed during the teenage years. Additionally, boys are four times more likely than girls to be diagnosed with ADHD/ADD (NIMH, 2014).

However, some research indicates that behavior problems present a student enters school may not persist. According to Duncan, Lee, Magnuson, and Metzger (2009), many children, who upon school entry exhibited high levels of antisocial behavior problems, did not display such problems a few years later, and they had no higher likelihood of engaging in negative behaviors later on than those who never exhibited serious behaviors in elementary school. In fact, aggressive behaviors had a somewhat normative feature in early childhood and diminished in most children during early elementary school (Campbell, Shaw, & Gilliom, 2000; NICHD ECCRN, 2004). Whether behavior problems like aggression or attention concerns persist in later years or not, it is incumbent upon educators to be watchful stewards and examiners of the research regarding the potential impact the presence of such factors from toddlerhood into school years can have upon student reading achievement in the classroom.

The Roles of Behavior and Attention in Reading Achievement

Hinshaw (1992) examined various studies regarding behavior and attention issues and their relationship with academic underachievement. He found inattention and hyperactivity were more strongly correlated with lower achievement than aggressive behaviors (Hinshaw, 1992). Hinshaw (1992) explained “Early attention problems interact in crucial ways with neurodevelopmental delay and with later neuropsychological dysfunction to predispose toward academic failure and aggressive delinquency” (p. 150). Hinshaw (1992) asserted that early academic skills and emotional regulation skills may have a reciprocal influence, where students at young ages who struggle with early reading difficulties may experience increasing frustration and become more inattentive or disruptive in their behavior. Likewise, students with early attention concerns may be more likely to exhibit reading difficulties and possibly aggressive behaviors.

Fergusson and Horwood (1995) conducted one of the only longitudinal studies that examined the independent associations of school-age externalizing behaviors (both aggression and inattention) on later achievement results. Specifically, they used structural equation models applied to data from a longitudinal study of New Zealand children followed from birth to determine the independent association of early problem behaviors and inattention with cognitive level at age eight, achievement scores at ages 10 through 13, and subsequent behavior problems at age 15. Overall, children with higher levels of externalizing behavior, such as aggression, inattention, impulsivity, etc., during the preschool and school-age years were at-risk for lower academic achievement throughout elementary school and beyond with results consistent across gender (Fergusson & Horwood, 1995). However, early externalizing behavior in the area of

conduct problems at age eight was not predictive of later achievement among students ages 10 to 13 (Fergusson & Horwood, 1995). In contrast, the early manifestation of attention concerns measured at age eight were found to be predictive of later achievement among students ages 10 to 13 (Fergusson & Horwood, 1995).

Finn et al. (1995) investigated the relationship between both teacher ratings of aggressive behavior and attention concerns among approximately 1,000 fourth grade students and their academic achievement in reading and math. Problem behaviors were stratified into four categories: students with attention concerns, those with aggressive behavior, those with neither problem, and those displaying both. They concluded that students with neither problem demonstrated higher achievement in reading and math than those with one problem behavior, either disruptive behavior or inattention (Finn et al., 1995). Students rated as inattentive scored significantly lower than their disruptive counterparts, and therefore, attention concerns were found to be better predictors of lower achievement in reading and math than disruptive behavior (Finn et al., 1995). Results were consistent among males and females.

The NICHD ECCRN conducted an examination of over 1,100 children whose mothers reported rates of physical aggression from toddlerhood to third grade as part of the Study of Early Child Care and Youth Development. Findings indicated that incidents of minor aggression declined over time and were not found to be associated with poor achievement in third grade (NICHD ECCRN, 2004). However, higher patterns or persistent “trajectories” of aggressive behavior from ages two through nine were predictive of lower academic achievement (Duncan et al., 2007; NICHD ECCRN, 2004).

Trzesniewski, Moffitt, Caspi, Taylor, and Maughan (2006) sought to investigate the associations between reading achievement and behavior problems. Using a national longitudinal sample of twins from Great Britain, Trzesniewski et al. (2006) analyzed the reading achievement of children at age seven and compared it with their ratings of antisocial behavior at ages five and seven (measured by ratings on the Child Behavior Checklist and the Teacher Report Form Externalizing scores). Causal models indicated antisocial behaviors and poor reading achievement had reciprocal relationship, which means that the presence of one could raise the risk for the other. The findings indicated the associations for girls were weaker and antisocial behavior was a risk factor for poor reading achievement, but the opposite was not true. Attention concerns and reading performance were not found to be associated, and Trzesniewski et al. (2006) found that the presence of either was largely explained by genetic factors.

Duncan et al. (2007) conducted a multiple regression meta-analysis of data from approximately 36,000 children across six large-scale longitudinal studies, including the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99 (ECLS-K), the NIHCD Study of Early Child Care and Youth Development (SECCYD), and the National Longitudinal Survey of Youth (NLSY). They examined the relationship between school readiness skills in the areas of academics, attention, and behavior at age five and subsequent teacher ratings and test scores in reading and math at ages 7 and 14. The authors concluded that the only predictors of later reading and math achievement reflected in the data sets were school entry skills in math, reading, and attention (Duncan et al., 2007). Additionally, children's attention appeared to be modestly predictive for both reading and math achievement in first through eighth grades after controlling for

aggressive behavior (Duncan et al., 2007). Early behavior problems themselves, such as aggression and lack of social skills, were not found to be associated with later reading or math achievement when attention skills were introduced into the regression model (Duncan et al., 2007). Duncan et al. (2007) found the possession of attention skills during preschool and kindergarten were linked to gains in reading three to nine years later, even after controlling for early cognitive skills at school entry and aggressive behavior. As supported by the findings of Hinshaw (1992) and Duncan et al. (2007), Brennan et al. (2012) offer that “Early symptoms and/or diagnoses of ADHD to be one of the most salient correlates of academic achievement” (p. 3).

Flynt (2008) studied the influence of behavior among approximately 300 students living in North Carolina as rated by their teachers on achievement in math and reading during the first, third, and eighth grades. Teacher ratings of student behavior in first grade were more predictive of reading achievement than IQ, yet in third grade, both teacher ratings of behavior and IQ resulted in similar associations with reading achievement (Flynt, 2008). Hostile behavior, as perceived by the teacher, was a significant negative predictor of first grade reading achievement (Flynt, 2008). Overall, Flynt (2008) found that students who exhibited more creative, focused, and on-task behaviors generally had higher reading and math achievement scores than students who were perceived as exhibiting negative behaviors such as hostility (Flynt, 2008). Thus, these findings support a negative association between problem behaviors and reading achievement as well as infer an indirect positive association between attention skills and reading achievement. Across gender, a statistically significant difference in teacher ratings of males and females was found. Findings indicated boys were more likely to

exhibit inappropriate classroom behavior than girls (Flynt, 2008). In first grade, males were rated as more distracted and hostile than their female classmates, and in third grade, males were rated simply as being more hostile (Flynt, 2008). Because the persistence of behavior or attention issues may have a greater impact upon later schooling attainment than their existence at any single point in time (Duncan & Magnuson, 2009), it is therefore important to examine the predictive nature of both single occurrence as well as the persistence of behavioral factors upon achievement in reading.

Using a regression analysis of two data sets from the NLSY and the BSS, Duncan and Magnuson (2009) examined whether patterns of persistent academic, attention, and behavior problems at ages six, eight, and 10 were a stronger predictor of later attainment of schooling than at school entry alone. Findings indicated that school-entry age anti-social behavior was mildly related to high school completion, but school-entry age attention concerns were not. More strikingly, Duncan and Magnuson (2009) concluded a pattern of persistent problem behaviors throughout elementary was a predictor of high school completion. Specifically, persistent anti-social behavior was associated with a 10 percentage point drop in high school completion (Duncan & Magnuson, 2009). However, although associated, a persistent problem with inattention was not found to be a predictor of later high school completion (Duncan & Magnuson, 2009). Also, Duncan and Magnuson (2009) found problems with “behavior were more predictive of schooling attainment for boys than for girls” (p. 18).

In Brennan et al.’s (2012) study, parent ratings of toddler-age aggression, oppositionality, inattention, and hyperactivity-impulsivity among a sample of 566 children considered high-risk were evaluated to determine their association with school-

age academic achievement around ages seven and eight. Contrary to the extant literature, findings by Brennan et al. (2012) demonstrated that toddler-age aggression was modestly more associated with later school-age academic performance than were inattention or hyperactivity-impulsivity. Further, Brennan et al. (2012) asserted that children demonstrating aggressive behavior at school entry may be less likely to engage in learning tasks, thereby creating an indirect relationship with lower achievement.

Examining data from more than 14,000 children in nearly 900 kindergarten programs participating in the ECLS-K longitudinal study, Georges et al. (2012) assessed the relationship between school-entry student behavior, including lack of attention, with their subsequent test scores throughout the kindergarten year. Four groups of problem behaviors were examined: children exhibiting no problem behavior, those displaying both aggressive behavior and lack of attention, or those demonstrating one of the two.

Georges et al. (2012) found

Children with both behavior problems and those with attention problems alone had lower scores and made fewer gains in both mathematics and reading over the kindergarten year compared with children with neither behavior problem or children with only aggressive behavior. (p. 983)

Students exhibiting aggression performed statistically similar to those with no behavior problems, and there was no significant association between aggressive behavior and achievement in mathematics or reading when attention skills were considered (Georges et al., 2012). Thus, focused attention was found to likely increase children's time on task, which in turn promoted their academic achievement (NICHD ECCRN, 2004). Georges et al. (2012) asserted schools must be prepared to address attention

concerns in order to promote academic success and to minimize such failure because it could lead to aggressive behavior later due to task frustration.

The role of behavior on instructional time related to achievement. A well-documented trend of increasing problem behavior among students has emerged since the late 1980s (Lassen, Steele, & Sailor, 2006). The examination of how this factor is related to student achievement in reading, specifically through its impact upon the amount of instructional time, has been the topic of various studies (Raver, 2002). Ladd et al. (1999) examined two short-term longitudinal studies involving nearly 200 full-day kindergarten students from three Midwestern towns. Results from both investigations concluded that student classroom participation, specifically the capacity to participate independently and cooperatively in kindergarten, held a strong correlation with early achievement and that the relationships children form with their teachers affect their classroom participation and subsequent achievement (Ladd et al., 1999). Ladd et al. (1999) also indicated that aggressive problem behaviors may be linked to lower achievement through its association with lower class participation rates and fewer opportunities to learn cooperatively from peers. Other studies indicated similar findings. Problem behaviors have been found to be associated with less positive, instructional feedback from teachers as well as reduced time on task by students (Georges et al., 2012; Ladd et al., 1999; Raver, 2002).

Lassen et al. (2006) studied how the reduction in problem behaviors, as defined by time spent out of class for discipline referrals, induced by the implementation of Positive Behavior Supports (PBS), related to the academic achievement of middle school students over a 3-year period. Findings demonstrated a statistically significant reduction in discipline and the resulting lost class time were related to increases in reading and

math standardized achievement scores. Thus, reducing problem behaviors led to an increased opportunity to learn and positive association with reading achievement.

In their analysis of existing research, Clunies-Ross, Little, Kienhuis, and Sgm (2008) found that student problem behaviors had a negative effect on student learning time and academic performance. Student misbehavior was a common concern among teachers, who reported spending a considerable amount of time on behavior management, which reduced the amount of time they spent on academic learning (Clunies-Ross et al., 2008; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). Boulden (2010) similarly concluded from the literature that time spent addressing disruptive behaviors competed with student learning time and negatively impacted the academic achievement of the whole class, not just the child who was being disruptive. Castle (2011) explained “Classroom misbehavior likely attenuates student learning by forcing teachers to allocate more time to managing misbehavior in lieu of instruction” (p. 39).

Similar to Duncan et al. (2007), Castle (2011) used the ECLS-K data set to study how problem behaviors related to math and reading achievement in kindergarten through third grade students. Castle also investigated how children’s approaches to learning and teachers’ instructional time and pedagogy may play a role in that association. As Castle (2011) explained, “Both class misbehavior and the presence of one or more children identified with an SED [severe emotional disturbance] were negatively associated with children’s early reading achievement” (p. 31). In addition, Castle (2011) determined increased problem behaviors were related to a decrease in instructional time spent on reading, which was indirectly associated with lower reading achievement.

In contrast to Castle (2011), Georges et al. (2012) concluded that having more students in the classroom with aggressive behavior did not affect the reading performance of the whole class, yet the number of students with attention concerns was related to lower reading test scores. However, Georges et al. (2012) suggested higher rates of aggressive behavior and inattention among students in the classroom could affect the achievement of other students in the class through the impact these factors have upon instructional time. Given the research, it is incumbent upon schools to mitigate the potential effects that problem behaviors and attention concerns have upon the time spent on learning in order to best support the likelihood of student achievement in reading.

The specific role of attention concerns in reading achievement. Yen et al. (2004) employed a series of structural models to examine a sample of more than 1,300 students from ages six to 17 years. Results showed that after controlling for cognitive ability, the capability of young children to sustain attention as a learning behavior was positively associated with academic achievement in early grades (Yen et al., 2004). Similarly, Spira (2005) found attention to be associated with early foundational reading skills. Specifically, preschool children with early problems of inattention showed poorer acquisition of important prerequisites of decoding such as letter-sound association as well as more significant attention problems in kindergarten (Spira, 2005). Spira concluded, “Children who are less able to concentrate, sustain attention, and resist distraction show poorer receptive language phonological awareness, and print concepts throughout preschool and kindergarten” (p. 77). Thus, children who were inattentive in preschool and kindergarten were at greater risk for delay in successful mastery of decoding skills and therefore subsequently lower reading achievement.

Duckworth and Schoon (2010) examined data from the Avon Longitudinal Study of Parents and Children (ALSPAC), which included more than 14,000 children born in England in the early 1990s, and their outcomes on national English and math assessments administered during their final year of elementary school at approximately age 10. Results showed early attention skills were predictive of later achievement (Duckworth & Schoon, 2010). Specifically, high ratings of children by their mothers in the area of inattentive and hyperactive behavior on the Strengths and Difficulties Questionnaire administered at age six were strongly and negatively associated with reading and math achievement at the end of elementary school (Duckworth & Schoon, 2010). Similarly, inattention at age eight also strongly and negatively predicted achievement in reading and math at the end of elementary school (Duckworth & Schoon, 2010).

Razza et al. (2012) studied a sample of diverse, socioeconomically disadvantaged children born between 1998 and 2000 into 2,595 families across 18 U.S. cities who were part of a larger study entitled Fragile Families and Child Wellbeing Study. Data were collected from phone interviews with mothers and fathers when children were age 1, 3, 5, and 9, an in-home study at age 5, and school success measures at age 9. Razza et al. (2012) examined the association between attention in preschool and school success in later childhood. Findings indicated that focused attention at age 5 was a significant predictor of later passage comprehension, applied behavior solutions, and approaches to learning (Razza et al., 2012). Lack of impulsivity at age 5 was also predictive of positive behavioral outcomes at age 9 (Razza et al., 2012). Focused attention at age 5 resulted in higher reading and math achievement and teacher-reported readiness to learn at age 9 (Razza et al., 2012). The ability to focus attention in the classroom was thought to

increase the amount of time students engaged and participated in learning tasks, which in turn led to the furthering of their academic skills (Razza et al., 2012).

The research regarding problem behaviors and attention concerns as they relate to reading achievement has been mixed. While the majority of studies cited an association between inattention and low achievement in reading, others did not. Some studies indicated a relationship between problem behaviors and reading achievement, yet some yielded opposite results. In addition, few studies examine how prior reading achievement, problem behaviors, attention concerns, gender, and grade level predict future reading achievement. With the growing number of behavior and attention issues among students in schools and the increasing demand to ensure students develop proficiently as readers, a need exists for continued examination of the effect that prior reading performance, problem behaviors, attention concerns, gender, and grade level have upon later reading performance in elementary school. Therefore, it would be beneficial for educators to build upon the existing body of research to further examine whether the prevalence of problem behaviors and attention concerns are predictive of subsequent reading achievement. With this information, educators will be able to address and mitigate those that impede learning and prevent schools from reaching their goal to ensure the academic achievement of all students.

Summary

This literature review served two overarching purposes. The first purpose was to provide an overview of the current research, albeit mixed in its findings, that illustrated how prior reading achievement, problem behaviors, and attention concerns have been shown to predict achievement in reading. The second purpose was to establish the

direction for which the current study will further pursue how prior reading skills, problem behaviors, and attention concerns translate to later reading achievement for males and females across elementary grade levels. Findings of studies in the review also shed light on the performance by U.S. students on international assessments of reading performance followed by their performance on national assessments of reading across states. Finally, studies in the review reflected the increasing prevalence of problem behaviors and attention concerns among students in schools and their affect upon students' opportunity to learn. Chapter three includes the methodology used in the current study and a description of the population and sample, sampling procedures, measurement, data collection procedures, data analysis and hypothesis testing, and limitations.

Chapter Three

Methods

The purpose of this study was to determine how prior reading achievement, problem behaviors, attention concerns, gender, and grade level are associated with student achievement in reading. Specifically, the aim of this study was to investigate the extent to which fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring reading achievement on SRI among students in second through fourth grades. In this chapter, a detailed discussion of the methodology used to conduct this study is provided. Sections include the research design, population and sample, sampling procedures, instrumentation, data collection procedures, data analysis and hypothesis testing, and the limitations of the study.

Research Design

This study was quantitative and non-experimental in nature. Archival data were used. Given the nature of this study, stepwise multiple regression models were designed to address the research question. Salkind (2004) describes regression analysis as “A statistical technique where several variables are used to predict one” (p. 386). Multiple regression models are developed to identify the combination of independent variables (i.e., predictors) that are most predictive of the dependent variable (i.e., criterion) (Salkind, 2004). Stepwise regression is designed to find the most parsimonious set of predictors that are most effective in predicting the dependent variable. The independent variables of this study were fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns,

gender, and grade level. The dependent variable was the spring SRI reading achievement score.

Population and Sample

The population for this study included 301 students in the second, third, and fourth grades at Anytown School enrolled during the 2013-2014 school year. Anytown School is located in a suburban district of a major Midwest metropolitan area. The school was a K-4 building where there were approximately 100 students per grade level. There were three to five teachers in each grade level. The population of the school was composed of approximately 36% of the students meeting poverty guidelines as defined by their qualification for free or reduced price lunch as of February 2014. Approximately 20% of the student body was considered of minority ethnicity (DESE, 2013). In terms of gender, the school was composed of a relatively equal division of male and female students. After 14% of the population was removed due to missing assessment scores or demographic information, the sample included 259 students.

Sampling Procedures

The participants in this study were selected using purposive sampling. According to Lunenburg and Irby (2008), "Purposive sampling involves selecting a sample based on the researcher's experience or knowledge of the group to be sampled" (p. 175). The entire population of students enrolled in grades two, three, and four at Anytown School was considered. Only students who participated in the fall, winter, and spring SRI reading assessments were included. If a student did not participate in all of the required assessments or if there was missing demographic data relevant to the study (i.e., grade level and gender), they were excluded from the sample.

Instrumentation

The instrument utilized in this study was the Scholastic Reading Inventory (SRI). Based on the Lexile Framework, the SRI is a computer-adaptive test developed by Scholastic, Inc. that uses a common metric, Lexile (L), to evaluate both reading ability and text difficulty of narrative and expository texts for students in grades K-12. Thus, the Lexile provides educators with the estimated level of comprehension a reader is likely to have with a given level of text (MetaMetrics, 2008; National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). The SRI reports student reading comprehension proficiency as well as text complexity in terms of scale scores, ranging from less than 100L (Beginning Reader) to 1500L. When a reader's comprehension level and the text difficulty level (both measured in Lexiles) match, the Lexile Framework estimates the reader will comprehend approximately 75% of the text at that Lexile level. When a text is 250L higher than the student's measure, the Lexile Framework projects the reader will only comprehend 50% of the text. A comprehension rate of 90% is projected when the reader measure surpasses the text measure by 250L (Scholastic, Inc., 2007). The reader's Lexile score is determined using a formula that takes into account the difficulty of the items a student answered correctly as well as those answered incorrectly (Scholastic, Inc., 2007).

The SRI includes a bank of over 5,000 multiple-choice items presented as embedded completion items for which readers read an authentic expository or narrative passage and select the option that best completes the final sentence (National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). To determine the correct response, readers are to paraphrase information from a passage, draw logical conclusions based on

that information, make inferences, identify supporting details, or make generalizations supported by information from the passage (Scholastic, Inc., 2007). The SRI does not have a time constraint, but students typically complete the assessment in 20-30 minutes (Scholastic, Inc., 2007). The SRI can be administered in a group setting or individually, and a practice test is provided during a reader's first experience with SRI to ensure the student understands how to take the assessment (Scholastic, Inc., 2007).

Once the SRI has established a baseline text level for a student, the test continually adapts the level of text according to how the student responds to each item, and "steps up or down" in difficulty level accordingly (Scholastic, Inc., 2007, p. 26). Results are reported as raw, standard, percentile, and composite scores, and grade level equivalents, normal curve equivalents, and stanines are included. Developmental benchmarks are also provided (National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). Results include criterion-referenced information, which indicate the approximate Lexile range to best guide instruction and text selection for an individual student (Scholastic, Inc., 2007). SRI also provides norm-referenced information in the form of a percentile rank, indicating how a student reads compared to other students at that grade level, and a grade equivalency score, describing a student's reading performance in terms of a grade level and month at which the student is functioning (Scholastic, Inc., 2007). SRI offers reports reflecting the growth of an individual reader over time, average yearly growth at the classroom level, and the predicted amount of growth a reader will experience from fall to spring based upon their beginning Lexile level (Knutson et al., 2011).

The SRI is administered by Anytown District three times throughout a given year in grades 2 through 8. Because the test is administered over several years and estimates the reading level using a common scale, the SRI provides short-term and long-term data to Anytown educators about the reading proficiency of students. The staff is able to access related reports through the Scholastic Achievement Manager reporting tool for timely data about individual student proficiency on texts of varying difficulty levels and the predicted growth over time for those individuals. Thus, educators can use the information to set individual growth goals with students (Knutson et al., 2011). According to Knutson et al. (2011), “The process of setting growth goals is particularly useful in cases where struggling readers need to exceed typical growth expectations in order to accelerate to grade-level performance” (p. 1).

Measurement. The SRI was developed using the Rasch one-parameter item response theory model to correlate a student’s reading ability to the item difficulty (Scholastic, Inc., 2007). Because each reader completes a unique test and results rely partially on prior reading performance on SRI, the error associated with any individual student or their score is unique (Scholastic, Inc., 2007). Because the assessment results are available as scale scores, SRI overcomes the disadvantage of tests that rely solely upon raw scores or percentiles by allowing for comparison of a student’s reading ability between different test administrations (Scholastic, Inc., 2007).

Explained in the SRI technical guide (Scholastic, Inc., 2007), the advantage of scaled scores is:

Each question on a test has a unique level of difficulty; therefore, answering 23 items correctly on one form of a test requires a slightly different level of

achievement than answering 23 items correctly on another form of the test. But receiving a scale score (in this case, a Lexile measure) of 675L on one form of a test represents the same level of reading ability as receiving a scale score of 675L on another form of the test. (p. 28)

Calculated from reader measures, derived from a national sample of students, MetaMetrics (2014) provides an estimated range of expected Lexile performance by readers at each grade level. Table 1 shows the expected range of readers' Lexile levels at mid-year on the SRI.

Table 1

Typical Reader Lexile Ranges by Grade Level

Grade	Reader Lexile Ranges, Mid-Year ^a
1	Up to 300L
2	140L to 500L
3	330L to 700L
4	445L to 810L
5	565L to 910L
6	665L to 1000L
7	735L to 1065L
8	805L to 1100L

Note. Adapted from "Lexile-to-Grade Correspondence,"

by MetaMetrics, 2014, p. 1.

^a25th Percentile to 75th Percentile (Middle 50%

Interquartile Range)

Research to determine the mean Lexile range for each grade level as well as the expected growth was conducted. Knutson et al. (2011) found annual growth expectations are greater for students at lower Lexile ranges than at higher ones, and with the exception

of either end of the Lexile range, average growth is typically higher in third through fifth grades than sixth through ninth grades. For example, a third grade student scoring at the 50th percentile with a 590L would be expected to see a fall-to-spring increase of 117L. However, a fourth grade student scoring at the 50th percentile with a 700L would be expected to see a fall-to-spring increase of only 80L.

Validity and reliability. While standard error of measurement exists in all instruments, the SRI was found to be a highly reliable measure of student reading ability because it consistently provides “reproducible measures of reader performance independently of item author, source of text, and occasion of measurement” (Scholastic, Inc., 2007, p. 69). Reliable measures “provide evidence that the instrument that you are using produces consistent results over time” (Calabrese, 2006, p. 61).

Studies were conducted to confirm the reliability of the reader’s Lexile performance level score on the SRI assessment. In January 2000, a study of 104 students in grades 1 through 11 was conducted over a 2-week period (National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). The SRI was administered twice, and Lexile scores from students in the sample were compared with those from the STAR assessment. The correlation between the two assessments was .886. In 2004-2005, a second study of 33,759 students in grades 2 through 10 from a large urban school was conducted (National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). Reader consistency correlations for each grade level were calculated over a 4-month period using data from the first and second SRI administrations and ranged from .829 in third grade to .832 in fourth grade (National Center on Intensive Intervention, 2014; Scholastic, Inc., 2007). Morsy, Kieffer, and Snow (2010) determined the SRI to be a reliable measure

across reading levels. They found a standard error of measurement regarding a student's identified Lexile level ranging from 55L to 83L across grade levels (Morsy et al., 2010).

“Validity is the degree to which an instrument measures what it purports to measure” (Lunenburg & Irby, 2008, p. 181). In a working paper prepared for the USDOE by White and Clement (2001), Dr. M. J. Adams, a member of the panel of reading experts commissioned to evaluate the Lexile Framework for Reading used in SRI, found the assessment to be “exceptional in the psychometric care with which it has been developed; the extent of its formal validation with different populations of texts, tests, and children” (p. 3). Three types of validity were evaluated with regards to the SRI: content, criterion-related, and construct.

Content validity addresses whether the items included in an assessment adequately represent the potential universe of content for which the assessment was designed (Salkind, 2004; Scholastic, Inc., 2007). During development, Scholastic, Inc. (2007) ensured content validity of the SRI by verifying all text passages were authentic and developmentally appropriate for the range of readers, including through the use of passages for middle and high school students classified as struggling readers who were of high interest to them at a lower readability level (Scholastic, Inc., 2007). In addition, content validity was established by providing questions that were relevant to the genre of text (Scholastic, Inc., 2007).

Criterion-related validity addresses whether an assessment predicts a set of abilities in a current or future setting (Salkind, 2004). Reading skills generally improve throughout the course of schooling, with the greatest growth occurring during the elementary years due to the specific instruction on reading that occurs (Scholastic, Inc.,

2007). The median achievement on the SRI assessment was found to climb rapidly in elementary years and then level off in middle school (Scholastic, Inc., 2007). In a study conducted by Stenner, Burdick, Sanford, and Burdick (2006), the SRI and its Lexile metric were found to be highly accurate with regards to its measure of text readability with a standard deviation of 64L for a standard-length passage of approximately 125 words. In multiple studies, no statistically significant fluctuations in the magnitude of pretest-posttest changes in reading performance on SRI were found to be associated with demographic characteristics such as gender, race, etc. (Scholastic, Inc., 2007) (see Table 2).

Table 2

Concurrent Validity of the Performance Level Lexile Score

Grade Level	<i>n</i> (range)	Coefficient Median (L)
Unknown	525	85.2
Middle School	399	86.0
Middle & High School	361	118.7
Middle School	573	109.5
Grades 7 & 8	548	95.9

Note. Adapted from “Scholastic Reading Inventory,” by National Center on Intensive Intervention, 2014, p. 1-2, and from “Scholastic Reading Inventory: Technical Guide,” by Scholastic, Inc., 2007, p. 72.

Multiple studies were used by Scholastic, Inc. (2007) to confirm construct validity of SRI. Construct validity is the extent to which an instrument measures and accounts for some underlying theory such as the developmental progression of reading (Salkind, 2004). In one study conducted between 2001 and 2005 in a large urban school district in

Florida, the SRI was administered to all students in grades 2 through 10 in September and March each year. Students also took the annual Florida state assessment, which was comprised of the norm-referenced Stanford Achievement Tests, Ninth or Tenth Edition (SAT-9/10) and the criterion-referenced Sunshine State Standards Test (SSS).

Additionally, a sample of the population participated in the Preliminary Scholastic Aptitude Test (PSAT). The correlations indicated the four assessments measure a similar construct, thus indicating the validity of the SRI (Scholastic, Inc., 2007).

According to Scholastic, Inc. (2007), construct validity was also confirmed via another study conducted in a large urban district where SRI was administered to all students in grades 2 through 10 twice a year beginning in the 2000-2001 school year. A quadratic regression was used to estimate growth in reading ability among the sample population of 45,495 students for whom the researchers had at least seven SRI scores. The result was a regression slope reflecting approximately 100L of growth from fall to spring ($> .50L$ per day). The median R^2 coefficient was between .800 and .849 indicating that the relationship of reading ability and the passage of time was .91. Findings from this study were consistent with other studies used by Scholastic, Inc. (2007), further providing evidence of the validity of SRI.

Other Variables' Measurement

The problem behaviors of students were measured as the total amount of minutes a student spent out of the classroom. These behaviors were determined to be sufficiently disruptive or hurtful by the teacher or staff member. The BIST model is used at Anytown School to provide teachers a system of support to address disruptive or hurtful behavior with grace and accountability so that they can maintain a safe and productive learning

environment (BIST, 2014). When a child is unable to respond to teacher requests or is being hurtful or disruptive, teachers follow a continuum (i.e., safe seat, buddy room, and focus room). Initially, the child may be asked to move to a seat in the classroom (i.e., safe seat or calm spot). If the disruptive behavior continues, the teacher will remove the child from their classroom and place them in an alternative setting in another classroom (i.e., a buddy room). This move is intended to help the child move from an unsuccessful setting to a quiet place where they have time to refocus and get back on track. If a student continues the problem behaviors in the buddy room, they are then removed to a classroom (i.e., focus room) facilitated by a staff member (typically the Focus Facilitator), who works individually with the child to successfully help them stop the behavior and prepare to reenter the learning environment. The child will then work back through the BIST continuum to eventually return to their classroom.

Time out of class due to problem behaviors can last anywhere from a few minutes to a few hours, depending upon how long it takes the child to successfully stop the disruption or hurtful behavior and be ready to process the event with the teacher. Each event, including the time out of class, was logged by staff members into a database called Protabula (Moss & Poblete, 2014) that was used by staff at Anytown School to monitor data for behavior prevention and planning purposes. The purpose of the program was to track the amount of minutes a child's problem behaviors required him or her to leave the learning environment as well as the circumstances surrounding each event. Teachers and staff were trained in the system throughout the fall of 2013, which included information about how the system worked, how to log information, and a review of situations warranting a child to leave the learning environment. When a student left the classroom

because of problem behaviors, teachers and staff logged the location, reason for removal from the classroom, activity in which the child was engaged at the time of the behavior, whether the removal was planned or unplanned (proactive or reactive), staff member's name who received the child, event start and end times, and any relevant information for the receiving staff member (Moss & Poblete, 2014). For the purpose of the current study, the independent variable of problem behaviors was calculated as the amount of time a student spent out of the classroom due to problem behaviors during the 2013-2014 school year as logged in the Protabula database.

Attention concerns of students were determined based on parent-reported attention conditions, including but not limited to forms of ADHD and ADD or medications taken for such conditions. Parents recorded this information on the Health Inventory Form (see Appendix A) required by the district in which the study was conducted or on the Medication Order and Consent Form (see Appendix B) that lists prescriptions or over-the-counter medications the nurse is authorized to dispense at school. At least annually, during the registration process, each parent completes these forms, which ask for information such as diagnosed medical conditions and any medications that the child is taking. The parent can submit the forms electronically or in paper form to the school nurse who then enters the information into the health section of SIS. Parents may provide updates at any time throughout the year by re-submitting the forms or providing a note from themselves or their child's physician. The school nurse uses this information for the purpose of monitoring a student's health so that they are able to attend school and remain in the classroom to learn. For the purpose of the current study, attention concerns were determined based on parent-reported attention conditions,

including but not limited to, forms of ADHD and ADD or medications taken for such conditions.

Data Collection Procedures

Protocols for privacy, confidentiality, and student rights must be ensured when conducting research. Prior to conducting the study, approval was sought from Anytown District by submitting a letter of request to conduct research to the assistant superintendent outlining the nature of the study and the specific data requested (see Appendix C). The assistant superintendent granted permission to conduct the study in September 2014 (see Appendix D). Additionally, a proposal of research was submitted to Baker University's Institutional Review Board (IRB) (see Appendix E). The IRB reviewed and approved the proposal in September 2014 (see Appendix F).

Upon receiving approval from Anytown District and Baker University's IRB, data collection procedures began. Fall, winter, and spring SRI Lexile scores, as well as the grade level and gender, of each student in the sample was retrieved from the SIS by the district technology department. Student names were removed and data was coded according to the district-assigned student identification number. An employee of the technology department provided the data in the form of an Excel spreadsheet.

Data regarding time out of class due to problem behaviors was provided by the Protabula staff. Protabula system administrators retrieved information about the total number of minutes spent out of class due to problem behaviors by each student in the sample. Student names were removed and data was coded according to the student identification number. The data was provided in the form of an Excel spreadsheet.

The school nurse compiled a list of all students in the sample and indicated which did or did not have parent-reported attention concerns. Student names were removed and data was coded according to the student identification number. The school nurse provided the data in the form of an Excel spreadsheet.

The SRI scores, time out of class due to problem behaviors, attention concerns information, gender, and grade level were then combined into one Excel spreadsheet. The data were input into IBM® SPSS® Statistics Faculty Pack 22 for Windows for data analysis.

Data Analysis and Hypothesis Testing

The following research question, corresponding hypotheses, and data analyses guided this study. The level of significance used for the statistical analysis was $\alpha = .05$.

RQ. To what extent do fall SRI score, winter SRI score, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring student achievement in reading, as measured by the SRI?

H1. The fall SRI score is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H2. The winter SRI score is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H3. Time out of class due to problem behaviors is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H4. Parent-reported attention concerns are a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H5. Gender is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H6. Grade level is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

A multiple regression analysis was conducted to address the research question. Based on the F test for the coefficient of determination, statistically significant models were identified and these models were evaluated to find the best subset of the independent variables for predicting student achievement in reading. The correlations of the variables were examined for their strength and associations between each predictor variable and the criterion variable, and each variable was tested for its contribution to the final model. Each slope coefficient was tested using a t test.

Limitations

In a study, limitations represent “factors that may have an effect on the interpretation of the findings or on the generalizability of the results” (Lunenburg & Irby, 2008, p. 133). The study had two limitations. In all decisions regarding classroom management, there is a degree of subjectivity among teachers. On-going, comprehensive efforts were taken by the school administrator and appropriate staff to train teachers to use consistent criteria for defining disruptive behavior and determining the removal of a student from their classroom learning environment due to such behavior. A limitation of this study was that some variance between teachers may have occurred in the determination and reporting of problem behaviors.

A second limitation was that attention concerns were reported by parents, allowing for the possibility for error by parents who may not have reported diagnosed

attention concerns or reported such a condition that had not been diagnosed.

Additionally, the absence of information may not indicate the absence of attention concerns.

Summary

This chapter included a detailed description of the methodology used for this study. The overall research design, population, and sample were explained. The reliability and validity of the SRI assessments and the process by which data analysis was conducted were described. Also included in this chapter were the research question and corresponding hypotheses tested as well as the limitations of the study. Chapter four includes the results of this study.

Chapter Four

Results

The purpose of this study was to investigate the extent to which fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict student achievement in reading on the spring SRI. This chapter includes a detailed discussion of the descriptive statistics and results of the hypothesis testing.

Descriptive Statistics

The potential participants in this study were enrolled in the second, third, and fourth grades in Anytown School during the 2013-2014 school year ($n = 301$). However, if a student did not have the reported information for each of the variables (fall, winter, and spring SRI scores, problem behaviors, attention concerns, gender, and grade level), they were excluded from the sample. The final sample included 259 students. The final demographic breakdown can be seen in Tables 3 and 4.

Table 3

Demographic Characteristics of the Sample - Gender

Gender	Total Students	Problem Behaviors	Attention Concerns
Male	131	29	13
Female	128	17	4
Total	259	46	17

Of the 46 students reported to have spent time out of class due to problem behaviors, 42 students were identified as having problem behaviors but no attention concerns. Five students in the sample were reported to have attention concerns but spent no time out of

class due to problem behaviors. Four students reportedly had both attention concerns and time spent out of class due to problem behaviors.

Table 4

Demographic Characteristics of the Sample - Grade Level

Grade Level	Total Students	Problem Behaviors	Attention Concerns
2 nd	90	8	6
3 rd	95	19	8
4 th	74	19	3
Total	259	46	17

However, the data indicated that females in the sample outperformed males on all SRI administrations (see Table 5).

Table 5

Gender and SRI Performance

Gender	Fall SRI	Winter SRI	Spring SRI
Male	430.79	499.98	586.96
Female	453.69	544.65	631.75

Fall and winter SRI scores, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level were included as variables in the stepwise multiple regression models to determine the extent to which the variables were predictors of spring SRI scores.

Hypothesis Testing

This section includes the results of hypothesis testing. Multiple regression models using stepwise methods were used to address the research question for this study.

Following the hypotheses, a discussion of the combination of variables that produced the most parsimonious regression model is included. The level of significance for the stepwise multiple regression models was set at .05.

RQ. To what extent do fall SRI score, winter SRI score, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring student achievement in reading, as measured by the SRI?

H1. The fall SRI score is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H2. The winter SRI score is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H3. Time out of class due to problem behaviors is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H4. Parent-reported attention concerns are a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H5. Gender is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

H6. Grade level is a predictor of student achievement in reading, as measured by the spring administration of the SRI.

The independent variables used in this analysis included the fall and winter SRI scores, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level. The dependent variable for the analysis was the spring SRI scores for second, third, and fourth grade students. For the research question, all variables were reviewed. Students for whom the required demographic data was

obtained, and who participated in the spring SRI as well as the fall and winter SRI, were included in the analysis ($n = 259$).

Table 6 contains the correlation coefficient and probability of the relationship between each independent variable and the spring SRI scores. All variables had statistically significant relationships with spring SRI scores, with the exception of gender. Winter SRI scores had the strongest relationship to spring SRI scores followed by fall SRI scores. Grade level had a moderately weak relationship with spring SRI scores. Attention concerns were found to be negatively correlated (although weak) to spring SRI scores, indicating students with attention concerns have lower spring SRI scores. Time out of class due to problem behaviors also had a negatively weak correlation with spring SRI scores, indicating students with problem behaviors have lower spring SRI scores.

Table 6

Variables' Relationships with SRI Spring Scores

Variable	r	p
SRI fall	.888	< .001
SRI winter	.930	< .001
Problem behaviors	-.193	.001
Attention concerns	-.244	< .001
Gender	.077	.110
Grade level	.436	< .001

Despite five of the six variables having a significant correlation with spring SRI scores, only winter SRI scores, attention concerns, and grade level remained in the final stepwise regression model and were determined to be predictors of reading achievement on the spring SRI.

The most parsimonious model identified for predicting spring SRI scores for students in the sample included the winter SRI scores, attention concerns, and grade level, $F = 616.441$, $df = 3, 255$, $p < .001$. The percent of variability in the spring SRI scores explained by winter SRI scores, attention concerns, and grade level was 87.9%. Each of the variables was tested for a significant contribution to the model. Each slope coefficient (B) was tested using a t test. The winter SRI score was a significant predictor of spring SRI score, $t = 36.606$, $p < .001$. Grade level was predictive of the spring SRI score, $t = -4.314$, $p < .001$. Attention concerns were also a significant predictor of the spring SRI score, $t = -2.753$, $p < .05$.

The regression equation for predicting spring SRI scores was: Spring SRI Score = $.928(\text{Winter SRI Score}) - 41.906(\text{Grade Level}) - 72.422(\text{Attention Concerns}) + 252.651$. Winter SRI scores predict spring SRI scores in that for every one point increase a student achieves in their Lexile score on the winter SRI, that child is predicted to increase their spring SRI score by nearly the same amount (.928). The model also indicates that the increase in SRI scores is predicted to be approximately 42 Lexile points less as students increase grade levels. Finally, a student with parent-reported attention concerns is predicted to score approximately 72 Lexile points less than peers who do not have attention concerns. This finding supports hypotheses two, four, and six of the study.

Summary

This chapter included the descriptive statistics and results of hypothesis testing for this study. Multiple regression models using the stepwise method were conducted to determine which variables best predict spring SRI scores. The data analyses show that the winter SRI score, attention concerns, and grade level were statistically significant

predictors of spring SRI scores. Although fall SRI scores and time out of class due to problem behaviors were found to have significant relationships with spring SRI scores, they were not found to be predictive of spring SRI scores and were therefore excluded from the final regression model. Gender was not found have a statistically significant relationship with spring SRI scores. Chapter five includes a summary of the study, findings related to the literature, implications for action, recommendations for future research, and concluding remarks.

Chapter Five

Interpretation and Recommendations

The academic achievement of students is central to the mission of every school, yet schools are reporting increased problem behaviors and attention concerns among students (Melillo, 2009; NIMH, 2014; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). These concerns can lead to a lack of student achievement, specifically in reading (Duncan et al., 2007; Georges et al., 2012; NICHD ECCRN, 2004). The purpose of this study was to determine to what extent fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predict spring reading achievement on SRI among students in second, third, and fourth grades. Chapter five includes a study summary, the findings of this study as they relate to the literature review, and the conclusions of the research.

Study Summary

This study was conducted to determine whether prior reading performance (fall and winter SRI scores), time out of class due to problem behaviors, attention concerns, and demographics (grade level and gender) were predictors of spring reading achievement (SRI scores). Within this section, an overview of the problem, purpose statement and research question, review of the methodology, major findings, and findings related to literature are discussed.

Overview of the problem. Schools in the United States continue to be held accountable at the national, state, and local levels for the academic achievement of all students. Reading is vital to that achievement. Research suggests that students who lack

reading skills are more likely to continue to struggle in reading as they progress through school (Annie E. Casey Foundation, 2011; Duncan et al., 2007; Evers, 1998; Juel, 1988; Musen, 2010). Therefore, it is especially important for educators to understand what factors predict student reading performance as they progress through school. With problem behaviors and attention concerns among students increasing in prevalence (Melillo, 2009; NIMH, 2014; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012), the research examining how behavior and attention are related to reading achievement has been mixed (Duncan et al., 2007). While some studies have found problem behaviors are related to lower academic performance (Brennan et al., 2012; Castle, 2011; Finn et al., 1995; Flynt, 2008; NICHD ECCRN, 2004), other studies indicate only a weak relationship or no association at all (Duncan et al., 2007; Fergusson & Horwood, 1995; Georges et al., 2012). Studies offer relatively consistent evidence that attention concerns have a correlation to later reading achievement (Brennan et al., 2012; Duckworth & Schoon, 2010; Duncan et al., 2007; Fergusson & Horwood, 1995; Finn et al., 1995; Georges et al., 2012; Hinshaw, 1992; Razza et al., 2012; Yen et al., 2004). Similar to national trends, the number of students with problem behaviors and attention concerns at Anytown School is concerning. Further exploration into the extent to which those factors predict reading achievement is needed so that teachers and administrators can better respond to ensure the success of students in reading.

Purpose statement and research question. The purpose of this study was to determine to what extent fall reading performance on SRI, winter reading performance on SRI, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level were predictors of spring reading achievement on SRI among

students in second, third, and fourth grades. Six hypotheses were associated with the research question to determine if any of the independent variables (fall SRI scores, winter SRI scores, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level) were predictors of the dependent variable of spring reading achievement (SRI scores).

Review of the methodology. A non-experimental research design was utilized for this study. Archival data from second through fourth grade students enrolled at Anytown School during the 2013-2014 school year were included. Data were gathered by the district technology department, school nurse, and Protabula system administrators after the Institutional Review Board for Baker University and the Assistant Superintendent for Anytown District approved the study (see Appendices D and F). The hypotheses in this study stated that each independent variable (fall SRI scores, winter SRI scores, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level) were predictors of the dependent variable (spring SRI scores).

Data were input into IBM® SPSS® Statistics Faculty Pack 22 for Windows for analyses. Multiple regression models using stepwise methods were conducted; the correlations were analyzed for the strength of the relationship between each of the independent variables and the spring SRI scores, and each variable was tested for its significant contribution to the final model.

Major findings. A multiple regression model was used to address the research question. The evidence provided by the model did not support the first, third, or fifth hypotheses, which examined whether fall SRI scores, time out of class due to problem behaviors, and gender, respectively, were predictors of spring reading achievement on

SRI. Although found to have a statistically significant relationship with spring reading achievement, fall SRI scores and time out of class due to problem behaviors were not statistically significant predictors of spring SRI scores. No association was found between gender and spring reading achievement in this study. Therefore, fall SRI scores, time out of class due to problem behaviors, and gender did not remain in the final model as predictors of spring reading achievement.

Results from the hypothesis testing supported the second, fourth and sixth hypotheses, which investigated whether winter SRI scores, parent-reported attention concerns, and grade level, respectively, were predictors of spring reading achievement. As compared to the other variables, winter SRI scores were found to have the strongest relationship with subsequent student achievement in reading, followed by parent-reported attention concerns and grade level, respectively. Students who had attention concerns, as reported by a parent, were more likely to have lower reading scores on spring SRI. Although students' SRI scores are shown to increase as they progress through grade levels, the regression results suggest this increase is predicted to be less as students advance through second to fourth grades.

Findings Related to the Literature

The purpose of this study was to extend the current understanding of how prior reading achievement, problem behaviors, and attention concerns relate to spring reading achievement, as well as to examine the factors of grade level and gender. Earlier findings from the literature indicated that problem behaviors and attention concerns were negatively associated with reading achievement, with attention concerns playing a more significant role (Finn et al., 1995; Georges et al., 2012; Hinshaw, 1992). However, other

studies have indicated no evidence of an association between problem behaviors and reading achievement (Duncan et al., 2007; Fergusson & Horwood, 1995). Previous literature has consistently demonstrated attention was significantly related to reading performance (Duckworth & Schoon, 2010; Razza et al., 2012; Spira, 2005).

The first and second hypotheses examined how prior reading achievement related to and was a predictor of spring reading achievement. Literature relating to prior reading performance indicated that students who demonstrate success with reading skills at school-entry and elementary school have more favorable academic outcomes than their peers whose early reading struggles tend to persist (Annie E. Casey Foundation, 2011; Duncan et al., 2007; Evers, 1998; Juel, 1988; Musen, 2010; Snow et al., 1998). The results of the current study supported these research results by finding that both fall and winter reading performance on SRI were significantly related to subsequent spring reading achievement on SRI. However, only winter SRI scores were a predictor of spring SRI scores, thus indicating students with higher winter SRI scores were predicted to score higher on the spring SRI.

The third hypothesis investigated whether time out of class due to problem behaviors were a predictor of subsequent reading scores. Reflected in the existing literature, Duncan et al. (2007) did not find a significant relationship between behavior problems and later achievement, yet Brennan et al. (2010) found toddler-age aggression to be associated with school-age academic achievement and Georges et al. (2012) identified test score gaps among children with behavior problems. The current study mirrored findings from these studies, determining that problem behaviors were weakly associated with spring reading achievement on SRI among second through fourth grade

students. However, it was not a predictor of spring SRI scores. Thus, students who spend time out of class due to problem behaviors were not predicted to perform differently on spring SRI than students without problem behaviors.

The fourth hypothesis examined whether parent-reported attention concerns were a predictor of subsequent reading scores. Existing literature indicates a relationship between attention concerns and later reading performance (Duncan et al., 2007; Finn et al. 1995; Georges et al., 2012; Spira, 2005; Yen et al., 2004). Results of the current study showed that attention was moderately correlated with spring reading achievement on SRI among second through fourth grade students. In addition, attention was found to be a predictor of spring SRI scores, thus indicating that students with attention concerns, as reported by a parent, predicted to score lower on the spring SRI than students for whom no attention concerns were reported.

The fifth hypothesis examined whether gender was a predictor of subsequent reading performance on SRI. Duncan et al. (2007) concluded the association of school-entry reading skills with later reading performance was broadly similar for both boys and girls. However, in recent years, girls have outperformed their male counterparts in reading on various national and international assessments (NCES, 2011, 2014; OECD, 2014). Results of the current study showed that gender was neither significantly related to nor predictive of spring reading achievement on SRI among second through fourth grade students.

The sixth hypothesis examined whether grade level was a predictor of subsequent reading scores. The current literature suggests that prior reading skills, whether at school entry or during school-age years, are related to later reading performance (Duncan et al.,

2007; Evers, 1998; Juel, 1988; Musen, 2010). Juel (1988) found first-grade reading scores to be predictive of future reading scores. Evers (1998) concluded nearly three-fourths of poor readers in third-grade students still struggled in ninth grade. Just as the absence of reading skills was related to future reading concerns, the presence of reading skills correlated to future reading success. Duncan et al. (2007) found children who began kindergarten with early reading skills were likely to do well later in elementary years. The current study extended the literature by examining whether grade level predicted spring reading achievement. The results indicated that grade level was moderately correlated with spring reading achievement on SRI and was a predictor of spring SRI scores among second through fourth grade students. Thus, as grade level increases from second to fourth grades, there is predicted to be less of an increase in spring SRI scores. However, the data indicated that females outperformed males on all SRI administrations, which is supported by previous research such as NAEP results (NCES 2014).

Conclusions

Schools are responsible for ensuring the achievement of all students. With reading essential to success in all subjects, it is critical educators understand how problem behaviors and attention concerns predict subsequent achievement among students in reading. The focus of this study included an examination of how the factors of prior reading performance, time out of class due to problem behaviors, parent-reported attention concerns, gender, and grade level predicted subsequent reading achievement on the spring SRI. The implications of this study can help educators examine the behavior and attention of their students to plan and respond for their success in reading.

Implications for action. The findings of this study should prompt parents, teachers, administrators, board members, and other stakeholders to examine closely the prior reading performance and attention concerns of students at each grade level. Understanding how these factors (winter reading performance, attention concerns, and grade level) are predictive of spring reading achievement of elementary students would provide educators with further motivation to monitor student progress closely in order to plan instruction and intervention that mitigate the potential negative effects of these variables upon reading success. It would also be beneficial for districts to embed professional development and collaborative planning time for teachers regarding how to analyze the data effectively and plan research-based instructional responses.

The prevalence of attention concerns among students has risen (Melillo, 2009; NIMH, 2014; Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). The results of this study should prompt districts to investigate the most effective methods to help students with attention concerns acquire the skills necessary to successfully attend to learning, especially in the area of reading. However, given that information about attention concerns is often maintained by the school nurse, it is recommended that districts examine how to best equip teachers and administrators with information about attention concerns so that they can be empowered to determine effective instructional programming that meets the needs of those students in reading.

Parents could benefit from the knowledge about the association between attention concerns and students' achievement in reading. Schools should help parents understand the importance of reporting any attention concerns or diagnosis to aide staff in planning for reading success. The results of this study also indicate it may be beneficial for

teachers to help parents understand the purpose in monitoring student reading performance throughout the year, especially at mid-year (winter), is because prior reading performance can predict spring reading achievement. Therefore teachers can use the data they collect to plan for student reading success.

The findings of this study indicated that problem behaviors were related to spring reading scores but were not a predictor of them. Districts should continue to examine further the time students spend out of class due to problem behaviors to better understand their relationship with reading performance. Although this study did not indicate problem behaviors predicted spring reading achievement, the findings of some studies have suggested behavior is associated with reading (Georges et al., 2012) and teachers have reported that behaviors negatively impact their teaching environment (Scholastic, Inc. & Bill and Melinda Gates Foundation, 2012). Therefore, districts should examine how to best support teachers through additional professional development about effective behavior intervention strategies and provide the time for staff to collaboratively plan implementation.

This study will give leaders of the Anytown District, and other educational leaders, valuable data when making financial and systemic decisions that support the reading achievement of elementary students. The findings will also assist districts in making future recommendations or changes that equip teachers with the essential training, time, and strategies to successfully address the needs of their students who have prior reading struggles or attention concerns at each grade level. By doing so, districts will ultimately enhance the learning of all students.

Recommendations for future research. Findings from this study added to the literature regarding the how prior reading performance and attention concerns are significant predictors of subsequent reading performance. Specifically, the current study was conducted to examine whether prior reading performance, problem behaviors, attention concerns, gender, and grade level were predictors of spring reading achievement on SRI among students in second through fourth grades. The following are recommendations for future research.

The first recommendation is to replicate the current study by examining how the independent variables of prior reading performance, problem behaviors, attention concerns, and gender predict spring reading achievement on SRI within a single grade level among students at second, third, or fourth grades. Given the development that occurs within students during that timeframe, it would provide helpful information to examine if the variables are predictors of spring reading achievement when examined within each grade level individually.

The second recommendation is that the current study be replicated to examine if other problem behaviors are related to subsequent reading performance. Problem behaviors in this study were defined as time spent out of class due to behavior. Although not all schools have systems in place to track the time students spend out of class due to behavior, other ways to measure problem behaviors exist (i.e., number of discipline referrals, visits to a behavior interventionist or focus room teacher). Problem behaviors as defined in the current study were found to have a relationship (although weak) with spring SRI scores, and therefore, it would be helpful to educators to investigate if other types of problem behaviors remained as predictors of spring reading achievement.

Additionally, extending the current study to examine if a certain amount of time spent out of class due to problem behaviors (e.g., 0-499 minutes per year, 500-999 minutes per year, 1000 or more minutes per year, etc.) was more or less predictive of spring reading achievement. This would allow teachers to monitor how a student's behavior impacts their reading.

It is also recommended that the present study be replicated to investigate if other attention concerns are a predictor of subsequent reading achievement. The information about attention concerns used for this study was maintained by the school nurse and not readily available to teachers. However, other means to identify which students have attention concerns exist (i.e., teacher ratings of students' attention skills). When such information is accessible to teachers, they are able to effectively respond to student needs.

It is further recommended to replicate the study with a larger sample. The current study included data from the second through fourth grade student population at one school. It would be beneficial to assess if consistent results are found with a larger number of students at those grade levels. Additionally, since SRI is a test used internationally with students through high school, it would be useful to examine if the results are consistent at other grade levels as well.

Replicating the current study to include demographic variables other than grade level and gender is another recommendation based on the outcomes of this study. Much research exists examining the effects of socioeconomic status and ethnicity upon student outcomes. Therefore, it would provide valuable information to extend the current study

to examine whether socioeconomic status and ethnicity, among other demographic characteristics, are predictors of subsequent reading achievement.

A final recommendation is to extend the present study to examine if prior reading achievement is not only a predictor of spring reading achievement but also whether those students are proficient readers in the spring. As is the case at schools across the nation, educators at Anytown School strive to help each child develop the skills to read proficiently. While the current study was conducted to examine whether certain independent variables were predictors of spring reading achievement on SRI, it did not investigate whether these variables were predictors of students' proficient reading status. While information about reading achievement is helpful, educators need to know which variables can accurately predict the grade level reading proficiency of their students by the end of the school year so they can respond effectively to ensure their students become proficient readers.

Concluding remarks. The successful development of reading skills is essential to the academic success of all students in schools around the nation. A body of research exists that suggests prior reading achievement, problem behaviors, and attention concerns are related to subsequent reading performance by students (Brennan et al., 2012; Duncan et al, 2007; Evers, 1998; Georges et al., 2012), yet other studies suggest one or both of the latter two variables do not (Duncan et al., 2007). Findings from the current study indicate that winter reading performance, parent-reported attention concerns, and grade level can be used to predict spring reading achievement among students. The fact that time out of class due to problem behaviors and gender were not found to be predictors of reading performance is perhaps equally important for schools to know. This study will

empower schools with information about variables that can predict reading achievement so that they can effectively plan instruction and intervention to ensure all students will achieve success in reading. For students who are struggling readers and those with attention concerns, the results of this study will provide schools around the nation with a call to action to recognize that those characteristics can predict reading achievement and to effectively respond in a manner that ensures each child in classrooms around the nation becomes a successful reader.

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Appendices

Appendix A: Health Inventory Form



HEALTH INVENTORY FORM

Dear Parent/Legal Guardian: Please complete the information below. It is very important for this information to be kept current in case of illness or injury while at school. Please let the school know all telephone number changes.

~PLEASE PRINT~

Student _____ Date of Birth _____
 Address _____
 City/State _____
 Grade/Teacher _____ Home Phone _____
 Father's Name _____ Work Phone _____
 E-Mail _____ Fax _____ Cell Phone _____
 Place of Employment _____
 Mother's Name _____ Work Phone _____
 E-Mail _____ Fax _____ Cell Phone _____
 Place of Employment _____
 Name of neighbor or local relative to be called in case parents cannot be reached:
 Name _____ Phone _____
 Name _____ Phone _____
 Primary Care Provider _____ Phone _____
 Address _____

Check all that apply:

<input type="checkbox"/> Asthma	<input type="checkbox"/> Migraines	<input type="checkbox"/> Heart Condition _____
<input type="checkbox"/> No Inhaler	<input type="checkbox"/> Seizures	_____
<input type="checkbox"/> Inhaler	<input type="checkbox"/> Fainting	<input type="checkbox"/> Other _____
<input type="checkbox"/> Student carries Inhaler (9-12 grades only)	<input type="checkbox"/> ADD/ADHD	_____
<input type="checkbox"/> Diabetes		_____
<input type="checkbox"/> Insulin Pump		_____
<input type="checkbox"/> Insulin injections		_____
<input type="checkbox"/> Medications at home _____		

Allergies (food, medical, seasonal, etc. Include reactions) _____

I have received a copy of the _____ Health Services. By signing this form you agree to allow the _____ School District to discuss any medical information for your child with the individual(s) you have listed and release the _____ School District from any liability associated with the release of this information.

Signature of Parent/Legal Guardian _____
 Relationship to Student _____ Date _____

The _____ District reserves the right to transport your child to the nearest hospital in case of an emergency.

Appendix B: Medication Order and Consent Form

--	--

STUDENT _____ GRADE _____ SCHOOL _____ FAX _____

PARENT/LEGAL GUARDIAN: Please INITIAL one or more of the listed non-prescription, school-owned medications as appropriate for your child and authorize administration with signature below. Medications will be administered in accordance with school policy.

- Acetaminophen (like Tylenol) titrate dosage by age/weight for pain or temperature
 Antacid (like Tums) for the relief of stomach indigestion
 Anti-Itch Lotion (like Caladryl) apply topically for itching or insect bites
 Throat Spray (like Chloraseptic) for sore throat
 Triple Antibiotic Ointment (like Neosporin) for minor cuts, scrapes and burns
 Camphophenique Liquid for fever blisters, cold sores or insect bites
 Sterile Saline Solution for eye irrigation

FOR GRADES 7-12 ONLY:

- Cough Drops (K-6 may NOT receive cough drops)
 Ibuprofen - titrate dosage by age/weight for pain or temperature

AUTHORIZATION:

I hereby give permission for my child to receive the ~~non-prescription, school-owned~~ medications indicated above as deemed necessary by the school nurse or designated personnel. I understand that the _____ District, and its representatives, administering medications according to order and proper dosage, shall not be held liable for damages as a result of any adverse reaction. I also authorize the school nurse to contact the student's Authorized Prescriber/Primary Care Provider regarding any written order.

Parent/Legal Guardian _____ Date _____

DO NOT AUTHORIZE:

I do not give permission for my child to receive the medications indicated above at school. However, I authorize the school nurse to contact the student's Authorized Prescriber/Primary Care Provider regarding any written order.

Parent/Legal Guardian _____ Date _____

Authorized Prescriber/PRIMARY CARE PROVIDER: Prescription medication and non-prescription, non-school-owned medication brought from home and required for administration during school hours:

RX: _____
(Please include Drug Name, dosage, time and duration of administration)

NON RX: _____

Diagnosis: _____

Authorized Prescriber/Primary Care Provider PRINTED Name _____ Signature _____

MD DO FNP ANP PA DDS Office Phone _____ Date _____

PARENT/LEGAL GUARDIAN CONSENT:

I hereby give permission for my child to receive the prescribed medications and non-prescription, non-school-owned medications indicated as deemed necessary by the school nurse or designee. I understand that I have the ultimate responsibility for providing the school with an adequate supply of medication(s) and for informing the ~~school district immediately~~ if any information provided on this form changes, or if administration of medication(s) should cease. I understand that the _____ District, and its representatives, administering medications according to order and proper dosage, shall not be held liable for damages as a result of any adverse reaction. I also authorize the school nurse to contact the student's Authorized Prescriber/Primary Care Provider regarding any written order.


Parent/Legal Guardian _____ Date _____

Appendix C: Request to Anytown District to Conduct Research

September 1, 2014



As a follow-up to prior discussion, I respectfully submit this letter officially requesting permission from the district to conduct the current proposed research study as a partial fulfillment for my doctoral degree in educational leadership from Baker University. I have also requested permission from the Baker Institutional Review Board (IRB) to conduct this research, ensuring all necessary measures will be taken to ensure the privacy and confidentiality of participants. Only archival data will be used for this study, and therefore no direct contact will be made with students or parents.

The purpose of this study will be to determine how the independent variables of behavior, attention issues, prior reading achievement scores, gender, and grade level are associated with subsequent student achievement in reading. Specifically, the function of this study will be to investigate the extent to which fall reading performance on SRI, winter reading performance on SRI, time out of class due to behavior, the presence of attention issues as reported by parents, gender, and grade level predict student achievement in reading on the spring SRI among students at  Elementary in Grades 2-4 who were enrolled during the 2013-14 school year. SIS data including SRI scores, gender, and grade level will be requested from the technology department, time out of class due to problem will be requested from the owners of Protabula, and any parent-reported attention concerns will be requested from the school nurse. Student names will be removed from all data and student numbers will be used to ensure confidentiality and privacy. As an additional assurance given the nature of this study, the school and district will be referred to as "Anytown" for the purposes of publication.

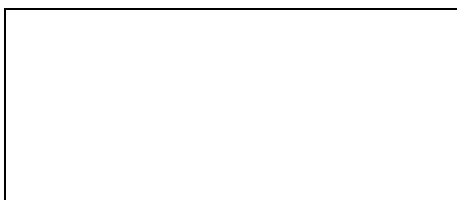
I respectfully request your permission to conduct this study as proposed. It is my intent to complete my dissertation by November 30, 2014.

Respectfully submitted,

Michelle Hofmann

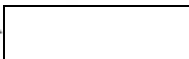
Michelle Hofmann

Appendix D: Approval from Anytown District to Conduct Research



September 1, 2014

Dear



As a follow-up to prior discussion, I respectfully submit this letter officially requesting permission from the district to conduct the current proposed research study as a partial fulfillment for my doctoral degree in educational leadership from Baker University. I have also requested permission from the Baker Institutional Review Board (IRB) to conduct this research, ensuring all necessary measures will be taken to ensure the privacy and confidentiality of participants. Only archival data will be used for this study, and therefore no direct contact will be made with students or parents.

The purpose of this study will be to determine how the independent variables of behavior, attention issues, prior reading achievement scores, gender, and grade level are associated with subsequent student achievement in reading. Specifically, the function of this study will be to investigate the extent to which fall reading performance on SRI, winter reading performance on SRI, time out of class due to behavior, the presence of attention issues as reported by parents, gender, and grade level predict student achievement in reading on the spring SRI among students at [redacted] in Grades 2-4 who were enrolled during the 2013-14 school year. SIS data including SRI scores, gender, and grade level will be requested from the technology department, time out of class due to problem will be requested from the owners of Protabula, and any parent-reported attention concerns will be requested from the school nurse. Student names will be removed from all data and student numbers will be used to ensure confidentiality and privacy. As an additional assurance given the nature of this study, the school and district will be referred to as "Anytown" for the purposes of publication.

I respectfully request your permission to conduct this study as proposed. It is my intent to complete my dissertation by November 30, 2014.

Respectfully submitted,

Michelle Hofman



District Representative Granting Study Permission



Position

Assistant Superintendent

Appendix E: Institutional Review Board Request - Baker University

**SCHOOL OF EDUCATION
GRADUATE DEPARTMENT**



IRB PROTOCOL NUMBER _____

Date: August 25, 2014

(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. Verneda Edwards	<u>V. Edwards</u>	Major Advisor
2. Katie Hole	<u>K. Hole</u>	Research Analyst
3. Inge Bach	_____	University Committee Member
4. Dr. Barbara Condra	_____	External Committee Member

Principal Investigator: Michelle L. Hofmann
 Phone: 816-616-4210
 Email: hofmann.michelle@gmail.com
 Mailing address: 7332 Walnut Street
 Kansas City, MO 64114

Faculty sponsor: Dr. Verneda Edwards
 Phone: 913-344-1227
 Email: vedwards@bakeru.edu
 Expected Category of Review: Exempt Expedited Full

II: Protocol Title

**Problem Behavior and Attention Concerns as Predictors of Reading
Achievement in Second through Fourth Grade**

Summary

The following summary must accompany the proposal. Be specific about exactly what participants will experience, and about the protections that have been included to safeguard participants from harm. Careful attention to the following may help facilitate the review process:

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

The purpose of this study is to examine to what extent do fall SRI achievement scores, winter SRI achievement scores, time out of class due to problem behavior, parent-reported attention concern, grade level, and gender predict student achievement in reading, as measured by the Scholastic Reading Inventory in spring.

This study will be conducted in Anytown School, Anytown, a suburban Midwest district. Data from students in second, third, and fourth grade from the 2013-14 school year will be used. The findings could result in the ability of district officials and teachers to predict subsequent reading achievement early and determine a plan to effectively intervene.

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

There will be no condition or manipulation included in this study, which will investigate the predictive nature of fall and winter reading achievement scores on SRI, problem behavior that results in time out of class, attention concerns reported by parents, gender and grade level upon spring reading achievement scores on SRI.

What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.

Will the subjects encounter the risk of psychological, social, physical, or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

The independent variables included in this study are fall and winter SRI reading achievement scores, problem behavior that results in time out of class, attention concerns as reported by parents, gender, and grade level. The dependent variable is the spring SRI scores. No questionnaires or other instruments will be used for the purposes of this study. Student data for this study will be archival and obtained through the student information system, behavior database, and school health files.

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

No, there will not be any stress to the subjects in this study.

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

No, the subjects in this study will not be misled in anyway.

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

No there will not be a request made to subjects. Archival data will be used for the second, third, and fourth graders who are a part of the study. Information in the report will include an identification number.

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

No, the subjects will not be contacted as part of this study.

Approximately how much time will be demanded of each subject?

No time will be demanded of the subjects.

Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

Subjects in this study will be second, third, or fourth graders at Anytown School, Anytown, Given all information for the study will archival, students will not be contacted or solicited for this study. District officials will review the findings of this request and determine if the research may be conducted.

What steps will be taken to ensure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

Archival data will be collected from Anytown School. All subjects will be referred to by their identification number. No inducements will be offered to participate in this study.

How will you ensure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

No consent is required. All data is archival. No inducements will be offered.

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, data from this study will not be made a part of any permanent record that can be identified with the subjects.

Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.

No, subjects from this study will not be made a part of any permanent record that can be identified for future purposes.

What steps will be taken to ensure the confidentiality of the data?

The researcher submitted an application to conduct research and to obtain archival data from Anytown School District. Data generated for this study will not be used for any other purposes. No names or other identifications will be available to identify the subjects in the study. All data will be stored...Aggregate data will be shared with Baker University and Anytown School District once the study is completed. Based on Baker University guidelines the data collected for this study will be stored on a secure site for at least three year, after which, it will be destroyed.

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 accrued by subjects or society in this research study. The benefit of the study is its contribution to the body of research related to the relationship of behavior problems, parent-reported attention concerns, prior reading performance, gender, and grade level on reading achievement in elementary years. Studies currently report mixed findings, especially related to the correlation of behavior to reading achievement, and little about the predictive nature of either behavior or attention on later reading achievement.

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

All data used in this study is archival. Such data includes student names (names will be replaced with student identification numbers), gender, grade level, time out of class for behavior problems, parent-reported attention concerns, and SRI reading achievement scores for the 2013-14 school year.

Appendix F: Letter of Research Approval – Baker University



September 2, 2014

Dear Michelle Hofmann and Dr. Edwards,

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
Molly Anderson
Scott Crenshaw