

EFFECTS OF SINGLE-GENDER EDUCATION ON THE READING  
ACHIEVEMENT OF THIRD THROUGH FIFTH GRADE BOYS

by

Michael Shane Brown

Liberty University

A Dissertation Proposal Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

July, 2013

Effects of single-gender education on the reading achievement of  
third through fifth grade boys  
by Michael Shane Brown

A Dissertation Presented in Partial Fulfillment  
Of the Requirements for the Degree  
Doctor of Education

Liberty University, Lynchburg, VA  
July, 2013

APPROVED BY:

Tamika Hibbert, Ed.D., Committee Chair

Amy McLemore, Ed.D., Committee Member

Bill Kamm, Ed.D., Committee Member

Scott Watson, PhD, Associate Dean, Advanced Programs

## ABSTRACT

It is said repeatedly, boys can't read. However, the statement should be boys *can* read they just don't. Understanding there is a need for action is the first step educators must take in helping boys emerge as confident and successful readers. Single-gender classrooms can be successful tools when seeking new ways in which to engage boys in reading. This is a step towards creating atmospheres where boys are encouraged to read and where reading is tailored to their interests. The purpose of this causal comparative study was to examine the Measures of Academic Progress (MAP) reading achievement scores of third through fifth grade males placed in both single-gendered and co-educational classrooms. A one-way repeated measures ANOVA was performed and it was observed that there was a statistically significant difference between the scores of third through fifth grade students taught in single-gendered classrooms compared to those taught in co-educational classrooms. Although it was observed that students in single-gendered classrooms generally performed more consistently at or above grade level in each grade but third on the fall 2011 and spring 2012 tests, there appeared to be no significant difference in the at or above grade level percentages of either the control or experimental groups.

Descriptors: single-gendered, co-educational, Measures of Academic Progress (MAP), reading achievement

## **Dedication**

This dissertation is dedicated to my amazing mom. For without her love and guidance I would not be who I am today.

### **“Through My Mother’s Eyes”**

My mother sees me as a bright, handsome young man.

Who’s all grown up in this busy world.

Who’s funny, courageous, brave, and strong.

Who’s intelligent and knows right from wrong.

Who makes decisions on his own.

In this hectic world, I stand tall.

And keep my composure through it all.

But once I was a little boy.

Who was small and dependent in this busy world

So how did I become the man I call me?

I was cared for, loved and raised properly.

I had a wonderful model to look up to.

I was taught to reach for the stars.

And be proud of everything you are.

So now I’m reaching my goals and dreams.

And I have you to thank for everything.

I love you mom!

© Jessica R. Nickell

## Acknowledgments

I have many times throughout this dissertation process been comforted and strengthened by the prayers, guidance, and input of many people. God once again proved His faithfulness in carrying me through this process and guiding my way by providing just what I needed from Him at just the right time. This has truly been more than an academic journey but a spiritual one as well.

To my wife Sarah, thank you so much for the many hours you watched our two girls while I worked. This degree is as much yours as it is mine. Your love and support was the catalyst I needed to step out in the journey and for that I am forever grateful. To my girls, Ashlyn and Hannah, thank you for allowing daddy time to work and thank you for always being one of the best parts of my life.

I prayed fervently about finding the perfect chair and God was once again faithful. To Dr. Tamika Hibbert, a simple thank you and an acknowledgement here seems inadequate for the many hours which have been spent on your part offering guidance and feedback, by making yourself accessible, and by providing quick responses so I could move forward. All the best to you now and always!

To my committee members, Dr. Amy McLemore and Dr. Bill Kamm, you both were certainly another answered prayer. Thank you for the time you invested in helping me develop this study, invaluable feedback, and for being so encouraging and supportive.

My Lee University colleagues, thanks for always allowing me to pick your brains, use your class for research, and believing in me to begin with. Lastly, I could not end without saying thank you to my Watson's 919 Facebook group who has traveled this journey with such professionalism and determination.

## Table of Contents

ABSTRACT .....	3
Dedication .....	4
Acknowledgments.....	5
Table of Contents .....	6
List of Tables .....	10
List of Abbreviations .....	11
CHAPTER ONE: INTRODUCTION.....	12
Background.....	12
Problem Statement .....	15
Purpose Statement.....	17
Research Questions.....	19
Hypotheses .....	19
Identification of Variables .....	20
Definitions of Core Terms .....	21
Research Plan.....	21
CHAPTER TWO: LITERATURE REVIEW.....	23
Introduction.....	23
Theoretical Framework.....	23
Review of the Literature .....	26
Learning Differences Among Boys and Girls .....	26
Gender and Its Relationship to Learning Styles .....	28
Academic Achievement of Boys .....	29

Theories Surrounding Boys’ Lower Reading Achievement.....	30
Brain-Theory and Gender Specific Education.....	34
Boys and Their Interest in Reading .....	35
Motivation.....	37
A Brief History of Single-Gendered Education.....	38
Single-Gendered Education in the 21st Century.....	39
Recent Studies.....	40
Single-Gendered Education’s Effects on Boys.....	41
Single-Gendered versus Co-Educational Learning.....	44
Support for Single-Gender Education.....	45
Opposition to Single-Gender Education .....	47
Single-Gender Implementation in South Carolina Public Schools.....	50
South Carolina Department of Education Survey on Single-Gender Education ..	51
Summary.....	52
<b>CHAPER THREE: METHODOLOGY.....</b>	<b>54</b>
Introduction.....	54
Research Design.....	55
Questions and Hypotheses .....	57
Participants.....	58
Setting .....	60
Instrumentation .....	61
Procedures.....	63
Data Analysis .....	65
Statistical Assumptions.....	66

Normality.....	66
Homogeneity of variance and covariance.....	66
CHAPTER FOUR: RESULTS .....	68
Descriptive Statistics.....	69
Research Question One.....	73
Research Question Two .....	74
Summary of Results.....	77
CHAPTER FIVE: DISCUSSION.....	79
Statement of the Problem.....	79
Summary of the Findings.....	80
Research Question One.....	80
Research Question Two .....	81
Discussion of the Findings.....	82
Research Question One.....	82
Research Question Two .....	83
Theoretical Implications .....	85
Practical Implications.....	86
Limitations .....	87
Internal Validity .....	89
External Validity.....	90
Ecological Validity .....	90
Recommendations for Further Research.....	91
REFERENCES .....	93
APPENDIX A: Permission Email .....	108

APPENDIX B: Instrument..... 109

APPENDIX C: School A (Single-Gendered), 3rd-5th Grade MAP Scores ..... 110

APPENDIX D: School B (Co-educational), 3rd-5th Grade MAP Scores ..... 112

## **List of Tables**

Table 1: Learning Characteristics.....	28
Table 2: Sample Population.....	60
Table 3: Mean and standard deviation – Fall 2011 and Spring 2012.....	70
Table 4: Mean and standard deviation – Grade 3 - Fall 2011 and Spring 2012.....	71
Table 5: Mean and standard deviation – Grade 4 - Fall 2011 and Spring 2012.....	71
Table 6: Mean and standard deviation – Grade 5 - Fall 2011 and Spring 2012.....	71
Table 7: Levene’s Test of Equality of Error Variances Results.....	73
Table 8: Fall 2011 Percentage of Students At, Above, or Below Grade- Level.....	76
Table 9: Spring 2012 Percentage of Students At, Above, or Below Grade-Level.....	76

## **List of Abbreviations**

Analysis of Covariance (ANCOVA)

Analysis of Variance (ANOVA)

Measures of Academic Progress (MAP)

National Assessment of Educational Progress (NAEP)

National Association for Single Sex Publication (NASSPE)

No Child Left Behind (NCLB)

Northwest Evaluation Association (NWEA)

Programme for International Student Assessment (PISA)

Rausch Unit Score (RIT)

## CHAPTER ONE: INTRODUCTION

### Background

With an increased number of boys whose reading achievement is below the desired level of performance, one must question what the reason might be and what is being done to combat the issue. Moss (2000) stated that it has been known for some while that, in general terms, boys do less well than girls at reading, almost regardless of the criteria used to assess competence. Not only is their performance weaker, they also read fewer books than girls, and much less fiction. Many factors play a key role in affecting boys' reading achievement. The research was very informative and allowed the researcher to see the severity of this problem. Not only in the United States, but also abroad most boys are underperforming girls in reading achievement (McKechnie, 2006). Educators must take heed and develop ways to once again improve the reading achievement for boys.

It has been stated repeatedly, "Boys can't read." Is it possible that what really should be stated is, "Boys *can* read they just don't?" The US Department of Education (2005) has said that school age boys tend to read a grade and a half lower than girls. McKechnie (2006) stated that until recently, both research and practice were more interested in uncovering and addressing the unfair, unequal treatment of girls. But times have changed. Researchers have argued that girls have improved in almost all performance indicators, while boys have not (Kehler, Martino, & Watson, 2010; Skelton & Francis, 2011). Due to an emphasis concerning the underachievement of girls, society has noted that boys and their reading achievement have fallen prey to complacency and lack of fortitude in addressing the issue at hand. This has created boys who have no

desire to learn or succeed in school because of self-efficacy issues that are not being addressed. Overall, boys' attitudes about reading have voluntarily changed dramatically during their elementary years. Becoming more aware of what is happening with boys and their attitudes toward reading will allow educators the opportunity to become more proactive in dealing with meeting their needs in the area of literacy achievement (McNeil, 2009; Prado & Plourde, 2011).

The importance of boys' reading achievement should be the central focus of schools in their efforts to increase student achievement in all areas and with both genders. Getting to the root of the problem surrounding this issue is a step in the right direction toward rectifying a spiraling decline. When educators understand the importance of dealing with these root issues such as a lack of male role models, reading material that does not pique the interest of boys, or a lack of understanding related to the gender differences that exist in learning, then strategies can be implemented to specifically address boys and their reading achievement.

Children's literacy is of central concern to both educationalists and society at large, hence its importance in practice and research. Reading attainment has been shown to be affected by such factors as age, family background, teaching methods and materials, gender, attitudes to reading and reading habits (Davies & Brember, 1993, p. 1).

Advocates for boys and their lack of achievement in reading have proposed many ideas to springboard an interest in reading as well as increased academic achievement. Recently, single-gender education has gained national attention as a possible solution to some of the academic issues facing boys and girls alike. For example, Sax (2005; 2007) argues that boys and girls have a number of 'hardwired' differences that are best

accommodated by single-sex schooling. He claimed that ‘in the coeducational classroom so many of the choices we make are to the advantage of girls, but disadvantage boys’ (Sax, 2008) and that schooling boys and girls separately is the best way to accommodate boys’ needs without disadvantaging girls. A number of studies have examined the effects of single-sex schooling on educational achievement for males and females. In many cases, the results of these studies have suggested that the effects of single-sex schooling may vary with gender.

Sadker and Sadker (1995) summarized research findings for males and females in coeducational school settings and in U.S. society. According to Sadker and Sadker (1995), female students are disadvantaged in coeducational settings, including fewer opportunities to contribute vocally in classes, fewer leadership opportunities, and lower course enrollment and achievement in fields traditionally dominated by males. Male students have higher risk factors than females according to statistics related to accidents, suicides, and homicides. They are more likely to be labeled with learning or behavior problems in school, fail more classes, are retained at a higher rate, and are more likely to drop out of school. Sadker and Sadker (1995) also noted an achievement gap between white males and minority males, as well as lower levels of self-esteem for minority or low socio-economic students.

Research on single-gender schooling suggested that the single-gender classes eliminated certain classroom distractions from the opposite sex, particularly for the girls (Anfara & Mertens, 2008; Hayes, 2008; Protheroe, 2009). Teachers and students reported that the single-gender setting provided opportunities to dialogue openly about issues particular to adolescent boys or girls in each community. Fighting among girls did not necessarily improve in single-gender schools, as some students reported that instead

of fighting over boys they fought over issues of friendship and gossiping about each other. Many boys noted an increase in teasing and disruptive behavior, while finding the single-gender classroom to be a more productive work environment.

The literature related to same-gender schooling demonstrates the need for credible studies in U.S. public schools. Research in the field of single-sex education is timely due to No Child Left Behind (NCLB) encouraging this strategy as a means to improve student achievement (Hutchison, 2001; Logsdon, 2003). As public schools experiment with same-gender education, attention to research-supported theory and practice is of great importance to the creation of same-gender programs. Advocates for same-gender schooling have stated opinions that highlight a setting which enhances educational opportunity and frees students from gender stereotypes (Friend, 2006). This type of environment can lead to success for boys in reading as shown by a higher level of interest in reading as well as increased academic achievement.

### **Problem Statement**

Moss (2000) noted that boys score lower than girls in reading, regardless of the criteria used to assess competence. Not only is their performance weaker, they read fewer books than girls, especially fiction (Moss, 2000). Boys' reading habits are of concern when educators looked at their underachievement in school. When compared to girls' achievement and how they develop in literacy over time, educators must engage in conversation about what can be done to address this gap (Daniels, Creese, Hey, Leonard, & Smith, 2001; Friend, 2006; McKechnie, 2006). Reading achievement that does not meet the level of performance expected at specific age increments can have lasting effects. These include possible retention, decreased motivation, increased dropout rates,

and possible incarceration (Clark, Lee, Goodman, & Yacco, 2008; Fleishman, n.d.; Hernandez, 2011; Hong & Bing, 2007; Varlas, 2005).

According to Clark et. al (2008) and Hong & Bing (2007) student retention is on the rise especially with boys based on their underachievement in reading. This retention carried with it the possibilities of either present success or future failure. Often these students are less likely to stay motivated while continuously enrolled in school nor will they work to achieve the expectations set forth for them (Fleishman, n.d.). This decreased motivation eventually leads to significant problems when these boys are easily distracted and unable to keep up with the learning pace of their age appropriate peers in other subjects such as English or science and social studies. They are then motivated to find other ways of manipulating and/or retaliating against the system they so desperately wish to depart (Hernandez, 2011).

When motivation is decreased and manipulation has become an important survival mechanism, it is not long before these boys reach the age at which they can legally be allowed to drop out. Since the passage of NCLB in 2001, schools have worked diligently to decrease their dropout rate which in turn increases their graduation rate (Fleishman, n.d.). Hernandez (2011) found that students who are not reading proficiently by the third grade are four times more likely to leave high school never having received a diploma. If students were unable to master basic reading skills within the first years of schooling then the chances of this happening jump to six times more likely.

Today's young adults who either graduate with low literacy skills or drop out of school have little chance for employment, even in low-paying jobs, and are more likely to end up on public assistance. Those who do find work are often

stuck in minimum wage jobs that pay too little to support a family in today's society. Even more disturbing is the increased likelihood that high school dropouts, who enter society lacking work skills and life skills, will end up in a correction facility (Fleishmann, n.d.).

The number of juveniles and adults who cannot read well or read at all and find themselves residing in one of our nation's correctional facilities has risen astronomically over the last fifty years (Hernandez, 2011). All of these stated concerns can be easily traced back to the level of reading achievement at which boys perform that can serve as a possible predictor of their future success.

This study was designed to address the problem of whether or not implementing single-gender education can positively affect the reading achievement of third through fifth grade boys and thereby influence their future learning success.

### **Purpose Statement**

The purpose of this study was to analyze the effect of single-gender education on the reading achievement of third through fifth grade boys. This was determined by analyzing their performance on a state reading assessment. Boys are underperforming girls in reading worldwide and educators are slowly realizing something must be done to remedy the situation (McKechnie, 2006). Lack of male role models and the absence of freedom of choice could be some of the contributing factors to boys' underachievement (Sokal, et al., 2005). Creating single-gender classrooms where boys are free from the typical gender stereotyped pressures can be an effective strategy in bridging the existing gap (Bonomo, 2010; Gross, 2009). According to Hill (2011), understanding there is a need for action is the first step educators must take in helping boys emerge as confident and successful readers.

Gender differences are also factors if we are to understand that boys and girls learn differently. Reading preferences differ among genders therefore affecting reading performance. Girls are typically better at reading while boys are typically better at math and science. It is common knowledge that men and women are very different with differing abilities when it comes to learning. Men tend to be more spatial and women tend to be more verbal (Oakhill, & Petrides, 2007; Lynn, & Mikk, 2009). Although this information has not been widely accepted it does play an important role in understanding more about the gender differences in reading achievement. National Assessment of Educational Progress (NAEP) dataset for the fourth, eighth, and twelfth grade reading scores by students' gender across the years 1992, 1994, 1998, 2000, 2002, and 2003 showed significant differences in reading scores by gender that were consistent across grade level and years with females scoring significantly higher than males (Lynn & Mikk, 2009, p.4).

Daniels et al. (2001) argued:

Males are often told that they should learn alone under the guidance of the teacher. This aspect of emergent masculinity in schools gives rise to higher levels of bidding for teacher attention. Given the limited time for teachers, males must find alternate ways of bidding for the teacher's attention. These ways may often be disruptive (p.113).

These boys have been persuaded by popular culture that girls and boys are discouraged from certain learning opportunities based solely on the fact that they are biologically different.

Research over the last two decades, in particular, has shown that interest has a powerful influence on adults and children's learning across a range of knowledge

domains, individuals and subject areas (Oakhill & Petrides, 2007, p.223). It is likely that the effects of interest on learning are mediated by increases in focused attention and persistence: students who rate a topic as interesting are more likely to report feeling interested, and to persist with reading and ultimately, to understand more. A high level of interest may trigger motivation to understand, which will increase persistence and eventually learning (Oakhill & Petrides, 2007, p. 232).

### **Research Questions**

The research questions posed for this project include the following:

**RQ1:** What is the effect on the Measures of Academic Progress (MAP) reading achievement scores of third through fifth grade male students when taught in a single-gender classroom versus a coeducational classroom?

**RQ2:** What is the effect on the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the Measures of Academic Progress (MAP) reading when taught in a single-gender classroom versus a coeducational classroom?

### **Hypotheses**

In order to evaluate the effects on students, a causal-comparative design has been selected. The researcher hypothesized that there will be a statistically significant difference on the MAP reading achievement scores of third through fifth grade male students taught in single-gender classrooms versus those taught in coeducational classrooms. Conversely, the null hypotheses stated that there will be no statistically significant difference in reading achievement scores.

**H<sub>01</sub>:** There will be no statistically significant difference in the reading achievement pre and post-test scores of third through fifth grade male students taught in

single-gender classrooms versus those taught in co-educational classrooms as shown by the MAP.

**H<sub>02</sub>:** There will be no statistically significant difference in the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the MAP reading when taught in a single-gender classroom versus a coeducational classroom.

### **Identification of Variables**

The key independent variable for this experiment was the single-gender and co-educational classrooms. The researcher sought to better understand whether or not this variable could be a possible cause for the dependent variable being measured which happens to be class placement and its relationship to academic achievement in reading.

The MAP test used to document the students' achievement in reading scores provided the researcher with the appropriate amount of validity and reliability based on its implementation throughout the state that is being used in the research study. This test has been utilized for a number of years in this state due to the consistently reliable and valid results it provides teachers and school systems. This specific instrument offered the type of reliability structure in which most of the coefficients are between .80 and .90. Northwest Evaluation Association (NWEA, 2004) also accounts for internal consistency by looking at the marginal reliability coefficient and determining the reliability between each question. This information afforded the researcher the needed establishment of validity and reliability respective to this measurement of the dependent variable.

## **Definitions of Core Terms**

The following core terms were defined as they will increase the reader's awareness and understanding of this educational topic. These definitions are not all inclusive but rather present the basic terms needed to better grasp the proposed study.

*Single-gender education:* education in which members of identical genders are placed in the same classroom for educational purposes (Gibb, Fergusson & Horwood, 2008).

*Co-educational classroom:* the integrated education of both males and females in the same institution (Gibb et al., 2008).

*Measures of Academic Progress (MAP):* an assessment instrument that provides teachers with detailed information regarding student progress and achievement in several areas of learning (Northwest Evaluation Association, 2004).

*Transformational learning:* a term used in educational theory to describe a process which leads the learner to re-evaluate past beliefs and experience which had previously been understood within assumptions derived from others (Mezirow, 2000).

*Brain Theory:* an idea presented by neural psychologists that suggests boys' and girls' brains are dramatically different, therefore resulting in the need for vastly different approaches to learning (Gurian, 2006).

## **Research Plan**

The research design that was chosen for this study was Causal-Comparative Research (Ex Post Facto). According to Gall, Gall, and Borg (2007), causal-comparative research is a type of non-experimental investigation in which researchers seek to identify cause and effect relationships by forming groups of individuals in whom the independent variable is present or absent and then determine whether the groups differ on the

dependent variable. The casual-comparative method is designed to explore the differences among two groups and no causality is inferred among the groups (Schenker & Rumrill, 2004). This design was best suited for the proposed study based on its use of a cause and effect relationship. The researcher proposed that single-gender classrooms will have an effect on male's level of interest in reading as shown by their academic achievement in reading. The most logical way to design a study would be determining if single-gender classrooms have a greater effect on reading achievement than do co-educational classrooms.

The data were assigned specific dichotomous numbers in order for the proper analysis to take place. In the gathering of scores for the purposes of analysis the chosen population sample was both the single-gendered and co-educational classroom males. The researcher was only concerned with the MAP, reading achievement scores of third, fourth, and fifth grade males in both single-gendered and co-educational classrooms from the 2011-2012 school year.

The same procedures detailed above occurred for students who had been given the fall 2011 and spring 2012 MAP reading tests. The data were coded in the predetermined manner and handled accordingly.

The results were analyzed and the findings were reported in Chapters Four and Five.

## **CHAPTER TWO: LITERATURE REVIEW**

### **Introduction**

This study examined the effects of single-gender education on the reading achievement of third through fifth grade boys, and sought to build upon the existing, yet limited, body of research concerning single-gender education. There arose topics such as the impact of reading achievement, single-gender education, and the need for classrooms that support the reading achievement of boys. This chapter begins with a theoretical framework for the study. The rationale for the use of this theoretical framework is discussed. The chapter continues with discussions about ideas directly related to gender differences in learning; academic achievement of boys; different theories relating to boys; lower reading achievement; the reading interest of boys; brain-based learning; single-gender classes in the 21<sup>st</sup> century; single-gendered versus coeducational learning, as well as the effects of single-gendered instruction for boys. The chapter then concludes with a concise summary of the key points taken from the literature as well as the evident gap that exists within the literature that this study will seek to address.

### **Theoretical Framework**

Transformative Learning is a term used in educational theory to describe a process which leads the learner to re-evaluate past beliefs and experience which had previously been understood within assumptions derived from others. It is central to Mezirow's Transformative Learning Theory (Mezirow, 2000), which describes a learning process of "becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation" (Mezirow,

2000, p. 4). Researchers divide Transformative Learning into three phases: critical reflection, reflective discourse, and action. Transformative Learning often involves deep, powerful emotions or beliefs, and is evidenced in action (Mezirow, 2000, p. 8).

Transformative learning is the expansion of consciousness through the transformation of basic worldview and specific capacities of the self; transformative learning is facilitated through consciously directed processes such as appreciatively accessing and receiving the symbolic contents of the unconscious and critically analyzing underlying premises (Mezirow, 2000, p. 9).

Mezirow (2000) suggests that all learning is change but not all change is transformation. There is a difference between transmissional, transactional, and transformational education. In the first, knowledge is transmitted from teacher to student. In transactional education, it is recognized that the student has valuable experiences, and learns best through experience, inquiry, critical thinking and interaction with other learners. It could be argued that some of the research regarding transformative learning has been in the realm of transactional education, and that what is seen as transformative by some authors is in fact still within the realm of transactional learning.

Transformative learning is the process in which the students involved in this projected study will undergo. The basis of this theory concerns one with the expectations behind this specified research study. Reading is often a difficult and abandoned pastime of many male students. With so many other items vying for their attention, reading is not assigned top priority. Whatever the reasons behind this lack of interest, transformation must occur in order for male students to realize the benefits of reading and the possibilities that lie within by taking a valid interest in this timeless pastime.

Vygotsky's theory of social constructivism was a second theory that guided this research study. Social constructivism was foundational to this study because it shaped by the importance of the social environment in the construction of meaning for students (Vygotsky, 1978). Interaction among the teacher and the student, as well as among the other students, helps each student to construct meaning out of ideas in the single-gendered classroom. Vygotsky (1978) defined a learner's zone of proximal development as the difference between what a learner can learn independently compared to what a learner can learn with a more capable peer or adult. In providing male students with an environment that is free from peer pressure or performance pressure, the desire is for their core beliefs about reading to undergo a transformative change. The hope rests in that boys who are instructed in all single-gendered classrooms will feel uninhibited by gender stereotypes and become more actively engaged in reading therefore affecting their level of interest as shown by their increased academic achievement in the subject area.

Moss (2000) noted that boys score lower than girls in reading, regardless of the criteria used to assess competence. Not only is their performance weaker, they read fewer books than girls, especially fiction (Moss, 2000). With an increased number of boys with reading achievement below the desired level of performance, one must question what the reason might be and what is being done to combat the issue.

Boys' reading habits are of concern when educators look at their underachievement in school. When compared to girls' achievement and how they develop in literacy over time, educators must engage in conversation about what can be done to address this gap (Daniels et al., 2001; Friend, 2006; McKechnie, 2006). There are alternatives to making sure that boys are educated in ways that address specific needs in regards to learning. Educators must consider current research. Single-gender

education can offer possible positive results for increasing boys' interest and academic achievement in reading.

## **Review of the Literature**

### **Learning Differences Among Boys and Girls**

It is no secret that men and women differ on many levels but when it comes to learning their difference become more noticeable. Men tend to be more spatial and women tend to be more verbal (Oakhill, & Petrides, 2007; Lynn, & Mikk, 2009). Although this information has not been widely accepted among the members of society, educators realize that it does play an important role in understanding more about the gender differences in reading achievement. National Assessment of Educational Progress (NAEP) dataset for the fourth, eighth, and twelfth grade reading scores by students' gender across the years 1992, 1994, 1998, 2000, 2002, and 2003 showed significant differences in reading scores by gender that were consistent across grade level and years with females scoring higher than males (Lynn & Mikk, 2009). In 2000 a Programme for International Student Assessment (PISA) test given to fifteen-year olds in twenty-seven countries showed that girls scored higher than boys in all countries (Lynn & Mikk, 2009). The PISA tests given in 2003 and 2006 to forty and fifty-six countries respectively showed that girls scored higher than boys in all countries again. The Progress in International Reading Literacy Study (PIRLS) tests given in 2001 to thirty-five countries and 2006 to forty countries showed that fourth grade girls out performed boys in reading in all countries.

Boys often have more TVs and DVD players than girls, taking time from being able to read. Boys seemed to have more books at home even though they were not good in reading. Girls usually have their own study desk, making this a possible factor. There

was more classic literature and poetry in girls' homes. Girls were generally from homes without computers (Hall & Coles, 1997; Bonomo, 2010; Costello, 2008). This may again reduce boys' time for reading books or magazines. These results suggest that girls' achievement is growing with age and more language practice. This superiority is leading to better jobs in professions that require more reading and language, one possible reason for so many female teachers.

Daniels et al. (2001) found that often males are instructed that their learning should occur with a teacher's guidance. This has however increased the demands for needing a teacher's attention. Due to time constraints on teachers, males must find alternate ways to gain this attention, even if it means becoming disruptive (p.113).

Hall and Coles (1997) argued that:

Boys need to be encouraged to understand how they have been socially constructed as readers; they need to be engaged in discussion about their reading and the implications of the choices they make. It is only by taking the differences seriously that critical and discerning readers will be developed, and critical readers are necessary to undermine current highly gendered reading practices which potentially disadvantage both genders (p.61).

Table 1

*Learning Characteristics*

Females	Males
Comfortable with cooperative learning activities.	Enjoys competition and challenges. Likes “Loud and Moving.”
Enjoy open ended assignments.	Enjoy quick pace assignments.
Tend to report more verbally and participate in class discussions.	Enjoy quick paced assignments that can be completed quickly.
Use the arts to express feelings and concepts.	Use analogies based on sports or action figures when expressing concepts.
Prefer reading assignments.	Prefer math or science assignments.
Express self more through poetry and fiction.	Express self more through non-fiction.
Enjoy informal learning arrangements.	Works more effectively in formal setting.
Enjoy role playing or skits to summarize key concepts or previous learning.	Enjoy activities that are fact-oriented and objective when summarizing a concept.

*Note.* Adapted from “Comparison of PASS assessment scores in single-gender and heterogeneous middle schools in South Carolina,” by Patricia Canada, July 2012. Adapted with permission (see Appendix A).

**Gender and Its Relationship to Learning Styles**

Learning styles of boys and girls have long been part of an ongoing debate about the best ways in which to develop educational programs that fit these differing needs.

The immediate and long-term effects of learning styles should have tremendous influence on how programs are designed in their quest to educate these differing genders (Bonomo, 2010; Costello, 2008). One of the most important differences, and a major factor in appropriate reading achievement, is the genders’ motivation and attitude towards specific

learning activities. Geist and King (2008) proposed that boys are slower than girls in their development when attending to certain tasks and activities. Girls have an ability to “self-manage” in cases of boredom whereas boys are more prone to becoming behavior concerns (p. 46).

Logan and Johnston (2010) found that “differences in attention, interest and preference for different types of classroom activities may mean that boys and girls spend different amounts of time engaged in activities” (p.177). This information is imperative as educators seek to better understand the learning needs of students. An increased awareness should have a positive effect on the learning outcomes of both genders. It is noted however that, “It could be the case therefore that boys’ attitudes or motivation plays a more significant role in their performance in assessments, although further research is necessary in order to determine this” (Logan & Johnston, 2010, p.178).

Not only do these learning styles affect students in the early grades, their effect extends beyond these years and into the secondary schools (Akhtar, 2011; Ogundokun, 2011). Educators hold the key to better understanding these learning styles by working to increase successful learning activities before the students carry these deficiencies into their college careers and adult lives. Learning styles can and will determine successful learning experiences and work to influence future learning opportunities (Ogundokun, 2011). Gaining such an understanding of the relationship between gender and learning styles can be the foundation for creating learning environments that promote success across both genders (Carrier, 2009; Prado & Plourde, 2011).

### **Academic Achievement of Boys**

“Boys can’t read.” This has been stated repeatedly. One should note that maybe the possibility exists that “Boys *can* read they just don’t?” McKechnie (2006) argued,

“That until recently, both research and practice were more interested in uncovering and addressing the unfair, unequal treatment of girls. But times have changed. Everyone agrees that girls have improved in almost all performance indicators, while boys have not” (p.57). School age boys tend to read a grade and a half lower than girls according to the US Department of Education (2009). While educators and researchers have focused on raising the achievement level of girls boys’ reading achievement has shown a steady decline (McKechnie, 2006). This steady decline has resulted in the loss of desire, among boys, to succeed in learning opportunities. Their issues with self-efficacy as it relates to learning have been a contributing factor as well. Educators must work at becoming proactive in an effort to meet the needs of boys in the area of literacy. Working to change their attitudes about reading is imperative if we are to develop lifelong learners.

Boys’ reading achievement should become the central focus of schools in an effort to improve student achievement in all subject areas regardless of gender. An understanding of the specific issues is a positive step towards reversing this decline. This understanding will also lead to better training and preparation for educators in strategies that can be implemented for gender success across all subjects.

Children’s literacy is of central concern to both educationalists and society at large, hence its importance in practice and research. Reading attainment has been shown to be affected by such factors as age, family background, teaching methods and materials, gender, attitudes to reading and reading habits (Davies & Brember, 1993, p. 1).

### **Theories Surrounding Boys’ Lower Reading Achievement**

With numerous amounts of research being conducted on the reasons behind lower reading achievement among boys, several reoccurring theories have been presented.

Male role models who read play a vital role in motivating boys to read (O'Reilly & Alexander, 1998; Sokal, Katz, Chaszewski, & Wojcik, 2007; Giles, 2008; Sokal, & Katz, 2008). Some studies contradicted this (Hall & Coles, 1997; Giles, 2008) but it has proven to be significant even in making small gains in reading achievement. A male role model is a species that to most boys at risk has become almost extinct. Sure they see police men, firemen, truck drivers and even a few male P.E. teachers but that does not fulfill the void of male role models who seem to be missing in the world of reading. Most boys associate reading with females. This is not surprising seeing as most of their entry level reading experience is either a mother or an elementary female teacher. Male role models serve a great purpose in hopefully developing a love of reading.

Gender theory has proposed some interesting findings for research. The theory posits that gender is a multi-dimensional construct that includes gender stereotype knowledge, gender attitudes, gender preferences, and gender schematicity. The two dimensions of interest in this study are gender stereotype knowledge and gender schematicity (Sokal et al., 2005). Often the exposure to male reading teachers may encourage some boys to re-reclassify reading as a masculine or gender-neutral activity which could, in turn, lead to more positive attitudes toward reading and better reading for some boys (Sokal, et.al., 2005). However, this study found no positive relationship between male models and reading achievement. The same study was conducted again in 2007 except this time they added a technology component in which the students were given the option of reading the stories from the computer instead of from books. Sokal, et. al (2007) stated that the findings of the study did not support any differential effects on achievement when boys were taught by male or female tutors, although self-perception differences did emerge. Reading achievement did increase with each group

despite the male or female tutor. Males' self-perception developed more positively when they were taught by females. This could be because females are more nurturing in their approach. Reading became a less feminized activity after working with male tutors and after working with those who used a computer.

Between about the third or fifth grade, boys become disconnected with books. Gender issues begin to play a huge role in their attitudes about reading. Giles (2008) argued that if they do not see members of their own gender reading they won't deem it important. Children emulate what they see their elders doing. Boys want to be men and if they never see a man reading then educators can be sure they won't either. Educators can be hopeful that boys will have some type of adult male role model in their life that will take the time to share the love of reading with them.

Boys' attitudes about reading are often shaped by family and culture (Lynch, 2002; Love & Hamston, 2006; Smith, 2004). Researchers have found that students who are labeled reluctant readers at school will actually engage in many forms of reading at home. The ways in which parents position themselves to guide their sons into those forms of reading which are privileged academically and inter-generationally, and the ways in which boys and their parents negotiate conflicts arising from these different positions can be a predictor of success in a boys being interested in reading (Love & Hamston, 2006). Examining the role of parents in relation to children's perception of competence may reveal possible reasons for children's reading achievement (Lynch, 2002). It has been shown that parents who believed they could exercise some influence over their children's development were more proactive and successful in cultivating their children's competencies than parents who doubted that they could do much to affect their children's developmental course (p.55).

Children's views of themselves have often been great predictors for success in school. How they feel about themselves as readers will determine how much reading they will do and if comprehension is going to be a priority. Parents play significant roles in children's perceptions of their reading ability (O'Reilly & Alexander, 1998; Lynch, 2002). Girls and boys are affected in different ways when their mothers and fathers support them or offer them feedback in reading. In 2002, Lynch conducted a study consisting of sixty-six students ages eight and nine. Ninety-two parents also participated in the project study. Parents were measured on their self-efficacy beliefs for their children's reading achievement. The students were asked questions concerning self-efficacy as well as given an achievement test. The results were then compared for positive and negative correlations. A strong correlation was found between parents' attitudes about reading and their child's reading achievement; thus solidifying that parents are key in creating an environment where their child can become a successful reader (Lynch, 2002).

The power of choice is a remarkable concept. When given choices about their learning students often become engaged and motivated to work to their highest potential (Davies, & Brember, 1993; Sullivan, 2004; Stauffer, 2007). Schools often dismiss what boys like to read so they stop reading altogether. Davies & Brember (1993) argued that "the literacy practices that appeal to some boys are not always valued in the context of institutionalized school literacy and may be overlooked, to the frustration of both student and teacher" (p. 512). The reading that appeals to boys is directly linked to gender identity. Boys read typical science fiction and sports materials while girls chose more relationship and romance items. Their (boys) reading choices are often prohibited in the classroom in response to the emphasis on culture and character. These combined theories

offer us some basic insight into a few of the main arguments behind boys and their lower reading achievement.

### **Brain-Theory and Gender Specific Education**

Distinctive differences exist between boys' and girls' brains according to Gurian (2006) and Sax (2006). These differences include the structure of the retina, the cochlea, and the autonomic nervous system. With this gender specific information, brain theories have been the foundation upon which schools have built their justifications for single-gender education since the modification of Title IX.

In providing a look at the stark contrasts, boys' stress responses are controlled by the sympathetic section of the autonomic nervous system (Sax, 2006). Their reliance on M cells providing them quick accessibility in regards to spatial activities and graphic clues allow them another degree of difference from girls (Gurian, 2006). Kommer (2006) provided crucial information for educators everywhere in that boys' disengagement in learning is due to the fact that their brains shift into a rest state many times a day. Don't let this be confusing in that although their brains may rest, boys are more likely to appear restless and squirm. A smaller amount of serotonin making its way through the pre-frontal cortex is to blame. This is not the case for girls. Girls' brains never rest, as their cerebral cortex remains in a state of functionality (Gurian, 2006).

Neural scientists have observed and recorded the following observations concerning girls and their brains. A girl's brain has increased blood flow to the cerebral cortex containing the verbal and sensorial centers. This results in more connections between these specific functioning centers. Girls are also experiencing more neural connections between the verbal and emotive centers within the limbic system. The system of nerves that connect the right and left brain hemispheres, known as the corpus

callosum, is 20% larger on average according to Gurian, Sousa, and Walsh (as cited in Kommer, 2006). When discussing the use of hemispheres, it has been noted that girls do not typically have a dominant hemisphere while boys' right-hemispheres are primarily dominant. In regards to facial expressions, girls are more apt at discerning them due to different eye chemistry and brain receptors (Sax, 2005). Girls rely on P cells that are responsible for the connecting of color variety with the upper portion of the brain both optically and neurally within their vision center. Not only is this reflective of learning patterns but a girl's hearing is significantly more sensitive, especially at the higher frequencies, thus increasing their ability in speech discrimination. Sax (2006) reported that girls' stress responses are mostly impacted by the parasympathetic sector of the autonomic nervous system.

Visual-spatial processing and memory targeting are developed much earlier on in boys than girls (Sax, 2005). Neural scientists would argue that the ability to verbalize feelings is more problematic for boys due to the fact that the specific brain activity accountable for emotion remains in the amygdale area (which performs a primary role in the processing and memory of emotional reactions). Between the two genders it is apparent that the regions of the brain responsible for language, spatial memory, motor coordination, and relationship development grow at various rates, times, and sequences (Cahill, 2005; Sax, 2005).

### **Boys and Their Interest in Reading**

Research over the last two decades, in particular, has shown that interest has a powerful influence on adults and children's learning across a range of knowledge domains, individuals and subject areas (Oakhill & Petrides, 2007; Palmer, 2008). It is likely that the effects of interest on learning are mediated by increases in focused

attention and persistence: students who rate a topic as interesting are more likely to report feeling interested, and to persist with reading—and ultimately, to understand more. Literature has also indicated that high interest results in superior comprehension and greater reading speed. The effects of interest however have been more noticeable for boys than girls. If students thought that a text was going to be interesting, then that contributed to their scores on comprehension and their ability to stick with the test.

Many theories have tried to explain why some boys fail at certain comprehension assessments. It could be that the material is not appropriate or does not peak their interest. Boys have often shown a preference for more informational texts and girls for more fictional texts. This could be due to the notion that boys see reading as a feminine act and therefore need a more interesting text to keep them engaged (Sullivan, 2004; Cavazos-Kottke, 2005; Oakhill & Petrides, 2007). A high level of interest may trigger motivation to understand, which will increase persistence and, eventually, learning (Oakhill & Petrides, 2007; Lingo, 2007). Thus, although it might not always be feasible to utilize individual interests in education, the elicitation and maintenance of situational interest could make a significant contribution to students' motivation, and might improve learning in all content areas (Oakhill & Petrides, 2007). Educators should seek to encourage their interests as best they can. It is unfathomable to think educators can restructure the classroom to meet every boy's interest need. Thus, it is necessary to ensure that children are taught adequate strategies for reading comprehension that will enable them to extract the meaning of a text regardless of their personal level of interest in the content of that text (Oakhill & Petrides, 2007).

McKechnie (2006) conducted interviews with boys about their perceptions of reading. Most of the boys owned books of fiction but their main titles were non-fiction

materials. The author observed large amounts of science fiction, fantasy, sports, and comedy. One characteristic the boys had in common was owning series books such as *Captain Underpants*, *Redwall*, and *Animorphs*. When asked about their favorite books it was usually a non-fiction title. Most of the non-fiction favorites were somehow related to some activity in their life. Some had game manuals, dictionaries, or even almanacs that were their favorite. Books with illustrations were also very important to their collection of works. Most reading that was done was for pleasure and information gathering about certain activities. When the boys were asked about this type of reading, such as almanacs, dictionaries etc., they did not see it as real reading.

### **Motivation**

Reading can be an enjoyable activity for children no matter their age, but all this depends largely on their individual motivations to engage in reading (Marinak & Gambrell, 2010). “While phonemic awareness, phonics, vocabulary, fluency, and comprehension allow students to be skillful and strategic readers, without the intrinsic motivation to read, students may never reach their fullest potential as literacy learners” (Marinak & Gambrell, 2010, p. 129). Motivations among boys takes into account that a vested interest must first be established in order for boys to effectively engage in any reading activity. McGeown, Goodwin, Henderson, & Wright (2012), argued that reading is often viewed as a feminine activity and therefore boys tend to equate reading with characteristics of females which consequently decreases their motivation to read for fear of labels and stereotyping. Other factors such as early literacy problems and learning disabilities have often contributed to the decrease in motivation to read for males (Logan, Medford, & Hughes, February 2011; Melekoglu, 2011; Corcoran & Mamalakis, 2009; Morgan, Compton, Cordray, Fuchs, Sep/Oct, 2008).

There are significant differences among intrinsic and extrinsic factors as they relate to motivating one to read (McGeown, et al., 2012). Extrinsically motivated individuals are often motivated by external factors therefore; “They are engaging in the activity to achieve a separable outcome, rather than engaging in the activity purely for the enjoyment of it” (McGeown, et al., 2012, p. 329). On the other hand, intrinsically motivated individuals engage in activities such as reading because they are interested or curious and consequently tend to initiate and sustain such activities without external pressures (Corcoran & Mamalakis, 2009). Understandably, not all individuals are intrinsically motivated to engage in reading but boys are generally less intrinsically motivated than girls (Logan, et al., February 2011; Morgan, et al., Sep/Oct, 2008).

Motivation plays a key role in working to increase the reading achievement for both genders, but especially boys. Understanding the secrets to long-term motivation could be the catalyst needed to spur an increased interest in reading and thus produce literate individuals with a vested interest in life-long literacy (Melekoglu, 2011).

### **A Brief History of Single-Gendered Education**

The late 19th century began to see a rise in coeducational schooling (Anfara & Mertens, 2008). Before this time public education was primarily single-gendered although it was never labeled as such. Schooling for many years was for boys only. Eventually girls were allowed the same opportunities but in a school all their own (Dee, 2006). The rise of coeducational classrooms began due to an understanding of better fiscal management. According to Anfara and Mertens (2008), the United States saw that it was much more cost effective to educate students all together instead of operating separate facilities that essentially doubled their educational spending. This decision was also a step in the right direction for feminists who saw this as an influential part of the

women's rights movement. Coeducational schooling would allow a mix of the genders and hopefully promote equity among them. Their influence was also important for the passage of Title IX of the Education Amendments of 1972 which provided mandates for gender equity in all schools that were federally funded (Martino, Mills, & Lingard, 2005). This left single-gendered education solely for private and religiously affiliated schools (Hubbard & Datnow, 2005).

Starting in the 1990s single-gendered education saw a surge in interest as individuals and groups revisited this idea as a possible educational alternative (Anfara & Mertens, 2008). The authorization of No Child Left Behind (NCLB) brought the United States into a 21<sup>st</sup> century education. According to Lingard, Martino, & Mills (2010) and the U.S. Department of Education (2008) this led to further changes in Title IX regulations. These changes offered an expansion of opportunities for public schools in order to legally offer the option of single-gendered instruction. "Public schools are now allowed to include single-sex classes as a part of their educational program, within certain parameters, if they believe those classes will improve student learning and achievement" (Gurian, Stevens, & Daniels, 2009).

### **Single-Gendered Education in the 21st Century**

January 2002 brought about significant changes in education as President Bush signed into law "No Child Left Behind" (NCLB). This document increased funding for school districts across the nation and encouraged schools to begin operating single-gendered classrooms and even schools. As long as schools are able to provide both boys and girls with comparable classes and facilities, single-gender public education is not only an innovative way to educate students but it provides an incentive for programs to

compete for up to \$450 million each year in federal funding (Flannery, 2006; Logsdon, 2003).

In March 2002, when NASSPE (National Association for Single Sex Public Education) was founded, only about a dozen public schools offered single-gender classrooms. For the 2011-2012 school year, at least 506 public schools in the United States are offering single-sex educational opportunities. About 390 of those schools are COED schools which offer single-sex CLASSROOMS, but which retain at least some coed activities (National Association for Single Sex Public Education, 2011).

Even though these numbers are astounding as representative of a substantial increase in the number of single-gendered classrooms and schools, not everyone believes that these types of classrooms are beneficial to girls or boys (DeFao, 2007). Numerous opposing opinions have surfaced over the years including those of the American Civil Liberties Union as well as the National Organization of Women. The foundations of their arguments rest in that singling students out for instruction works to alienate the student socially. They are unable to develop the social skills necessary to interact with members of the opposite sex. Besides not understanding social cues and such for later years, these organizations argued that an increase in gender stereotyping was inevitable (Sharpe, 2000).

### **Recent Studies**

The United States Department of Education (2009) in the wake of increased numbers of single gendered classrooms due to funding from NCLB decided to develop a study involving existing schools and classrooms utilizing this form of instruction. Mael, Alonso, Gibson, Rogers, & Smith (2005) conducted the study using the 88 single-

gendered schools in the U.S. public school system. Their conclusions were insufficient. They provided no findings supportive of either opinions for single-gendered or against it.

In 2006 Smithers and Robinson conducted a review of studies which evaluated educational settings for girls and boys together and separately, either in different schools or classes. The studies took place in locations as far away as Australia, New Zealand, Ireland, and the United Kingdom, as well as including Canada and the United States. Their conclusions stated that findings were inconsistent therefore leading them to infer that single-gender education was neither beneficial nor disadvantageous. However, the researchers noted that despite ability, social background, or race, gender influences prevailed.

Over the last decade many opinions have surfaced related to single-gendered education. Some of these have been supported by research although not substantial. Misunderstandings and a lack of existing research provide evidence that an increase in research studies focused on single-gendered education must be conducted using a variety of study types. This will work to increase knowledge in the US of this type of educational setting and what it can or cannot provide in order to increase student success.

### **Single-Gendered Education's Effects on Boys**

Advocates for boys and their lack of interest and achievement in reading have proposed many ideas to springboard an interest in reading as well as an increase in academic achievement. Most recently, single-gender education has gained national attention as a possible solution to some of the academic issues facing boys and girls alike. For example, Sax (2005; 2007) argued that boys and girls have a number of 'hardwired' differences that are best accommodated by single-sex schooling. He claimed that 'in the coeducational classroom so many of the choices we make are to the advantage of girls,

but disadvantage boys' (Sax, 2008, p.10) and that schooling boys and girls separately is the best way to accommodate boys' needs without disadvantaging girls. A number of studies have examined the effects of single-sex schooling on educational achievement for males and females. In many cases, the results of these studies have suggested that the effects of single-sex schooling may vary with gender (Gibb et al., 2008).

Sadker and Sadker (1995) summarized research findings for males and females in coeducational school settings in U.S. society. According to Sadker and Sadker (1995), female students are disadvantaged in coeducational settings, including fewer opportunities to contribute vocally in classes, fewer leadership opportunities, and lower course enrollment and achievement in fields traditionally dominated by males. Male students have higher risk factors than females according to statistics related to accidents, suicides, and homicides. They are more likely to be labeled with learning or behavior problems in school, fail more classes, are retained at a higher rate, and are more likely to drop out of school. Sadker and Sadker (1995) also noted an achievement gap between white males and minority males, as well as lower levels of self-esteem for minority or low socio-economic students.

Other findings included that the single-gender classes eliminated certain classroom distractions from the opposite sex, particularly for the girls (Gurian et al., 2009; Protheroe, 2009; Anfara & Mertens, 2008; Meyer, 2008; Salomone, 2006). Teachers and students reported that the single-gender setting provided opportunities to dialogue openly about issues particular to adolescent boys or girls in each community. Fighting among girls did not necessarily improve in single-gender schools, as some students reported that instead of fighting over boys they fought over issues of friendship and gossiping about each other. Many boys noted an increase in teasing and disruptive

behavior, while finding the single-gender classroom to be a more productive work environment.

Piechura-Couture, Heins, & Tichenor, (2011) provided detailed information regarding the overrepresentation of boys in special education. Over the years it has become apparent that special education referrals have increased and with that the population of males in this category has increased as well. Studies showed that single-gendered education may be a positive alternative for male students for whom special education services may be warranted (Piechura-Couture et al., 2011; Mulholland, Hansen, & Kaminski, 2004). An increase in attention to the specific needs of boys combined with classroom activities tailored for physical movement and increased tolerance for noise levels, the success of male students with academic or behavioral concerns increased significantly compared to their placement in co-educational classrooms. This also resulted in fewer male special education referrals being made.

The literature related to same-gender schooling demonstrates the need for credible studies in U.S. public schools. Research in the field of single-sex education is timely due to NCLB encouraging this strategy as a means to improve student achievement. As public schools experiment with same-gender education, attention to research-supported theory and practice is of great importance to the creation of same-gender programs. Advocates for same-gender schooling state opinions that the setting enhances educational opportunity and frees students from gender stereotypes (Friend, 2006). This type of environment can lead to success for boys in reading as shown by a higher level of interest in reading as well as increased academic achievement.

## **Single-Gendered versus Co-Educational Learning**

In his letter to the U.S. Department of Education's Office of Civil Rights, Sax (2004), Executive Director of the National Association of Single Sex Public Education articulated his opinions regarding the importance and benefits of single-gendered education. He brought forth the compelling argument that grades and test scores increased for girls in seventh through twelfth grades as well as boys in kindergarten through fifth grades. The decrease of disciplinary problems as well as gender stereotypes were cited as vitally important factors. The genders were able to freely pursue interests in areas not normally pursued in coeducational settings.

Outside of these implications Sax (2004) also noted improvements not related to academics such as decreased teenage pregnancy and increased leadership potential for girls. Boys worked to decrease disciplinary issues and increase their self-esteem and self-efficacy.

The *American University Law Review* published an article by U.S. Senator Kay Hutchison in 2001. Hutchison (2001) offered support for the evidence showing that at certain ages, both boys and girls in single-gender programs could increase focus on their studies, build more confidence and ultimately be more successful in school as well as later in their careers. Senator Hutchison argued that study after study had proven the academic success and ambition exhibited by boys and girls in single-gendered schools over that of their co-educated peers. Hutchison noted, however, that much of the single-gender programs research was conducted in private and parochial schools and that the effects on boys in single-gendered classrooms had not been as thoroughly documented.

A significant number of advantages can be found for both co-educational and single-gender schools according to the U.S. Department of Education, Office of Planning,

Evaluation and Policy Development, Policy and Program Studies Service (2005). The U.S. Department of Education reported on the outcomes in favor of or against single-gendered education. This type of instruction was viewed as an alternative form of schooling. A systematic review of eighty-eight quantitative and four qualitative studies was included in the report. The study's results were in favor of single-gendered education due to the positive effect it can have on academic achievement. The findings indicated that, in general, "most studies reported positive effects for single-gender schools on all-subject achievement tests" (p. xv).

The U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service (2005) argued that, "The preponderance of studies in areas such as academic accomplishment and adaptation or socio-emotional development yielded results lending support to single-gender education" (p. xvii). Parents, students, and other key stakeholders would have been compelled to process the results based on the reported outcomes. Support could be found in the areas of academic achievement, long-term indicators of success, and self-concept. All these areas represent bi-products of involvement in single-gendered instruction. It was evident however the lack of quality studies that were used in the study. The need for more studies and especially ones involving elementary students became apparent. It was also noted that a majority of the studies tended to focus on girls therefore creating a need for more male focused studies.

### **Support for Single-Gender Education**

Supporters of single-gender education have long noted their reasons for the development of such programs. Citing issues such as the academic crisis boys may find themselves in, obvious biological differences, the widening achievement gap and the

notion that boys are easily distracted (Gurian et al., 2009; Protheroe, 2009; Anfara & Mertens, 2008; Meyer, 2008). All these concerns have raised the bar for educators in how they seek to meet the needs of boys while providing an appropriate and equal education for both genders (Protheroe, 2009; McNeil, 2008).

The term “boy crisis” referred to information that was released from the National Center for Educational Statistics in 2005. This information drew special attention to the large number of boys with lower scores on the National Assessment of Educational Progress, the high rate of dropouts and suspensions for boys, as well as an increase in the identification of learning disabilities related to boys (National Center for Educational Statistics, 2005). In regards to the obvious “wiring” differences among boys and girls, Salomone (2006) argued that

We know that girls as a group enter school with more advanced verbal and fine-motor skills, have longer attention spans, and greater impulse control. This typical although not universal occurrence puts many young boys at a disadvantage in the lower grades. At the same time, boys tend to have more advanced visual-spatial skills through much of schooling, which puts them at an advantage in math and science (p.787).

These differences can easily work to set boys up for failure in their academic pursuits early in their educational careers (Gurian et al., 2009).

The achievement gap among the genders is widening and the focus is usually on target groups such as African American or Hispanic males (Anfara & Mertens, 2008).

Study after study has demonstrated that girls and boys in single-sex schools are academically more successful and ambitious than their coeducational

counterparts. Minority students in single-sex schools often show dramatic improvements in attitudes toward school (Meyer, 2008, p.20).

Many educators are aware that boys can be easily distracted while learning. Research has argued that the single-gender classes eliminated certain classroom distractions from the opposite sex, particularly for the girls (Gurian et al., 2009; Protheroe, 2009; Anfara & Mertens, 2008; Meyer, 2008; Salomone, 2006). Teachers and students reported that the single-gender setting provided opportunities to dialogue openly about issues particular to adolescent boys or girls in each community.

The issues discussed such as the “boy crisis”, a widening achievement gap among the genders, “wiring” differences and the realization that boys are easily distracted all work towards building support for single-gender education. “Albert Einstein observed that it is insanity to believe that you can travel the same path and get a different result. The simple truth is that American public schools work less well for males in general” (Goff & Johnson, 2008, p. 1).

### **Opposition to Single-Gender Education**

As one looks into the reasons for supporting single-gendered education, it should be dually noted that there also exists research in opposition to this proposed educational alternative. The opposing views claim that single-gendered education discriminates against both genders, does not provide equal educational opportunities, is not supported by definitive research, and alienates each gender’s need to learn appropriate social interaction in order to develop healthy relationships (McCreary, 2011; Jackson, 2010; Anfara & Mertens, 2008; Bracey, 2007).

Numerous organizations have been developed for the purpose of promoting equal opportunities for women and have therefore raised concerns over the ideals behind

single-gendered education. The National Coalition for Women and Girls in Education, The National Women's Law Center, the American Association of University Women, and the National Organization for Women are just a small representation of the opinions being voiced concerning the discrimination against girls in reference to single-gendered education. Their position argued that boys are often given more attention due to their learning needs while girls are not given priorities in learning nor are they readily encouraged to excel in male dominated areas such as math or science (Bracey, 2007). This discrimination has become the foundation upon which these organizations propose major changes need to be made to the coeducational model instead of encouraging a separating of the genders.

Separate may not be equal in regards to schools that implement single-gendered education (Anfara & Mertens, 2008). The concerns for inequality arose when specific genders are not offered the same types of educational programs. This type of inequality can lead to a stereotypical attitude towards the opposite gender that may not be warranted (McCreary, 2011). If single-gendered education is going to be an alternative then the programs must be designed to ensure that each gender is receiving quality instruction that is specifically tailored to their learning needs and one that offers diverse opportunities for educational success (Bonomo, 2010).

An intriguing fact concerning this debate surrounding single-gender education is what both sides agree upon. They agree that single-gender education should be a "separate but equal" educational alternative (Patterson, 2012; Greene, 2010; Friend, 2007). Supporters as well as those opposed to single-gender education promote the same ideals in their concern that education for all students be as equal as possible regardless of gender. Those in opposition of single-gendered classrooms fear that students will not be

given the same educational opportunities as their co-educational peers. This opinion is both valid and understandable. Both sides however do agree on this one issue whether they realize it or not. Those in opposition fear that students will be at a disadvantage in terms of educational opportunities as stated above. However, supporters of this educational alternative understand the importance of equal learning opportunities for both genders (Friend, 2007). These supporters advocate for the equal educational treatment of all students. These individuals recognize the ramifications of students being placed in single-gender classrooms and then given unequal educational opportunities. Therefore the importance of equal opportunity is one ideal both sides can agree upon.

Bracey (2007) stated that research surrounding single-gendered education has been seen as inconclusive and lacking in breadth and depth. The studies relevant to this educational alternative have been lacking in quantity as well as quality. The most recent studies conducted in the United States have also been guilty of utilizing schools that are so distinctly different from the onset that the research bears no relevance when those factors have not been considered (Bonomo, 2010). It is apparent that in order for single-gendered education to be considered noteworthy and a viable educational alternative, then a significant number of quality research studies must be conducted and their results made public. These studies should work to build a reputable body of knowledge that schools systems can utilize when making informed educational decisions.

According to McCreary (2011) and Jackson (2010) single-gendered education could lead education towards the creation of social systems that are outdated and misinformed. The development of single-gendered education programs has the potential to break down the social structure society has worked hard at creating in regards to male and female interactions and relationships. Jackson (2010) argued that,

In a world of ever-increasing visibility of gender diversity and exploration of the complexity of human sex and sexuality, single-sex schooling is an anachronism – one that has the potential to take us back to a time when females and males who behaved outside gender norms were perceived as ‘problems’ instead of as people (p.237).

### **Single-Gender Implementation in South Carolina Public Schools**

Numerous laws being revamped for the purpose of closing the achievement gap as well as increasing accountability for education, has prompted a trend towards the implementation of single-gender education at all academic levels throughout the United States. This idea of single-gender education has however, had a long history and tradition within the international educational community (Gurian et al., 2009; Younger & Warrington, 2006).

Educational improvement has and will continue to be the driving force behind the decisions that are made in the best interest of students. This devout commitment to improvement, for example, led the State of South Carolina to take solidified actions towards the implementation of single-gender programs (Rex & Chadwell, 2009). The most important step towards this improvement was the creation of a state-level position responsible for the leading, facilitating, and provision of assistance in training individuals for the single-gender initiative (Gurian et al., 2009). Single-gender programs, although not the most innovative of ideas, have developed and changed over the years as emerging research and increased knowledge built a better foundation and understanding for this type of educational program. For this reason single-gender education has resurfaced as an alternative for traditional educational settings in South Carolina (Rex & Chadwell, 2009).

With such a vast array of students' needs, Hubbard & Datnow (2005) reported that single-gender education enhances the teachers' abilities to accommodate those needs. Sadker (1999) found that often teachers unknowingly battle the inclination to focus a majority of instruction on males and provide them frequent, direct attention. Single-gender education, by removing students of the opposite sex, provides an opportunity for increased teacher attention resulting in enhanced student performance for both boys and girls. South Carolina decided to implement single-gender education in many schools across the state due to its encouraging results namely, higher levels of learning and achievement, accompanied by an increased state of well-being (South Carolina Department of Education, 2008b). The schools have however, taken into consideration that idea that single-gender education may not be the best alternative form of instruction for every student. With this in mind each school that offers single-gendered classrooms, must also offer the same number of co-educational classrooms for students whose parents choose for them to enroll in these classes. The classrooms are designed so that students can be successful no matter what form of instruction they choose. The classrooms have been set up in such a manner that the students have similar experiences throughout the school year they just happen to be tailored to meet individual needs of students. These single-gender classrooms have provided students with a different instructional setting and have therefore spawned positive impacts for elementary, middle, and high school students.

### **South Carolina Department of Education Survey on Single-Gender Education**

Throughout the months of April and May 2008, the South Carolina Department of Education posted via their website, three surveys regarding Single-Gender Education. Schools that were implementing single-gendered classes were all sent links for the

survey. Teacher, parents, and students were all encouraged to participate in the survey and provide honest responses to each of the questions. Through the use of a Likert scale ranging from strongly agree to strongly disagree, all participants indicated their level of agreement as it related to different categorical statements. Although statewide participation was voluntary and anonymous, approximately 2200 students, 178 parents, and 181 teachers responded to the survey.

The department of education developed and administered the survey with the aim to understand perceptions of the single-gender program in individual schools as well as across the state. The survey also lent itself to providing insight on pieces that were effective and those possibly needing more refining. The Department of Education understood the critical need to evaluate the impact that single-gender education was having on students, teachers, and parents. All involved parties were in agreement that single-gender classes improved student confidence, participation, as well as desire coupled with the ability to succeed in school. The results showed that 67% of students, 75% of parents, and 80% of teachers readily agreed that single-gender classes help students in school performance (South Carolina Department of Education, 2008a).

### **Summary**

Research has shown that there exists numerous differences between boys and girls when it comes to learning. These differences contribute to many significant issues that cannot be addressed through coeducational classrooms. The need to understand boys' lower academic achievement in reading is vital for solutions to be sought in order to address the inconsistencies.

The numerous theories surrounding boys and their lower reading achievement have led researchers to formulate questions regarding the importance their level of

interest plays in working to increase achievement. Interest has been studied as a powerful motivator for boys increasing their reading achievement. Being able to tailor reading to meet the needs of boys has proven successful in their engaging more in the process while simultaneously building skills needed for critical comprehension.

In response to how best to meet the needs of boys in regards to reading achievement, single-gendered education has over the last twenty years, risen to become a viable alternative to coeducational learning. The positive effects of single-gendered education are numerous and studies have shown that this type of instruction can be more beneficial for students than coeducational instruction.

Taylor (2004) told us that professional literature indicates the majority of boys in the world are struggling with literacy. This review of literature showed that the impact of learning differences among boys and girls therefore affects the reading interest of boys. The positive effects of single-gendered classrooms on boys reading achievement were also revealed. The research articles however showed a lack in the number of studies completed concerning single-gendered education. The Chapter Three describes the methodology for determining the effects of single-gendered education on boys' interest in reading as seen by academic achievement in reading. The chapter also details the process used in the study to determine interest levels pre-and post-class as well as changes in state test scores as a result of single-gendered instruction.

## **CHAPER THREE: METHODOLOGY**

### **Introduction**

Boys' reading habits are an issue of concern when educators also look at the underachievement of boys in school. When compared to girls' achievement and how they develop in literacy over time, educators must engage in conversation about what can be done to address this significant gap (Cavazos-Kottke, 2005). Single-gender education can offer possible positive results for increasing boys' academic achievement in reading (Sax, 2007). The purpose of this study was to investigate the effects of single-gender education on the reading achievement of third through fifth grade boys.

The literature has shown that studies conducted in the area of single-gender education are limited and should be increased. It was also observed that the quality of the single-gendered studies should be improved upon by looking at larger numbers of control and experimental groups. The researcher therefore chose to use a Non- Experimental Causal-Comparative Research (Ex Post Facto) design due to the nature of the study. It sought to explain a cause and effect relationship among groups who possess a dependent variable (being males) but possibly differ on an independent variable (placement in single-gender classrooms). Comparisons were made using third through fifth grade fall and spring Measures of Academic Progress (MAP), reading achievement scores and percentages for all single-gendered as well as co-educational student participants. The MAP reading test was the same test for both the fall and spring semesters as to increase the reliability and validity of the comparison scores. Scores were gathered using archival data from the 2011-2012 school year.

The following research questions were also constructed specific to this study and were answered through data collection and analysis: (a) What is the effect on the MAP reading achievement scores of third through fifth grade male students when taught in a single-gender classroom versus a coeducational classroom? and (b) What is the effect on the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the Measures of Academic Progress (MAP) reading when taught in a single-gender classroom versus a coeducational classroom?

The purpose of this chapter was to describe the methodology for the study and is divided into the following key sections: introduction research design, questions and hypotheses, participants, setting, instrumentation, procedures, and analysis.

### **Research Design**

The research design that was chosen for this study was the Causal-Comparative Research (Ex Post Facto). According to Gall et al. (2007), causal-comparative research is a type of non-experimental investigation in which researchers seek to identify cause and effect relationships by forming groups of individuals in whom the independent variable is present or absent and then determine whether the groups differ on the dependent variable. The casual-comparative method is designed to explore the differences among two groups and no causality is inferred among the groups (Schenker & Rumrill, 2004). This design was best suited for the proposed study based on its use of a cause and effect relationship. The researcher proposed that single-gender classrooms will have an effect on males' level of interest in reading as shown by their academic achievement in reading. The most logical way to design a study would have been to determine if single-gender classrooms have a greater effect on reading achievement than do co-educational classrooms.

In the casual-comparative research method, the dependent variable is not manipulated but will have already occurred when looking at the effect of the independent variable. The casual-comparative method allows for no randomization among participants, no intervention for participants, and the groups formed are based upon their gender and not the fact that the reading interest of the students was manipulated (Casual-Comparative, 2006).

Causal-comparative research offers the elements of an experimental design without the randomization of students into control and experimental groups. The researcher provided evidence that controls are being offered in order to ameliorate the control of any external variables that could possibly affect the dependent variables. In this study the independent variable of single-gendered and co-educational classrooms can be controlled but the dependent variable of reading achievement cannot be controlled by manipulation of the proposed causes of this increase in reading achievement due to placement in single-gendered or co-educational classrooms.

One limitation of this causal-comparative design was that the researcher could only infer causality. There are no grounds for a concrete conclusion with causal-comparative research. For example, interpretation of the findings may vary. If it was found that single gender students achieve higher than co-educational students, higher achievement could be attributed to the possibility that single-gender students are more motivated and effective students in the first place. If this interpretation was correct, it could be inferred that other variables, being students' motivation and effectiveness are the cause of an increase in reading achievement (Gall et al., 2007).

The study was comprised of several sets of male single-gender classrooms serving as the experimental group as well as several sets of co-educational classrooms serving as

the control group. All students were in the third, fourth, or fifth grades and represent two elementary charter schools in a southeastern state.

The researcher proposed to look at students' academic achievement in reading as it is affected by single-gender and co-educational classrooms. The desired results were an increase in males' academic achievement in reading within the single-gendered classrooms. The stereotypical male's academic achievement in reading is usually low when compared to females. The researcher hoped to determine a direct link to a change in reading achievement based on the make-up of the classroom in which the students are placed.

### **Questions and Hypotheses**

The research questions posed for this project include the following:

**RQ1:** What is the effect on the Measures of Academic Progress (MAP) reading achievement scores of third through fifth grade male students when taught in a single-gender classroom versus a coeducational classroom?

**RQ2:** What is the effect on the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the Measures of Academic Progress (MAP) reading when taught in a single-gender classroom versus a coeducational classroom?

In order to evaluate the effects on students, a causal-comparative design has been selected. The researcher hypothesized that there will be a statistically significant difference on the MAP reading achievement scores of third through fifth grade male students taught in single-gender classrooms versus those taught in coeducational classrooms. Conversely, the null hypotheses stated that there will be no statistically significant difference in reading achievement scores.

**H<sub>01</sub>:** There will be no statistically significant difference in the reading achievement pre and post-test scores of third through fifth grade male students taught in single-gender classrooms versus those taught in co-educational classrooms as shown by the MAP.

**H<sub>02</sub>:** There will be no statistically significant difference in the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the MAP reading when taught in a single-gender classroom versus a coeducational classroom.

### **Participants**

The number of single-gender classrooms has increased and grown to include large numbers of males and females. Due to these large numbers the researcher chose to focus the study on third through fifth grade boys in single-gender and co-educational classrooms. The students were chosen from two elementary charter schools located in two school districts specific to one southeastern state known for its single-gender initiative. School A offered only single-gendered classrooms K-8 and school B offered only co-educational classrooms K-6. The students were representative of typical third, fourth, and fifth grade students in terms of age and years of schooling. The classrooms chosen were similar in grade level, subjects taught, student/teacher ratio, and teaching methods. The specific school districts were chosen due to the fact that they represent a large number of districts in the state that incorporate single-gender schools and classrooms for third through fifth grade boys.

There were over 10,000 third through fifth grade males in the chosen southeastern state. Participants were chosen through a convenience sample determined by contacting several elementary charter schools located in the state's numerous southeastern school

districts. All of the contacted elementary charter schools provided third through fifth grade male single-gendered and co-educational classrooms. A statistical power of analysis was completed to determine the appropriate sample size for increased validity.

Table 2

*Sample Population*

Grade	School A Single-gendered	School B Co-educational	Totals
3	20	40	60
4	23	42	65
5	14	40	54
Totals	57	122	$n = 179$

As noted in Table 2, the researcher secured a sample population where  $n = 179$  males who participated in the study. Of the sample population, 57 were placed in single-gendered classrooms (*experimental group*) and 122 were placed in co-educational classrooms (*control group*).

The researcher understood the importance of following all the appropriate steps that must be taken in order to provide the ethical protection needed for the students, teachers, and school systems involved in the study. All data received was coded for single-gender and co-educational classrooms only. No other specific identifiers were needed to effectively analyze the data.

### **Setting**

Schools all over the U.S. have chosen to begin implementing single-gender classrooms; even schools since the implementation of No Child Left Behind. NCLB offered schools an opportunity to provide students with a choice in regards to the best instructional setting for learning to occur. While conducting an in-depth review of literature it became apparent that a specific southeastern state had recorded some of the largest numbers of single-gender classrooms and promoted great success while doing so.

In 2007 this southeastern state department of education hired the nation's first single-gender initiative coordinator. This single-gender initiative coordinator's responsibility was to train teachers across the state while working to increase the number of schools offering single-gender classrooms. It was imperative that elementary schools utilizing both single-gender and co-educational classrooms for third through fifth grade males be chosen for this study.

For the school years 2009-2013 there were 30 elementary schools, including charters, that offered single-gender and co-educational classrooms. These elementary schools were spread out all across parts of this southeastern state. These elementary schools housed mostly K-5 with a few K-8, and ranged in size from 200-600 students. The first elementary charter school (School A) that was chosen had single-gender classrooms for all grade levels K-8. The second elementary charter school (School B) had all co-educational classrooms for each grade level K-6. When single-gender education became a priority for this state so did choice for parents. Even though several schools offered single-gender classrooms, they have offered the same number of co-educational classrooms.

This specific state was chosen due to the researcher's proximity as well as their endeavor to be a front runner in the implementation of single-gender classrooms. Over the last several years this state's school systems in particular have worked to make their name synonymous with single-gender education. Much research has been conducted within the system and they have noted much success from their endeavors.

### **Instrumentation**

The chosen state for gathering the specific research used the MAP test, or Measures of Academic Progress created by the Northwest Evaluation Association or

NWEA. The MAP tests are computerized, nationally aligned tests given in reading, math, language arts, and science (Northwest Evaluation Association, 2004; see Appendix B). The tests were given to all students in first through eighth grades and are administered three times each year in order to assess developmental readiness in specific subject areas. The test is administered at the beginning, the middle and again at the end of the school year. During the testing, MAP modifies the level of questioning based upon student responses to determine a Rausch Unit (RIT) and in the end provide a score based on the RIT scale (Northwest Evaluation Association, 2012). Each time the test was given, reports allowed teachers to address the specific learning needs of each student according to their individual scores. This southeastern state has utilized the MAP tests for over five years now and strongly advocated the importance of the data teachers are able to analyze in providing further individualized student instruction. The researcher planned to use third through fifth grade RIT scores from the MAP reading tests. This particular reading achievement test is composed of subcategories which include word recognition and vocabulary, reading comprehension – literal, reading comprehension – inferential/interpretive, reading comprehension – evaluation, and literary response and analysis. These subcategory scores are calculated to receive an average RIT score. The archival data gathered used tests that were given at the beginning of the school year (August 2011) with comparisons being made using the same students' spring scores (May 2012) based on the updated research timeline.

The researcher had chosen to use the scores from this specific test due to the reliability and validity it provides.

What NWEA referred to as test-retest reliability is more accurately a mix between test-retest reliability and a type of parallel forms reliability, both of which are

spread across 7 to 12 months – a much longer time frame than the typical two or three weeks (Northwest Evaluation Association, 2004, p.2).

With this type of reliability structure most of the coefficients were at their lowest .86 and their highest .95. NWEA also accounts for internal consistency by looking at the marginal reliability coefficient and determining the reliability between each question (Northwest Evaluation Association, 2004).

In looking at the validity of a specific research instrument, a researcher must ensure that the results given are going to be sufficient in working to prove or nullify any hypothesis (Hauser & Kingsbury, 2009). The researcher must guarantee that communication of these results will be well received due to the unquestionable nature of the instrument's validity. NWEA worked to safeguard content validity by making appropriate comparisons with national standards and providing for differing levels of difficulty among the tested items (Hauser & Kingsbury, 2009; Northwest Evaluation Association, 2004). NWEA preferred to maintain concurrent validity by determining the Pearson correlation coefficients for test/re-test reliability when given within close time frames (Northwest Evaluation Association, 2004). For these individual procedures, coefficients were never below .80 which signifies a strong internal validity.

### **Procedures**

After the research proposal was approved by the appropriate dissertation committee individuals, the researcher's application for the proposed study was submitted about a month prior to the designated IRB meeting. The researcher received ample feedback within two weeks and the necessary revisions were made as quickly as possible. During this time, the Director of Data Management and Analysis in the chosen state was contacted. The study was described as well as the needs for the specific data to be

gathered. Support from this individual was vital for the study to continue. The director was instructed that once IRB approval was granted, contact would then be made once again to follow through on the data retrieval.

Once approval from Liberty University and the Institutional Review Board was received in February of 2013 the director was again contacted in order to update him on the researcher's progress. The Director of Data Analysis gave his verbal approval for data collection to begin at the discretion of individual school principals. Both of the assessments had already been administered prior to data collection. It served as an excellent reference point for assessing the mean scores in the groups of students being sampled. The researcher, with the support of Director of Data Analysis, contacted two elementary charter schools. Approval was granted from both schools' designated administrator in charge of data management. One school offered single-gender classrooms for all students K-8 and housed about 700 students. The second charter school offered only co-educational classrooms for students K-6 and housed 600 students. The charter schools were chosen because of their identifiable similarities in programming and educational philosophies. The designated school leaders helped the researcher gather the specific archival data needed from the 2011-2012 school year and were able to provide the researcher with the necessary confidential and non-publicly accessible data. All information that was transferred was kept strictly confidential according to IRB protocol (Liberty University Institutional Review Board, 2010). The appropriate steps were taken to ensure that student rights and individual scores were protected under the ethical guidelines provided by the IRB and FERPA. MAP scores were received in an anonymous format as the researcher did not need individual student names attached to statistical measures.

In the gathering of scores for the purposes of analysis, the chosen population sample was both the single-gendered and co-educational classroom males. The researcher was only concerned with the MAP reading achievement scores of third through fifth grade males in both single-gendered and co-educational classrooms.

The same procedures detailed above occurred for students who had been given the fall 2011 and spring 2012 MAP reading tests. The data were coded in the predetermined manner and handled accordingly. The results were analyzed and the findings are reported in chapters four and five of the researcher's dissertation.

### **Data Analysis**

Univariate and multivariate analyses were used to examine the research questions of this study. An exploratory data analysis and then computation of descriptive statistics for each comparison group was conducted which identified a mean for the reported scores as well as the standard deviation. This study used applicable statistical processes, such as *t*-tests and a one-way repeated measures ANOVA (with the independent variable being School A or School B and the dependent variable being fall 2011 or spring 2012) that were designed to assess for group differences. This analysis gave the researcher specific information that was needed to support or nullify the previously stated hypotheses as well as provided the necessary answers to the research questions that provided the foundation for this study.

With the type of data gathered and the desire of the researcher to further analyze a breakdown of groups, a one-way repeated measures ANOVA (Analysis of Variance) was one statistical program which was used in interpreting the grade level achievement scores from this study. There are some similarities between the *t*-test and ANOVA. Like the *t*-test, ANOVAs are used to test theories on differences for the average values of some

outcome between two groups; however, while the *t*-test can be used to compare two means or one mean against a known distribution, ANOVA can be used to examine differences among the means of several different groups at once. ANOVA is a statistical technique for assessing how observable independent variables influence a continuous dependent variable (Gall et al., 2007). An ANOVA was used to analyze the data since the researcher was able to look at more than two means.

“Parametric statistics assume the data are absent of outliers, normally distributed, and the variables have a linear relationship. Data must meet additional assumptions for the use of multivariate statistics beyond normality and linearity. ANOVA additionally requires homogeneity of variance” (Beavers, 2011).

### **Statistical Assumptions**

**Normality.** The use of descriptive statistics for each variable (grade level) helped to identify any existing outliers. Outliers were then modified by adjusting the score to 0.5 above/below the highest/lowest normal scaled score. This adjustment was dependent upon the extreme to which it was outlying (Osborne & Overbay, 2004). In this study, one spring 2012 score for a third grade student at School B had to be modified as an outlier (as represented by the bolded score in Appendix D). Once this adjustment was made, normality was checked by viewing the newly calculated skewness and kurtosis. The fact that skewness and kurtosis must be smaller than +/- 1, was the criteria used to determine that all variables were sufficiently normally distributed for the use of parametric statistics (Beavers, 2011).

**Homogeneity of variance and covariance.** It is the assumption of homogeneity of variance that the variance is equal across all populations. Utilizing a random selection generator, equal groups for independent variables, such as schools, were created. These

equal sample sizes were needed as a precaution against the  $t$ -tests and  $F$ -tests not functioning as intended under violation of this assumption. For each group included in a  $t$ -test or ANOVA, Levene's test of homogeneity of variance was first calculated (see Table 7). The population variances were assumed to be equal where Levene's test was not significant. On the other hand, if a significant test appeared it was presumed that the variances were not equal and therefore the  $t$ -tests had to be evaluated using the correction for unequal variances.

## CHAPTER FOUR: RESULTS

The purpose of this study was to determine if the placement of students in a single-gendered classroom vs. a co-educational classroom had an effect on the MAP scaled reading scores of third through fifth grade male students. This chapter presents information on the data collected from two southeastern charter elementary schools. Fifty-seven single-gender student scores were collected and 122 co-educational student scores were collected. Preliminary analyses were conducted (a) to determine whether ANOVA assumptions were met by examining if the variances were equal for both groups as well as the dependent variables' normality (b) to examine differences between the two groups and the percentage of students scoring at or above grade level over the two test administrations. ANOVA results examined the effectiveness of class placement on student reading achievement addressing the following research questions:

**RQ1:** What is the effect on the Measures of Academic Progress (MAP) reading achievement scores of third through fifth grade male students when taught in a single-gender classroom versus a coeducational classroom?

**RQ2:** What is the effect on the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the Measures of Academic Progress (MAP) reading when taught in a single-gender classroom versus a coeducational classroom?

In this chapter, results of this research study are presented. The chapter is divided into four sections detailing: descriptive statistics, research question one, research question two, and a summary of the results. Each question is addressed individually along with respective offerings of detailed data analysis and results.

## **Descriptive Statistics**

This study included results from 179 third through fifth grade male students. Two southeastern charter elementary schools participated in this study. School A only offered single-gendered classrooms, housed K-8 students and had a population of 700. School B only offered co-educational classrooms, housed K-6 and had a population of 600. Each of these schools, although offering diverse classroom settings, was chosen due to their similarities in curriculum and instruction. Students in either school were taught using the same state approved curriculum and even though instruction varied by individual teacher, the schools afforded students a quality environment for learning to take place. Each of these schools provided the researcher with archival MAP reading achievement scores from their fall 2011 and spring 2012 testing reports for grades 3-5. Appendices C and D are representative of the archival data received from the participating elementary charter schools. Appendix C represented the fall 2011 and spring 2012 MAP reading achievement scores of third through fifth grade male students in single-gendered classrooms from School A. Appendix D outlined the fall 2011 and spring 2012 MAP reading achievement scores of third through fifth grade male students in co-educational classrooms from School B.

These scores were then calculated to find the mean and standard deviations for each school's fall 2011 and spring 2012 reading achievement scores. Table 3 outlines the analysis results for the mean and standard deviations for grades three through five. It was noted that students in the single-gendered classrooms had a higher fall 2011 and spring 2012 average score. This observation is based simply on the data presented but further analysis was required to determine the statistical significance, if any, that existed among the varying grade level scores.

Table 3

*Mean and Standard Deviation – Fall 2011 and Spring 2012*

School	Fall 11 Mean	Fall 11 SD	Spring 12 Mean	Spring 12 SD
School A	200.5	16.4	210.2	15.2
School B	194.3	15.7	205.2	16.8

It was determined that an analysis of each individual grade level's reading achievement score mean and standard deviation was needed. This was due to the fact that the separation of grade levels for use in a one-way repeated measures ANOVA was necessary in order to account for test differentiation. Tables 4 through 6 represent the individual grade levels of each school and their calculated mean and standard deviations for the fall 2011 and spring 2012 reporting periods. It was observed that only in grade three did single-gendered School A not have a higher mean fall 2011 score than School B. It was also noted that single-gendered School A had a higher mean spring 2012 score in each grade level. These observations were based simply on the data presented but further analysis was required to determine the statistical significance, if any, that existed among the varying grade level scores.

Table 4

*Mean and Standard Deviation – Grade 3 - Fall 2011 and Spring 2012*

School	Fall 11 Mean	Fall 11 SD	Spring 12 Mean	Spring 12 SD
School A Grade 3	193	15.1	205.3	15.1
School B Grade 3	196.8	14.1	201.8	18.1

Table 5

*Mean and Standard Deviation – Grade 4 - Fall 2011 and Spring 2012*

School	Fall 11 Mean	Fall 11 SD	Spring 12 Mean	Spring 12 SD
School A Grade 4	201	17.3	209.6	18.1
School B Grade 4	185	16.8	201.4	16.9

Table 6

*Mean and Standard Deviation – Grade 5 - Fall 2011 and Spring 2012*

School	Fall 11 Mean	Fall 11 SD	Spring 12 Mean	Spring 12 SD
School A Grade 5	209	11.3	218	8.6
School B Grade 5	201.6	10.8	212.6	12.8

For each group included in the *t*-test or ANOVA, Levene's test of homogeneity of variance was first calculated. The population variances were assumed to be equal where Levene's test was not significant. On the other hand, if a significant test appeared it was presumed that the variances were not equal and therefore the *t*-tests had to be evaluated using the correction for unequal variances. Table 7 details the *F* values for each grade level group and their accompanying significance levels for both fall 2011 and spring 2012. From this table we can see that homogeneity of variance among the groups existed and therefore the researcher was able to more confidently interpret results from the one-way repeated measures ANOVA.

Table 7

*Levene's Test of Equality of Error Variances Results*

	Grade 3	Grade 4	Grade 5
Fall 2011	$F(1,41) = .272, p = .605$	$F(1,43) = 2.185, p = .147$	$F(1,31) = 1.028, p = .318$
Spring 2012	$F(1,41) = 3.655, p = .063$	$F(1,43) = .273, p = .604$	$F(1,31) = .124, p = .727$

**Research Question One**

*What is the effect on the Measures of Academic Progress (MAP) reading achievement scores of third through fifth grade male students when taught in a single-gender classroom versus a coeducational classroom?*

MAP data were collected from the 2011-2012 school year for male students in grades three through five. School A students had all been placed in single-gendered classrooms (experimental) and School B students had all been placed in co-educational classrooms (control). The researcher utilized scores from each student's fall 2011 MAP reading achievement test and then compared those among grade levels and schools using the same test in the spring of 2012.

A one-way repeated measures ANOVA was determined to be the best statistical analysis to run for this data set comparing the type of school, single-gendered or co-educational, to that of the time at which the test was administered, fall 2011 or spring 2012 for each grade level. Grade three produced a statistically significant difference in favor of School A, single-gendered, where  $F(1, 43) = 30.850, p < .05$ ; grade four produced a statistically significant difference in favor of School A, single-gendered, where  $F(1, 41) = 23.644, p < .05$ ; grade five also produced a statistically significant difference in favor of School A, single-gendered, where  $F(1, 31) = 39.385, p < .05$ .

Based on these results the researcher concluded that a rejection of the original null hypothesis was supported.

To better determine the nature of the interaction a *t*-test was conducted to compare the fall 2011 and spring 2012 mean scores of each grade level from both school groups. It was found that a statistically significant difference existed among the grade four fall 2011 ( $t = 0.0006$ ,  $p < .05$ ) and the grade five fall 2011 ( $t = 0.0098$ ,  $p < .05$ ) mean scores for the experimental and control groups, in favor of the experimental group. A statistically significant difference was not found to exist among the grade three fall 2011 ( $t = 0.4022$ ,  $p < .05$ ), the grade three spring 2012 ( $t = 0.3022$ ,  $p < .05$ ), the grade four spring 2012 ( $t = 0.1244$ ,  $p < .05$ ) or the grade five spring 2012 ( $t = 0.1106$ ,  $p < .05$ ) mean scores of the experimental and control groups. Based on these results the researcher concluded that a complete rejection of the original null hypothesis was not supported.

### **Research Question Two**

*What is the effect on the percentage of third through fifth grade male students who met or exceeded the pre-determined target grade level score on the Measures of Academic Progress (MAP) reading when taught in a single-gender classroom versus a coeducational classroom?*

As stated in the Northwest Evaluation Association (2013) Growth Guideline Chart, students' RIT scores from fall and spring are compared to national grade level RIT scores. These grade level scores determine whether a child was performing at, above, or below grade level specific to their fall or spring test administration time frame. A student in the fall of grade three would need to have a RIT score of 192 or higher to be at or above grade level. A student in the fall of grade four would need a score of 201 or higher

to achieve at or above grade level. A student in the fall of grade five would be required to score a 208 or higher to achieve at or above grade level. According to the same growth guideline chart (Northwest Evaluation Association, 2013), a student in the spring of grade three would need a score of 200 or higher to be considered at or above grade level. A student in the spring of grade four would need a score of 207 or higher to achieve at or above grade level. A student in the spring of grade five would be required a score of 212 or higher to achieve at or above grade level.

In order to help answer research question two, the researcher performed a simple arithmetic formula for finding percentages. Using the growth guidelines detailed above, the students were grouped according to whether they scored at or above grade level or below grade level for both School A and School B. These totals were then divided by the number of sample participants in that specific grade level. This gave the researcher a percentage for each grade level grouping, for each school. Tables 8 and 9 show the groupings at, above or below grade level, grade level, school, and the percentage of students meeting this predetermined criteria.

Table 8

*Fall 2011 Percentage of Students At, Above, or Below Grade-Level*

Fall 2011	Grade Level	
	% At or Above	% Below
Grade 3 – School A (SG)	60	40
Grade 3 – School B (Co-ed)	81	19
Grade 4 – School A	52	48
Grade 4 – School B	24	76
Grade 5 – School A	64	36
Grade 5 – School B	35	65

Table 9

*Spring 2012 Percentage of Students At, Above, or Below Grade-Level*

Spring 2012	Grade Level	
	% At or Above	% Below
Grade 3 – School A (SG)	65	35
Grade 3 – School B (Co-ed)	65	35
Grade 4 – School A	65	35
Grade 4 – School B	57	43
Grade 5 – School A	71	29
Grade 5 – School B	60	40

Although it was observed that students in single-gendered classrooms generally performed more consistently at or above grade level in each grade but third, there appears to be no significant difference in the percentage levels of either group, therefore leading the researcher to support the originally stated null hypothesis. The highlighted percentages in Tables 8 and 9 are representative of data the researcher found notable. For example, the significant decrease from School B, grade 3, fall 2011 to spring 2012, of those at or above grade level. School B, grades 4 and 5 each saw a significant increase in the percentage of students at or above grade level. However, without performing further statistical analysis or implementing a qualitative component of research, these notable percentages lead the researcher to infer causality.

### **Summary of Results**

The purpose of this study was to determine if the placement of students in a single-gendered classroom vs. a co-educational classroom had an effect on the MAP scaled reading scores of third through fifth grade male students. The means of the RIT scaled scores were examined to determine if there was a significant difference in the mean scores of those placed in single-gendered classrooms compared to those placed in co-educational classrooms. The percentage of students scoring at or above grade level on the MAP reading achievement test was also examined for both groups of students. The researcher found a statistically significant difference in the mean MAP, RIT fall 2011 and spring 2012 scores for students in grades three and four who were placed in single-gendered classrooms. It was determined that the sample size for grade five was not large enough to provide the researcher with valid support for a statistically significant difference among the control or experimental groups. No statistically significant difference was found with the percentage of students scoring at or above grade level on

the MAP fall 2011 or spring 2012 reading achievement test in either the control or experimental groups.

## **CHAPTER FIVE: DISCUSSION**

The purpose of this chapter is to review and discuss the results of this quantitative research study. This chapter is organized into the following sections: statement of the problem, summary of the findings, discussion of the findings, theoretical implications and practical implications, limitations, and recommendations for further research.

### **Statement of the Problem**

Boys' reading habits are of concern when educators looked at their underachievement in school. When compared to girls' achievement and how they develop in literacy over time, educators must engage in conversation about what can be done to address this gap (Daniels et al., 2001; Friend, 2006; McKechnie, 2006). Reading achievement that does not meet the level of performance expected at specific age increments can have lasting effects. These include possible retention, decreased motivation, increased dropout rates, and possible incarceration (Clark et al., 2008; Fleishman, n.d.; Hernandez, 2011; Hong & Bing, 2007; Varlas, 2005).

Often these students are less likely to stay motivated while continuously enrolled in school nor will they work to achieve the expectations set forth for them (Fleishman, n.d.). This decreased motivation eventually leads to significant problems when these boys are easily distracted and unable to keep up with the learning pace of their age appropriate peers in other subjects such as English or science and social studies.

Hernandez (2011) found that students who are not reading proficiently by the third grade are four times more likely to leave high school never having received a diploma. If students were unable to master basic reading skills within the first years of schooling then the chances of this happening jump to six times more likely.

Today's young adults who either graduate with low literacy skills or drop out of school have little chance for employment, even in low-paying jobs, and are more likely to end up on public assistance. Those who do find work are often stuck in minimum wage jobs that pay too little to support a family in today's society. Even more disturbing is the increased likelihood that high school dropouts, who enter society lacking work skills and life skills, will end up in a correction facility (Fleishmann, n.d.).

This study was designed to address the problem of whether or not implementing single-gender education can positively affect the reading achievement of third through fifth grade boys and thereby influence their future learning success.

### **Summary of the Findings**

#### **Research Question One**

For research question one, the researcher examined the mean MAP, RIT scores for third through fifth grade male students from two charter elementary schools over one school year, 2011-2012. The populations of male students used were in either the control group, a co-educational classroom, or the experimental group, a single-gendered classroom. Each group of male students was given the MAP reading achievement test in the fall of 2011 and again in the spring of 2012. The study included 179 participants from two southeastern charter elementary schools. The control group had 122 students who were placed in co-educational classrooms. The experimental group had 57 students who were placed in single-gendered classrooms.

The researcher conducted several exploratory sets of data analysis in order to adjust for items such as normality, skewness, and the assumed group differences. Once these were conducted and groups were determined to be homogenous among variances,

as well as items adjusted as needed, the researcher then performed a one-way repeated measures ANOVA on the fall 2011 and spring 2012 scores comparing each grade level in School A to the respective grade level in School B. Results from this analysis revealed a statistically significant difference in mean RIT scores of students in grades three through five who had been placed in single-gendered classrooms compared to those who had been placed in co-educational classrooms. The significance levels were  $p < .05$ . The null hypothesis was rejected in favor of the alternative.

### **Research Question Two**

For research question two, the researcher examined the percentage of students at each grade level, third through fifth, who scored at or above grade level on their fall 2011 and spring 2012 MAP reading achievement test. Utilizing a national growth guideline chart provided by Northwest Evaluation Association, the researcher was able to determine what RIT scores placed a student at or above grade level in their respective grades. Using the growth guidelines chart, the students were grouped according to whether they scored at or above grade level or below grade level for both School A and School B. The researcher performed a simple arithmetic formula for finding percentages. The total number of students in each group was then divided by the number of sample participants in that specific grade level. This gave the researcher a percentage for each grade level grouping, for each school.

Although it was observed that students in single-gendered classrooms generally performed more consistently at or above grade level in each grade but third, there appeared to be no significant difference in the percentage levels of the control or experimental groups. These results did not allow the researcher to reject the null hypothesis.

## **Discussion of the Findings**

### **Research Question One**

Results from this study yielded a statistically significant difference among the pre and post MAP reading achievement scores of male students, grades three through five, placed in single-gendered classrooms. The researcher concluded that placement in single-gendered classrooms does have an effect on the reading achievement of third through fifth grade males. These results are consistent with several studies conducted using similar control and experimental groupings that yielded positive results. These studies sought to determine whether or not placement in a single-gendered classroom would help to increase student achievement for both genders. South Carolina Department of Education (2008a) had been a forerunner in the case for single-gendered education. Their state research found that student achievement in all subjects was higher, behavioral issues decreased drastically, and parental satisfaction was extremely positive. These results led them to increase their number of single-gendered classroom offerings across the state. Hutchison (2001), Piechura-Couture et al. (2011), Mulholland et al. (2004) each investigated the impact that single-gendered classrooms had on students of both genders in regards to academic achievement, self-esteem, social influences, and decreased gender stereotyping. Their research proved positive in support of single-gendered education for both males and females. They recorded dramatic increases in student achievement over time as well as an increase in students' self-esteem. This rise in achievement and self-esteem helped each gender to form more meaningful relationships with peers as well as the opposite gender. A decrease in gender stereotyping was also evident as each gender was given an opportunity to excel in areas

they found interesting without fear of being demoralized for what some would consider more of a gender specific area of interest.

However, these results did contradict the negative effects some investigations found related to the placement of students in single-gendered classrooms. Many researchers suggested that placement in single-gendered classrooms served as a manner of increasing gender stereotyping while diminishing the chances for both genders to learn how to interact in socially appropriate ways (McCreary, 2011; Jackson, 2010). It was stated that single-gendered classrooms were developed to only address the achievement needs of boys rather than girls and did more to create parameters in which neither gender was able to succeed in typical gender dominated subjects such as science and math (Anfara & Mertens, 2008; Bracey, 2007). These studies supported equal opportunities for both genders instead of simply offering a possible quick fix to a long range issue. It became apparent to the researcher however, that the absence of research in both quantity and quality involving single-gendered education, warrants the need for further discussions on whether or not the effects, positive or negative, can be validly supported.

### **Research Question Two**

Research question two focused on the percentage of single-gendered students who scored at or above grade level on the MAP reading achievement test, as compared to students in co-educational classrooms. Although it was observed that students in single-gendered classrooms generally performed more consistently at or above grade level in each grade but third, there appeared to be no significant difference in the percentage levels of the control or experimental groups. The researcher concluded that, based on these specific results, it cannot be assumed that placement in single-gendered classrooms does have an effect on the reading achievement of third through fifth grade males

compared to students placed in co-educational classrooms. The researcher can infer that the consistency of students scoring at or above grade level could be a possible result of single-gender class placement. These results are consistent with researchers who have offered valid arguments for single-gendered education. For example, Sax (2005; 2007) argued that boys and girls have a number of 'hardwired' differences that are best accommodated by single-gendered schooling. He proposed that 'in the coeducational classroom so many of the choices we make are to the advantage of girls, but to the disadvantage of boys' (Sax, 2008, p.10) and that schooling boys and girls separately is the best way to accommodate boys' needs without disadvantaging girls. However, in many cases, the results of these studies have suggested that the effects of single-sex schooling may vary with gender (Gibb et al., 2008).

Sadker and Sadker (1995) summarized research findings for males and females in coeducational school settings in U.S. society. According to Sadker and Sadker (1995), female students are disadvantaged in coeducational settings, including fewer opportunities to contribute vocally in classes, fewer leadership opportunities, and lower course enrollment and achievement in fields traditionally dominated by males. Other findings included that the single-gender classes eliminated certain classroom distractions from the opposite sex, particularly for the girls (Gurian et al., 2009; Protheroe, 2009; Anfara & Mertens, 2008; Meyer, 2008; Salomone, 2006).

The literature related to single-gendered schooling demonstrates the need for credible studies in U.S. public schools. Research in the field of single-gendered education is timely due to No Child Left Behind encouraging this strategy as a means to improve student achievement. As public schools experiment with single-gendered

education, attention to research-supported theory and practice is of great importance to the creation of single-gendered programs.

### **Theoretical Implications**

In the present study it was found that students placed in single-gendered classrooms scored higher on the MAP reading achievement test than students placed in co-educational classrooms. In the researcher's opinion, placement in a single-gendered classroom provided support for Mezirow's Transformative Learning Theory (Mezirow, 2000), as was evidenced by the results of this study. Transformative Learning (Mezirow, 2000) is a term used in educational theory to describe a process which leads the learner to re-evaluate past beliefs and experiences which had previously been understood within assumptions derived from others. Reading is often a difficult and abandoned pastime of many male students. With so many other items vying for their attention, reading is not assigned top priority. Whatever the reasons behind this lack of interest, transformation must occur in order for male students to realize the benefits of reading and the possibilities that lie within by taking a valid interest in this unending pastime. In providing male students with an environment that is free from peer pressure or performance pressure, the desire is for their core beliefs about reading to undergo a transformative change. It is anticipated that boys who are instructed in single-gendered classrooms will feel uninhibited by gender stereotypes and become more actively engaged in reading therefore affecting their level of interest as shown by their increased academic achievement in the subject area.

The researcher also hypothesized that based on this study's positive achievement results, placement in a single-gendered classroom also supports Vygotsky's Social Development Theory (Vygotsky, 1978). Vygotsky's focus was on the connections that

occurred between people and the contexts within they achieved these shared experiences. The tools gained from this interaction were simply used to serve as ways to communicate but then became internalized which in turn led to higher thinking skills (Vygotsky, 1978). The male students in single-gendered classrooms were able to further develop these communication tools by being able to have more shared experiences with individuals of the same gender. This type of interaction was, according to Vygotsky, key to helping them develop improved thinking skills. The types of advanced level thinking skills needed to help increase reading achievement.

### **Practical Implications**

The results of this study may help educators better understand the significance of single-gendered education and then seek to determine whether or not single-gendered education is a viable option for increasing student achievement in reading, or across all subject areas. Taylor (2004) told us that professional literature indicates the majority of boys in the world are struggling with literacy. Becoming more aware of what is happening with boys and their attitudes toward reading will allow educators the opportunity to become more proactive in meeting their needs in the area of literacy achievement (McNeil, 2009; Prado & Plourde, 2011). Single-gendered education may prove to be an excellent resource for school systems in addressing the achievement gap that exists among groups of students. Hutchison (2001) offered support for the evidence showing that at certain ages, both boys and girls in single-gender programs could increase focus on their studies, build more confidence and ultimately be more successful in school as well as later in their careers. Senator Hutchison argued that study after study had proven the academic success and ambition exhibited by boys and girls in single-gendered schools over that of their co-educated peers. A significant number of advantages can be

found for both co-educational and single-gender schools according to the U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service (2005). The U.S. Department of Education reported on the outcomes in favor of or against single-gendered education. This type of instruction was viewed as an alternative form of schooling. A systematic review of eighty-eight quantitative and four qualitative studies was included in the report. The study's results were in favor of single-gendered education due to the positive effect it can have on academic achievement. The findings indicated that, in general, "most studies reported positive effects for single-gender schools on all-subject achievement tests" (p. xv).

Single-gendered education may not be the ideal learning environment for every student, but educators cannot let that assumption dispel the idea that single-gendered education is not ideal for any student. Parental education, gender specific training, continuous professional development, and continuous evaluation will be imperative to the successful implementation of such a student focused program. The results of this research can serve as a springboard for planning, development, and implementation; however, more empirical evidence related to the effects of single-gendered education is needed.

### **Limitations**

There were several core assumptions related to the proposed study the researcher had chosen to complete. These assumptions were based on experience and the reading of current research related to the topic of single-gender education.

The researcher assumed that single-gender education will benefit boys and their interest in reading by removing some underlying barriers created by co-educational

grouping. It offered educators an alternative to traditional co-education based on the success some schools have had implementing this design.

The assumption was made that a decision to include schools from another state would have benefits since the specific state has been involved in single-gender education for several years while the research design chosen has the benefits of providing valid and reliable results based on controls for internal and external validities.

The number of participants in the study warranted greater reliability and truly represents a population of male, third through fifth grade students. It was also imperative to note that educators were more likely to participate in said study since it could offer more research for the field of single-gender education.

Although the researcher worked diligently to propose a study that is worthwhile and would in some way contribute to the field of education, it goes without saying that every study regardless of the initial make-up has its share of limitations. This proposed study was no different. The following limitations are being offered since the researcher understands that the proposed study is in no way free from them: non-randomization of subjects, use of third through fifth grade students only, and not many schools in the researcher's state utilize single-gender education.

Randomization of subjects has proven to increase the validity of any type of experiment. Since the researcher included several classrooms from different schools, randomization became impossible. The researcher had no control over the placement of students into specific classrooms utilizing single-gender education.

The study was limited in that it only focused on classrooms consisting of third through fifth grade students. This was pertinent for the representation of a given population of typical third through fifth grade males but not representative of males in

other grades. Other grades of students would be needed to make broader generalizations concerning gathered results.

The last limitation addressed the limited number of single-gender classrooms in the researcher's home state. Single-gender classrooms were not widely publicized in this state; therefore it was difficult to know if they even existed in the state's public school system. A neighboring state, which also happened to be the researcher's original birth place, was a largely publicized proponent of single-gender education which is why the researcher chose to utilize classrooms from this specific state. The limitation existed in the distance between the researcher and the experimental and control groups. No on-site management of the research study took place. All of the communication was through phone calls and emails.

### **Internal Validity**

**Testing.** This aspect could have only been controlled by the lack of information the classroom students were given concerning the set-up of the achievement test. The period of time between pre and posttests was long enough for the students to not remember the specifics of the questions.

**Instrumentation.** This was controlled by the lack of information regarding the study and what was being observed. The smaller the amount of information the students are given the less likely results are to be skewed.

**Experimental mortality.** The groups were made as equally desirable as possible so as to keep students interested enough to stay in their specified groups.

**Differential selection.** The groups chosen represented some differences that needed to be considered. This issue was controlled by calculating some exploratory data

analyses. It gave information in regards to posttest change in light of pre-existing group differences.

**Compensatory rivalry by the control group.** This aspect was controlled by the lack of information the classroom students were given concerning the set-up of the design. This was done in an effort to keep students from knowing which group was being studied.

**Resentful demoralization of the control group.** This was controlled by ensuring that students in the experimental group were taught the same curriculum as the control group. The two groups were similar with the exception of the make-up for the classrooms. All boys compared to a mixture of girls and boys. The individual schools assured the researcher that this variable was controlled to the best of their ability.

### **External Validity**

**Population Validity.** This could have been controlled if the study was expanded throughout several states and school systems in which single-gendered classrooms exist or are willing to experiment with them. This however did not happen in regards to the study being discussed.

### **Ecological Validity**

**Explicit description of the experimental treatment.** The researcher worked to ensure that through detailed documentation this study could be easily replicated. Since it was a simple study to replicate, details were provided as to how each group was utilized and the specific treatment that took place for the experimental group. Specifics on the Measures of Academic Progress (MAP) were available for any researcher interested in replicating this study.

**Measurement of the dependent variable.** This concern was controlled through the reliability and the validity of the achievement measure chosen. The assessment measured the intended dependent variable as shown by assessing student achievement in reading.

**Pretest sensitization.** The researcher realized that the pre-test could have led to an increase in post-test results simply because it was given. With the idea that the tests were spread over a school year, probability was high that the students did not remember the pre-test question types and therefore provided bias free answers.

### **Recommendations for Further Research**

With limitations on this study coupled with the dearth of previous research on this topic, further research is warranted. Replication of this study should occur with the recommendation of extending the longevity of the study to include more school years than represented within the original study, which only compared scores from one complete year for each school. The study's longevity could provide detailed information regarding students' success in single-gendered classrooms as compared to co-educational classrooms.

The researcher would also recommend that the study include more than third through fifth grade students. It would be beneficial to see that the effect of single-gendered classrooms on the reading achievement of males K-5 is possible. This would afford the researcher an opportunity to increase the reliability of the study as it seeks to focus on a larger population of male students. Along with increasing the student sample to include kindergarten, first, and second, the researcher sees the benefit to including female students in a study similar to this. Adding in female scores could lend itself to helping support the brain theories discussed in the literature review section.

A study with a more aggressive research-design as well as random sampling would benefit the reliability and validity of the researcher's results. Although the causal-comparative design worked well for the researcher's original intended purposes, it would be valid to look at a possible quasi-experimental research design.

Once could utilize this method of research while adding a qualitative component and that could prove useful. Deciding to research the aspects of individual student attitudes while in single-gendered classrooms vs. those of their co-educational counterparts could provide a more meaningful look at the effects of single-gendered classrooms. The suggested research might be considered in determining if more has to do with academic achievement or social factors that accompany class placement.

Conducting further research on teaching methods and instructional strategies utilized by single-gender classroom teachers and their colleagues in co-educational classrooms could provide the researcher with a better foundational understanding of student achievement. What contribution do these factors make to student achievement, if any?

The question could be raised for further research; does placement in single-gendered classrooms have a greater effect on achievement at the elementary, middle, or high school levels? This could be answered by utilizing longitudinal data from each of these educational levels to determine any statistical significance in a student's possible need for a single-gender or co-educational placement based solely on their level of maturity.

## REFERENCES

- Akhtar, Z. (2011, October). Gender-wise and institution-wise difference in learning styles of secondary school students. *Language in India*, 11(10), 408+. Retrieved from [http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA276186671&v=2.1&u=vic\\_liberty&it=r&p=AONE&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA276186671&v=2.1&u=vic_liberty&it=r&p=AONE&sw=w)
- Anfara, V., & Mertens, S. (2008). Do single-sex classes and schools make a difference? *Middle School Journal*, 40(2), 52-59. Retrieved February 3, 2012, from Research Library. (Document ID: 1601929511).
- Beavers, A. S. (2011). *Personality profiles of pre-service teachers: An examination of discipline differences and predictive validity on future job satisfaction*. (Doctoral Dissertation).
- Bracey, G. W. (2007, February). The success of single-sex education is still unproven. *The Education Digest*, 72(6), 22-26. Retrieved February 18, 2012, from Research Library. (Document ID: 1209294041).
- Bonomo, V. (2010). Gender matters in elementary education: Research-based strategies to meet the distinctive learning needs of boys and girls. *Educational Horizons*, 88(4), 257. Retrieved from [http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA241875980&v=2.1&u=vic\\_liberty&it=r&p=AONE&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA241875980&v=2.1&u=vic_liberty&it=r&p=AONE&sw=w)
- Cahill, L. (2005). His brain, her brain. *Scientific American*, 292(5), 40-47. Retrieved from Academic Search Complete database.
- Canada, P. O. (2012). *Comparison of PASS assessment scores in single-gender and heterogeneous middle schools in South Carolina*. (Doctoral dissertation). Retrieved from <http://digitalcommons.liberty.edu/doctoral/>

- Carrier, S. (2009). Environmental education in the schoolyard: Learning styles and gender. *The Journal of Environmental Education*, 40(3), 2-12. Retrieved February 25, 2012, from Research Library. (Document ID: 1663730021).
- Casual-Comparative (2006). Retrieved from <http://www.socialresearchmethods.net>
- Cavazos-Kottke, S. (2005). Tuned out but turned on: Boys' (dis)engaged reading in and out of school. *Journal of Adolescent & Adult Literacy*, 49(3), 180-184. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>, doi:10.1598/JAAL.49.3.1
- Clark, M., Lee, S., Goodman, W., & Yacco, S. (2008, June). Examining male underachievement in public education: Action research at a district level. National Association of Secondary School Principals. *NASSP Bulletin*, 92(2), 111-132. Retrieved February 5, 2012, from Research Library. (Document ID: 1527173341).
- Corcoran, C. A., & Mamalakis, A. (2009). Fifth grade students' perceptions of reading motivation techniques. *Reading Improvement*, 46(3), 137-142. Retrieved from <http://search.proquest.com/docview/215798226?accountid=12085>
- Costello, B. (2008, May). Leveraging gender differences to boost test scores. *The Education Digest*, 73(9), 32-35. Retrieved February 25, 2012, from Research Library. (Document ID: 1477278121).
- Daniels, H., Creese, A., Hey, V., Leonard, D., & Smith, M. (2001). Gender and learning: Equity, equality and pedagogy. *Support for Learning*, 16(3), 112. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Davies, J., & Brember, I. (1993). Comics or stories? Differences in the reading attitudes. *Gender & Education*, 5(3), 305. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>

- Dee, T. (2006). The why chromosomes. *Education Next*, 6(4), 68-75. Retrieved from [http://media.hoover.org/documents/ednext20064\\_68.pdf](http://media.hoover.org/documents/ednext20064_68.pdf)
- DeFao, J. (2007, June 18). *Chronicle Staff Writer*. Single-gender education gains ground as boys lag. *San Francisco Chronicle*. Retrieved July 11, 2011 from <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/06/18/MNG7SQH1E51.DTL>
- Friend, J. (2007). Single-gender public education and federal policy: Implications of gender-based school reforms in Philadelphia. *American Educational History Journal*, 34(1), 55-67. Retrieved from <http://search.proquest.com/docview/230050941?accountid=12085>
- Friend, J. (2006). Research on same-gender grouping in eighth grade science classrooms. *Research in Middle Level Education Online*, 30(4), 1-15. Retrieved from Education Research Complete database.
- Flannery, M. E. (2006, April). *No girls allowed*. Retrieved from National Education Association. [http://www.nea.org/nea\\_today/0604/sing/sex.html](http://www.nea.org/nea_today/0604/sing/sex.html)
- Fleishman, E. B. (n.d.). *Adolescent literacy: A national reading crisis*. Retrieved from Scholastic Inc. Read 180. [http://teacher.scholastic.com/products/research/pdfs/PP\\_R180\\_Literacy\\_Crisis.pdf](http://teacher.scholastic.com/products/research/pdfs/PP_R180_Literacy_Crisis.pdf)
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed). Boston, MA: Pearson Education, Inc.
- Geist, E., & King, M. (2008). Different, not better: Gender differences in mathematics learning and achievement. *Journal of Instructional Psychology*, 35(1), 43-52. Retrieved from Academic Search Complete database.

- Gibb, S., Fergusson, D., & Horwood, L. (2008). Effects of single-sex and coeducational schooling on the gender gap in educational achievement. *Australian Journal of Education*, 52(3), 301-317. Retrieved from ERIC database.
- Giles, G. (2008). Wanted: Male models. *School Library Journal*, 54(12), 48-49.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Goff, W. D., & Johnson, N. J. (2008). Beyond insanity: Creating all male classrooms and schools as a policy option in the portfolio of local school districts. *Forum on Public Policy: A Journal of the Oxford Round Table*. Retrieved from  
[http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA218606493&v=2.1&u=vic\\_liberty&it=r&p=AONE&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA218606493&v=2.1&u=vic_liberty&it=r&p=AONE&sw=w)
- Greene, P. K. (2010). Still failing at fairness: How gender bias cheats girls and boys in school and what we can do about it. *Kappa Delta Pi Record*, 46(3), 142-142.  
 Retrieved from <http://search.proquest.com/docview/232056126?accountid=12085>
- Gross, K. (2009, June). Effects of single-sex and coeducational schooling on the gender gap in educational achievement. *Youth Studies Australia*, 28(2), 59. Retrieved from [http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA202485505&v=2.1&u=vic\\_liberty&it=r&p=AONE&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA202485505&v=2.1&u=vic_liberty&it=r&p=AONE&sw=w)
- Gurian, M. (2006). Learning and gender. *American School Board Journal*, 193(10), 19-22. Retrieved from Academic Search Complete database.
- Gurian, M., Stevens, K., & Daniels, P. (2009). Single-sex classrooms are succeeding. *Educational Horizons*, 87(4), 234-245. Retrieved from Education Research Complete database.

- Hall, C., & Coles, M. (1997). Gendered Readings: Helping boys develop as critical readers. *Gender & Education*, 9(1), 61-68.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>,  
doi:10.1080/09540259721457
- Hauser, C. & Kingsbury, G. G. (2009). *Individual score validity in a modest-stakes adaptive educational testing setting*. Northwest Evaluation Association.  
Retrieved from <http://www.kingsburycenter.org/our-research/about-our-research>
- Hayes, R. (2008, March). Boys will only flourish in single-sex schools. *The Times Educational Supplement: TES*, (4781), 29. Retrieved February 3, 2012, from ProQuest Newsstand. (Document ID: 1478234581).
- Hernandez, D. J. (2011). Double jeopardy: How third grade reading skills and poverty affect high school graduation. *Educational and Psychological Measurements*, 38(2). Retrieved from  
<http://fcd-us.org/sites/default/files/DoubleJeopardyReport.pdf>
- Hill, R. L. (2011). *The Effect of Single-Gender Education on the Achievement of Sixth Grade Mathematics Students*. (Doctoral dissertation). Retrieved from  
<http://digitalcommons.liberty.edu/doctoral/>
- Hong G. & Bing, Y. (2007). Early-grade retention and children's reading and math learning in elementary years *Educational Evaluation and Policy Analysis*, 29(4), pp. 239-261.
- Hubbard, L., & Datnow, A. (2005). Do single-sex schools improve the education of low-income and minority students? An investigation of California's public single-gender academies. *Anthropology and Education Quarterly*, 36(2), 115-131.  
Retrieved from ProQuest Psychology Journals Database.

- Hutchison, K. B. (2001). The lesson of single-sex public education: Both successful and constitutional. *American University Law Review*, 50, 1075-1082.
- Jackson, J. (2010). 'Dangerous presumptions': How single-sex schooling reifies false notions of sex, gender, and sexuality. *Gender & Education*, 22(2), 227-238.  
doi:10.1080/09540250903359452
- Kehler, M., Martino, W., & Watson, A. (2010). The problem of boys' literacy underachievement: Raising some questions. *Journal of Adolescent and Adult Literacy*, 53(5), 356+. Retrieved from  
[http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA229718995&v=2.1&u=vic\\_liberty&it=r&p=AONE&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA229718995&v=2.1&u=vic_liberty&it=r&p=AONE&sw=w)
- Kommer, D. (2006). Boys and girls together. *Clearing House*, 79(6), 247-251.  
Retrieved from Academic Search Complete database.
- Liberty University Institutional Review Board (2010). Retrieved from  
<http://www.liberty.edu/index.cfm?PID=12606>
- Lingard, B., Martino, W., & Mills, M. (2010). Boys and schooling: Beyond structural reform. *Gender and Education*, 22(1), 140-141. doi:10.1080/09540250903464757
- Lingo, S. (2007). The all guys book club: Where boys take the risk to read. *Library Media Connection*, 25(7), 24-28.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Logan, S., & Johnston, R. (2010). Investigating gender differences in reading. *Educational Review*, 62(2), 175-187. doi:10.1080/00131911003637006

- Logan, S., Medford, E., & Hughes, N. (February 2011). The importance of intrinsic motivation for high and low ability readers' reading comprehension performance. *Learning and Individual Differences, 21*(1), 124-128. ISSN 1041-6080, 10.1016/j.lindif.2010.09.011.
- Logsdon, E. C. (2003, April). "No child left behind" and the promotion of single-sex public education in primary and secondary schools: Shattering the glass ceilings perpetrated by coeducation [Electronic version]. *Journal of Law and Education*. Retrieved from [http://findarticles.com/p/articles/mi\\_qa3994/is\\_20034/ai\\_n9199030](http://findarticles.com/p/articles/mi_qa3994/is_20034/ai_n9199030)
- Love, K., & Hamston, J. (2003). Teenage boys' leisure reading dispositions: Juggling male youth culture and family cultural capital. *Educational Review, 55*(2), 161. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Lynch, J. (2002). Parents' self-efficacy beliefs, parents' gender, children's reader self-perceptions, reading achievement and gender. *Journal of Research in Reading, 25*(1), 54. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Lynn, R., & Mikk, J. (2009, March). Sex differences in reading achievement. *TRAMES: A Journal of the Humanities & Social Sciences, 13*(1), 3-13. Retrieved November 2010, doi:10.3176/tr.2009.1.01
- Mael, F., Alonso, A., Gibson, D., Rogers, K., & Smith, M. (2005). *Single-sex versus coeducational schooling: A systematic review*. Washington, D.C.: U.S. Department of Education: Office of Planning, Evaluation and Policy Development.

- Marinak, B. A., & Gambrell, L. B. (2010). Reading motivation: Exploring the elementary gender gap. *Literacy Research and Instruction*, 49(2), 129-141. Retrieved from <http://search.proquest.com/docview/89250430?accountid=12085>
- Martino, M., Mills, M., & Lingard, B. (2005). Interrogating single-gender classes as a strategy for addressing boys' educational and social needs. *Oxford Review of Education*, 31(2) 237-254. doi:10.1080/03054980500117843
- McCreary, A. (2011). Public single-sex K-12 education: The renewal of sex-based policy by post-race politics, 1986-2006. *Journal of Law and Education*, 40(3), 461-497. Retrieved February 18, 2012, from ProQuest Criminal Justice. (Document ID: 2395849671).
- McGeown, S., Goodwin, H., Henderson, N., & Wright, P. (2012). Gender differences in reading motivation: Does sex or gender identity provide a better account? *Journal of Research in Reading*, 35: 328–336. doi: 10.1111/j.1467-9817.2010.01481.x
- McKechnie, L. (2006). Spiderman is not for babies (Peter, 4 years): The boys and reading problem from the perspective of the boys themselves. *Canadian Journal of Information & Library Sciences*, 30(1/2), 57-67. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- McNeil, B. (2009). *Reaching for the top: Passing the literacy key to marginalized adolescent boys*. International Association of School Librarianship. Selected Papers from the ... Annual Conference, 1-11. Retrieved February 3, 2012, from Research Library. (Document ID: 1968710661).
- McNeil, M. (2008). Single-sex schooling gets new showcase. *Education Week*, 27(36). (ERIC Document Reproduction Service No. EJ797211). Retrieved from ERIC database.

- Melekoglu, M. A. (2011, November). Impact of motivation to read on reading gains for struggling readers with and without learning disabilities. *Learning Disability Quarterly*, 34(4), 248+. Retrieved from [http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA272362787&v=2.1&u=vic\\_liberty&it=r&p=ITOF&sw=w](http://go.galegroup.com.ezproxy.liberty.edu:2048/ps/i.do?id=GALE%7CA272362787&v=2.1&u=vic_liberty&it=r&p=ITOF&sw=w)
- Meyer, P. (2008). Learning separately; The case for single-sex schools. *Education Next*, 8(1), 10-24.
- Mezirow, J. (2000). *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey Bass.
- Morgan, P. L., Fuchs, D., Compton, D. L., Cordray, D. S., & Fuchs, L. S. (Sep/Oct, 2008). Does early reading failure decrease children's reading motivation? *Journal of Learning Disabilities*, 41(5), 387.
- Moss, G. (2000). Raising boys' attainment in reading: Some principles for intervention. *Reading*, 34(3), 101.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Mulholland, J., Hansen, P., & Kaminski, E. (2004). Do single-gender classrooms in coeducational settings address boys' underachievement? An Australian study. *Educational Studies* (03055698), 30(1), 19-32.  
doi:10/1080.0305569032000159714
- National Association for Single Sex Public Education, (2011). *Single-sex vs. coed: The evidence*. Retrieved July 11, 2011, from <http://www.singlesexschools.org/evidence.html>

- National Center for Education Statistics. (2005). *The condition of education in 2005*. Washington, DC. Department of Education.  
<http://nces.ed.gov/pubs2005/2005094.pdf>
- No Child Left Behind (NCLB) Act of 2001, Pub. L. No. 107-110, § 115, Stat. 1425 (2002).
- Northwest Evaluation Association. (2004). *Reliability and validity estimates*.  
[http://images.pcmac.org/Uploads/Jacksonville117/Jacksonville117/Sites/DocumentsCategories/Documents/Reliability\\_and\\_Validity\\_Estimates.pdf](http://images.pcmac.org/Uploads/Jacksonville117/Jacksonville117/Sites/DocumentsCategories/Documents/Reliability_and_Validity_Estimates.pdf)
- Northwest Evaluation Association. (2013). *MAP growth guideline chart*. Retrieved January 2013 from  
<http://www.nwea.org/products-services/assessments/help-all-kids-learn>
- Oakhill, J., & Petrides, A. (2007). Sex differences in the effects of interest on boys' and girls' reading comprehension. *British Journal of Psychology*, 98(2), 223-235. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Ogundokun, M. (2011). Learning style, school environment and test anxiety as correlates of learning outcomes among secondary school students. *Psychologia*, 19(2), 321-336. Retrieved February 25, 2012, from ProQuest Psychology Journals. (Document ID: 2465275571).
- O'Reilly, J., & Alexander, J. (1998). Newspapers as a reading resource: Their impact on boys and on parental involvement. *Reading*, 32(3), 21.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Osborne, J., & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research, and Evaluation*, 9, 1-6.

- Palmer, T. (2008). Reading the game: Using sport to encourage boys and men to read more. *APLIS*, 21(2), 78-83. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Patterson, G. A. (February 2012). Separating the boys from the girls. *Phi Delta Kappan*, 93(5), 37-41, <http://ejournals.ebsco.com.ezproxy.liberty.edu:2048/direct.asp?ArticleID=424D845EE526EF6A84AA>
- Piechura-Couture, K., Heins, E., & Tichenor, M. (2011). The boy factor: Can single-gender classes reduce the over-representation of boys in special education?. *Journal of Instructional Psychology*, 38(4), 255-263.
- Prado, L., & Plourde, L. (2011). Increasing reading comprehension through the explicit teaching of reading strategies: is there a difference among the genders? *Reading Improvement*, 48(1), 32-43. Retrieved January 31, 2012, from ProQuest Education Journals. (Document ID: 2397273961).
- Protheroe, N. (2009). Single-Sex Classrooms. *Principal*, 88(5), 32-35.
- Rex, J., & Chadwell, D. (2009). Single-gender classrooms. *School Administrator*, 66(8), 28-33. Retrieved from Education Research Complete database.
- Sadker, M., & Sadker, D. (1995). *Failing at fairness: How our schools cheat girls*. New York: Touchstone.
- Sadker, D. (1999). Gender equity: Still knocking at the classroom door. *Educational Leadership*, 56(5), 22. Retrieved from Associates Programs Source database.
- Salomone, R. C. (2006). Single-sex programs: Resolving the research conundrum. *Teachers College Record*, 108(4), 778-802.
- Sax, L. (2004). Single sex proposed regulations comments. Retrieved from: <http://www.singlesexschools.org/OCR.htm>

- Sax, L. (2005). *Why gender matters: What parents and teachers need to know about the emerging science of sex differences*. New York: Doubleday.
- Sax, L. (2006). Six degrees of separation: What teachers need to know about the emerging science of sex differences. *Educational Horizons*, 84(3), 190-200.  
Retrieved from Education Research Complete database.
- Sax, L. (2007). *Boys adrift: The five factors driving the growing epidemic of unmotivated boys and underachieving young men*. New York: Perseus Publishing.
- Sax, L. (January 2008). Boys, brains and toxic lessons. *The Times*. Retrieved from <http://www.timesonline.co.uk/tol/news/uk/education/article3234354.ece>
- Schenker, J., & Rumrill, J. (2004). Causal-comparative research designs. *Journal of Vocational Rehabilitation*, 21(3), 117-121. Retrieved from Academic Search Complete database.
- Sharpe, W. (2000). Single-gender classes: Are they better? [Electronic Version]. *Education World*. Retrieved from [http://www.educationworld.com/a\\_curr/curr215.shtml](http://www.educationworld.com/a_curr/curr215.shtml)
- Skelton, C., & Francis, B. (2011). Successful boys and literacy: Are “literate boys” challenging or repackaging hegemonic masculinity? *Curriculum Inquiry*, 41: 456–479. doi: 10.1111/j.1467-873X.2011.00559.x
- Smith, S. (2004). The non-fiction reading habits of young successful boy readers: Forming connections between masculinity and reading. *Literacy*, 38(1), 10-16.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>, doi:10.1111/j.0034-0472.2004.03801003.x

- Smithers, A., & Robinson, P. (2006). *The paradox of single-sex and co-educational schooling*. University of Buckingham, Center for Education and Employment Research. Retrieved from:  
[www.buckingham.ac.uk/education/research/ceer/pdfs/hmcscsd.pdf](http://www.buckingham.ac.uk/education/research/ceer/pdfs/hmcscsd.pdf)
- Sokal, L., Katz, H., Adkins, M., Grills, T., Stewart, C., Priddle, G., et al. (2005). Factors affecting inner-city boys' reading: Are male teachers the answer? *Canadian Journal of Urban Research*, 14(1), 107-130.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Sokal, L., Katz, H., Chaszewski, L., & Wojcik, C. (2007). Good-bye, Mr. Chips: Male teacher shortages and boys' reading achievement. *Sex Roles*, 56(9/10), 651-659.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>, doi:10.1007/s11199-007-9206-4
- Sokal, L., & Katz, H. (2008). Effects of technology and male teachers on boys' reading. *Australian Journal of Education*, 52(1), 81-94.  
<http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- South Carolina Department of Education. (2011). Retrieved from  
<http://ed.sc.gov/agency/programs-services/45/>
- South Carolina Department of Education. (2008a). *South Carolina surveys on single-gender education*. Retrieved from <http://www.ed.sc.gov/agency/Innovation-and-Support/Public-School-Choice/SingleGender/Documents/SglGenderSrvyRpt08.pdf>
- South Carolina Department of Education. (2008b). *Survey results show support for single-gender classes*. Retrieved from <http://ed.sc.gov/news/more.cfm?articleID=1015>

- Stauffer, S. (2007). Developing children's interest in reading. *Library Trends*, 56(2), 402-422. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Sullivan, M. (2004). Why Johnny won't read. *School Library Journal*, 50(8), 36-39. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- Taylor, D. (2004). Not just boring stories: Reconsidering the gender gap for boys. *Journal of Adolescent and Adult Literacy*, 48(4), 290-298. <http://search.ebscohost.com.ezproxy.liberty.edu:2048>
- U.S. Department of Education. (2009). *Evaluation of programs-Early implementation of single-sex schools: Perceptions and characteristics*. Retrieved from <http://www.ed.gov/rschstat/eval/other/single-sex/characteristics/index.html>
- U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1994, 1998, 2000, 2002, and 2003 Reading Assessment.
- U.S. Department of Education. (2008). *Early implementation of public single-sex schools: Perceptions and characteristics*. Retrieved from <http://www2.ed.gov/rschstat/eval/other/single-sex/characteristics/characteristics.pdf>
- U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service. (2005). *Single-sex versus secondary schooling: A systematic review*. Retrieved from: <http://www.ed.gov/about/offices/list/opepd/reports.html>
- Varlas, L. (2005). Bridging the widest gap. *Education Update*, 47(8). Retrieved from <http://www.ascd.org/publications/newsletters/education-update/aug05/vol47/num08/Bridging-the-Widest-Gap.aspx>

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Younger, M., & Warrington, M. (2006). Would Harry and Hermione have done better in single-sex classes? A review of single-sex teaching in coeducational secondary 104 schools in the United Kingdom. *American Educational Research Journal*, 43(4), 579-620. Retrieved from Education Research Complete database.

## APPENDIX

### APPENDIX A: Permission Email

**From:** Brown, Shane  
**Sent:** Sunday, July 29, 2012 4:21 PM  
**To:** Canada, Patricia O  
**Subject:** RE: Dissertation

Dr. Canada :)

What type of study design did you use?

Do I have your permission to adapt your TABLE 1 on Single-Gender Learning Characteristics? I love it...and it would fit well in my lit review.

You will now have your work cited for the first time :)

Shane Brown

---

**From:** Canada, Patricia O  
**Sent:** Monday, July 30, 2012 11:35 AM  
**To:** Brown, Shane  
**Subject:** RE: Dissertation

:) Title sounds strange. I focused on the 2010 PASS results for middle schools. I obtained data from 78 middle schools(39 single gender and 39 mixed gender) and compared their results.

Yes you have my permission to use my Table in your dissertation.

Patricia O. Canada

## **APPENDIX B: Instrument**

The Measures of Academic Progress (MAP) utilizes a computerized multiple choice format and tests students on various subjects throughout a calendar school year. The test is administered at the beginning, the middle and again at the end of the school year. During the testing, MAP modifies the level of questioning based upon student responses to determine a Rausch Unit (RIT) and in the end provide a score based on the RIT scale (Northwest Evaluation Association, 2012). Subtests for the reading section include: word recognition and vocabulary, reading comprehension - literal, reading comprehension – inferential/interpretive, reading comprehension – evaluation, and literary response and analysis. According to Northwest Evaluation Association (2012), the third grade reading norms (RIT values) are 193 for the beginning-of-the year median and 201 for the end-of-the year median; fourth grade reading norms (RIT values) are 201 for the beginning-of-the year median and 207 for the end-of-the year median; fifth grade reading norms (RIT values) are 209 for the beginning-of-the year median and 212 for the end-of-the year median.

**APPENDIX C**

**School A (Single-Gendered), 3<sup>rd</sup>-5<sup>th</sup> Grade MAP Scores**

#	<i>RIT</i>	
	<i>Fall 11</i>	<i>Spring 12</i>
1	158	198
2	162	193
3	166	198
4	173	173
5	173	171
6	176	197
7	180	193
8	183	178
9	184	187
10	185	182
11	187	198
12	188	201
13	189	200
14	189	200
15	191	211
16	193	196
17	196	212
18	196	183
19	196	215
20	197	213
21	198	226
22	198	209
23	198	206
24	199	227
25	199	215
26	199	211
27	200	205
28	201	202
29	202	215
30	202	213
31	203	205
32	203	221
33	204	223
34	206	223
35	207	215
36	208	209
37	208	219

---

38	208	221
39	209	228
40	209	223
41	210	234
42	211	211
43	212	203
44	212	212
45	214	223
46	214	223
47	215	221
48	215	229
49	216	221
50	217	227
51	218	227
52	220	227
53	221	211
54	225	222
55	226	223
56	226	223
57	237	234

---

**APPENDIX D**

**School B (Co-educational), 3<sup>rd</sup>-5<sup>th</sup> Grade MAP Scores**

#	<i>RIT</i>	
	<i>Fall 11</i>	<i>Spring 12</i>
1	147	216
2	153	217
3	154	220
4	158	155
5	158	155
6	158	155
7	162	162
8	162	162
9	163	220
10	166	222
11	167	201
12	168	168
13	168	168
14	169	203
15	172	171
16	172	171
17	174	207
18	178	173
<b>19</b>	178	<b>175</b>
20	178	173
21	178	175
22	178	207
23	182	207
24	182	210
25	184	210
26	185	210
27	185	188
28	186	183
29	186	183
30	186	219
31	187	192
32	187	199
33	188	211
34	189	212
35	190	183
36	190	183
37	191	212

---

38	191	201
39	192	189
40	192	189
41	194	192
42	194	225
43	194	192
44	194	214
45	194	220
46	195	195
47	195	195
48	195	206
49	195	220
50	196	197
51	196	201
52	196	197
53	196	208
54	196	220
55	197	197
56	197	197
57	198	198
58	198	203
59	198	207
60	198	207
61	198	207
62	198	198
63	199	210
64	199	210
65	199	210
66	199	220
67	200	203
68	200	203
69	200	208
70	200	221
71	201	206
72	201	208
73	201	211
74	201	206
75	201	208
76	201	211
77	201	208
78	201	209
79	202	213
80	202	213

---

---

81	202	209
82	202	209
83	202	210
84	202	211
85	203	222
86	204	211
87	205	213
88	205	214
89	205	214
90	205	213
91	205	214
92	205	214
93	205	211
94	205	212
95	206	214
96	206	214
97	206	213
98	207	214
99	207	214
100	207	223
101	208	214
102	209	216
103	209	214
104	209	215
105	209	216
106	210	217
107	210	220
108	210	216
109	210	224
110	211	217
111	211	225
112	212	220
113	212	217
114	212	218
115	212	226
116	212	227
117	213	219
118	213	219
119	213	227
120	217	222
121	220	224
122	221	225

---