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Comparing Academic Performance Data of Students in Single-Gender Classrooms: Which Gender Benefits the Most, African-American Males or African-American Females?

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COMPARING ACADEMIC PERFORMANCE DATA OF STUDENTS IN SINGLE-GENDER CLASSROOMS: WHICH GENDER BENEFITS THE MOST, AFRICAN-AMERICAN MALES OR AFRICAN-AMERICAN FEMALES?

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Abstract

COMPARING ACADEMIC PERFORMANCE DATA OF STUDENTS IN SINGLE-GENDER CLASSROOMS: WHICH GENDER BENEFITS THE MOST, AFRICAN-AMERICAN MALES OR AFRICAN-AMERICAN FEMALES? Gore, Daris F., 2019: Dissertation, Gardner-Webb University.

The purpose of this quantitative study was to determine if single-gender settings have a statistically significant effect on African-American male and/or African-American female academic achievement on English assessment from sixth through eighth grade. Social science statistics were used to determine if a statistically significant difference occurred in the performance of African-American males and/or female students in single-gender classrooms compared to African-American male and female students in coed classrooms. A two-way analysis of variance (ANOVA) was conducted to assess if differences exist on a dependent variable (student achievement) by independent variables (instructional setting and gender). A statistically significant difference occurred among girls during sixth through eighth grade (girls in coed environments had higher achievement scores), among males in sixth and seventh grades (males in coed environments had higher achievement scores), and among boys and girls during eighth grade (boys exhibited a higher percentage of proficiency in single-gender contexts than girls in single-gender classrooms). Results suggest that coeducational environments are more academically advantageous for African-American middle school boys and girls, especially during younger years, than single-gender environments. Mean achievement scores increased among single-gender classrooms, according to gender and alongside year length or student age. This suggests that single-gender classrooms may be more academically

advantageous as students age; however, this study suggests additional research to verify the credibility of this suggestion since this study focused primarily on assessing statistical significance, of which none was found in regard to single-gender classrooms being more academically advantageous than coed classrooms.

Keywords: single-gender, African American, quantitative study, academic achievement

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Chapter 1: Introduction

> School efforts to close the gap in academic achievement between ethnic and racial minority students and white students have been largely unsuccessful to date; differences in educational performance persist at all achievement levels, with the gap greatest between students of color and immigrants and their white and Asian American peers at high achievement levels. (Schwartz, 2001, p. 1)

For example, National Center for Education Statistics (NCES, 2016) reported the reading performance of eighth-grade students on the National Assessment for Education Progress (NAEP) assessment. The NAEP assessment is the largest national evaluation measure used to assess what America's students know and can do in reading, science, writing, the arts, civics, economics, geography, history, technology, and engineering literacy. The scores on the NAEP reading assessment range from 0-500 and are grouped into one of four categories: below basic, basic, proficient, or advanced. Below basic indicates that the eighth-grade student did not demonstrate the use of reading concepts and procedures in order to solve problems that are applicable to everyday life. Scale scores which range from 0-242 are categorized as below basic. Students who score below basic did not demonstrate mastery of basic reading concepts. Scores from 243-280 are categorized as basic. A score categorized as basic indicates that the student did demonstrate the use concepts and procedures to solve word problems that can be applied to real-world settings. Scale scores ranging from 281-321 are categorized as proficient. An eighth-grade student who scored proficient on the 2015 NAEP assessment demonstrated the ability to use inductive and deductive reasoning to identify and apply strategies and procedures to solve geometric and algebraic equations. A scale score of

323-500 is categorized as advanced. Students who scored advanced demonstrated the ability to justify solutions, understand hypotheses, draw conclusions for geometric proofs, and solve nonroutine reading problems.

On the 2015 NAEP reading assessment, 24% of all eighth-grade students in the United States scored below basic, 42% scored basic, 31% scored proficient, and only 4% scored advanced; therefore, as documented by data reported by NCES (2016), most eighth-grade students who attend middle schools across the United States are not proficient in reading and only demonstrate mastery of reading concepts at the basic level. Table 1 displays the percentages of eighth-grade students in the country who scored at each proficiency level on the 2015 NAEP reading assessment. The results of the 2015 NAEP reading assessment were not statistically significantly different from results reported by NCES in 2013, 2014, and in 2015. While NCES (2016) reported that most eighth-grade students are not proficient in reading, when reporting the 2015 NAEP reading scores by race, the performance of eighth-grade African-American students was lower than those of all other racially diverse eighth-grade student groups.

Table 1

Percentages of Eighth-Grade Students Who Scored at Each Proficiency Level on the 2015 NAEP Reading Assessment-U.S.

Proficiency Level	Percentages of Students
Below Basic	24
Basic	42
Proficient	31
Advanced	4

Source: NCES (2016).

According to the NCES (2016), when categorizing the 2015 NAEP reading scores for eighth-grade students by race and achievement levels, higher percentages of African-

American eighth-grade students scored below basic and fewer scored either proficient or advanced. For example, in 2015, 13% of Asian/Pacific Islander eighth-grade students scored below basic, 33% scored basic, 44% scored proficient, and 10% scored advanced; therefore, 54% of all Asian/Pacific Islander eighth-grade students scored either at or above proficient. Among American Indian/Alaska Native eighth-grade students, 37% scored below basic, 41% scored basic, 20% scored proficient, and 2% scored advanced. For American Indian/Alaska Native eighth-grade students, 21% scored at or above proficient. Of the Hispanic students, 34% scored below basic, 45% scored basic, 20% scored proficient, and 1% scored advanced; therefore, 21% of all Hispanic eighth-grade students scored at or above proficient in reading in 2015. Among students from two or more races, 21% scored below basic, 41% scored basic, 33% scored proficient, and 5% scored advanced; therefore, among eighth-grade students from two or more races, 38% scored at or above proficient in reading. Also in 2015, 15% of White eighth-grade students scored below basic, 41% scored basic, 39% scored proficient, and 5% scored advanced; therefore, 44% of all White eighth-grade students scored at or above proficient in reading in 2015. Among African-American students, however, 41% scored below basic, 43% scored basic, 15% scored proficient, and 1% scored advanced. Only 16% of all African-American eighth-grade students scored at or above proficient. These data indicate that the highest percentages of African-American eighth-grade students scored below basic. Table 2 displays the percentages of racially diverse student groups who scored at each achievement level.

Table 2

Percentages of Racially Diverse Students Who Scored at Each Achievement Level on the 2015 NAEP Assessment in Reading

Race	Below Basic	Basic	Proficient	Advanced
African American	41	43	15	1
American Indian/Alaska Native	37	41	20	2
Asian/Pacific Islander	13	33	44	10
Hispanic	34	45	20	1
Two or More Races	21	41	33	5
White	15	41	39	5

Source: NCES (2016).

In the state of South Carolina, when categorizing the 2015 NAEP reading scores for eighth-grade students by race and achievement levels, higher percentages of African-American eighth-grade students scored below basic and fewer scored either proficient and advanced. For example, among Hispanic students, 21% scored at or above proficient. Also in 2015, 44% of White eighth-grade students scored at or above proficient in reading; however, among African-American students, 16% scored at or above proficient. These data indicate that the lowest percentages of African-American eighth-grade students scored at or above proficient.

When examining the 2015 NAEP reading scores by gender, across the nation, more males scored at or above proficient in reading than females. Specifically, 33% of eighth-grade males throughout the country scored at or above proficient; however, 29% of females scored at or above proficient, a difference of 4%. In the state of South Carolina, more females scored at or above proficient than males. Specifically, 25% of eighth-grade males throughout the country scored at or above proficient; however, 27% of females scored at or above proficient, a difference of 2%.

The achievement gap is a national crisis impacting students across the nation.

Barton and Coley (2010) suggested each year when the National Assessment of Educational Progress (NAEP) releases "the nation's report card," the front-page news focuses on whether scores are rising or falling and whether the achievement gap is changing. Speculation is rife as to whether any change is some indication of either the success or failure of the No Child Left Behind (NCLB) Act and other efforts in our local-state-federal education system. School reform and educational initiatives have been passed over the past decades to improve student academic performance, which could ultimately achieve the goal to close the achievement gap and provide all students with an equitable education (Barton & Coley, 2010).

Educational initiatives have been subject to many trends in our society. For decades, coeducation, a practice in which boys and girls are educated in the same classroom, has been the norm for kindergarten through 12th grade (K-12) public education in the United States (Datnow & Hubbard, 2016). The creation of gender-based schools is the latest in a series of reforms (e.g., charter schools, vouchers) aimed at providing all American children with a quality education (Rubenstein, 2012). This trend in education changed when some public schools started to experiment with gender-based education, most often in the form of separate mathematics or science classes as a way of bringing more girls into the natural sciences and math (Ceci, Williams, & Barnett, 2009; Feniger, 2015; Kessels & Hannover, 2012).

In the early 1990s, at least 15 states in the United States responded to the call for the improvement of education or to gender equality concerns (American Association of University Women [AAUW], 2011; Hammer, 1996; Noddings, 2011; Thorne, 1993); thus, the United States has seen a dramatic rise in the number of gender-based public

schools and classrooms over the last decade (Weil, 2008; Williams, 2014). According to Sax (2012), 366 public schools in the United States offered gender-based classes or gender-based schools as of November 2011. Prior to 2016, gender-based classes in public schools were generally limited to physical education and sex education classes, but a growing gender gap in performance and achievement has led public schools to reexamine gender-based possibilities (Gurian, Stevens, & Daniels, 2013).

Schools across the United States have implemented successful single-gender programs at the elementary and middle school levels (Gurian & Stevens, 2013). A successful single-gender school is one in which students taking gender-based classes significantly outperform students in non-gender-based classes in academics and behavior. For example, according to Flannery (2016), at Thurgood Marshall Elementary in Seattle, Washington, with a predominately African-American population, 10% of the boys in coeducational classes met state standards, while 66% of the boys in single-gender classrooms achieved that goal. Within the first year, the school's discipline referrals dropped from 30 referrals per day to fewer than two a day. All of these improvements occurred without any additional funds from the state. The program at Thurgood Marshall has now achieved consistently high results for 4 consecutive years (Flannery, 2016). Additionally, at Woodland Elementary in Deland, Florida, 37% of boys passed a state writing test in a coeducational classroom in 2015; however, in an all-boy class, 86% passed that same test (Flannery, 2016).

The issue of gender gaps in mathematics, reading, and science in United States schools has been an ongoing issue in education, with researchers arguing that a gender gap does not exist in these subjects anymore (Robinson & Lubienski, 2014; Rosenthal et

al., 2013). A gap in reading and math scores still exists in lower grades, with boys continuing to outpace girls in math, while girl scores surpass those of the boys in reading (Ellison & Swanson, 2014; Marks, 2012; Rycik, 2012; Saketopoulou, 2011). Middle school administrators began experimenting in the early 1990s with gender-based classrooms in some subjects, typically mathematics, reading, and science (Hammer, 1996). In an urban school district in the southeastern United States, middle school administrators implemented gender-based instruction for the seventh-grade class in science and social studies in the 2002-2003 school year; however, these middle schools transitioned back to the traditional coeducational instructional environment in the 2005-2006 school year. Although there is literature that deals with the benefits of gender-based instruction, there appears to be little or no literature that explains why schools transition from gender-based instruction to traditional coeducational instruction, thus making this a major focus of the study.

Gender-based instruction remains a hotly contested area of education due to the lack of agreement about what constitutes equity in practice (AAUW, 2011; Williams, 2015). Gurian, Henley, and Truman (2010) showed that middle school was a very important time to separate boys and girls for some classes because of the hormonal, developmental, and social difficulties young males and females face during early-to-middle adolescence. There has been much debate about whether boys and girls should be educated in single-gender instructional environments; when in fact, their minds crave to be educated in both educational settings, single-gender and traditional instructional environments (Gurian et al., 2010).

Major international studies, including studies conducted in the United States,

Canada, England, and Australia, have demonstrated that gender-based education can help both boys and girls (AAUW, 1992; Datnow & Hubbard, 2016; Gurian & Stevens, 2013; Spielhagen, 2012). Researchers (Datnow & Hubbard, 2016; Rury, 2012) sought to determine if students placed in gender-based instructional environments produced higher standardized test scores than students who remained in the traditional non-gender-based instructional environments. As a result, educational researchers (Spielhagen, 2012; Streitmatter, 2011) began to examine the effects of gender-based instruction on student success. Gurian and Stevens (2013) found that implementation of gender-based classes was initially driven by the need to improve standardized test scores measuring competency in math, language arts, science, and social studies. This study sought to determine why middle school administrators are transitioning back to a traditional coeducational environment when literature and evidence strongly support gender-based instruction and document its effects on student academic success (AAUW, 2011; Gurian et al., 2010; Gurian & Stevens, 2013; National Association for Single Sex Public Education [NASSPE], 2011; Spielhagen, 2012).

Problem Statement

The school used in this study is located in South Carolina and serves approximately 400 middle and high school students. Approximately 225 of the students are high school students, and the remaining are middle school students. The state school report card indicates that 15% of middle school students scored exemplary, 27.9% of the middle school students scored met, and 57.1% of students scored not met on the English section of the PASS assessment. Various interventions have been implemented to monitor and assess student academic progress and needs before transiting from middle

school to high school; however, the majority of middle school students are not proficient in reading. The most important factor that drove the initial transition to gender-based instructional programs was the growing recognition that there were clear differences in learning in a single-gender environment and that these differences affected the discipline of students in schools, especially in public middle schools (NASSPE, 2016).

Gaps in the Research

Although studies (e.g., AAUW, 2011; Gurian et al., 2010; Spielhagen, 2012) have addressed the effectiveness of gender-based instruction versus non-gender-based instruction, few have sought to explain which gender performs better in the classroom. Research has concertedly directed administrators and teachers to experiment with separate-sex options (Cassen & Kingdon, 2011; Gurian et al., 2010). Researchers proposed single-gender options as the solution to many behavior and academic problems across all grade levels. Researchers have posited that instituting single-gender education would curtail or remove nearly 50% of middle school learning and discipline problems (Gurian et al., 2010).

To gain a better understanding of the significance of gender-based instruction, researching both transitional choices is important to broaden the base of the literature for gender-based instruction; however, in this study, student assessment performance data in single-gender instruction classes were assessed to understand if there is a significant statistical difference in African-American male and female academic performance on standardized assessments over a 3-year period when compared to males and females receiving instruction in a coed classroom environment.

Purpose of Study

The overall purpose of this study was to determine if the type of classroom setting, single-gender, had a statistically significant effect on male and female English achievement of African-American students from sixth through eighth grade. The study examined student academic assessment data in single-gender classrooms to determine if there was a significant statistical difference in performance when comparing males and females in single-gender classrooms compared to males and females receiving English instruction in a coed classroom. To investigate the phenomenon, two factors were considered: (a) African-American male students' English achievement in single-gender classrooms; and (b) African-American female students' English achievement in single-gender classrooms.

Conceptual Base

Theoretical rationales provide support that gender-based schools are more effective academically and developmentally than non-gender-based schools (Datnow & Hubbard, 2016; Skelton, 2014); however, little to no research exists as to the impact of gender-based classroom settings on the performance of African-American students in English. Educational theories view the education of a child as an unfolding process (Sofrioniou, 2016). A child develops as a product of his/her surroundings, and the purpose of the teacher is to provide the necessary educational conditions for the development. The feminist theory, developmental theory, and social theory form the theoretical base for this study.

Feminist Theory

Feminist theory encompasses two different theories. Each theory has a different view significant to this study. The following discussion includes the liberal feminism theory and the social feminist theory. Female students may feel self-conscious, intimidated, shy, or incapable of succeeding when placed in coeducational environments. According to Sadker and Zittleman (2013), the feminist theory acknowledges and has made society more aware of sexism and biases against female students in the school environment.

Feminism refers to the ongoing struggle to free women from centuries of oppression, exploitation, and marginalization in all the vast majority of known human societies (Mama, 2011). Resurgent religiosity has worked against women's academic freedom, as brotherhoods of various creeds dictate the dress styles and demand passivity, silence, and servitude from women students and ensure they are not allowed into leadership positions (Diaw, 2011; Odejide, 2011).

According to Streitmatter (2011), the fact that middle-class professional women tend to have greater economic resources than other groups of women supports the liberal feminism theory. Equality of opportunity for women is the goal, with one outcome being women's assimilation into the world of men, rather than any attempt to accomplish the reverse (Settles, Jellison, & Pratt-Hyatt, 2009; Streitmatter, 2011). Liberal feminism, supported by the National Organization for Women, calls for the eradication of sexism through the assimilation of women into the social and economic mainstream (Lindsey, 1997; Mechtenberg, 2013). The liberal feminism theory is significant to this study because it exercises a woman's right to compete for jobs usually considered jobs for men.

Additionally, the liberal feminist theory is significant to the return of coeducation because it fosters girl participation in classes designed for boys and vice versa. For example, the theory fosters schools allowing girls to participate in shop classes and boys in home economic classes.

A feminist ethic is rooted in a vision of the world in which women are no longer oppressed or subjected to male intimidation (Mama, 2011). Marxism provides the intellectual foundation for the socialist feminist theory. In this theory, the capitalist state fosters the subordination of women by requiring the unpaid and underpaid labor force of women to function (Chhin, Bleeker, & Jacobs, 2012; Sainz, Palmen, & Garcia-Cuesta, 2011; Streitmatter, 2011). As the woman remains under the economic domination of her family, and later her husband, she becomes emotionally dependent. Men's economic and emotional domination of women, supported by the capitalist system, contributes to women's submission and oppression. The socialist theory suggests that to change the social order would require dismantling the capitalist system (James, 2014; Streitmatter, 2011). Lindsey (1997) suggested that women in Latin America made up the largest group of socialist feminists and that the socialist feminism theory was a setback for women. The socialist feminism theory was relevant to this study in that it provided the framework for promoting educational opportunities for women that allow them a choice of a career rather than being oppressed and dependent on men; therefore, placing females in gender-based instructional environments would allow them the opportunity to take on and maintain leadership roles traditionally held by males (i.e., president of clubs and organizations such as SGA). Sadker and Zittleman (2013) became aware of the educational methods that seemed to hinder the future potential for girls. It did not matter

that girls received better grades and high averages on their report cards; they were still sent to finishing schools and the boys were sent to college. Thus, gender-based schools for females and the socialist feminism theory were significant to the study because in gender-based classes, females are prepared for a college education and careers equal to those of males rather than for roles such as housewife and motherhood that defined women's careers more than 50 years ago.

Developmental Theory

Piaget's (1969) theory of cognitive development provided the conceptual framework for considering the role of development in gender-based educational decisions (Cooney, Cross, & Trunk, 1993). Piaget deepened the field's understanding of the experience of childhood, thus making his work important to education. Piaget offered a learning theory based on the idea of readiness. His approach to development did not overemphasize maturation and readiness. Instead, he pointed out that after the first few months of life, maturation is marginal in its effects, whereas experience is essential (Piaget, 1969). Development through different intellectual phases is necessarily coincident with relevant active experience; the child actively promotes, rather than passively enters readiness; and the teacher must endeavor to be a step ahead of any particular level of readiness (Mercer, 2012). Piaget revealed a "natural order or development" (p. 62) of the child and focused on the mental and moral development as well as the physical. Piaget had shown that certain formalization in terms of group-like structures can account for a great number of observable behaviors within a certain stage of development.

According to Piaget (1969), development occurs at all ages by the interaction of

two fundamental processes which he referred to as assimilation and accommodation. Unlike traditional school curricula, Piaget's theory does not focus on the child's accumulating information and skills, for which traditional schools assume the child automatically possesses a framework for understanding. Piaget posited that children acquire knowledge through action upon the environment rather than through the senses from outside sources (Piaget, 1969). The theory of development was relevant to this study in that it deals with the cognitive development of boys and girls and their readiness to mentally, intellectually, and socially interact with each other. According to Piaget, the study of the developing mind means the study of the natural ways in which a biosocial organism grows, learns, and matures. Such study leads to a greater understanding of the ways in which we facilitate the process of development through improvement of current interventions or inventing new ones. If school leaders are to improve the schools, they need to create environments that are more in harmony with the process of development. This goal applies as much to the organization and climate of the school as to the social and intellectual character of classroom life (Piaget, 1969).

Social Theory

A general social theory identifies the categories of persons constructed by the practices of a community and specifies the relations among these categories in terms of power, prestige, and specialized function within the community. Social theory explained the history and function of these categories and relationships, what keeps them going, and how they change; for example, categories formed by gender and class may give way to those formed by conversation and action. According to Power (1996), John Locke assigned the virtues a central role in education because success in both practical and

academic pursuits required an ability to control one's desires and avoid distractions. Locke's educational thought was two dimensional: one dimension, lodged in his psychology, focused on the origin of ideas and the statue of knowledge; the other, based on his perceptions of man's social nature, expressed his attitude on schooling (Power, 1996).

According to Wall (2015), John Dewey stated that human beings naturally seek to express their creative intelligence and that schools should offer the social environment for doing so. Similarly, rather than the school remaining isolated from social life, Dewey advocated it assumes the role to contribute to the transformation to a better social order. He recognized the effect of class barriers and distinctions and argued that schools should foster their elimination (Wall, 2015). According to Palmer (2015), the most effective curriculum for such a school would attend to the present interests of children, not as a motivational strategy but to teach the essential relationship between human knowledge and social experience. Wall stated that Dewey severely criticized public schools for silencing or ignoring student interests and experiences; using artificial language that alienated students; relying excessively on testing to assess student learning; differentiating students according to their presumed ability and gender; and moreover, isolating subjects from one another instead of uniting them around student experience and knowledge (Cassen & Kingdon, 2011; Palmer, 2015; Vekiri, 2012; Wall, 2015). According to Palmer and Wall, Dewey stressed the social and moral nature of the school and believed that the school should serve as a miniature community, an embryonic society, one that actively fosters the growth of the democracy being undermined by urban industrial society. Dewey made it clear that teachers played a crucial role in helping to

link children's interests to sustained intellectual development and to educative experiences; thus, for Dewey, education was the construction and reorganization of experiences that add meaning and increase one's ability to direct the course of subsequence experiences (Palmer, 2015; Wall, 2015).

The writing of Lev Vygotsky, an early 20th century Russian psychologist, exerted a significant influence on the development of social theory in the early years of the 21st century (Daniels, Cole, & Wertsch, 2011). His nondeterministic, nonreductionist account of the formation of the mind provides current theoretical developments with a broadly drawn yet very powerful sketch of the ways in which humans shape and are shaped by social, cultural, and historical conditions (Daniels et al., 2011).

Boys and girls should communicate and interact with each other at some point in their educational careers (Gurian & Stevens, 2013; Vekiri, 2012). The social theory helps to determine the point at which interaction should occur. Even when children are not placed in gender-based classes, girls still primarily interact with girls and boys still primarily interact with boys. The social theory was very significant to this study because it discussed the negative behavioral and educational results of distractions inherent in classroom interactions between boys and girls (Bigler & Liben, 2011; Gurian & Stevens, 2013). Most recent theoretical accounts of gender typing adopt constructivist perspectives (Bigler & Liben, 2011). Consistent with these accounts, a practice was developed based on educational approaches in the Piagetian and Vygotskian traditions that emphasize the importance of active learning strategies. These traditions have been supported by educational research which suggests that learning environments that encourage active participation are more effective for young children than passive learning

environments (Bigler & Liben, 2011; Siegler, 2015).

Research Questions

The following research questions guided the study:

1. To what extent was there a statistically significant difference in the achievement of African-American males receiving single-gender instruction when compared to African-American males receiving instruction in a coed classroom as demonstrated by proficiency on Palmetto Assessment of State Standards (PASS) assessment data in English?
2. To what extent was there a statistically significant difference in the achievement of African-American females receiving single-gender instruction when compared to African-American females receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?
3. To what extent was there a statistically significant difference in the achievement of single-gender education among African-American males and African-American females as demonstrated by proficiency on PASS assessment data?

Professional Significance of the Problem

The debate about the benefits and significance of gender-based instruction and coeducational schooling has been an area of interest of several educational researchers (Ecker, 2012; Gurian & Stevens, 2013; Mael, 1998; NASSPE, 2016; Protheroe, 2009; Spielhagen, 2012; Streitmatter, 2011). While focusing on gender sensitivity and utilizing gender-based instruction within the coeducational context, educators are attempting to

clarify which individuals or target populations benefit most from which type of schooling (Skelton, 2014). In doing so, schools attempt to explicate issues of gender construction; explore the common and different needs of boys and girls; examine potentially limiting expectations and negative behaviors; and celebrate differences, while being sensitive to the developmental needs of each gender (Shah & Conchar, 2013).

Few studies appear to examine motives for transitioning from a gender-based instructional program back to a non-gender-based instructional environment. This study adds to the overall literature on gender-based instruction but, more importantly, fills an existing gap in the literature. As districts evaluate their gender-based programs, this study provides important data and topics of conversation to frame their decisions.

Overview of Methodology

The independent variables were instruction and gender in the study. The dependent variable was PASS assessment data. The population of the longitudinal study was a group of African-American male and female middle school students within a rural district in South Carolina. The researcher included African-American male and female students being taught English in a single-gender classroom. To investigate the research questions, the percentage of students who scored met or exemplary on PASS assessments was compared and analyzed based on student gender.

Definitions of Terms

Coeducation. A traditional type of education where boys and girls are educated in the same setting at the same time (Gurian & Stevens, 2013).

Gender-based instruction. Teaching homogeneous (same sex) classes (Gurian & Stevens, 2013).

Non-gender-based instruction. Teaching heterogeneous (coeducational) classes (Gurian & Stevens, 2013).

Sex/gender. Refers to the biological and social characteristics of being male or female (Gurian & Stevens, 2013).

Traditional instruction. Instructional strategies that have been passed on (Dana & Silva, 2013; Gurian & Stevens, 2013).

Gender gap. The difference between the achievements of boys and girls and the attainments of men and women (Hammer, 1996).

Education Amendments of 1972. No person in the United States shall, on the bias of sex, be excluded from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance (Reese, 2015).

South Carolina PASS (SCPASS) English. SCPASS tests are designed to measure the academic performance of charter and public school students in English/ language arts (ELA), mathematics, science, and social studies (South Carolina Department of Education [SCDOE], 2013).

Limitations

Limitations were used to identify potential weaknesses of the study (Creswell, 2014). The study was based on a small sample of African-American male and female students; its sample size limits generalizability and makes it difficult to replicate. The scores examined in the study are representative only of students from one school. Additionally, the study only focused on participants' PASS English assessment data; therefore, the study did not take into account the impact of single-gender instruction and

achievement in other subject areas.

Delimitations

According to Creswell (2014), delimitation narrows the scope of a study. This study examined only the students' English PASS performance data for 3 years. Another delimitation was the researcher did not have control over the years of experience or the educational level of the teachers who taught the students.

Organization of the Study

Chapter 1 discussed the problem statement; the significance, nature, and purpose of the study; educational theories that supported the study; assumptions; and limitations of the study. Chapter 2 provides a literature review on gender-based instruction focusing primarily on its effectiveness and the pros and cons associated with its implication. Chapter 3 justifies the methodology and explains the nature of data collection for the study. Chapter 4 reveals an analysis of the data collected as well as introduces themes that emerged. Chapter 5 concludes the study and presents recommendations for future studies.

Chapter 2: Literature Review

Overview of the Section

The purpose of this quantitative study was to examine and determine if the type of classroom setting, single-gender, had a statistically significant impact on the English achievement of African-American male or female students. Boys and girls are generally considered to have the same learning capabilities in elementary school; however, in middle school, girls tend to fall behind boys academically in mathematics before eventually catching up to them later (Below, Skinner, Fearrington & Sorrell, 2015). This section provides the framework for understanding the concept of gender-based instruction and how it differs from non-gender-based instruction. The first part of this review describes and defines gender-based and non-gender-based instructional models. The second part compares and contrasts the characteristics of gender-based and non-gender-based instructional environments, discusses the advantages and disadvantages of each instructional model, and notates teacher perceptions of gender-based and non-gender-based instruction in the middle school setting.

Introduction. Educators and other stakeholders have pondered whether boys and girls learn differently. While the apparent differences of boys and girls are obvious, their learning styles could be viewed as a phenomenon to be studied. This concern begs the question whether (a) one gender uses one learning style over another, (b) segregating boys from girls is beneficial from an academic or social basis, and (c) mixing the genders produces unnecessary distractions for boys and girls. Many instructional institutions are turning to an alternative method of instruction, gender-based instruction (NASSPE, 2016). Based on Title IX, the educational amendment that prohibited the separation of

students based on sex, these classroom settings are not permissible in the public school setting; however, in 2012, under a provision of NCLB, came new regulations authorizing single-sex education (NASSPE, 2016). The new amendment provide more flexibility in offering gender-based education in public institutions while also being consistent with the regulations of Title IX. In order to offer gender-based learning environments, institutions must justify their intent by providing a rationale for the implementation of gender-based instruction, providing a non-gender-based class in the same subject, and completing a review process every 2 years (NASSPE, 2011).

NCLB legislation allows public schools to provide gender-based education if school districts believe doing so will help both genders improve school performance (Gurian & Stevens, 2013; Klein, 2012). As a result of this decision, gender-based instruction increased throughout the nation, reaching a total of 241 schools in 2012. Of the schools implementing gender-based instruction, 44 adopted this educational model for all students and classes. The remainder of the schools allowed students the option of gender-based or non-gender-based instruction (NASSPE, 2011). Today, gender-based schools exist mainly in religious schools or elite independent schools (Billger, 2009; Skelton, 2014; Spielhagen, 2012).

According to Tyre (2012), the growing popularity of gender-based classes also gained momentum in other countries, namely New Zealand, the United Kingdom, and Ireland. These countries adopted gender-based instruction after reviewing research conducted in the United States. The United States reported an overall increase in student achievement. After experiencing positive feedback in gender-based instruction, New Zealand, United Kingdom, and Ireland reviewed data and implemented plans to increase

student achievement. They established mechanisms for comprehensive and integrated actions to promote coordination and collaboration among the administrators, teachers, parents, students, and community partners.

In contrast, these countries also experienced negative gender-based instructional experiences. A major barrier to the achievement of quality education was the existence of gender-based violence in and around the schools in New Zealand, United Kingdom, and Ireland (Tyre, 2012). School-related gender-based violence (SRGBV) refers to acts of sexual, physical, or psychological violence inflicted on students in and around schools because of stereotypes and roles or norms attributed to or expected of them because of their gender (George, 2011). Gender stereotypes attributed to boy and girl vulnerability to sexual harassment, rape, coercion, exploitation, and discrimination from teachers, staff, and peers (Kim & Bailey, 2003). These negative experiences result in poor student performance, irregular attendance, dropout, truancy, and low self-esteem. To rectify this violent behavior, these countries put in place mechanisms for a safe and effective reporting of, and response to, incidents of gender- based violence. Additionally, they trained relevant personnel within the education system and implemented gender transformative teaching and learning mechanisms.

Steedman (1985) conducted an ethnographic study that examined the effects of both gender-based and non-gender-based schools on secondary school students in Britain. The results suggested that in general, boys outperformed girls on educational outcomes in chemistry, physics, and mathematics, while girls did better than the boys in English, French, and biological sciences; however, the results also indicated that both boys and girls in gender-based settings performed better in most subjects than their peers in non-

gender-based schools. A study in Australia (Rowe, 1988) examined the effects of both gender-based and non-gender-based schools on middle school students. Although the results showed no vast differences by gender, they did show that students in gender-based classes indicated greater levels of confidence in mathematics. Further, girls who moved from gender-based to non-gender-based mathematics classes showed a decline in their confidence and their mathematical performance. Similar studies conducted by NASSPE (2011) also reported that boys were more likely to enroll and excel in higher level science and mathematics courses, while girls excelled in upper level reading and language arts courses.

Theoretical Framework

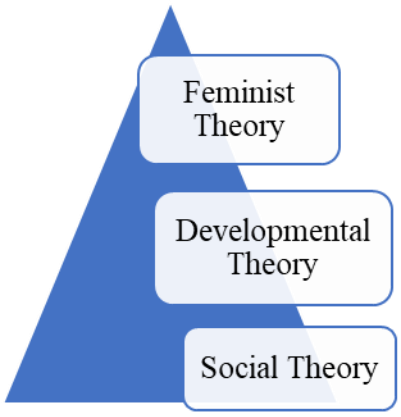

Figure 1. Theoretical Framework Overview for Gender-Based Instruction.

Figure 1 shows three theories that comprise the theoretical framework for this study. Theoretical rationales provide support that gender-based schools are more effective academically and developmentally than non-gender-based schools (Datnow & Hubbard, 2016; Skelton, 2014). The theoretical framework consists of the feminist theory, development theory, and social theory, which collectively support gender-based

instruction. According to Sadker and Zittleman (2013), the feminist theory acknowledges and has made society more aware of sexism and biases against female students in the school environment. Piaget (1969) stated that the goal (development theory) applied as much to the organization and climate of the school as to the social and intellectual character of classroom life. The social theory was very significant because it discussed the negative behavioral and educational results of distraction inherent in classroom interactions between boys and girls (Bigler & Liben, 2011; Gurian & Stevens, 2013).

Non-Gender-Based and Gender-Based Instructional Environments

A non-gender-based instructional environment contains both genders (males and females) in one educational space. There is no separation of the genders, and all instruction is given in a general environment that tries to enhance the learning of both genders through differentiated learning strategies and methods. This type of instructional environment has a global view of the realities of life which reflects real-world experiences of working and coexisting with the opposite gender (Rubenstein, 2012). In life, the workforce is not separated by gender. Most people work in an environment that has a combination of gender, nationalities, and cultures.

On the contrary, a gender-based instructional environment is formed through the separation of gender: male or female. The instructional environment may take the form of a single-gender class, consisting of either males or females within a coeducational school setting or a single-gender school (Bradley, 2015). Gender-based schools are the latest school reform aimed at providing students with an equal and quality education (Feniger, 2015).

Gender-based and non-gender-based schools provide structure that is conducive to learning (Datnow & Hubbard, 2002; Mastekaasa & Smeby, 2012; Wood, 2012); therefore, in order for gender-based and non-gender-based schools to be successful and impact student performance, students, administrators, parents, and other stakeholders must buy into and support the concept at each stage of the planning and implementation process.

In a gender-based school, the selection of teachers, professional development, and training for teachers and administrators on gender-based instruction are important factors. If this is a new implementation or a reimplementation of this type of instructional model, all parties involved must be a part of the planning and implementation process (Tyre, 2012). Although non-gender-based schools require just as much planning as gender-based schools, it is not as complicated as the implementation of a gender-based school. Most schools are non-gender-based instructional environments; therefore, collegiate students majoring in education are being trained to teach in non-gender-based educational environments. They are being equipped with the tools, training, and strategies for non-gender-based schools (Lloyd, 2016).

History of Single-Gender Education

In the late 1960s and early 1970s, some United States students were separated by gender on a daily basis. The purpose for separating the girls from the boys varied. For example, girls were enrolled in home economics, while boys were enrolled in auto mechanics or agricultural classes. These classes separated by gender were designed to help prepare students for jobs as adults. In physical education and sex education classes, boys and girls were separated even though the curriculum was the same. The rationale

for separating students by gender was due to their individual abilities, characteristics, and social and personal functioning (Pollard, 1999).

Before the 1980s, many public K-12 schools saw the value of single-gender education (Pollard, 1999); however, with the inception of Title IX, many of the public schools did away with single-gender education. Now, with the implementation of NCLB, there is increased interest in single-gender education. As of January 2016, there were 518 public schools offering single-sex educational opportunities. According to NASSPE (2016), 95 of the 518 schools qualified as single-gender schools. In these schools, students have lunch and classes with either all boy or all girl students.

United States schools were segregated until the 20th century due to the notion that girls and boys should be educated to fulfill their individual roles as adults in society (Resnick, 2012). Girls were educated at home, in colonial times, to establish domestic skills and spiritual education. During this same period, only boys were allowed to be educated outside of the home. As democracy spread throughout the colonies, opportunities slowly opened up for educating girls. During the early 1800s, women were viewed as the primary caregiver and educator in the home. Since children were viewed as the nation's future and women the primary educators, it became necessary to educate women. Schools opened to accommodate girl interests in education (Resnick, 2012).

Economic needs surpassed societal opinions in the early 1900s. Schools became coeducational in an effort to save money and combine resources (Resnick, 2012). By culture, the movement of coeducational or public schools was fueled to enrich their quality of being and keeping intact their value system through the constructs of coeducation. There were many debates surrounding coeducational schools because

affluent parents did not want their daughters going to school with boys who were not of their socioeconomic status or ethnic background (Resnick, 2012). In the progressive era, 1890 to 1914, coeducational schools tracked girls and boys in vocational training classes. Tracking was used to reduce the dropout rate among boys and at the same time protect girls' place in society. Boys were enrolled in woodshop, auto mechanics, and industrial arts; while girls were enrolled in home economics and secretarial training. Coeducation prepared them for their individual roles in society–boys to be the breadwinners and girls to be the caregivers. Since coeducation was an economic decision and not a pedagogical strategy, little attention was given to how to provide equal educational opportunities for girls and boys (Datnow, Hubbard, & Woody, 2001).

Rationale for Single-Gender Education

Although single-gender education existed in the private and parochial sectors, public schools experimented with single-gender education (Riordan, 2002). Many experimented with some method of separating the sexes in math and science. Public schools experimented in Baltimore, Detroit, and Milwaukee with Afrocentric academies for boys. The Young Women's Leadership Schools were implemented for girls in Harlem and Chicago. In California, the highest example of the government's role in the creation of single-gender public schools was the single-gender legislation. Pollard (1999) identified three goals that represent a distinct departure from earlier rationales for single-gender education:

1. Enhance the academic achievement of girls in specific content areas.
2. Support classroom social organization.
3. Provide mechanisms for formal and informal socialization within a specific

cultural content.

The first goal of single-gender education is to increase the academic achievement of girls in subject areas–speaks to the documentation of gender bias in coeducational classrooms. The second goal of single-gender education is to support classroom social organization–speaks to "the socialization of gender within our schools assuring that girls are made aware that they are unequal to boys" (Chapman, 2012). The third goal of single-gender education is to provide mechanisms for social and culturally appropriate learning and teaching styles. The desire to help classroom social organization or to control the classroom or discipline was part of the argument for coeducation (Chapman, 2012). It is fascinating to note that the argument that placed girls in coeducational classes to manage boys' aggressive behavior is now being used to minimize distractions and peer pressure in single-gender classes. One of the most frequent goals of single-gender academies is to reduce distraction (Davis, 2005).

Research is the 1980s sparked debates of whether women learned differently than men and justified the need for all-girl schools. Tidball's (1973) analysis of graduates who were successful fueled assumptions that men and women needed their own learning space. The assumption made was that girls and women have different learning needs from boys and men, which renewed an interest in single-gender education at the college level.

Legal Status of Single-Gender Education

The U.S. Department of Education published new regulations on October 25, 2012 to regulate single-gender education in public schools. The provisions under NCLB sections 5131(a)(23) and 5131(c) paved the way for coeducational elementary and

secondary schools to provide single-gender classrooms legally. According to NASSPE (2016), NCLB legalized single-gender education in public schools if administrators perform the following:

1. Provide a rationale for offering a single-gender class in a particular subject.
2. Provide an educational class in the same subject and geographically accessible location.
3. Conduct a review every 2 years to determine whether single-gender classes are still necessary to remedy whatever inequity prompted the school to offer the single-gender class in the first place.

These new regulations cleared up the confusion surrounding the legal status of single-gender schools. Incentives were given to some school districts to develop single-gender schools instead of single-gender classes because they are exempt from the provisions under NCLB. Public single-gender schools do not have to provide a rationale for offering single-gender classes or conduct a review every 2 years. Public single-gender schools do, however, have to provide equal courses, services, and facilities at another location or within the same building. Other schools can be coeducational or single gender. Charter schools are exempt from the requirements to provide a rationale for single-gender classes, offering equivalent courses, or conducting a periodic review (NASSPE, 2016).

The Effectiveness of Single-Gender Schools

Single-gender schools are more successful academically and developmentally than coeducation schools, especially for at-risk and minority students (Brighter Choice Charter School, 2002). Research that has been done on single-sex education is in the

private sector and focuses on all-girl schools. There have been no systematic reviews of the relative effects of single-gender and coeducational schools or classrooms.

There were two comprehensive reviews of research. The first study was conducted by Moore, Piper, and Schaefer (1992) for a U.S. Department report which concluded that "There is sufficient evidence to support the proposition that single-sex schools may produce positive outcomes for young women and countervailing evidence to reject the proposition is not sufficiently convincing" (p. 42). The second study by Mael (1998) concluded, "That the predominance of research certainly shows a role for single-sex schools (as an option if not the norm)" (p. 121). Riordan (1990) argued that the research is "exceedingly persuasive" (p. 13) in demonstrating that single-sex schools are effective in terms of providing both greater equality and greater achievement, especially for low income and working-class students, most especially for African-American and Hispanic-American boys and girls.

Riordan (1990) believed that data are both reliable and persistent when several specifications are made. Riordan's (1990) argument was centered on the notion of an academic culture that is endemic to single-sex schools. Riordan's (1990) conclusions were drawn on research that was completed in the private sector. When comparing single-sex schools to coeducational schools, Riordan (1990) noted that it was insignificant for the middle class and advantaged students. The consequences are significant for students who are historically disadvantage and at risk.

Single-sex schools work to improve student achievement (Lee & Bryk, 1986). When students enrolled in single-sex schools are compared to coeducational schools, it has been shown that they have higher performance outcomes on standardized tests in

math, reading, and civics. Students in single-sex schools have higher levels of leadership behavior in school and do more homework. They also have favorable attitudes towards school. Students in single-gender schools are more prone to take heavier course loads and have higher educational expectations and less sex-role stereotyping. Single-sex schools have higher levels of discipline and order and have a better social life than coeducational schools do.

Lee and Bryk (1986) identified several rationales to support why single-sex schools are more successful academically and developmentally than coeducational schools, especially for students who are at risk. The rationales for positive effects of single-sex schools are as follows.

1. The diminished strength of youth culture values.
2. Greater degree of order and control.
3. The provision of more successful role models.
4. A reduction of sex differences in curriculum and opportunities.
5. A reduction of sex bias in teacher student interaction,
6. A reduction of sex stereotypes in peer interaction.
7. The provision of a greater number of leadership opportunities.
8. Single-gender schools require a proacademic parent/student choice.
9. Small school size.
10. A core curriculum emphasizing academic subjects taken by all students (organization of the curriculum).
11. Positive relationships among teachers, parents, and students that lead to a shared values community with the emphasis on academics and school social

organization.

12. Active constructivist teaching and learning (organization of instruction).

Single-gender schools are places where students can learn. According to Riordan (2002), single-sex schools offer more successful same-gender teacher-student role models, more leadership opportunities, greater order, and fewer distractions. The option of attending a single-sex school is a proacademic choice. Girls gain more because of the significant reductions in gender bias in both teaching and peer interactions; however, it may be different for African-American boys.

Pros of Single-Gender Education

Single-gender education has been around a long time in the private and public sector. The question is what are the merits and drawbacks for offering such a program for at-risk students. Some studies show single-gender education is beneficial, and other studies report that it is not. It has been strongly stated that single-gender education is more beneficial to girls than it is to boys.

Riordan (1999) concluded that single-gender schools help improve student achievement, particularly for disadvantaged children. Riordan (1999) also stated that fewer social problems and improved discipline will carry over into their adult lives. Lee and Bryk (1986) studied 1,807 students in Catholic high schools and found that the students in single-gender schools significantly outperformed students in coeducational schools. Single-gender schools work to improve student achievement (Lee & Bryk, 1986).

In 2000, Thurgood Marshall Elementary School in Seattle, Washington, was changed from traditional coeducational classrooms to single-gender classrooms

(NASSPE, 2016). They reported a decrease in discipline referrals from approximately 30 referrals a day to approximately two a day. In 1 year, the boys went from being in the 10-30% performance level on the Washington Assessment of Student Learning to 73%, from a 20% reading average to 66%, and from a 20% in writing to 53%.

Cons of Single-Gender Education

Although, there are researchers who support single-gender schools and classrooms, there are critics who do not support single-gender schools. Sax (2005) stated that educators should be more cautious and more concerned about the possibility that single-sex education might reinforce negative stereotypes. Sax (2005) also stated that even though there have been success stories of improvement in neighborhood schools, not all schools achieve satisfactory results when they venture into single-gender education. The National Organization for Women (2016) opposes the segregation of girls and boys in single-sex schools or classrooms. The organization stated that studies show that all-male schools increase sexism and exacerbate feelings of superiority toward women.

Single-Gender Education in Public Schools

Title IX closed many doors of schools that offered single-gender education, but recent legislation has brought back to life single-gender education. The use of single-gender education has gained attention in middle schools. According to Ferrara (2005), "No one disputes that middle school education is a critical time when students are in transition" (p. 2) from elementary to middle school. Educators know that the needs of middle school students differ from elementary and high school students (Ecker, 2012; Tomlinson, Moon, & Callahan, 1998). During the middle school years, students change

emotionally, physically, and intellectually faster than any other time in their lives.

Students' middle school experience should include increases in confidence and academic success. According to Ferrara (2005), this growth needs to be structured with opportunities for choice and designed with an accountability plan. As stated by Ecker (2012), a school district's curriculum team can explore what is working and what needs to be changed in order to promote effective learning.

During their middle school experiences, students are faced with standardized tests in reading, ELA, mathematics, science, and social studies. Single-gender classes were implemented so both boys and girls could understand and achieve academic success, but separately. Sax (2005), the founder of NASSPE, stated that boys and girls learn differently and that single-gender education is the best choice to maximize learning.

Gurian et al. (2013) stated that at least half of middle school learning and discipline problems would be removed if schools were single-gender institutions. Gurian et al. (2013) further stated that in single-gender classes, competition between boys and girls is avoided and many psychosocial stresses, especially culturally imposed ones, are removed. In some cases, test scores and grades improved in single-gender classrooms and groupings. Students are less distracted in single-gender classes than in coeducational classes. Teachers report fewer disciplinary referrals, and girls are participating more in class.

Single-gender education has been implemented in school districts in which at-risk students were not academically successful. As a means, single-gender education is viewed to meet the needs of at-risk students (Hubbard & Datnow, 2013). Hubbard and Datnow (2013) conducted a 2-year ethnographic study of poor and minority students who

attended single-gender academies in California. Their study noted that improving academic achievement of poor minority students was more than just separating the students by their gender. The schools were successful because of the "school's organizational characteristics, positive student teacher relationships and ample resources" (Hubbard & Datnow, 2013, p. 115).

Hubbard and Datnow's (2013) research focused on the daily interactions between teachers and students. Their interviews with students, parents, teachers, and district officials revealed that the single-gender schools were successful because they provided systems of social support that addressed the needs of low-income, minority students. According to Hubbard and Datnow, "The rich resources made possible by generous state funding and strong, positive bonds forged between students and teachers in their everyday interactions played key roles as well" (p. 118). They contended that these three factors accounted for the schools' ability to maintain effective learning experiences for low-income and minority students who participated in the study.

The study took place in a 2-year period from 1998 to 2000 (Hubbard & Datnow, 2013). There were six single-gender academies, but they only reported on three of the schools because they served large populations of low-income, minority boys and girls who were challenged by limited English proficiency, poverty, race, discrimination, and geographical location. The schools' names were changed to Evergreen Elementary, Pine Middle School, and Palm High School. They conducted approximately 300 interviews at the schools. The student population at Evergreen was 60 students. Pine's population was approximately 140 students. Palm's population was 90 students. Hubbard and Datnow (2013) conducted focus groups with students in Grades 5, 6, 7, and 8. The focus groups

were conducted two to three times at each school site during the study.

Evergreen Elementary School was located in a small, rural town located in northern California and served students K through eighth grades. The communities gained their wealth from small farms and loggings. The small farms and loggings have disappeared, leaving the community without an economic base. The ethnic makeup of the students at this school was 50% European American, 37% Latino, and 10% Native American. Most of the students' test scores were 1.5 grade levels behind the national average (Hubbard & Datnow, 2013).

Pine Middle School was located in a predominately poor, ethnic minority school district in an urban area in northern California. It had approximately 140 students in Grades 5-8. The student population was 46% Latino, 38% African American, and 16% Pacific Islander. The school's low-income community had high records of unemployment, mobility, and crime. Approximately 50% of the students in the district were identified as limited English proficient. Most of the students received free or reduced-price lunches and had limited resources to medical and dental care. The school district had a high teenage pregnancy rate, and most of the households were headed by single parents. Mostly African-American boys and Latino boys were referred to the academy by the school district's teachers and administrators because of their poor academic performance, excessive absences, discipline problems, unresolved health, and human service needs (Hubbard & Datnow, 2013).

Palm High School was located in an urban area in southern California. As an alternative school, it served 90 students in Grades 7-12. The school's population was 45% European American, 39% Latino, 12% African American, and 2% Asian American.

Several of the students came from homes with a history of truancy, gang violence, substance abuse, and other forms of criminal behaviors.

According to Hubbard and Datnow (2013), "The students in this study generally were academically underachieving and in some cases two grade levels behind" (p. 121). Most of the students were tracked into general and remedial classes where teachers had low expectations of them. Low expectations and other factors contributed to excessive absences and in some cases students dropping out of school for a short time. Hubbard and Datnow reported that a major benefit for single-gender academies was "the ability to create an academic environment that eliminated distractions from the opposite sex" (p. 121). The elimination of distractions helped the students to be more focused academically in single-gender classes than coeducational classes. Since the students were separated during class time, they were not able to engage in the attention-getting antics that prevailed in coed classes. They also reported that the girls did not experience any harassment from the boys because of the separation.

The single-gender academies' "organizational alignment spared students the distractions and negative aspects associated with coeducational schools" (Hubbard & Datnow, 2013, p. 122). The single-gender academies had small class sizes, equal access to curriculum resources, and opportunities for enriching social and educational experiences supported by the state. Caring teachers worked closely with students to guide them to progress academically, socially, and morally. Teachers reported that students needed sound advice, and this situation was the best way to address concerns. Hubbard and Datnow (2013) concluded that successful outcomes relied heavily on the personal attention offered by some of the teachers. The teachers were able to meet the

needs of the students better than the schools that referred them to the single-gender academies. They found "three important, interrelated conditions that contributed to the positive experiences of low income and minority students: the single-gender setting, financial support from the state, and the presence of caring proactive teachers" (Hubbard & Datnow, 2013, pp. 127-128).

Madigan (2002) completed a study in which the experiences of Latino and African-American exceptional education students in single-gender and coeducational classes were described. Madigan reported that the single-gender classes had better attendance and better grade point averages. Students revealed that they did not feel threatened to ask questions or participate, whereas in the coeducational classes, girls were afraid to ask questions in danger of being made fun of by the boys.

Advantages and Disadvantages of Gender-Based Instruction

For many years, sociological and historical literature included the advantages and disadvantages of gender-based instruction versus non-gender-based instruction; thus, summarizing the research to date on this issue presents a challenge (Datnow & Hubbard, 2002). According to Gurian and Stevens (2013), the implementation of gender-based instruction led to many advantages for both girls and boys. Gurian and Stevens reported that gender-based instruction limits distractions from the opposite gender, improves academic performance, and provides freedom for students to be themselves without feeling like they have to impress the opposite gender.

On the contrary, several disadvantages of gender-based instruction caused legitimate concerns for both boys and girls (Bradley, 2015). For example, boys and girls separated in their classrooms would miss socialization opportunities to prepare them to

build successful relationships in the future (Gurian & Stevens, 2013). Critics of girl schools claimed that an all-female environment was not the real world and that girls taught in isolation from boys would not be able to work with the opposite sex in the workplace (Novotney, 2011). Much emphasis has been placed on providing women equal access to the same jobs and pay as men. Students in gender-based learning environments miss out on indirect opportunities to learn teamwork and cooperation in a mixed-gender work environment. Additionally, it limits the ability of boys and girls to learn the process of coexisting equally (Klein, 2012). This limitation prevents students from learning in a real-world atmosphere and interferes with the development of social skills (Gurian & Stevens, 2013). Some schools try to make up for this by allowing students to take nonacademic subjects in a non-gender-based educational setting; thus, working cooperatively in an academic environment with the opposite gender is essential to healthy development.

Advantages for girls. One advantage for girls in a gender-based educational environment is that girls are more likely to explore nontraditional subjects. Single-sex classrooms encourage girls to be daring by enrolling in classes they might not have otherwise taken (Coniglio, 2015). An additional advantage for girls is they would apply for more leadership roles in class, clubs, and student government. Girls would then run for higher offices such as president and vice president versus recording secretary or treasurer. Some girls feel at ease in expressing themselves without the pressure of male judgment. In an all-female setting, girls can speak freely without the fear of being ridiculed by boys for giving a wrong response during a lesson. This form of educational instruction builds up the female confidence and allows them to ask questions without fear

of getting laughed at or ridiculed by males in the class (Gurian & Stevens, 2013).

Advantages for boys. Just as single-gender all-female classes offer girls advantages in instruction, so do single-gender all-male classes offer advantages to boys. In 2012, the results of a 4-year study showed only 55% of boys in a coed classroom were proficient on the Florida Comprehensive Assessment Test (FCAT), while 85% of the boys in the single-gender classroom scored a proficient grade (Klein, 2012). One significant advantage to an all-male gender-based instructional environment is achievement scores in the area of reading comprehension. In every age group, boys scored lower than girls annually for more than 3 decades on U.S. Department of Education reading tests (NASSPE, 2016).

Reading and language skills are often more difficult concepts for many males to obtain (Coniglio, 2015); therefore, an additional advantage for boys in an all-male educational setting is boys observe other boys reading without the fear of feeling inadequate to a female reader. Boys will have the opportunity to read anything that interests them and be allowed movement during reading and the opportunity to listen to books on tape to improve their reading skills (Bradley, 2015). While such an opportunity was available in any educational environment, this strategy was done without distractions from the female counterpart in the learning environment. Separating boys from girls improved their attention spans because girls were not a distraction (Tyre, 2012). Discipline problems such as arguments and fighting for a female's attention are reduced, and clear expectations can be achieved in a timely manner without the males getting easily off task because of socializing with a female (Gurian & Stevens, 2013). The gender-based environment allows boys the latitude to take classes that boys in non-

gender-based schools often considered “too girlie,” such as home economics, fashion design, and typing (Goodkind, 2009). The all-boy environment encouraged boys to participate in activities that defy gender stereotypes (Gurian & Stevens, 2013). For example, boys were more willing to participate in all types of elective classes without fear of embarrassment from other boys (Goodkind, 2009; Tyre, 2012).

The effect of gender stereotyping is one disadvantage when separating boys and girls in the classroom. Conley (2011) contended, “there is evidence that segregation increases gender stereotyping and legitimizes institutional sexism” (p. 7). Leman (2015) suggested that students are strongly affected when their surrounding environment makes gender divisions explicit. The students noticed that their learning environments included the same type of people from the same types of backgrounds. Leman stated the effects are likely to have a profound impact on the kinds of learning experiences and personal and work relationships they may have later in life.

According to Klein (2012), students become isolated from understanding and gaining exposure to other perspectives and experiences within relationships with others. In a single-gender classroom, students lack the opportunity to know how the opposite sex behaves and responds in different situations. This lack of experience might be a disadvantage for students who do not have adequate social skills or outside opportunities to broaden their social experiences. In addition, students may not learn what behaviors are acceptable when interacting with the opposite sex (Akers, 2013).

The lack of ethnic and socioeconomic diversity a gender-based classroom creates may set students up for failure in future social situations (Klein, 2012). For example, students educated in single-gender classrooms may experience difficulty interacting with

people not from the same ethnic and socioeconomic background as them. Student knowledge of social cues and effective relationship building skills comes through firsthand experience. If students are taught in gender-based classrooms, this knowledge may not be in their repertoire when interacting with the opposite sex and people from different ethnic and socioeconomic backgrounds. Students educated in gender-based classrooms may experience issues with adjusting to non-gender-based educational environments (Akers, 2013). The students in this study are in middle school. As they move into high school and postsecondary education or the workforce, they will be placed in education and workplace settings that require expertise in interacting with the opposite sex.

Advantages and Disadvantages of Non-Gender-Based Instruction

Although there are many studies that promote the positives of non-gender-based instruction, there are some disadvantages to the process of educating students in this type of educational environment. An advantage of non-gender-based instructional environments is that they provide students with social skills that extend outside of the educational structure (Conley, 2011). Knowledge of social and relationship skills comes through experiences interacting with the opposite sex. Students educated in non-gender-based classrooms experience these social skills that prepare them to work in non-gender-based environments such the work place (Akers, 2013). Additionally, Akers (2013) stated that non-gender-based education encourages students to explore their personal interests without feeling constrained by gender roles and stereotypes.

On the contrary, there are very few disadvantages for non-gender-based education (Novotney, 2011). The most common disadvantages noted are discipline and student

behavior. Research states that in non-gender-based instructional environments, students, boys and girls, tend to act out more (Gurian & Stevens, 2013). The students feel the need to impress one another when in a non-gender-based class. Although it is important to allow students the time to socialize, most of the students create more disruptions when they are allowed time to communicate and socialize with the opposite gender (Akers, 2013).

Summary and Transition

Despite the many years of gender-based instruction in the United States in exclusive, private settings, there appears to be no consensus as to whether or not such education is beneficial for students enrolled in public schools (Billger, 2009; Shah & Conchar, 2013; Spielhagen, 2012). In the past 2 decades, there has been interest in gender-based public education (Gurian & Stevens, 2013). Research does not substantiate whether gender-based instruction is preferred over the non-gender-based model. The following research questions guided the study:

1. To what extent was there a statistically significant difference in the achievement of African-American males receiving single-gender instruction when compared to African-American males receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?
2. To what extent was there a statistically significant difference in the achievement of African-American females receiving single-gender instruction when compared to African-American females receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in

English?

3. To what extent was there a statistically significant difference in the achievement of single-gender education among African-American males and African-American females as demonstrated by proficiency on PASS assessment data?

The information addressed in the literature on gender-based and non-gender-based instruction provided the basis for this study. The single-gender instructional model provides benefits and barriers for implementation. Ultimately, educational stakeholders will determine if the single-gender instructional model best serves their learner. Chapter 3 presents the research design for this study.

Chapter 3: Methodology

In recent years, there has been a growing interest across the U.S. in gender-based education, both from the educational policy perspective and as a practical matter of instruction. As a result, over the last decade, education scholars have observed a substantial increase in the number of gender-based public schools and classrooms (Weil, 2008; Williams, 2014). Prior to 2016, gender-based classes in public schools were generally limited to physical education and sex education, but persistent and growing gender disparities in performance and scholastic achievement have led public schools to experiment more boldly with gender-based instruction (Gurian et al., 2013).

According to some recent reports, many schools across the nation have implemented successful single-gender programs at the elementary and middle school levels (Gurian & Stevens, 2013). The underlying policy assumption here is that a successful single-gender school is one in which students taking gender-based classes significantly outperform students in non-gender-based classes in academics and behavior; however, despite the many years of gender-based instruction in the U.S. in exclusive, predominantly private settings, currently there is no consensus among education researchers and educators in the field on whether gender-based instruction is in fact beneficial for students enrolled in public schools. Although the interest in gender-based education has constantly grown and more locales have implemented such an approach, extant empirical research on the issue of comparative effectiveness of gender-based education remained scarce. Surprisingly, there are very few empirical studies that have quantitatively evaluated the effectiveness of gender-based education.

This chapter presents the purpose of the study; discusses its methodological

approach and specific research design utilized; presents research questions and the associated hypotheses; describes the study population; delineates the sample used; expounds on data collection and data analyses, including instrumentation and research procedures; and finally, discusses measures used to assure the ethics of research.

Purpose

Given the remaining substantial lacunae in the current scholarly understanding of the comparative effectiveness of gender-based education and the paucity of empirical research on this important topic, this study compared quantitative means – the academic achievement levels of African-American males and females taught in a single-gender public classroom to African-American males and females who received instruction in a coed public classroom. Additionally, the researcher determined if a statistically significant difference occurred between male and female academic achievement performance taught in single-gender classrooms.

Research design. The study utilized a retrospective, correlational, and cross-sectional quantitative research design with multiple between-group comparisons and fixed effects. No variables in the study were manipulated.

A retrospective research design examined variables and relationships between them after the phenomenon under investigation had already occurred and its effects were measurable or observable (Knowlton & Phillips, 2013). In turn, correlational designs investigated the relationships between multiple variables without trying to ascertain causation, merely the degree of association or strength of correlation (Knowlton & Phillips, 2013); therefore, several key assumptions underlined the research design: (a) the extent to which the researcher can manipulate variables was limited or nonexistent; (b)

the goal of the research design was to quantitatively establish whether there are any statistically significant differences between the comparison groups; and (3) the effect of the phenomenon under investigation (i.e., instructional use of either gender-based or non-gender-based education) was measured directly.

The rationale for selection of the retrospective, correlational, and cross-sectional quantitative research design was twofold. First, given the nature of the research questions in the study, the other three quantitative research designs (descriptive, quasi-experimental and experimental) were inappropriate, because the purpose of the study was to investigate the relationship between gender-based education and scholastic performance of students, not make descriptive observations or test for causality for either suboptimal (quasi-experimental) or optimal (experimental) variable control. Second, it would be impossible to manipulate the dependent variable in the study (Aneshensel, 2013).

Research Questions

The results of the literature review and the remaining gaps in the current knowledge guided the development of the following research questions:

1. To what extent was there a statistically significant difference in the achievement of African-American males receiving single-gender instruction when compared to African-American males receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?
2. To what extent was there a statistically significant difference in the achievement of African-American females receiving single-gender instruction

when compared to African-American females receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?

3. To what extent was there a statistically significant difference in the achievement of single-gender education among African-American males and African-American females as demonstrated by proficiency on PASS assessment data?

Hypotheses

Based on these research questions and the research design, the following hypotheses were statistically tested:

H_1: There was a statistically significant difference in the percentage of African-American male students demonstrating proficiency on the PASS assessment in single-gender classrooms compared to African-American males who receive coed instruction.

H_0: There was a no statistically significant difference in the percentage of African-American male students demonstrating proficiency on the PASS assessment in single-gender classrooms compared to African-American males who receive coed instruction.

H_2: There was a statistically significant difference in the percentage of African-American female students demonstrating proficiency on the PASS assessment in single-gender classrooms compared to African-American female students who receive coed instruction.

H_0: There was no statistically significant difference in the percentage of

African-American female students demonstrating proficiency on the PASS assessment in single-gender classrooms compared to African-American female students who receive coed instruction.

H_3: African-American males do statistically benefit the most from single-gender education as demonstrated by proficiency on PASS assessment.

H_0: African-American males do not statistically benefit the most from single-gender education as demonstrated by proficiency on PASS assessment.

Population

For the purposes of the study, the research population was defined as African-American male and female public middle school students attending Grades 6-8 in the state of South Carolina. The study site was a small rural school located in a small southern town in the southeastern United States. The school consisted of approximately 400 students in Grades 6-12.

Sample

The research participants were drawn using a purposeful convenience sample with the following criteria: (a) African American, (b) attended the public school in the study, and (c) received either gender-based or coed instruction within this school. To achieve a testing group, a sample of at least 30 research participants were randomly selected. Also, measures were taken to draw a balanced sample in terms of gender and type of instruction to eliminate any selection biases and resultant collinearity effects.

Once the research sample was drawn, two comparison groups, coed and single-gender, were formed by the researcher using randomization. The coed classroom consisted of a total of 15 students (nine females and six males). The single-gender male class consisted of 17 males, and the single-gender female class consisted of 13 students.

For a more realistic comparison of student data, six males from the single-gender class were randomly selected, and nine females from the single-gender class were randomly selected for the research study. A letter of consent was obtained from the school district to utilize student archived PASS English assessment data in the study (see Appendix).

Variables

The first independent variable in the study was the type of instruction. The second independent variable in the study was gender. The dependent variable in the study was scholastic performance. This was a continuous variable that would be measured by PASS scores in English.

Data Collection

Materials. In accordance with South Carolina policies, all middle school students were assessed with the use of a standardized assessment called SCPASS to measure student growth at the end of each school year. At the onset of the study, PASS was the South Carolina state standardized test administered in Grades 3-8 in English, social studies, math, and science.

The standardized assessment measured student progress and categorized performance as not met, met, and exemplary. Student progress was tracked each year to show an increase or decrease in academic performance. Students scoring not met on the assessments were provided additional reinforcement to improve reading skills such as decoding and/or text reading efficient. Reading interventions implemented in single-gender and coed classroom instruction in the study included (a) whole group instruction, (b) differentiated instruction in small groups, (c) school-wide benchmark assessment, and (4) independent reading.

Instrumentation. Past performance data were collected on the reading sections of the English SCPASS for each student in the research sample. The standardized assessment adopted by South Carolina, as an approved performance indicator, was used only as a reference for literacy gains according to this state. The data from this database were used to analyze literacy growth. Quantitative data were used to conduct both descriptive and inferential analyses.

Procedures. The following procedures were used to guide data collection in the field of research during this study: (a) submitted request for research proposal to the school district for approval to conduct research in the district; (b) upon obtaining all approvals, collected all data relevant to the variables in the study; and (c) compiled all data and created a single dataset.

Data Analysis

The collected data were uploaded into Statistical Package for the Social Science (SPSS) to perform a two-way ANOVA. To examine the research questions, a two-way ANOVA was conducted to assess if a difference existed on a dependent variable by independent variables. A two-way ANOVA was the appropriate statistical test when the purpose of research was to assess if differences exist on a continuous (interval/ratio) dependent variable by a dichotomous (two groups) independent variable (Statistics Solutions, 2013). Three hypotheses were tested using quantitative data.

Validity and Reliability

Reliability was a measure of the consistency of results over time and the replicability of results using similar research methods (Letherby & Williams, 2013). Reliability also measured how well the sample results reflected the characteristics of the

population. In the study, reliability of the results was achieved by consistently following all sampling procedures described above. This allowed eliminating any biases and making the sample reflective of the population in this study.

The validity and reliability of the data collection instrument had been extensively tested and approved by the South Carolina education authorities and therefore it did not present any significant validity and reliability threats. SCPASS test items measured student performance on the South Carolina Academic Standards. The SCPASS test items were aligned to the standards for each subject and grade level. Standards outlined what schools were expected to teach and what students were expected to learn. Academic standards also included indicators that were statements of the specific cognitive processes and the content knowledge and skills students demonstrated to meet the grade-level standards. SCPASS test items were written to assess the content knowledge and skills described in the academic standards and indicators (SCDOE, 2013).

Limitations of the Study

Much of the researched literature related to understanding single-gender instruction compared to non-gender-based instruction pros, cons, rationale, and its benefits to student academic performance. The study investigated the outcome of student academic performance on English standardized assessment in single-gender classrooms in a Title I public school in the state of South Carolina.

This study utilized a small sample of African-American male and female students attending public school. This limited the generalizability of the study and potentially made it difficult to replicate. The scores that were examined in the study would represent only students from one school location, which also limits extrapolations to other schools

and locales but only to some extent. Teacher quality was a limitation of the study. Teachers providing instruction to students in coed and single-gender classrooms are all females with various years of teaching experience in traditional and single-gender instruction.

Furthermore, this transformation model of instruction did not focus on the instructional researched practices incorporated specifically for both male and female students to meet their learning needs. Additionally, the study focused only on the English achievement of the participants and therefore did not take into account the effects of single-gender instruction and achievement in other subject areas. Only the English scores from the PASS assessment were used to determine which gender benefited most from single-gender instruction, which also imposed some transferability limitations.

Ethical Considerations

Ethics of research. Any study involving human subjects requires that the research process should substantively and procedurally conform to the principles of respect for persons, beneficence, and justice (Health and Human Services [HHS], 2009; Sieber & Tolich, 2013). Respect for persons required that the researcher and the process of research should protect participant autonomy or the right to self-determination (HHS, 2009). The researcher ensured no harm to the research participants but also maximized the benefits while minimizing the possibility of harm (HHS, 2009). There was a mutual beneficence; i.e., equitable distribution of the burden and the benefits of the research between researcher and the participants (HHS, 2009).

To comply with all these principles wholly, the study fully satisfied all ethical requirements throughout its entire duration. Such ethical approach assured impartiality in

the selection of the research participants and alleviated research participant exposure to different types of risk, both known and unknown.

Identity protection. The complete and unconditional confidentiality of all research participants, both students and teachers, was fully assured for the entire duration of the study and particularly during the process of data collection. The true identities and the sociodemographic profiles of the research participants were intentionally concealed by using assigned code names instead of their real names. In other words, all data collected from the research participants were thoroughly and completely depersonalized, which made it impossible to infer specific identities of research participants in any way or form.

Letter of consent. Permission to utilize student archived PASS assessment data was obtained from the district (see Appendix). To meet the ethical guidelines, the following information was submitted: (a) a brief synopsis of the study, research questions and hypotheses; (b) a copy of research methodology; and (c) data collection and data management plans. This study was not associated with any risks to research participants. Research participants' self-identifiable information was not included in coding or transferred to statistical software. There were no conflicts of interest by the researcher in this study.

Summary

This chapter described the methodological solution for the study and discussed data collection and data analysis plans. Specifically, the chapter presented the purpose of the study; described the specific research design utilized; presented research questions and the associated hypotheses; described the study population; delineated the sample

used; expounded on the approaches to data collection and data analyses, including instrumentation and research procedures; and finally, discussed measures taken to assure the ethics of research. The results of the study analysis are presented in Chapter 4.

Chapter 4: Results

Introduction

This study sought to determine if the independent variables of single-gender classroom settings versus coed gender classrooms have a statistically significant influence on male and female English academic achievement outcomes of African-American students in Grades 6-8. In doing so, this study considered (a) African-American male student English achievement in single-gender classrooms; and (b) African-American female student English achievement in single-gender classrooms within a South Carolina school serving 400 middle and high school level students. Prior to this study, 57.1% of the school's middle school students scored not met on the English section of the PASS assessment. Despite prior interventions attempting to boost English performance levels, the majority of this school's middle school students still lacked proficiency. Hence, this study sought to fill gaps in research identified by AAUW (2011) and Gurian et al. (2010), for instance, which addressed the potential efficacy of gender-based instruction compared to coed instruction, yet lacked explanation regarding which gender, male or female, performs better in such coed versus single-gender environments.

In light of this identified gap, this study used the independent variables of instruction and gender and the dependent variable of PASS assessment data to conduct a longitudinal study on African-American male and female middle school students in rural South Carolina, examining which gender group performs more optimally in single-gender versus coed classroom environments. The percentage of students who passed the English PASS assessments was compared and evaluated based on gender using a retrospective, correlational, and cross-sectional quantitative design with multiple between group

comparisons and fixed effects to examine relationships between variables after the phenomenon being evaluated occurred and produced measurable impacts (Knowlton & Phillips, 2013). Rather than assessing causation, this study simply evaluated the degree of association or correlation between the aforementioned variables (PASS scores, gender and classroom setting, also referred to as instructional type). A two-way ANOVA test of variance was run on the data collected in order to produce the results described within this chapter. The results of the study were expanded on based on the analysis of the data collected.

Research Questions and Results

In order to arrive at these results, pupil performance levels were categorized based on how they scored on the SCPASS assessments. The pupils were rated exemplary, met, or not met based on their performance. If a learner was rated exemplary, that student demonstrated exemplary performance in meeting the grade-level standard in English for that grade level. If the pupil was rated met, the student met the grade-level standard. If the student was rated not met, that student did not meet the grade-level standard based on his/her performance. The data collected for this dissertation is the student English performance data on the SCPASS assessments over a 3-year time period, year 1-6th grade, year 2-7th grade, and year 3-8th grade. Table 3 displays the student groupings and classifications for the study.

Table 3

Student Group Classification

Single Gender	COED
SGF1	COEDF1
SGF2	COEDF2
SGF3	COEDF3
SGF4	COEDF4
SGF5	COEDF5
SGF6	COEDF6
SGF7	COEDF7
SGF8	COEDF8
SGF9	COEDF9
SGM1	COEDM1
SGM2	COEDM2
SGM3	COEDM3
SGM4	COEDM4
SGM5	COEDM5
SGM6	COEDM6
15 Total	15 Total

SG=single-gender, COED=coed, F=female, M=male, and Numeric Number=student identification number)

Figure 2 depicts the raw data collected, before evaluated using an ANOVA test of variance as described in the data analysis section following.

Class	Year 3-8th		Year 2-7th		Year 1-6th				Class	Year 3-8th		Year 2-7th		Year 1-6th	
SGF1	618	MET	631	MET	609	MET			COEDF1	574	NOT MET	600	MET	609	MET
SGF2	598	NOT MET	582	NOT MET	524	NOT MET			COEDF2	629	MET	664	Exemplary	644	Exemplary
SGF3	669	Exemplary	682	Exemplary	696	Exemplary			COEDF3	698	Exemplary	694	Exemplary	671	Exemplary
SGF4	603	MET	610	MET	615	MET			COEDF4	669	Exemplary	656	Exemplary	696	Exemplary
SGF5	618	MET	664	Exemplary	615	MET			COEDF5	698	Exemplary	656	Exemplary	644	MET
SGF6	640	MET	656	Exemplary	682	Exemplary			COEDF6	598	NOT MET	615	MET	606	MET
SGF7	588	NOT MET	582	NOT MET	546	NOT MET			COEDF7	654	Exemplary	656	Exemplary	652	Exemplary
SGF8	579	NOT MET	591	NOT MET	541	NOT MET			COEDF8	623	MET	649	MET	652	Exemplary
SGF9	629	MET	631	MET	622	MET			COEDF9	654	Exemplary	664	Exemplary	661	Exemplary
SGM1	629	MET	591	NOT MET	528	NOT MET			COEDM1	654	Exemplary	664	Exemplary	661	Exemplary
SGM2	687	Exemplary	642	MET	636	MET			COEDM2	677	Exemplary	694	Exemplary	629	MET
SGM3	551	NOT MET	573	NOT MET	552	NOT MET			COEDM3	647	MET	649	MET	696	Exemplary
SGM4	640	MET	560	NOT MET	661	Exemplary			COEDM4	613	MET	649	MET	682	Exemplary
SGM5	629	MET	625	MET	510	NOT MET			COEDM5	608	MET	656	Exemplary	636	MET
SGM6	634	MET	615	MET	552	NOT MET			COEDM6	608	MET	642	MET	626	MET
	620.8		**615.6667**		**592.6**					**640.2667**		**653.8667**		**651**	

Figure 2. Data collected according to gender, instruction type, PASS score and year. (SG=single-gender instruction, COED=coed instruction, F=female, M=male, and three digit numeric=PASS scores with means displayed at the bottom).

Based on the data displayed above, the mean PASS achievement score for males and females in single-gender classrooms for year 3-8 was 620.8. The mean for male and female single-gender classroom achievement scores for year 2-7 was 615.67. The mean achievement score for males and females in single-gender classrooms for year 1-6 was 592.6. Cumulatively, these results reveal lower achievement scores for males and females combined during earlier years versus later years.

In regard to coed classroom environments, the mean scores for males and females combined are as follows: 640.26 for year 3-8, 653.87 for year 2-7, and 651 for year 1-6. These results reveal the highest achievement scores for males and females combined in coed classrooms for year 2-7, with scores declining for year 1-6 and being lowest for year 3-8. Figure 3 depicts these results in tabulation.

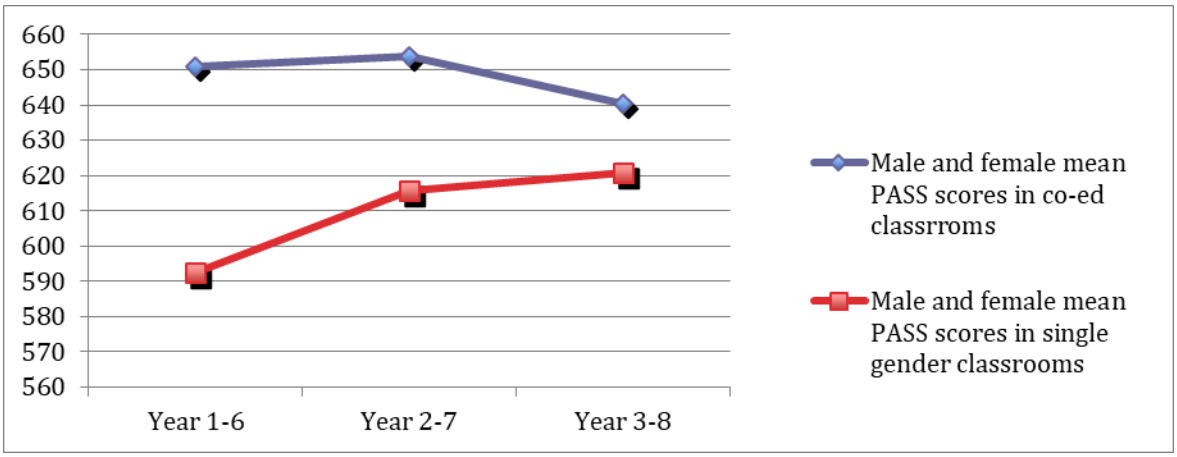

Figure 3. Mean scores of males and females according to year in coed versus single-gender classrooms.

Overall, combined male and female mean PASS scores were higher in coed environments than in single-gender classroom environments. Interestingly, combined gender scores of single-gender classroom environments improved alongside year length, whereas coed scores declined with year length. Figure 4 depicts the results of mean PASS scores according to male and female coed versus single-gender classroom environments individually.

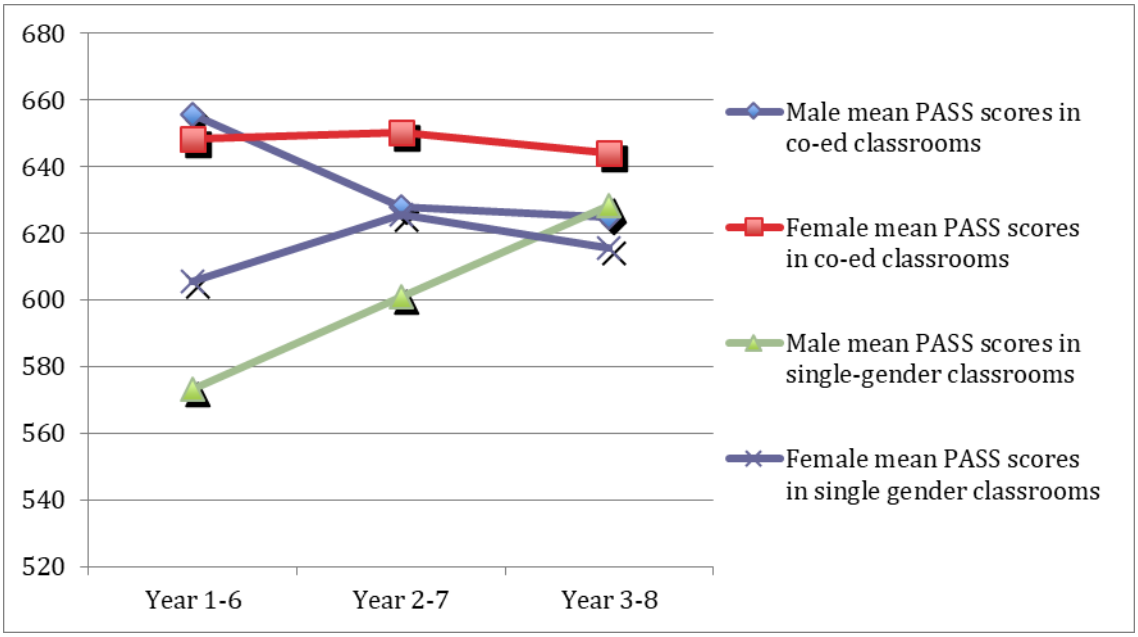

Figure 4. Mean scores of males versus females PASS scores in coed versus single-gender environments according to year.

Similar to the combined results, when male and female test group mean PASS scores are observed in solidarity from one another, both male and female group coed mean PASS scores decline as year length increases but are both generally higher than mean PASS scores of male and female mean scores of single-gender classroom PASS scores. Female coed classroom mean PASS scores exceed male coed mean PASS scores during years 2-7 and 3-8 but fell slightly below the male mean PASS score during year 1-6. The mean PASS score of males in single-gender classroom environments fell below the female mean PASS score of single-gender classroom environments during years 1-6 and 2-7 but exceeded the female mean score of single-gender classroom environments during year 3-8. Overall, there was little mean PASS score difference during year 2-7 between females in single-gender classroom environments and males in coed gender classrooms environments—revealing the two categories that exhibited the most similar

mean PASS scores. Overall, there was also little difference in mean PASS scores during year 3-8 between males in coed environments and males in single-gender classroom environments; these categories scored similarly in regard to their mean score.

Data Analysis and Results

Data analysis has been provided for each of the research questions of the study. Each data analysis contains the results of hypothesis testing as aligned with each specified research question.

Data Analysis, Research Question 1

The first research question of the study was, "To what extent was there a statistically significant difference in the achievement of African-American males receiving single-gender instruction when compared to African-American males receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?"

This research question was answered by calculating both the point estimates and 95% confidence intervals for passing rates for males in two classes (the coed class and the male-only class) and for three PASS tests (years 1-6, 2-7, and 3-8). Second, independent sample *t* tests were utilized to compare continuously measured PASS scores as a function of gender and class membership in the three PASS conditions (years 1-6, 2-7, and 3-8).

Year 1-6 confidence intervals of binomial probabilities. Table 4 displays single-gender and coed male student success outcomes and confidence interval ranges for year 1-6.

Table 4

Year 1-6 Male Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDM	6 of 6	100% - 100%
SGM	2 of 6	4.30% - 77.7%

In the coed class, six of six male students demonstrated proficiency or higher on the PASS assessment, year 1-6. In the single-gender class, two of six male students demonstrated proficiency or higher on the PASS assessment, year 1-6. The binomial confidence interval for two successes of six attempts in year 1-6 was from 0.043 to 0.777. It should be noted that the entirety of the 95% confidence interval of PASS proficiency for males in the male-only class (year 1-6), 4.30% to 77.70%, falls below the 95% confidence interval of PASS proficiency for males in the coed class (year 1-6), 100%-100%.

Year 1-6 *t* tests. Table 5 displays means, standard deviation, *t* value, and *p* value for male students in year 1-6.

Table 5

Year 1-6 Male Means, Standard Deviation, t Value, and p Value

Group		Mean	Standard Deviation
COEDM		655	29.41
SGM		573.17	60.97
t Value	-2.96		
p Value	.0143		

Males in the coed class scored 655 (*SD*=29.41) on PASS year 1-6, whereas males in the single-gender class scored 573.17 (*SD*=60.97). Males in the coed class did significantly better in year 1-6 PASS than males in the single-gender class; the *t* value is

-2.96. The *p* value is .0143. The result is significant at $p<.05$. Therefore, the null hypothesis for Research Question 1 and year 1-6 was rejected; males in the coed class were significantly more likely to be proficient on PASS than males in the single-gender class.

Figure 5 is the box plot of the relationship between males in the coed class and males in the single-gender class in terms of PASS score, year 1-6.

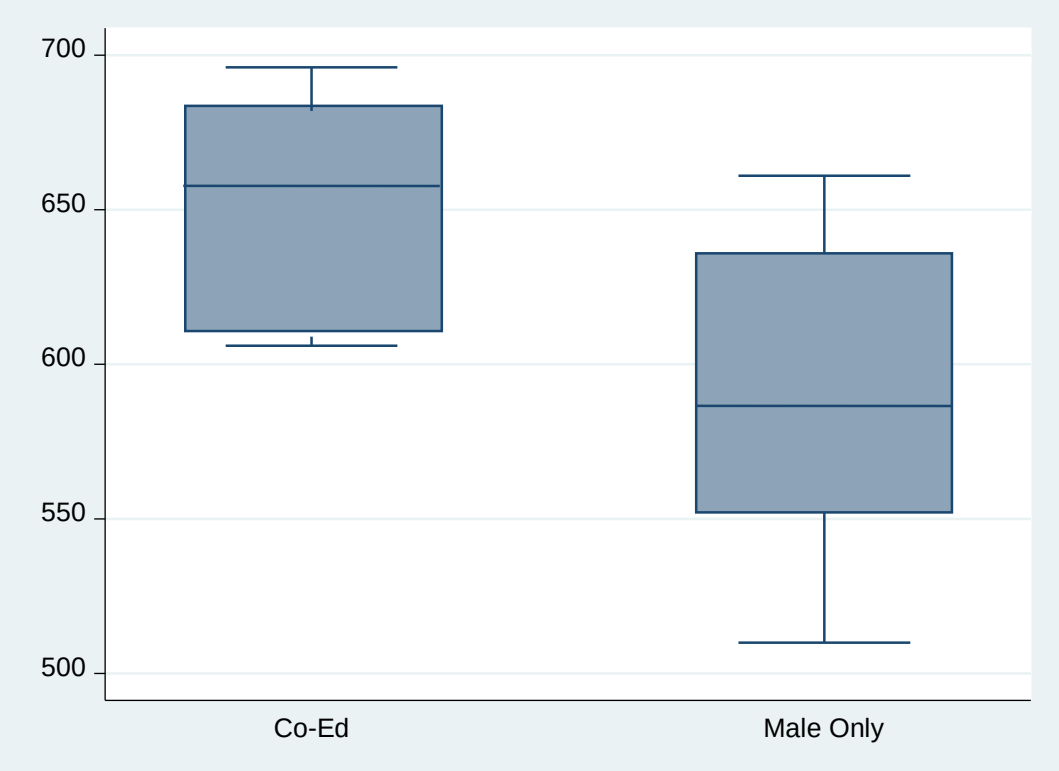

Figure 5. Male performance on PASS, year 1-6, by class membership.

Year 2-7 confidence intervals of binomial probabilities. Table 6 displays single-gender and coed male student success outcomes and confidence interval ranges for year 2-7.

Table 6

Year 2-7 Male Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDM	6 of 6	100% - 100%
SGM	3 of 6	11.80% - 88.20%

In the coed class, six of six male students demonstrated proficiency on the PASS assessment, year 2-7. In the single-gender class, three of six male students demonstrated proficiency on the PASS assessment, year 2-7. The binomial confidence interval for three successes of six attempts in year 2-7 was from 0.118 to .882. It should be noted that there was no overlap between the 95% confidence interval of PASS proficiency for males in the male-only class (year 2-7), 11.80% to 88.20%, and the 95% confidence interval of PASS proficiency for males in the coed class (year 2-7), 100%-100%.

Year 2-7 *t* tests. Table 7 displays mean, standard deviation, *t* value, and *p* value for males in year 2-7.

Table 7

Year 2-7 Means, Standard Deviation, t Value, and p Value

Group		Mean	Standard Deviation
COEDM		659	18.70
SGM		601	31.70
t Value	-3.86		
p Value	.0031		

Males in the coed class scored 659 (*SD*=18.70) on PASS year 2-7, whereas males in the single-gender class scored 601 (*SD*=31.70). Males in the coed class did significantly better in year 2-7 PASS than males in the single-gender class. The *t* value is -3.86. The *p* value is .0031. The result is significant at $p<.05$. Therefore, the null

hypothesis for Research Question 1 and year 2-7 is rejected; males in the coed class did have significantly different PASS rates than males in the single-gender class.

Figure 6 is the box plot of the relationship between males in the coed class and males in the single-gender class in terms of PASS score, year 2-7.

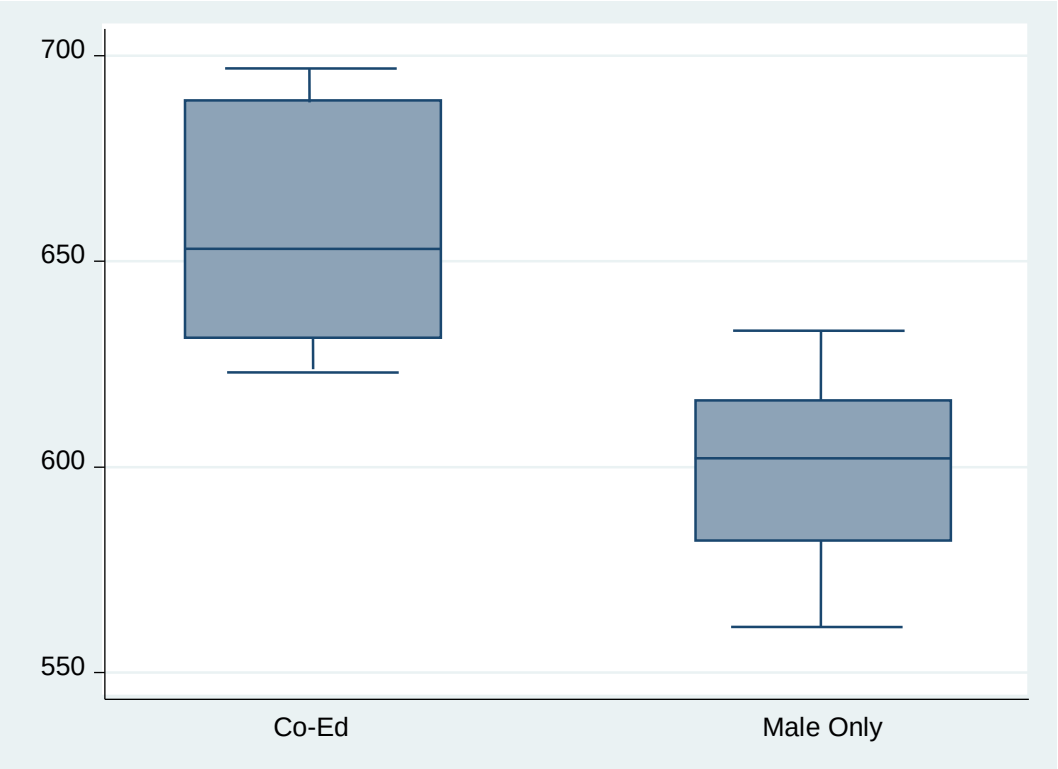

Figure 6. Male performance on PASS, year 2-7, by class membership.

Year 3-8 confidence intervals of binomial probabilities. Table 8 displays single-gender and coed male student success outcomes and confidence interval ranges for year 3-8.

Table 8

Year 3-8 Male Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDM	6 of 6	100% - 100%
SGM	5 of 6	35.9% - 99.6%

In the coed class, six of six male students demonstrated proficiency on the PASS assessment, year 3-8. In the single-gender class, five of six male students demonstrated proficiency on the PASS assessment, year 3-8. The entirety of the 95% confidence interval of PASS proficiency for males in the single-gender class (year 3-8), 0.359 to 0.996, was below the 95% confidence interval of PASS proficiency for males in the coed class (year 3-8), 100%-100%.

Year 3-8 *t* tests. Table 9 displays mean, standard deviation, *t* value, and *p* value for males in year 3-8.

Table 9

Year 3-8 Means, Standard Deviation, t Value, and p Value

Group		Mean	Standard Deviation
COEDM		634.5	29.02
SGM		628.33	43.80
t Value	-0.288		
p Value	.779		

Males in the coed class scored 634.5 (*SD*=29.02) on PASS year 3-8, whereas males in the single-gender class scored 628.33 (*SD*=43.80). Males in the coed class did not have a year 3-8 PASS score that was significantly different from the year 3-8 PASS scores of males in the single-gender class. The *t* value is -0.288. The *p* value is .779. The result is not significant at $p<.05$. Therefore, the null hypothesis for Research

Question 1 and year 3-8 was not rejected; males in the coed class did not have significantly higher PASS rates than males in the single-gender class.

Figure 7 is the box plot of the relationship between males in the coed class and males in the single-gender class in terms of PASS score, year 3-8.

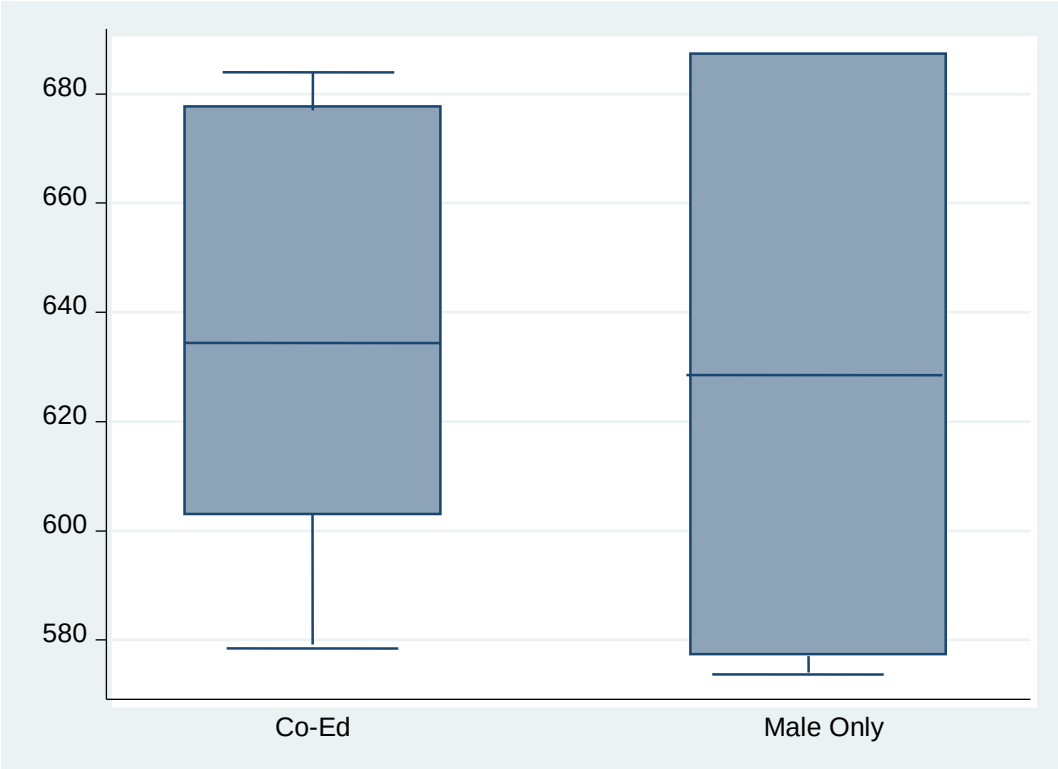

Figure 7. Male performance on PASS, year 3-8, by class membership.

Data Analysis, Research Question 2

The second research question of the study was, "To what extent was there a statistically significant difference in the achievement of African-American females receiving single-gender instruction when compared to African-American females receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?"

This research question was answered by calculating both the point estimates and

95% confidence intervals for passing rates for females in two classes (the coed class and the female-only class) and for three PASS tests (years 1-6, 2-7, and 3-8). Second, ordinary least squares regression was utilized to compare continuously measured PASS scores as a function of gender and class membership in the three PASS conditions (years 1-6, 2-7, and 3-8).

Year 1-6 student confidence intervals of binomial probabilities. Table 10 displays single-gender and coed female student success outcomes and confidence interval ranges for year 1-6.

Table 10

Year 1-6 Female Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDF	9 of 9	100% - 100%
SGF	6 of 9	50% - 82%

In the coed class, nine of nine female students demonstrated proficiency on the PASS assessment, year 1-6. In the single-gender class, six of nine female students demonstrated proficiency on the PASS assessment, year 1-6. The binomial confidence interval for six successes of nine attempts in year 1-6 was from 0.50 to 0.82. It should be noted that the entirety of the 95% confidence interval of PASS proficiency for females in the female-only class (year 1-6), 50% to 82%, falls below the 95% confidence interval of PASS proficiency for females in the coed class (year 1-6), 100%-100%.

Year 1-6 *t* tests. Table 11 displays mean, standard deviation, *t* value, and *p* value for year 1-6 of female students.

Table 11

Year 1-6 Means, Standard Deviation, t Value, and p Value for Female Students

Group		Mean	Standard Deviation
COEDF		648.33	28.17
SGF		605.56	60.05
t Value	-1.93		
p Value	.0709		

Females in the coed class scored 648.33 (*SD*=28.17) on PASS year 1-6, whereas females in the single-gender class scored 605.56 (*SD*=60.05). Females in the coed class did significantly better in year 1-6 PASS than females in the single-gender class. The *t* value is -1.93. The *p* value is .0709. The result is not significant at $p<.05$. Therefore, the null hypothesis for Research Question 2 and year 1-6 was not rejected; females in the coed class were significantly more likely to be proficient on PASS than females in the single-gender class.

Figure 8 is the box plot of the relationship between females in the coed class and females in the single-gender class in terms of PASS score, year 1-6.

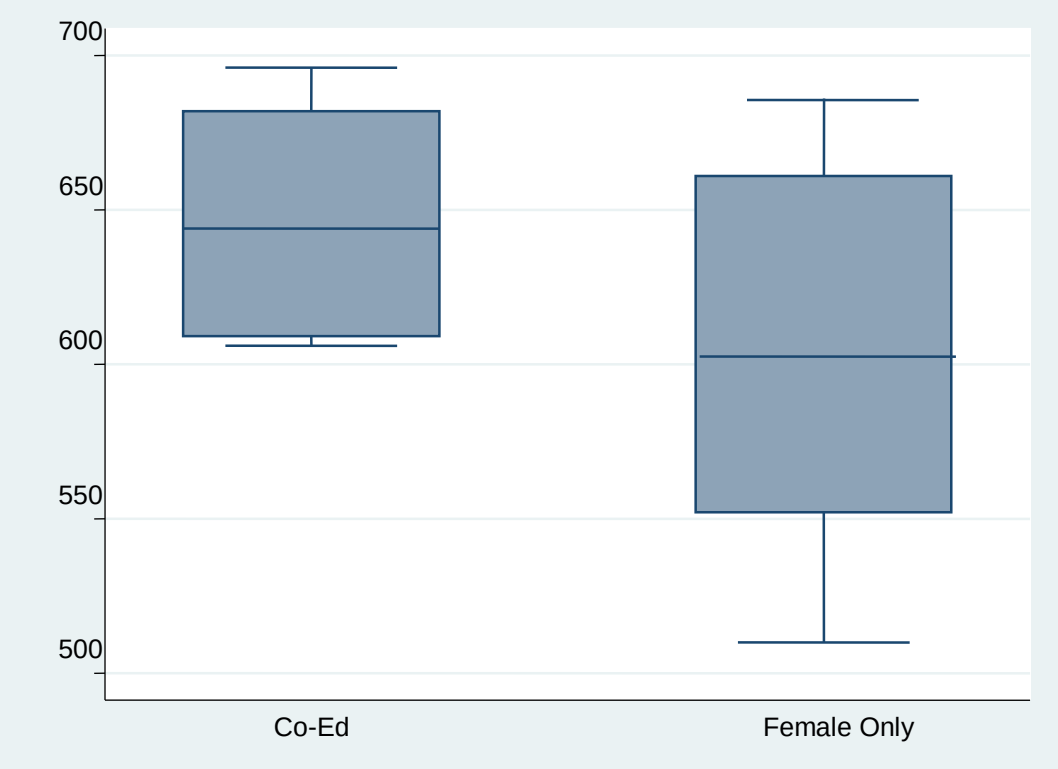

Figure 8. Female performance on PASS, year 1-6, by class membership.

Year 2-7 confidence intervals of binomial probabilities. Table 12 displays single-gender and coed female student success outcomes and confidence interval ranges for year 2-7.

Table 12

Year 2-7 Female Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDF	9 of 9	100% - 100%
SGF	6 of 9	50% - 82%

In the coed class, nine of nine female students demonstrated proficiency on the PASS assessment, year 2-7. In the single-gender class, six of nine female students demonstrated proficiency on the PASS assessment, year 2-7. The binomial confidence

interval for six successes of nine attempts in year 2-7 was from 0.50 to 0.82. It should be noted that the entirety of the 95% confidence interval of PASS proficiency for females in the female-only class (year 2-7), 50% to 82%, falls below the 95% confidence interval of PASS proficiency for females in the coed class (year 2-7), 100%-100%.

Year 2-7 *t* tests. Table 13 displays mean, standard deviation, *t* value, and *p* value for year 2-7 for female students.

Table 13

Year 2-7 Means, Standard Deviation, t Value, and p Value for Female Students

Group		Mean	Standard Deviation
COEDF		650.44	27.75
SGF		625.44	36.88
t Value	-1.63		
p Value	.1237		

Females in the coed class scored 650.44 (*SD*=27.75) on PASS year 2-7, whereas females in the single-gender class scored 625.44 (*SD*=36.88). Females in the coed class did significantly better in year 2-7 PASS than females in the single-gender class. The *t* value is -1.63. The *p* value is .1237. The result is *not* significant at $p<.05$. Therefore, the null hypothesis for Research Question 2 and year 2-7 was not rejected; females in the coed class were significantly more likely to be proficient on PASS than females in the single-gender class.

Figure 9 is the box plot of the relationship between females in the coed class and females in the single-gender class in terms of PASS score, year 2-7.

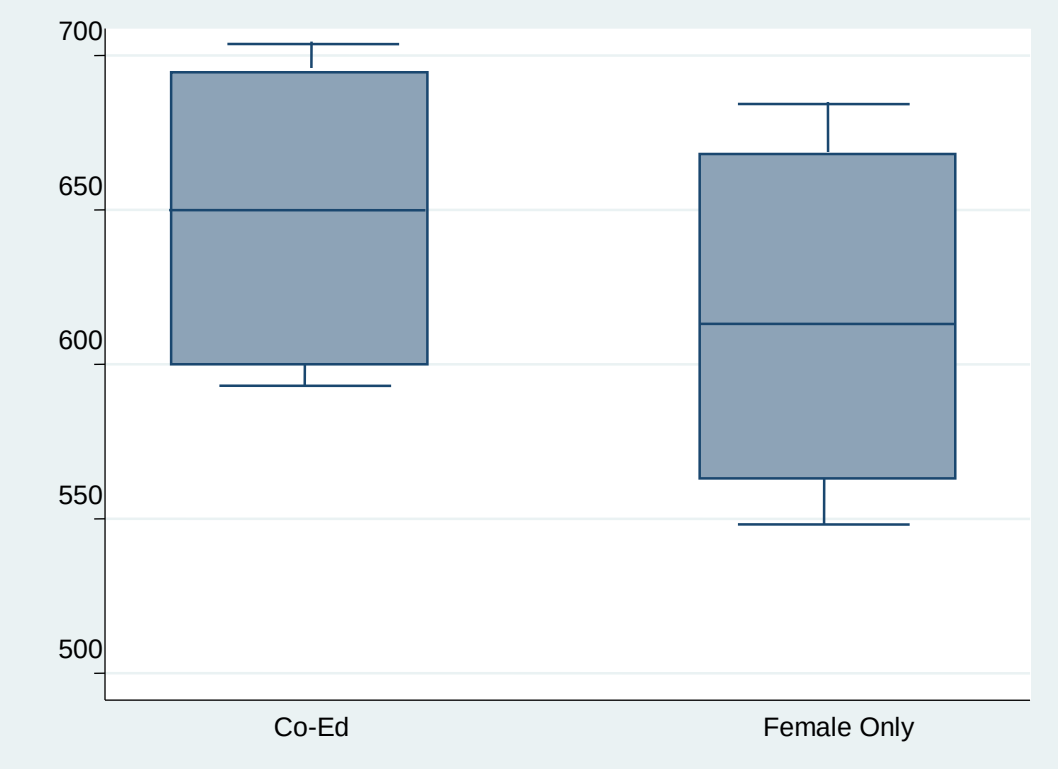

Figure 9. Female performance on PASS, year 2-7, by class membership.

Year 3-8 confidence intervals of binomial probabilities. Table 14 displays single gender and coed female student success outcomes and confidence interval ranges for year 3-8.

Table 14

Year 3-8 Female Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
COEDF	7 of 9	40.0% - 97.2%
SGF	6 of 9	30% - 92.5%

In the coed class, seven of nine female students demonstrated proficiency on the PASS assessment, year 3-8. In the single-gender class, six of nine female students demonstrated proficiency on the PASS assessment, year 3-8. The 95% confidence

interval of PASS proficiency for females in the coed class (year 3-8) was 0.400 to 0.972; the 95% confidence interval of PASS proficiency for females in the single-gender class (year 3-8) was 0.300 to 0.925. The 95% confidence interval of year 3-8 PASS success for females in the coed class was therefore from 40.00% to 97.20%, whereas the 95% confidence interval of year 3-8 PASS success for females in the single-gender class was from 30.00% to 92.50%.

Year 3-8 *t* tests. Table 15 displays mean, standard deviation, *t* value, and *p* value for year 3-8 for female students.

Table 15

Year 3-8 Means, Standard Deviation, t Value, and p Value for Female Students

Group		Mean	Standard Deviation
COEDF		644.11	42.34
SGF		615.78	27.86
t Value	-1.677		
p Value	.1129		

Females in the coed class scored 644.11 (*SD*=42.34) on PASS year 3-8, whereas females in the single-gender class scored 615.78 (*SD*=27.86). Females in the coed class did significantly better in year 3-8 PASS than females in the single-gender class. The *t* value is -1.677. The *p* value is .1129. The result is not significant at $p<.05$. Therefore, the null hypothesis for Research Question 2 and year 3-8 could not be rejected; females in the coed class did not have significantly different PASS rates than females in the single-gender class.

Figure 10 is the box plot of the relationship between females in the coed class and females in the single-gender class in terms of PASS score, year 3-8.

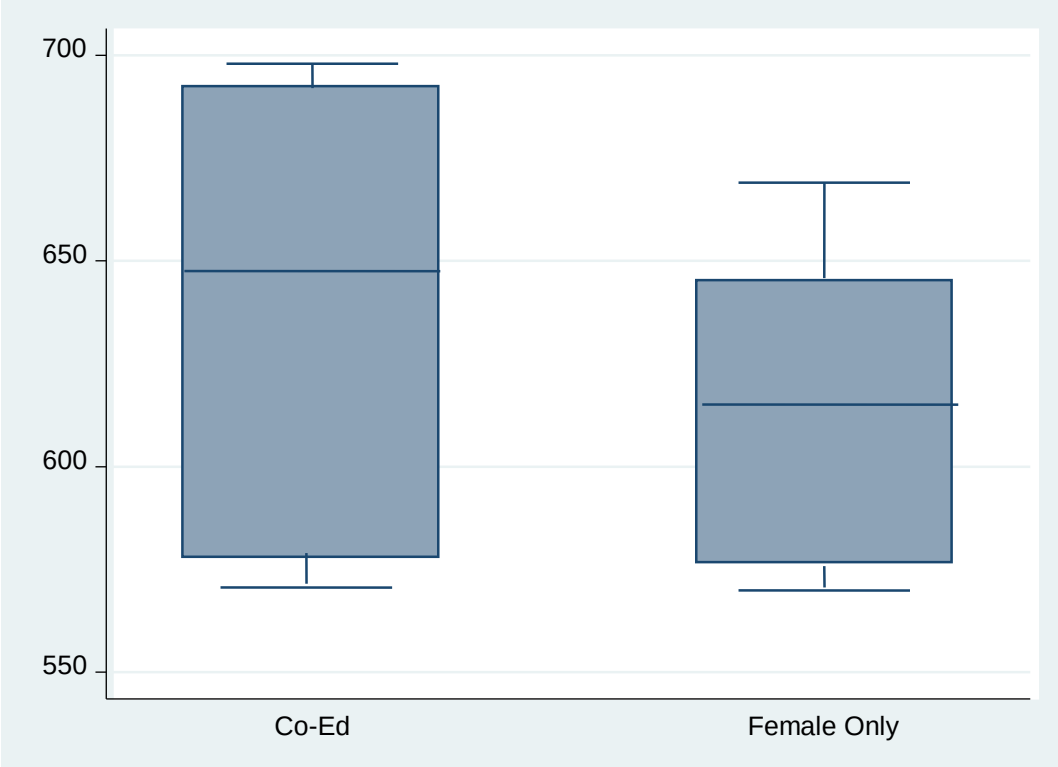

Figure 10. Female performance on PASS, year 3-8, by class membership.

Data Analysis, Research Question 3

The third research question of the study was, "To what extent was there a statistically significant difference in the achievement of single-gender education among African-American males and African-American females as demonstrated by proficiency on PASS assessment data?"

Confidence intervals for this comparison were calculated earlier and can be presented as follows.

Year 1-6. Table 16 displays male and female single-gender student success outcomes and confidence interval ranges for year 1-6.

Table 16

Year 1-6 Male and Female Single-Gender Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
SGM	2 of 6	4.3% - 77.7%
SGF	6 of 9	50% - 82%

In the single-gender class, two of six male students demonstrated proficiency on the PASS assessment, year 1-6. The binomial confidence interval for two successes of six attempts in year 1-6 was from 0.043 to 0.777. In the single-gender class, six of nine female students demonstrated proficiency on the PASS assessment, year 1-6. The binomial confidence interval for six successes of nine attempts in year 1-6 was from 0.50 to 0.82. Because of the substantial overlap in the 95% confidence of PASS success for males and females in single-gender classes, the null hypothesis associated with Research Question 3, year 1-6, could not be rejected. Males and females in single-gender classrooms had similar PASS success in year 1-6.

Year 2-7. Table 17 displays male and female single-gender student success outcomes and confidence interval ranges for year 2-7.

Table 17

Year 2-7 Male and Female Single-Gender Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
SGM	3 of 6	11.8% - 88.2%
SGF	6 of 9	50% - 82%

In the single-gender class, three of six male students demonstrated proficiency on the PASS assessment, year 2-7. The binomial confidence interval for three successes of six attempts in year 2-7 was from 0.118 to 0.882. In the single-gender class, six of nine

female students demonstrated proficiency on the PASS assessment, year 2-7. The binomial confidence interval for six successes of nine attempts in year 2-7 was from 0.50 to 0.82. Because of the substantial overlap in the 95% confidence of PASS success for males and females in single-gender classes, the null hypothesis associated with Research Question 3, year 2-7, could not be rejected. Males and females in single-gender classrooms had similar PASS success in year 2-7.

Year 3-8. Table 18 displays male and female single-gender student success outcomes and confidence interval ranges for year 3-8.

Table 18

Year 3-8 Male and Female Single-Gender Student Success Outcomes on PASS and Binomial Confidence Interval Ranges

Group	Success Outcomes	Confidence Interval Ranges
SGM	5 of 6	35.9% - 99.6%
SGF	5 of 9	21.2% - 86.3%

In the single-gender class, five of six male students demonstrated proficiency on the PASS assessment, year 3-8, representing a 95% confidence interval of 0.359 to 0.996. In the single-gender class, five of nine female students demonstrated proficiency on the PASS assessment, year 3-8; the 95% confidence interval of PASS proficiency for females in the coed class (year 3-8), was 0.212 to 0.863. Therefore, the null hypothesis for Research Question 3 and year 3-8 could not be rejected. Male students in single-gender classes had similar PASS proficiency rates to female students.

Summary and Transition

The results presented within this chapter evaluated student achievement based on year 1-6, year 2-7, and year 3-8. Research Question 1 examined the statistically significant difference of male achievement scores according to instruction type, while

Research Question 2 examined the statistically significant difference of female achievement scores according to instruction type. Research Question 3 examined the statistically significant difference of both male and female achievement scores as determined by instruction type. Essentially, the null hypothesis for Research Question 1 was rejected when examining years 1-6 and 2-7 but not when examining year 3-8. In response to Research Question 1, a statistically significant difference was observed during years 1-6 and 2-7 but not during year 3-8.

The null hypothesis for Research Question 2 was not rejected when examining years 1-6, 2-7, and 3-8, meaning female scores evaluated between years exhibited no statistically significant difference due to instruction type; females during years 1-6, 2-7, and 3-8 were more likely to exhibit met scores on the PASS in coed classrooms. In regard to Research Question 3, the null hypothesis was not rejected for years 1-6, 2-7, or 3-8.

The data analysis revealed that the only instances of statistical significance were as follows: (a) during years 1-6 and 2-7, males in coed classes were significantly more likely to be proficient on PASS than males in single-gender classes; (b) during year 3-8, males in single-gender classes exhibited similar PASS proficiency rates than males in single-gender classes; (c) during year 1-6, females in coed classes were significantly more likely to be proficient on PASS than females in single-gender classes; and (d) during years 2-7 and 3-8, females in coed classes were significantly more likely to be proficient on PASS than females in single-gender classes. These results have important implications for the original intent of this research, which was to evaluate the efficacy of single versus coed gender classroom environments in closing achievement gaps. Chapter

5 provides an interpretation of the data results, limitations, delimitations, and possible future research.

Chapter 5: Discussion

Introduction

The purpose of this study was to determine which type of classroom setting, either single-gender or coed classroom environment, had a statistically significant effect on male and female English achievement scores among African-American students in the sixth through eighth grades. The study compared African-American male and female student PASS test scores in single-gender versus coed classrooms using students in a South Carolina school. The majority of middle school students attending the South Carolina school used in the research were not proficient in English reading prior to the study's evaluations. Studies such as those conducted by Gurian et al. (2010) and Spielhagen (2012) addressed the efficacy of gender-based instruction among middle school students yet lacked explanation as to which gender performed more optimally in single-gender versus coed environments.

In light of research proposing single-gender classroom environments to possibly bolster student achievement scores (Gurian et al., 2010), this research sought to understand how single-gender classrooms might benefit student achievement by using a retrospective, correlational, and cross-sectional quantitative design. Additionally, this research applied a two-way ANOVA test of variance to the data (PASS scores according to gender and instruction type). The findings of this analysis have important implications for consideration in light of improving today's educational environments and closing gender-based achievement gaps. These implications are discussed throughout this chapter, including an overview interpretation of the results, what the results may mean within today's cultural educational context, and suggestions for future research.

The following research questions were used to guide this study's data collection:

1. To what extent was there a statistically significant difference in the achievement of African-American males receiving single-gender instruction when compared to African-American males receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?
2. To what extent was there a statistically significant difference in the achievement of African-American females receiving single-gender instruction when compared to African-American females receiving instruction in a coed classroom as demonstrated by proficiency on PASS assessment data in English?
3. To what extent was there a statistically significant difference in the achievement of single-gender education among African-American males and African-American females as demonstrated by proficiency on PASS assessment data?

PASS scores were evaluated among students during three intervals: year 1-6, year 2-7, and year 3-8.

In brief review of the prior chapter's results, the most important findings of the data analysis revealed statistical significance in the following instances: (a) during years 1-6 and 2-7, males in coed classes were significantly more likely to be proficient on PASS than males in single-gender classes; (b) during year 3-8, males in single-gender classes exhibited similar PASS proficiency rates to males in coed classes; (c) during year 1-6, females in coed classes were significantly more likely to be proficient on PASS than

females in single-gender classes; and (d) during years 2-7 and 3-8, females in coed classes were significantly more likely to be proficient on PASS than females in single-gender classes.

Overview Interpretation of Results

Statistical significance. As noted, the only instances of statistical significance were found as follows, associated with corresponding research questions. Research Question 1: Males in coed classes during years 1-6 and 2-7 were significantly more likely to be proficient on PASS than males in single-gender environments. Research Question 2: Females in coed classes during years 1-6, 2-7, and 3-8 were significantly more likely to be proficient on PASS than females in single-gender classes. Research Question 3: No significant findings. Cumulatively, these results suggest that in the case of this study population, students in single-gender environments demonstrated similar PASS performance to coed classrooms in the instance of males for year 3-8; that is, slightly older students. This suggests that among this study population, single-gender instruction environments may only be advantageous for male students during more progressed years; however, this is a generalized remark and requires in-depth discussion as will be explored within this chapter.

An Evaluation Based on Hypothesis

First, when examining differences in male performance between single-gender and coed classrooms, the following was noted. The null hypothesis for Research Question 1 and years 1-6 and 2-7 was rejected since males in coed classes during this time were more likely to be PASS proficient than single-gender class males; however, during year 3-8, in regard to Research Question 1, the null hypothesis was not rejected

since similarities between male coed and male single-gender scores were noticed. This suggests single-gender environments had some advantages for males over coed environments in eighth grade only; and in fact, coed environments were, according to these results, advantageous for males over single-gender environments in earlier years.

When examining female performance levels between classroom environments, it was apparent that the null hypothesis for Research Question 2 during years 1-6, 2-7, and 3-8 was not rejected: females in coed classes during these years were more likely to be proficient. These findings suggest coed classes are advantageous for females, and no advantage of single-gender classroom environments was found for females.

When examining both male and female performances comparatively, in response to Research Question 3, confidence range interval data sets demonstrated an overlap in the 95% confidence level of PASS success for both genders in single-gender environments; thus, the null hypothesis for Research Question 3 was not rejected for any of the years being analyzed. Simply based on these results, the single-gender environment may be advantageous only for older male students.

Observation and Evaluation of Compared Mean PASS Scores

A basic overview and evaluation of the raw data and comparisons of mean PASS scores reveal similar suggestions. Overall, when observing male and female mean PASS scores, both the male and female groups' mean PASS scores were higher in coed environments than in single-gender environments; however, interestingly, combined gender scores in single-gender classes appeared to improve with year length, logically speaking, as reading level demonstrates growth. Also interesting was the fact that coed scores declined with year length. The significance of these observations implies that

when gender scores are combined, coed classrooms may yield higher test scores than single-gender classrooms, conflicting with much of the literature reviewed within Chapter 2. Also significant was the suggestion based on these results that single-gender environments may be more useful in increasing reading PASS test scores with age, since although coed scores were higher, they declined with age, whereas single-gender scores improved with year length. In light of this, it would be interesting to understand how these scores continue to improve based on examinations of older and continuing participants.

Also significant, in response to the mean score in Figure 2 presented within Chapter 4, is the observation that coed classroom mean scores of males and females combined outperformed single-gender classroom scores of males and females; and both males and females overall and relative to initial scores during year 1-6 scored more optimally in single-gender classrooms during later years (3-8). Perhaps one of the most significant observations of these results, especially in light of the high-performance scores of coed environments as opposed to single-gender environments, was the fact that the single-gender environment male mean PASS score during year 3-8 was higher than the male mean score during year 3-8 in coed environments. Based on a comparison of mean scores, this suggests single-gender environments may be more advantageous for males during later years; however, based on the ANOVA variance test, this hypothesis was rejected because the difference was not great enough to be statistically significant. Nonetheless, this observation begs further study examining these types of performances as students age, simply based on an observation of the patterns demonstrated in Figure 4 presented in Chapter 4.

Overall, a synthesis of these results could imply that single-gender classrooms are more effective at eliciting higher test scores as student age increases. To clarify, in light of the slight drop in female single classrooms between years 2-7 and 3-8, it may be suggested that a greater year span/breadth and population sample size be evaluated for clarity, since the difference between years 1-6 and 3-8 among females in single-gender environments was still an incline in mean test scores.

Implications within Today's Educational Context

Legal implications. New regulations instigated in 2012 as a result of NCLB nullified prior Title IX regulations otherwise prohibiting gender-specific classrooms (NASSPE, 2016). The new flexibility in gender-based teaching and learning offerings and environments allows for research to be expanded in continuation of and further clarification of this study's findings; however, gender-based instruction must be justified by the organization embracing such practices, accompanied by a review process every 2 years. This means that this study's findings which suggest single-gender instruction may improve student achievement (presumably males) as age increases may be implemented in middle school age and early high school settings in order to continue testing relevancy and validity. In an effort to continue to improve student performance scores and bridge gender-based achievement gaps, these new and more flexible legal regulations must be taken advantage of, in order to continue to devise more advantageous classroom environments (Klein, 2012).

According to NASSPE (2016), approximately 44 schools adopted gender-based instruction as the norm for all students and classes; however, despite Gurian et al.'s (2010) and others' suggestions regarding the advantages of gender-based instruction, this

study's results reveal that significantly more inquiry and study are needed in order to rationalize a broader nationwide embrace of gender-based instruction. Retaining the legal and legislative flexibility to implement and test the efficacy of gender-based instruction seems necessary; however, embracing gender-based instruction at the omission of coed environments and/or assuming its efficacy over coed environments does not yet seem necessary or justified in light of this study's findings that clearly evidenced higher performance levels among coed environments. Existing cases of gender-based instruction, such as those within elite and religious schools (Billger, 2009; Skelton, 2014; Spielhagen, 2012), may be examined in light of their efficacy.

Applying Results and Theoretical Frameworks to Bridge Achievement Gaps

As Gurian and Stevens (2013) noted, today's growing gender-specified performance gap in public schools has incentivized researchers, policymakers, and educators to examine the efficacy of gender-based instructional environments, with which this study's quest aligned. Many middle and elementary school single-gender class environments have been implemented nationwide (Gurian & Stevens, 2013), and as a result have outperformed similarly aged students of similar demographics in coed environments. Gurian and Stevens's findings justified this study's research, which yielded curious findings in light of prior research. First, although this study's findings revealed year 3-8 males in single-gender classrooms to have higher PASS mean scores than males in single-gender classrooms, a significant difference was noticed among male students in coed classrooms versus single-gender performances compared during years 1-6 and 2-7; however, contrary to Gurian and Stevens's discussion, this study found that coed classrooms were in fact advantageous and outperformed single-gender classrooms

in several instances among both males and females: among females during years 1-6, 2-7, and 3-8 and among males during years 1-6 and 2-7. Therefore, when comparing the performance of single-gender classroom students of the same gender against performance of coed environments, coed environments in some instances were shown to be more advantageous rather than single-gender environments.

Therefore, this study's results conflict directly with findings such as those of Flannery (2016) who evaluated an African-American student population in Seattle finding a higher percentage of males in single-gender classrooms meet standards than males in coed classrooms. As a result of adopting gender-specific instruction, this Seattle school's disciplinary rates dropped from approximately 30 per day to two per day, saving the state and the school administrative funding. Woodland Elementary in Deland, Florida, achieved similar results after adopting single-gender classroom environments (Flannery, 2016). The discrepancy noticed within this study's results in comparison to prior studies of single-gender classroom success could be influenced by several factors including, but not limited to, geographic region, socioeconomic status, cultural background, teacher instructional approach, and peer influences; however, it should not be forgotten that although coed classrooms were observed to statistically elicit higher pass mean scores, an observation of mean score patterns revealed an increase in mean score levels as year length progressed among single-gender environments as opposed to coed environments. This suggests that although coed scores were higher, single-gender environments could be advantageous to improve achievement as students age, yet this contradicts Flannery's findings that single-gender environments were advantageous even among elementary school students.

The quest to understand how and in what instances gender-based instruction may be advantageous to student learning must not end, especially since gender achievement gaps continue to widen in the states (Robinson & Lubienski, 2014; Rosenthal et al., 2013). The discrepancies noticed when comparing this study's findings to prior studies is, however, congruent with the fact that the subject of gender instruction continues to be highly debated (AAUW, 2011; Williams, 2015) and perhaps for good reason: Consistency in and rationales regarding results and achievement appear difficult to identify.

Insight and understanding may be gained by revisiting this study's findings in light of the theories that were originally used to guide this study: the feminist theory, the developmental theory, and the social theory. The feminist theory, which included liberal feminism and social feminism, assumes that female students may feel self-conscious or shy in coed environments (Sadker & Zittleman, 2013) due to sexism and bias against females due to the pervasively male-dominating orientation of western culture. This theory would hypothetically seem to suggest that female students would perform more optimally in single-gender environments than males; however, the results of this study suggested the opposite, thus further scrutiny and examination of this theory considering the results are warranted. The feminist theory assumed, at large, that females have long been and continue to be marginalized in western culture due to religiosity and a patriarchal mindset. This mindset has subtly yet surely dictated female rights, cultural norms, dress styles, and professional and academic opportunities (Diaw, 2011; Mama, 2011; Odejide, 2011).

Liberal feminism assumed that as a woman's socioeconomic standing increases,

so do her economic resources and opportunities (Streitmatter, 2011). Considering the conflicting nature of this study's findings and the general theory of feminism, the liberal feminist theory may serve to explain, in part, this discrepancy by suggesting females within this study were socioeconomically advantaged; or, in light of this study's findings, the feminist theory may actually serve to explain why single-gender environments were not advantageous to females by suggesting that females in this particular school or demographic pool in fact felt no bias, discrimination, or limitation from their male peers or leaders. This would suggest that in the particular case of this study, the goals of the liberal feminist theory have been realized; that is, that these female participants as adolescent girls had already realized their equality, academically, to males. This would seem to suggest that sexism or gender bias is actually less of an issue or academic hindrance in the South Carolina school this study evaluated, thereby negating the need for gender instruction in the first place; however, a future qualitative study examining gender-based perceptions of bias would help to clarify the credibility of this suggestion.

The developmental theory also sheds light on this study's findings. Founded on Piaget's (1969) theory of cognitive development, the developmental theory served to aid in explaining gender-based educational instruction and achievement (Cooney et al., 1993). Piaget's conceptual idea of readiness assumes that maturation is mostly irrelevant to learning success when compared to the effects of experience upon learning. Intellectual development occurs in phases and is primarily instigated and furthered through experience rather than age, yet experience level is commonly associated with age. During this process, the teacher acts as a critical instigator of learning. Learning is an active experiential, rather than passive, process in which learning occurs through

assimilation and accommodation; therefore, rather than merely focusing on the accumulation of knowledge, Piaget emphasized the importance of knowledge assimilation through application and environmental experience.

While this study originally considered Piaget's (1969) theory in light of its ability to rationalize the need for gender-based instruction supporting the separate progressions of boy versus girl developmental stages (and may still serve to explain development as such), the results of this study also suggest that Piaget's theory, in this case, may explain that boys and girls in the South Carolina school examined were developmentally similar, considering the lack of statistical significance in differing performance levels among single-gender versus coed classrooms in some instances. Also, the likelihood of boys and girls to perform more optimally in coed environments during early years suggests that in some way, boys and girls actually leveraged one another's developmental abilities as social and environmental learning incentivizes, suggesting the relevance of the social theory to this study.

The social theory essentially categorizes individuals or social groups according to attributes such as power, function, and prestige and explains the relationships and functions of these categories within historical and community concepts. Gender constitutes one demographic category within the social theory (Power, 1996). This study originally discussed how classrooms encompassing opposing genders may increase the likelihood of academic distraction since students of opposite genders may be distracted by one another due to romantic or sexual attraction (Power, 1996); thus, according to Power's (1996) discussion of John Locke's suggestions, students in such coed environments would face increased pressure to control one's carnal, personal desires and

instead exhibit what Locke called virtue and restraint. However, based on an evaluation of student test scores, this alleged distraction did not appear to be an issue among students within this study, at least directly. The only observations that may suggest this to be an issue was the fact that mean test scores among groups in gender-specified classrooms improved as age increased. Moreover, the fact that both boys and girls in coed classrooms were more likely to excel in coed versus single-gender environments during early years implies that gender variation was not a hindrance among younger students but perhaps became more of a hindrance as students aged and approached adolescent years in which hormones, attractions, and social interactions became complicated. The fact that boys and girls were actually *more likely* to exhibit met PASS scores during younger years suggests that perhaps these coed environments actually helped younger students achieve, as opposed to older students, by encouraging social learning and scaffolding through the integration and interaction of peers of varied developmental levels. Scaffolding (as explained by Vygotsky's social learning theory) and opposite-sex interaction can be an important component of social and peer-based learning. For this reason, Daniels et al. (2011) noted that at some point during the learning process, boys and girls should interact with one another. The results of this study suggest that perhaps this interaction is most appropriate academically during students' younger years.

Wall (2015) suggested that in order to promote student optimal academic achievement, in light of social theories, schools should actually eliminate peer and socially based distractions. Wall's suggestion may be evidenced by this study's findings that test scores in single-gender environments improved with age, yet coed scores

declined with age. The fact that only year 3-8, cumulatively, was examined begs for clarification regarding how this trend would have been characterized were additional years to be examined. Perhaps single-gender scores would outdo coed scores? Conclusions regarding the legitimacy of Power's (1996) social theory in regard to this study are difficult to draw considering coed classroom environments performed more optimally compared to single-gender environments. As mentioned, the social theory aligns with this study when considering that scaffolding and peer-based learning could have played a part in the success of coed students during younger years and that opposite-sex peer distractions could have played a role in decreasing coed class mean PASS scores and increasing single-gender class mean scores with age.

Altogether, this study's results were more congruent with Akers (2013) argument against the use of single-gender classroom environments to bridge the gender-based academic achievement gap. From Akers's perspective and in light of this study's findings, it may be suggested that single-gender environments actually act as a disadvantage to learning because they deprive students of the diverse, varied social stimulation and interaction they otherwise need to build and boost confidence levels, achievement, understanding, and social capacity. Furthermore, such segregated environments may deprive students of needed stimulation and gender-diverse environments they will encounter in the real world; thus, an integration of this study's results with Akers's argument would seem to suggest that single-gender environments leave students ill prepared for the world outside of academia.

Professional Significance

When considering this study's results and their theoretical implications in light of professional development in the field of education, it becomes apparent that the success or lack thereof of gender-based instructional environments compared to coed environments may be contingent upon a multitude of factors, such as student developmental levels, socioeconomic status, teacher instructional modalities (such as how scaffolding is used), levels of discipline or encouragement received, and so forth. These factors all play a role in influencing learning efficacy in combination with gender-based social influences; therefore, educators should take care to consider the social, cultural, adaptive, and economic contexts of their schools and classrooms and the attributes or developmental abilities characterizing their specific students before making school-wide decisions to implement or refrain from implementing gender-based instruction. It has yet to be identified what target populations will benefit most from gender-based instruction (Skelton, 2014). For instance, this study suggested that the South Carolina school studied might not necessarily benefit from gender-based instruction as some other middle schools may; however, year 3-8 results in this study indicated single-gender classrooms were more advantageous for older age males considering this group demonstrated steady increase in performance and higher PASS average scores in eighth grade compared to males in coed classrooms.

Cultural Considerations

Similar to the manner in which economic and environmental teaching styles and other factors influence the success or lack thereof of gender-based learning, cultural factors also likely play a role and must be considered. Revisiting Akers's (2013)

argument that gender-specific environments leave students at an academic disadvantage from a cultural standpoint, this may be especially true considering the increasingly gender-fluid environment characterizing today's globalizing society. Populations of transgender and gender-fluid students are increasing (yet are still a marginalized minority) in schools today, especially in middle-schools in which adolescent students are exploring and emerging into their sexual and gender-based identities. The idea and implementation of gender-based classrooms leaves little room or flexibility for such students to find a place of belonging in academic environments which polarize gender identities. Furthermore, implementing gender-based instruction among socially liberal populations or among target demographics in which alternative gender identities are common poses the risk of alienating and further marginalizing these already minority and likely misunderstood student populations. Such marginalization or perceived segregation may further complicate these students' abilities to succeed academically.

For these reasons, a consideration of gender and sexual identity cultural characteristics is necessary when considering the success of gender-based instruction. These considerations also force educators to consider whether or not gender segregation is actually the answer to bridging the gender achievement gap or whether another approach that actually works to integrate inter-gender cooperation and disseminate gender bias (in support of the feminist theory [Mama, 2011]) might be more effective. In light of Mama's sentiments on the feminist theory, a coed learning environment may actually act more effectively in terms of preparing young girls to achieve, exhibit, and practice confidence in the face of male counterparts, while simultaneously teaching boys how to appropriately interact with females and respect females as equals rather than a

lesser sex (Bigler & Liben, 2011). Achieving such ideals would of course require investigation into most advantageous teaching strategies and classroom contexts in which to diffuse gender-based learning boundaries and biased perceptions.

Racially derived cultural demographic characteristics likely also play an important role in shaping gender-based achievements in single-gender versus coed classroom environments. For instance, African-American males and females nationwide statistically exhibit lower academic achievement scores on average than Caucasian peers (Barton & Coley, 2010). For this reason, this study was careful to examine only African-American male and female students rather than mixed-race students so as to eliminate the variable of race. Educators must take care to understand the cultural and racial possible predictors of achievement among school target populations before integrating gender-based instruction. For instance, gender achievement discrepancies may be higher among populations racially characterized by cultures that are predominantly patriarchal, whereas gender achievement gaps may not be as pressing of an issue in socially liberal environments in which girls feel little oppression from male perceptions and stereotypes.

Essentially, this study contributes to existing literature, in part, by confirming the highly complex nature of the gender achievement gap and how it may be solved, indicating that each instance or case scenario requires different measures based upon the underlying cultural and demographic characteristics. Educators must remain highly sensitive to the specific needs of each gender while also working to diffuse gender boundaries (Shah & Conchar, 2013). Considering the fact that few studies examine educator motives for transitioning back to coed educational environments from gender-segregated classroom environments, this study contributes to literature on the subject by

suggesting (based upon findings) that the transition back to coed classroom environments may in some cases be justified by underlying cultural and social determinants. In other words, because this study revealed that gender-specific classrooms are not always advantageous, this study's results justify that in instances in which gender-specific instruction has not been quantitatively or rationally proved, such schools may be justified in reverting to coed instructional environments. Furthermore, this study's findings are particularly relevant for the consideration of educators dealing with African American United States populations.

Limitations and Delimitations

The limitations of a study identify weaknesses of research and areas in potential need of improvement and consideration when conducting further, related research (Creswell, 2014). The first limitation of this study relates to the sample size, which was relatively small with respect to conducting a quantitative study. Since the study used an especially small sample size (30 respondents total, all variable groups included), the study's generalizability is limited; and the study may therefore be difficult to replicate. A small sample size was used in order to identify participant data and execute the study within a timely manner, while minimizing the costs of the study. Taking excess time to conduct the study may have yielded results with little current relevancy to surrounding educational contexts by the time of the study's completion.

Additionally, student scores in this study only pertained to one school in South Carolina, which also make the results of this study difficult to generalize or replicate; thus, this study's results contribute important implications and suggestions guiding educator considerations and future larger-sample-size inquires, yet may not themselves

be widely, generally, or factually applied. This study's findings are also limited to African-American students and may not be applied assumptions made regarding students of other racial descent. Once again, only African-American students were chosen so as to eliminate the variable of race, since racial achievement gaps also characterize academic disparities in the U.S. Also, a single location was used so as to better understand student academic performance within this particular South Carolina localized context.

Finally, this study's data only evaluated PASS English assessment scores; therefore, results cannot be generally applied to achievement scores of other subjects pertaining to this sample population. A single subject was chosen for evaluation so as to eliminate the variable of multiple subjects, which could have introduced variant achievements due to subject and understanding rather than classroom environment alone.

Future Research

Since the difference in male achievement scores between single-gender and coed classroom environments during year 3-8 was not statistically significant yet male mean PASS scores were slightly higher in single-gender environments during this time frame, further research is warranted examining whether or not this difference would become statistically significant as male student ages increase. This suggestion is based on an observation of the patterns demonstrated within the results of this study. Since this study's results suggest that single-gender classrooms are more effective at boosting academic performance gender specifically as student ages increase, it is suggested that future study examines a greater breadth of student age, or year span, using a similar design but a larger and similar sample population. This may aid in clarifying this study's somewhat complicated and conflicting results. Additionally, this study's results signified

a slight decline in female mean PASS scores between years 2-7 and 3-8, which further rationalizes future study examining greater time spans since the difference between this study's results from years 1-6 and 3-8 among females in single-gender environments still demonstrate an overall incline in mean PASS scores.

Future qualitative studies may serve to inform the rationale behind this quantitative study's findings. For instance, future qualitative studies may seek to understand why this student population did not exhibit significant statistical difference in single-gender versus coed environments during later years or why coed environments achieved higher test scores than single-gender environments, especially during early years. This may be understood more fully by examining how teaching environment or other factors such as socioeconomic status and developmental level influence performance. Such variables could also be examined quantitatively. Qualitative examination may seek to understand how male or female perceptions of the opposite gender influence the opposite gender performance levels, achievements, abilities, and/or comfort levels in this educational environment. Studies considering these factors would more fully integrate this study's findings with the social, feminist, and developmental theories considered previously. Studies of other subgroups should be considered to determine if similar student academic performance results would be observed.

Last, future studies may also examine gender discrimination and most successful means of dissolving gender bias in educational settings using action research. As transgender and gender-fluid identities become more popular, it may be suggested that educators assess gender performance and gender integration from a broader scope, while also seeking to become more gender current and gender literate in order to facilitate

nondiscriminatory, successful learning environments. When implementing gender-based instruction, educators must ensure a justified rationale is present, so as not to appear discriminatory (the very concept gender-specific classrooms ought to work against) in an increasingly gender-fluid society. The need to foster collaboration and understanding among educators and students has never been greater than in today's educational environment (Riordan, 1999), because as Spielhagen (2011) remarked, "it all depends" (p. 6); that is to say, gender-based classroom success depends on a multitude of factors as addressed within this discussion.

Summary Conclusions

This study's results and discussion have integrated findings of a longitudinal correlative study of South Carolina African-American student gender-based instruction English achievement scores with existing literature on the subject of gender-based instruction. Prior international studies conducted in the U.S., Canada, England, and Australia, for instance, demonstrate advantages of gender-based education (AAUW, 1992; Datnow & Hubbard, 2016; Gurian & Stevens, 2013; Spielhagen, 2012). Such studies served as the basis for rationalizing this study's investigations, which sought to determine whether single-gender or coed classroom environments had a statistically significant effect on male and female English achievement scores among African-American students in the sixth through eighth grades. This inquiry was accomplished by comparing African-American male and female student PASS test scores in coed versus single-gender classrooms using students in a South Carolina school. The results of this study indicated statistical significance only among girls during years 1-6, 2-7, and 3-8 (in which girls in coed environments were more likely to exhibit higher PASS achievement

mean scores than girls in single-gender environments), among boys during years 1-6 and 2-7 (in which boys in coed environments were more likely to exhibit higher PASS mean scores), and among boys and girls during year 3-8 (in which boys exhibited a higher percentage of PASS proficiency in single-gender contexts than girls in single-gender classrooms).

Conclusively, these results suggest that coed educational environments are more academically advantageous for African-American middle school boys and girls, especially during younger years, than single-gender environments; however, an observation of this study's mean PASS scores reveals that scores relatively increased among single-gender classrooms, according to gender and alongside year length or student age. This study's results suggest that single-gender classrooms may be more academically advantageous as students age; however, this study suggests that research is needed to verify the credibility of this suggestion since this study focused primarily on assessing statistical significance, of which none was found in regard to single-gender classrooms being more academically advantageous than coed classrooms. The issue of the gender achievement gap continues to be a complex phenomenon, which this study's results contribute to, yet also indicates the need for additional research on the subject.

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Appendix

Letter of Permission to Conduct Study from School District

[redacted] South Carolina [redacted]
Telephone: [redacted] • Fax: [redacted]
www.[redacted]k12.sc.us

[redacted]
Superintendent

May 30, 2018

Dear Mrs. Gore,

On behalf of [redacted] County School District, congratulations on reaching the milestone of dissertation phase of your graduate studies. We are in receipt of your request to conduct a research study for your doctoral dissertation titled "Comparing Academic Performance Data of Students in Single Gender Classroom: Which Gender Benefits the most, African American Males or African American Females?

The approved research does not include participation of students. In accordance with our district protocol, your approval to conduct research will be contingent upon the submission of your final IRB approval letter from Gardner-Webb University. Once this information is submitted you can begin research in our district.

I wish you much success with your research and dissertation process.

If you have any questions or concerns, please contact me. Again, congratulation.

Sincerely,

[redacted]

[redacted] Ph.D.
Superintendent

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