GENDER-BASED EDUCATION: THE PILOT YEAR
OF SINGLE-GENDER CLASSES AT A
PUBLIC ELEMENTARY SCHOOL

By
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The No Child Left Behind Act of 2001 requires public schools to be highly accountable for dollars spent on education and for the achievement of students. To support this mandate, the law expanded local control and allowed schools to explore innovative ways to enhance student learning (U.S.D.E., 2004). Given the opportunity, some public schools have experimented with single-gender classes as an avenue for improving the way students are taught.

Studies have indicated that separating students according to gender has a positive impact on learning (e.g., Haag, 2000; Maslen, 2001; and Sommers, 2001). Single-gender settings have also been reported to have a positive affect on the attitudes of students (NASSPE, 2004b; Colley et al., 1994, James & Richards, 2003; and Rowe, 2000). Because single-gender classes were not an option in the public school sector in recent years, most current studies of single-gender education involve private and parochial schools.
The purpose of this mixed methods study was to examine the initial impact of implementing gender-based instruction in a suburban public elementary school in central Mississippi. The impact was analyzed in terms of the overall perceptions of the administrator, teachers, students, and parents who participated in the pilot program. The impact was also measured by the students' performance in the areas of academic achievement, school attendance, and classroom behavior during the pilot year of fifth-grade, single-gender classes.

The results of the study indicated the overall perceptions of the participants were favorable toward single-gender classes. The students maintained approximately the same level of academic achievement in fifth-grade, single-gender classes as in fourth-grade coeducational classes. They produced an average of 2.6 years (grade equivalent) growth in Accelerated Math during the year of single-gender classes. The average daily attendance was consistent with previous attendance patterns and exceeded the district average. An analysis of discipline records revealed a positive difference in the reported conduct of students in the single-gender classes as compared to the students in coed classes throughout the district. The conclusions drawn from this study suggest continuing the single-gender classes. It is recommended that the administration and staff continue to explore gender-based teaching and classroom management.
DEDICATION

I would like to acknowledge that above all else, it is by God’s grace that I have accomplished this goal and earned a Doctorate of Philosophy in Educational Leadership. To Him I dedicate this degree as a tool for His service. If it honors the Father, my goal is accomplished. In the words of King Solomon, “. . . my son, be warned: the writing of many books is endless, and excessive devotion to books is wearying to the body. The conclusion, when all is heard, is: fear God and keep His commandments, for this is the whole of man” (Ecclesiastes 12:12-13).
AKNOWLEDGEMENTS

The successful completion of this graduate program required the contributions of many. My husband Gene has been my greatest encourager. He has unselfishly made the sacrifices necessary in a family for one member to commit the level of time and energy required to complete a task such as this. I thank the Lord for him. Likewise, I am thankful for the encouragement of my family and friends.

I am grateful for the cohort of fellow administrators and educators with whom I made the journey. Thanks, especially, to Claudia Steele and Roma Morris for their support throughout the program. “Two are better than one; because they have a good reward for their labor. For if they fall, the one will lift up his fellow . . .” (Ecclesiastes 4: 9-10).

This study would not have been possible without the vision and professionalism of Dr. Barbara McCool, principal of Flowood Elementary School. I appreciate her commitment to education and her willingness to take risks for the benefit of the children. It was an honor to work with her on this project.

I gratefully acknowledge the members of my graduate committee: Dr. Teri Brandenburg, Dr. W.C. Johnson, Dr. John Lamberth, and Dr. Vincent McGrath. It was a joy to work under their supervision. Dr. Brandenburg, my advisor, did an exemplary job of providing the leadership necessary to complete my dissertation. I am very thankful for her expertise and her kindness.
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CHAPTER I
INTRODUCTION

From the White House to the schoolhouse, concern for the condition of education in America abounds. In response to this concern, landmark education reform was designed and signed into law by U.S. President George W. Bush on January 8, 2002. The No Child Left Behind Act of 2001 (NCLB) represents significant changes in federal efforts to support elementary and secondary education in the United States. “It is built on four common-sense pillars: accountability for results, an emphasis on doing what works based on scientific research, expanded parental options, and expanded local control and flexibility” (U.S. Department of Education, 2004, p.1). As a result of NCLB, “school districts have more freedom to implement innovations and allocate resources, thereby giving local people a greater opportunity to affect decisions regarding school programs” (U.S.D.E., 2004, p.5).

One option some public schools are currently exercising is single-gender education. The term, single-sex education, may refer to the gender composition of the school, the classrooms, or the teaching staff (Husen & Postlethwaite, 1994). Private and parochial schools have a long history of offering single-gender educational opportunities, but because of federal regulation, public schools in the United States have not had the liberty to separate boys and girls in classrooms (NASSPE, 2004c).
The status of gender-based education began to change when NCLB included a provision, specifically sections 5131 (a) (23) and 5131(c), that was intended to authorize single-gender education in public schools. The new regulations allow coeducational public schools to offer single-sex schools or single-sex classrooms within coed schools (Federal Register, 2002).

A survey by the National Association for Single Sex Public Education (NASSPE, 2004e) during the 2003-2004 school year revealed there were 97 public schools in the United States that offered some form of single-gender education. Twenty-five of the public schools were entirely single-sex, while another 72 public schools offered some single-sex classrooms. By the beginning of the 2004-2005 school year, the number had risen to 143 public schools in the United States that offered gender-separate educational opportunities. Thirty-six of these were entirely single-sex, and 107 were public coed schools that offered some single-sex classrooms. In the fall of 2004, a public elementary school in central Mississippi joined the ranks of public schools offering single-gender classrooms.

Statement of Purpose

At the principal’s request, the school district approved a pilot program for the 2004-2005 school year in which the fifth-grade classes at the elementary school were divided by gender. The classes in the school district had always been coeducational. This was the first application of “all girls” or “all boys” classes at the elementary level. The purpose of this case study was to examine the initial impact of
implementing gender-based instruction in a suburban elementary school in central Mississippi. The impact was analyzed in terms of the attitudes and perceptions of the administrator, teachers, students, and parents involved in the pilot program. The impact also encompassed student performance as measured by academic achievement, school attendance, and classroom conduct.

Questions to Be Answered

This study addressed the following questions:

1. What were the overall perceptions of the administrator, teachers, students, and parents of their initial experience with single-gender education in a public elementary school?

2. What was the impact of single-gender education on the fifth-grade students in terms of school attendance, classroom conduct, and academic achievement?

Justification for the Study

Today’s educators are highly concerned with measuring academic growth in individual students. The No Child Left Behind Act of 2001 calls for states, districts, and schools to be accountable for dollars spent on education. “The law creates a culture of accountability, requiring schools to reassess what they are doing to raise achievement for all students and support teaching and learning” (U.S.D.E., 2004, p.6).

Given the pressure imposed by the accountability models and the opportunity for expanded local control enabled by current education legislation, some educators
are exploring various avenues for improving the way students are taught. One such avenue is single-gender schooling. In a changing society, not only the pedagogical but also the environmental and social aspects of schools must be considered. Several studies have indicated that separating students according to gender has a positive impact on academics (Haag, 2000; Rowe, 2000; Maslen, 2001; Sommers, 2001) and on the attitudes of students (Brutsaert & Bracke, 1994; Smith, 1996; NCGS, 1999; James & Richards, 2003).

Cathy Young (2002), vice president of the Washington, D.C.-based Women’s Freedom Network, observed that there are clearly educational problems that disproportionately affect male students. She believes these problems should be evaluated in the light of some gender-specific solutions. Programs funded by both private and government groups that address the issue of girls’ underachievement in math, science, and computers have proliferated. But programs targeting boys’ deficits in reading and writing, though they are working well in England, have not flourished in the United States. In 2001, the U.S. Department of Education gave nearly $200 million in grants to state initiatives aimed at improving reading skills in elementary schools as part of the Reading Excellence Program. None of this was used to specifically address the gender gap in literacy (Young, 2002).

Young (2002) believes that single-gender education deserves more consideration. She proposes that it may be the best option for some boys and girls, not just because of the difference between sexes but because some students learn best without the distracting presence of the other sex. Parents who want single-sex
schooling for their children have fewer options than those satisfied with coeducation. These are generally found in the private sector and are costly. The more diversity there is in education, the more it can be tailored to each child’s individuality.

Dr. Leonard Sax, executive director and founder of the National Association for Single Sex Public Education (NASSPE, 2004e) is a strong advocate for gender-based education. In his opinion, 30 years ago many educators believed the best way to ensure equal educational opportunities for girls and boys would be to insist on educating boys and girls in the same classroom. According to Sax, the best evidence now suggests that coeducational settings actually reinforce gender stereotypes, whereas single-gender classrooms break down gender stereotypes.

Many studies on single-gender education have been done in other countries (e.g., Scanlon, 2000; Hoffman, 2002; Wong, Lam, and Ho, 2001). However, what is believed to be the first comprehensive study of public single-sex schools is currently underway in the United States. The Department of Education is commissioning the study to determine whether all-boys or all-girls education can help improve learning. Cornelius Riordan, a sociology professor at Providence College in Rhode Island, will lead the $1.2 million study. Riordan will partner with the RMC Research Corporation in Portland, Oregon, and the Washington-based American Institutes for Research. The study will include an exhaustive review of the literature on the topic, followed by a survey of the existing public single-sex schools. Researchers will examine a wide range of factors, including grade levels, socioeconomic status of students, race, teacher credentials, per-pupil expenditures, and discipline (Davis, 2004, March 24).
According to Riordan, little research exists on single-gender education in U.S. public schools because there have been so few programs. The research that is available tends to focus on women’s colleges, elite private schools, Roman Catholic Schools, or single-sex schools in faraway nations (Viadero, 2002). The new regulations of NCLB have allowed an increase in single-gender public schools in America. The organization of these new schools and classrooms provides further opportunity for researchers to investigate whether single-gender academic settings are successful (Davis, 2004, March 10).

By examining the impact of single-gender classrooms on the performance of the fifth-grade students at the pilot school, both school and district-level administrators were able to evaluate the effectiveness of the single-gender classrooms and make decisions about the future of the program. The findings could influence decisions concerning other grade levels and other schools within the district in regard to single-gender grouping. Considering the relatively small number of public schools that have adopted the single-gender classroom format, this case study may contribute meaningfully to the body of available research by examining the perceptions of the stakeholders and the performance of the students involved in the pilot program.

Delimitations of the Study

This study was delimited to an intact group of fifth-grade students in a suburban school in Mississippi. The students were purposefully selected in that they were enrolled in the single-gender fifth-grade classes at the public school for the
2004-2005 school year. Differential selection occurred to the extent that men were assigned to teach the boys, and women were assigned to teach the girls.

Limitations of the Study

There were no coeducational classes in fifth grade at the school for the 2004-2005 school year to which the single-gender classes could be compared. Therefore, the application of findings was somewhat limited to similar-age students in the pilot school or school district. The findings could potentially be transferable to other schools and school districts whose demographics are similar.

The study was confined to one academic school year, thus long-term impact cannot be determined. The participants’ discipline records for the previous year were unavailable allowing for no comparisons to be made regarding the impact that single-gender classes may have had on behavior. Because this was the students’ first experience with single-gender classes, there was a possibility of compensatory rivalry between the gender groups wherein the students “perform beyond their usual level because they perceive that they are in competition” (Gall, Borg, & Gall, 1996, p.755).
CHAPTER II
REVIEW OF THE LITERATURE

Single-gender education is a multi-faceted issue. While it is not a new concept, there are new regulations, new applications, and new research studies emerging. The review of the literature presented here addresses the recent developments in the law regarding gender-based education and the mixed response to those changes. Current research exploring the influence that gender has upon the brain and learning will be introduced. Finally, an examination of national and international studies will provide the background for a case study of single-gender classrooms.

New Regulations for Single-Gender Education

Private and parochial schools have a long history of providing single-gender educational opportunities, but owing to federal legislation few public schools have offered that option since the early 1970s. The policies regulating single-gender education in the public sector have emerged from a series of legislative actions. The Equal Protection Clause of the Fourteenth Amendment reads, “. . . nor shall any state . . . deny to any person within its jurisdiction the equal protection of the laws.” The Fourteenth Amendment, which was proposed and ratified after the Civil War, was intended, among other things, to establish the citizenship of former slaves and to
ensure that the states did not deny equal rights to any person. The Supreme Court has often relied on the phrase “equal protection of the laws” as the basis for its civil rights rulings (American Bar Association, 2004). The requirements of the Equal Protection Clause of the Fourteenth Amendment of the U.S. Constitution also protect the rights of public school students who may be subject to sex-based classifications (Federal Register, 2004).

Title IX of the Education Amendments of 1972 prohibited discrimination on the basis of sex in educational programs and activities that receive federal financial assistance. The regulation stated that “. . . no person in the United States, on the basis of sex, can be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance” (20 U.S.C. 1681 as cited in the Federal Register, 2002). Categorical exceptions to this general prohibition of single-sex classes or activities included physical education classes that involved physical ability or bodily contact, classes that dealt exclusively with human sexuality, and choruses based on vocal range and quality (34 CFR 106.34 as cited in the Federal Register, 2002).

The Supreme Court has decided three significant constitutional cases specifically concerning single-sex education. In Vorcheimer v. School District of Philadelphia (1976) an evenly divided court let stand a decision allowing, under the Equal Protection Clause, a school district that also operated coeducational high schools to have two comparable single-sex high schools. The advent of the women’s movement stimulated more cases. In Mississippi University for Women v. Hogan
(1982) involving a state-sponsored female-only nursing school and in *United States v. Virginia* (1996) involving a state-sponsored, male-only military college, the courts ruled the schools were in violation of the Equal Protection Clause. Both institutions were compelled to admit both sexes into their programs (Federal Register, 2002).

The status of single-gender education began to change on January 8, 2002, when President Bush signed into law the No Child Left Behind Act of 2001 (NCLB), which reauthorized the Elementary and Secondary Act of 1965. Senator Kay Bailey Hutchinson, an advocate of single-gender public education, was responsible for introducing Senate Amendment 540 as a subsection of the No Child Left Behind Act of 2001. It was adopted by unanimous consent. In a June 14, 2001, press release Senator Hutchison stated the following:

> The Department of Education must step up to the plate and open the gates to make single-sex education available to all those who want it, not just those who can afford it. We want parents who might not be able to afford private school or might not have the option of a parochial school, to be able to access such [single-gender] programs in public schools. We want public schools to be in compliance with the law without having to go through a lot of red tape and bureaucracy. (Hutchinson, 2001)

Senator Hillary Clinton also emerged as a strong proponent of single-gender education in her remarks: “Public school choice should be expanded as broadly as possible. There should not be any obstacle to providing single-sex choice within the public school system” (Sax, 2002).
The No Child Left Behind Act of 2001 authorized funding for same-gender schools and classrooms. It also required the Department of Education to issue guidelines for local educational agencies regarding the applicable law on single-gender classes and schools. The purpose of these guidelines is to support efforts of school districts to improve educational outcomes for children and to provide public school parents with a diverse array of educational options that respond to the educational needs of their children. The guidelines also provide appropriate safeguards against discrimination (Federal Register, 2002).

On March 9, 2004, the Office of Civil Rights (OCR) of the United States Department of Education published the proposed framework for determining under what circumstance single-gender schools and classes may be provided in public elementary and secondary education. The OCR overview explained that current regulations (prior to NCLB) were designed to prevent discriminatory practices. Over the past 30 years, the situation has changed dramatically in that schools are far more equitable in their treatment of females, thus greater flexibility is warranted (Federal Register, 2004).

The proposed framework establishes standards to be used by the OCR of the U.S. Department of Education to determine whether recipients of federal financial assistance provide single-gender schools and classes that are consistent with Title IX regulations.

The amendments require that a recipient of federal aid that operates a non-vocational coeducational elementary or secondary school may provide non-
vocational single-sex classes if each single-sex class is based on the following objectives: (a) to provide a diversity of educational options to students and parents provided that the single-sex nature of the class is substantially related to achievement of that objective, or (b) to meet the particular, identified educational needs of its students, provided that the single-sex nature of the class is substantially related to meeting those needs. (Federal Register, 2004)

Mixed Response to New Regulations

According to Secretary of Education Rod Paige, the use of single-gender classes and schools can reflect important and legitimate efforts to improve educational outcomes for all students. Rather than being motivated by preconceived notions about gender, these efforts aim to provide new and better ways to help students learn and meet high standards. In developing the regulatory proposal, the Department of Education sought to ensure that educational opportunities are not limited to students based on gender and that single-gender classes are not based on sex-role stereotypes (Federal Register, 2004).

Not everyone agrees with Secretary Paige’s support of single-gender education. The National Coalition for Women and Girls in Education (NCWGE), a nonprofit coalition of more than 50 organizations dedicated to improving educational opportunities for women and girls, opposes the proposal to amend regulations implementing Title IX of the Education Amendments of 1972. NCWGE believes that Title IX and its regulations are critical for ensuring that all students have equal
educational opportunities. They further believe that the proposed regulations will severely weaken current Title IX standards and throw out basic protections against sex discrimination in education. The organization holds that the Department of Education does not have the authority to, nor should it, revise the Title IX regulations. Opposition stems from fear the proposal will allow schools to launch unlawful, unproved, and damaging educational experiments on our nation’s young people (The National Coalition for Women and Girls in Education, 2004).

Opposition also includes the National Women’s Law Center (NWLC), whose position is that without the safeguards of the Constitution and Title IX, a school would not need any persuasive rationale or purpose for separating the sexes. The schools could use harmful stereotypes in a way that would hurt girls and young women. Both the Constitution and Title IX of the Education Amendments of 1972 recognize that there are certain circumstances in which single-sex educational opportunities may be justified, but provide strong protections so that schools cannot limit students’ opportunities and aspirations through sex-segregated schools and classes (NWLC, 2000).

The American Civil Liberties Union (ACLU) opposes the proposed Title IX amendments as unconstitutional and failing to offer compelling justification for how the changes will improve educational opportunities for American students while ensuring that there will be no discriminatory impact. The ACLU argues the current proposal made by the Department of Education is not based on conclusive research about how to better educate children. They claim that not only has Title IX been
instrumental for more than 30 years in closing the gender gap in education but also in broadening social equality for women in general (ACLU, 2004).

Opponents of this movement fear regression into a male-dominated culture and loss of progress made toward gender equity. LaShawn Warren of the legislative counsel for the ACLU’s Washington office worries that one gender may get fewer opportunities, substandard equipment, or less qualified teachers. Leslie Annexstein, the director of the legal-advocacy fund at the Washington-based American Association of University Women, views the research as incomplete in determining whether single-gender education is beneficial (Davis, 2004, March. 10).

The Influence of Gender on Learning

Research has revealed that gender can influence learning. According to Doreen Kimura (1996), “The evidence from structural brain differences between the sexes, sex hormone influences, and similarities in sex differences across cultures, combine to suggest that men’s and women’s brains are to a significant extent wired differently from the start” (p. 260). Achiron, Lipitz, and Achiron’s, (2001) research has proven that differences in the male and female brain begin in the womb. About midway through gestation the sex hormones of males (androgens) that give rise to masculinity bind to brain tissue and begin to transform it. By 26 weeks gestation, the developing male brain is permanently and irreversibly transformed.

Using magnetic resonance imaging (MRI) invented in the late 1980’s, scientists have been able to study what areas of the brain are active when people
engage in particular activities. The studies have shown that males and females listen, read, process information, and experience emotions differently. For example, the male or female brain responds differently while listening to a passage being read: In males, only a small area of the brain “lights up,” whereas in females both frontal lobes of the brain “light up” (Phillips, Lowe, Lurito, Dzemidzic, & Matthews, 2001).

Hanlon, Thatcher, and Cline (1999) examined brain activity in 508 normal children—224 girls and 284 boys—ranging in age from two months to 16 years. They documented striking and consistent sex differences in the speed with which the brain matures. While the areas of the brain involved in language and fine motor skills mature about six years earlier in girls than in boys, the areas of the brain involved in targeting and spatial memory mature about four years earlier in boys than in girls. These researchers concluded that the areas of the brain involved in language, in spatial memory, in motor coordination, and in getting along with other people, develop at different rates and times and in a different order for males and females.

Another physiological difference in males and females that has the potential to impact learning is hearing. Cassidy and Ditty (2001) of Louisiana State University conducted a study of the hearing of 350 normal newborns. At 4000 Hz, the amplitude threshold for girls was three times softer than the threshold for boys who have a shorter, stiffer cochlea. These findings have implications for the classroom. Girls hear more keenly than boys and generally function better in a quieter setting. Boys benefit from the stimulus of a louder volume (NASSPE, 2004b).
Killgore, Oki, and Yurgelun-Todd (2001) determined that emotional activity is processed in completely different areas of the brain in boys and girls. In young children, the locus of emotional activity lies deep in the brain in the amygdala. As girls get older, the locus of emotional activity moves up to the cerebral cortex. This is the same part of the brain involved in reasoning, language, and higher cognitive skill. In boys the locus of emotional activity remains in the amygdala, the primitive subcortical area of the brain. Thus, girls are more likely than boys to be talkative and expressive. It is easy for girls to link emotions with ideas, whereas boys seek action. (Killgore et al., 2001).

Girls also cope differently with stress than boys. Taylor and Klein (2000) described the female reaction to stress as “tend and befriend.” This response accompanies a decreased heart rate, decreased brain blood flow, and perhaps dizziness or nausea. Boys, on the other hand, react with a “fight or flight” mentality. They experience an increased heart rate, increased brain blood flow, and increased arousal and alertness. Stress actually enhances learning in males while it impairs learning in females.

A report from the National Institutes of Health (Costa, Terracciano, and McCrae, 2001) disclosed that gender differences in personality were evident across all cultures studied, including China, Africa, Malaysia, the U.S., Europe, and others. The gender-specific personality and emotional characteristics affect how boys and girls perform in school. Boys tend to receive more attention than girls, and teachers
ask higher order questions of males. Boys tend to participate more in whole-group activities and to dominate class discussions (Weiman, 2004).

There are many examples of how these personality differences surface. Girls tend to have higher standards in the classroom and evaluate their performance more critically. They outperform boys in school (as measured by students’ grades) in all subjects and in all age groups (Feingold, 1994). Girls are more motivated and more concerned with pleasing adults. Boys are less motivated to study unless the material interests them. In school, males tend to excel at problem solving and multiple choice tests. Females excel in calculation, untimed and written tests, and they tend to have higher grades than males throughout their schooling (Weiman, 2004).

Sax (NASSPE, 2004b) has interpreted the research findings to imply distinct advantages of single-gender grouping that are unique to girls: (a) expanded educational opportunity, (b) custom-tailored learning, and (c) greater autonomy, especially in heterosexual relationships. Girls in single-gender classrooms are more likely to explore nontraditional subjects such as computer science, math, and physics because there is less intimidation than in a coed classroom. Girls enjoy cooperative learning opportunities in a safe, comfortable, welcoming environment (NASSPE, 2004b).

Sax (NASSPE, 2004a) also cites benefits of single-gender education for boys. One advantage is enabling teachers to custom-tailor their teaching styles to boys. In order to teach effectively, the teacher’s first task is to get the boys interested. Boys like the classroom to be energized. Confrontation works well with most boys. A
direct challenge such as “Prove it to me!” motivates boys to work harder. The all-boy classroom provides a more diverse and well-rounded educational experience that addresses the male learning style.

A recent nationwide survey by Gentry, Gable, and Rizza (2002) confirmed that boys at every age are less enthusiastic about school than girls. The older they get, the more they perceive school as “geeky.” Boys perceive the coed school as an institution run largely by women and run largely according to women’s rules. They see the top students are girls, and the teacher’s pet is a girl; thus, they devalue academic excellence (Gentry et al., 2002).

These impressions appear to impact future education. According to Conlin (2003), for 350 years, men outnumbered women on college campuses. Now, in every state, every income bracket, every racial and ethnic group, and most industrialized Western nations, women reign, earning an average 57% of all bachelor’s and 58% of all master’s degrees. In response to this diminishing interest among males, British educators are making efforts to address “laddism”: boys turning off to school. They are focusing on teaching techniques that re-engage boys. Gurian and Stevens (2004) say, “Our boys are now losing ground in school, and we must come to terms with it—not in a way that robs girls, but in a way that sustains our civilization (p.24).”

International Studies of Single-Gender Education

The National Foundation for Educational Research (NFER) in the United Kingdom was commissioned to study the effect of school size and school type
(single-sex vs. coed) on academic performance. The Foundation studied 2,954 high schools throughout England, where single-sex public high schools are widely available. The study found that even after controlling for students’ academic ability and other background factors, both girls and boys did significantly better in single-sex schools than in coed schools. The benefits were larger and more consistent for girls than boys at the high school level. Girls at all levels of academic ability did better in single-sex schools, whereas only boys at the lower end of the ability scale benefited. Girls in single-gender schools were found to be more likely to take non-traditional courses—courses that run against gender stereotypes—such as advanced math and physics. No such effect was seen for boys (Spielhofer, O’Donnell, Benton, Schagen, and Schagen, 2002).

Attitudes toward academic subjects are an indicator used by researchers to measure success in single-gender education. Colley, Comber, and Hargreaves (1994) surveyed British students (ages 11-12 and 15-16 years) from single-sex girls’ and boys’ schools and coeducational schools, asking them to rank their school subject preferences. In the younger age group, girls from single-sex schools showed stronger preferences than their female coed peers for stereotypical “masculine” subjects such as mathematics and science, and boys from single-sex schools showed stronger preferences than their male coed peers for stereotypical “feminine” subjects such as music and art.

Dr. Ken Rowe, a Principal Research Fellow at the Australian Council of Educational Research, addressed the Second Annual National Conference on
Coeducation in 2000. He disclosed the findings of the Victorian Certificate of Education (VCE) Data Project, a population study of 270,000 Year 12 students’ achievements in 53 subjects over a 6-year period (1994-1999). After adjusting for measures of students’ abilities and school sector (government, Catholic, and independent), Rowe found the achievements of boys and girls in single-sex environments were, on average, 15-22 percentile ranks higher than their counterparts in co-educational settings (Rowe, 2000).

Additionally, Rowe (2000) reported attitudinal differences in a study of 16,000 students drawn from 200 government, Catholic, and independent schools. In both primary and secondary schools, patterns were evident in students’ behaviors in the classroom and in their perceptions of teacher responsiveness, curriculum usefulness, and enjoyment of school. Rowe attributed the differences in students’ behaviors and perceptions to the limitations of coeducational schools to accommodate differences in the cognitive, social, and developmental growth rates of adolescent boys and girls.

Dean (1998) reported the results of a study by the British Office for Standards in Education (OFSTED) that measured whether socioeconomic variables might account for the superior performance of students in single-sex schools. In examining test results from 800 schools, OFSTED found superior performance appeared to be the direct result of single-sex education.

British educator Graham Able published a study of student performance in 30 coeducational and single-sex schools in England. Able reported the superior academic
performance of students in single-sex schools, recognizing an even greater academic advantage for the boys (Gordon, 2000). Single-sex schools routinely and overwhelmingly earn the highest scores on the required nationwide examinations in Britain. In 2000, almost every one of the 50 top-ranked British high schools, including the top 20, was single-sex (O’Leary, 2000).

Various studies address students’ academic achievement in single-gender settings. Some reports yield evidence that girls’ interest in math and computer science is stimulated more effectively in a single-gender educational setting (Culley, 1993; Newton & Beck, 1993). Scanlon (2000) reports there is a growing realization among science educators that learning experiences vary with the gender composition of the group. Researchers at Manchester University in England tested single-sex classroom advantages by assigning students in five public schools to either coed or single-sex classrooms. The experiment resulted in 68% of the boys in single-sex classes passing a standardized test of language skills compared to 33% in coed classes. Among the girls, 89% in single-sex classes passed the test, compared to 48% in coed classes (Henry, 2001).

Underwood and Underwood conducted a study in 1997 in which they paired 31 sets of 8-year olds on a computer-based language task. The students were matched for reading ability and randomly paired, girl-girl, boy-girl, and boy-boy. The Underwoods (1997) found a dramatic difference in story recall, depending on the gender composition of the pair. Boys in boy-boy pairs performed least well, while girls assigned to girl-girl pairs scored the highest. Interestingly, girls in boy-girl pairs
performed almost as badly as the boys did. Putting a girl with a boy degraded her performance by roughly 50% on the computer-based task. The effect was highly significant ($p < 0.001$).

A yearlong study from Germany (Hoffman, 2002) involved physics students in six coeducational high schools. The students were assigned to either coed physics classes or part single-sex and part coed. The study revealed that girls who had half their physics instruction in all-girl classes did significantly better than girls who were in coed classes ($p < 0.05$) and remained just as interested in physics at the end of the year. Wong, Lam, and Ho (2001) found similar results in a study of 45,000 students in 400 schools in Hong Kong where about one tenth of the schools are single-gender. After controlling for pre-existing ability, they found that girls in single-sex schools did significantly better on the mathematics examination than did girls in coed schools.

In 2002, Spielhofer, et al. of the United Kingdom conducted a value-added analysis of national performance data using multilevel modeling techniques to investigate the impact of single-sex education. After controlling for prior achievement and other background factors, results showed girls and boys in single-sex comprehensive schools achieved better in many areas than their peers in mixed schools. The most obvious difference was in science achievement.

When student achievement is used as a measure of the success or failure of a single-gender school, the results are sometimes ambiguous. For some studies that did find gaps favoring single-sex schools, once findings were adjusted for socioeconomic or ability variables, these differences diminished. For example, Harker and Nash
(1997) used data gathered in a longitudinal study of more than 5,000 eighth-grade students in New Zealand and controlled for individual characteristics (such as socioeconomic status) and school type. The researchers confirmed statistically significant differences in favor of girls at single-sex schools. Yet, after applying controls for ability levels and for social and ethnic backgrounds, differences disappeared.

United States Studies of Single-Gender Education

The policy shift made possible by NCLB designated “same-gender schools and classrooms (consistent with federal law)” an innovation for which public school districts could use federal funds (Federal Register, 2004). Researchers, educators, and policy makers have reacted differently to the U.S. Department of Education’s efforts to revise Title IX single-sex education regulations that date back to 1975. Supporters of single-gender education (Perry, 1996; Dean, 1998; Gordon, 2000; Rowe, 2000) point to data and anecdotal evidence that demonstrate the positive outcomes of single-gender private schools and the observed advantages for at-risk students. Rosemary Salomone (2003) and Leonard Sax (2005) tout the new research on social dynamics and the different ways the brain functions and develops, particularly in boys, as a basis of support for single-gender education. Opponents of gender-based instruction tend to contribute observed improvements to factors other than single-gender grouping (American Association of University Women, 1998; Gentry, Gable, & Rizza, 2002; Datnow, Hubbard, & Woody, 2001). The response is mixed:
While few advocates assert that such programs represent a fundamental reform strategy for improving education overall, most believe single-sex schools are one promising answer to some of the problems facing public schools today. (National Association of State Boards of Education, 2004)

One of the most extensive studies in the United States was in 1997 when California became the first state to experiment with single-gender public education on a large scale. Six districts opened twelve single-gender academies (both boys and girls) as a result of former California Governor Pete Wilson’s legislation and funding for a single-gender pilot program in the public school system. A study conducted by Datnow, Hubbard, and Woody (2001) assessed the consequences of single-gender schooling in the California public school sector. The study focused on the socio-political context, the organization and implementation of single-gender schooling, and the policy implications regarding school choice options.

The goals of the legislation were to increase the diversity of public educational offerings and, at the same time, provide equal access. According to Datnow et al. (2001), the goals were not met. The study found that the adoption and implementation of the academies were often motivated by the benefits that could be derived from the generous state grant. Educators used the funds attached to the pilot program to address more pressing issues such as low achievement, poverty, violence, and geographic isolation. In most cases, the districts designed their single-gender schools for “at risk” students who struggled academically, emotionally, and socially.
In examining the equity implications of single-gender public schooling, the researchers found that when single-gender academies tailored curriculum and instruction to meet the different educational needs of boys and girls, they did not, despite their best intentions, offer equal educational opportunity to both boys and girls. Most teachers were unable or unwilling to change traditional notions of gender and did little to challenge the students’ notions of gender. Datnow et al. (2001) concluded that while the single-gender academies were diligent in offering an equal distribution of resources to boys and girls, the schools were not a vehicle for gender equity.

The Datnow et al. study of the California pilot program drew varying responses. Leonard Sax, executive director of the National Association for Single Sex Public Education (NASSPE, 2004d), opined that the Datnow et al. report made it clear that the California program was profoundly flawed at the outset. Sax observed that Datnow and her associates found the program was undermined by implementation challenges, short timelines to propose and begin operation of the academies, staff and leadership turnover, and funding problems. Most educators saw it as a way to help address the more pressing educational and social problems of low achieving students. Thus, the California pilot program could not be used as a meaningful indicator of the success or failure of single-sex education in public schools.

Sommers (2001) concluded that the Datnow et al. study does not address whether single-sex schools improved grades, test scores, or attendance. It focused
narrowly on the question of how single-sex education affected the students’ views on gender, not on the improved academic performance that is noted in the anecdotal evidence. Sommers labeled Datnow and her associates “gender wardens” who “repeatedly put the aim of eliminating gender stereotypes ahead of children’s academic and moral needs” (p. 37).

A study by Cornelius Riordan (1990) used longitudinal data to clarify the effects of single-sex education on different populations and curricular areas. Riordan conducted separate analyses for students by sex and race on academic and attitudinal outcomes. He discovered that among African American and Hispanic American students attending Catholic secondary schools, both males and females in single-sex schools scored higher on standardized cognitive tests than their peers in mixed-sex schools. To explain the differences, Riordan applied a set of school variables as controls. He argued that policies in single-sex schools that emphasize the academic side of these variables explained virtually all the test score differences between the two types of schools. Additionally, both males and females in single-sex schools exhibited improvement on attitudinal variables such as leadership behavior.

The American Association of University Women (AAUW) conducted a review of research regarding student achievement and found “no evidence that single-sex education is better than coeducation.” The AAUW suggests that although all-girl schools seem to have positive effects on girls’ achievement when compared with coed schools, once the findings were adjusted for student socioeconomic status, pre-enrollment ability, and other variables, the differences diminished or disappeared
Similarly, LePore and Warren (1997), using data from the National Educational Longitudinal Study of 1988, found that boys in single-sex schools did not increase their test scores more than boys in coeducational schools and that girls experienced no statistically positive effects of single-sex schooling.

In contrast to these less-than-positive reviews (e.g., Datnow et al., Riordan, AAUW, etc.), there is a growing body of support for single-gender education. Haag (2000) in a meta-analysis determined that studies of attitudinal variables yielded some consistent findings, including differences in specific domains of self-concept between girls in single- and mixed-sex schools. The findings support the notion that single-sex contexts tend to foster a less stereotypical view of gender. In addition, the students perceived single-sex school environments to be more orderly. The positive achievement effects attributable to school type tended to be specific to certain contexts and group characteristics (such as socioeconomic status). Generally speaking, Haag observed that some single-sex schools were “doing something different” that might be reproducible in the coeducational context.

Haag (2000) further judged the “for” or “against” stance that shapes popular literature on single-sex education to be misleading because assessments of single-sex education’s success or failure are contingent on many factors. The goals of the organization, the indicators for judging success, and the historical context are just a few of the elements that influence the outcome of the single-gender educational experience. Haag surmised that while the research is inconsistent in its assessment of whether single-sex education is “better” than coeducation, the analysis does reveal
areas of consensus on specific indicators (e.g., attitudinal variables and academic achievement) which serve as starting points for further research into how single-sex schools affect educational outcomes.

A study commissioned in the spring of 1999 by the National Coalition of Girls’ Schools (NCGS) revealed the impact of single-gender private schools to be positive relevant to attitude and achievement. Based on a survey of 4,300 females, participants overwhelmingly perceived their preparation for college academics, their leadership opportunities, and the relevance of their program to be superior to that of coed schools. Results further showed that the NCGS alumni majored in math and science at a higher rate (13%) than females and males nationwide (2% and 10% respectively) (NCGS, 2000). Perry (1996) found that grade point averages were higher for both girls and boys in single-sex math and science classes than in mixed-sex classes.

According to Stabiner (2002), one current success story for single-gender education is The Young Women’s Leadership School of East Harlem (TYWLS) that helped pioneer the way for single-gender public schools with a class of seventh-grade girls in 1996. The school initially faced accusations of gender discrimination from federal authorities, the New York Civil Liberties Union, and the National Organization for Women. TYWLS serves primarily poor, ethnic minorities in an urban school system where half the high school students fail to graduate on time and a third never graduate at all. By 2002, the all-girl school had succeeded in graduating
two classes. All of the students went on to a four-year college with the exception of two girls who enlisted in the military.

In addition to academic benefits, Stabiner (2002) pointed out attitudinal effects resulting from single-gender classes. For example, while girls at coeducational schools tend to define self-esteem in terms of popularity and appearance, girls at single-sex schools define it in terms of academic achievement. After spending a year at TYWLS and the private all-girls Marlborough School in Los Angeles, Stabiner, author of *ALL GIRLS: Single-Sex Education and Why It Matters*, was convinced that single-sex programs are an appropriate option for public schools.

Benjamin Wright, outgoing principal of Thurgood Marshall Elementary School in Seattle, found his students improved significantly when he began offering single-sex classrooms in 2001. The average boys’ score in reading went from the 10th percentile to the 66th percentile after single-sex education was implemented. Discipline referrals were dramatically reduced from an average of 30 per day to fewer than two per day. Wright also reported an improvement in student morale, the doubling of the number of students going to college, and a reduction in teen pregnancies (Single-Sex Education, 2003).

The Moten Elementary School in Washington, D.C., began offering single-sex programs in 2001. Prior to the change, the performance of the students on standardized tests at Moten was among the worst in the District. By the end of the school year, the percentage rank on the math portion of the Stanford 9 test went from 49% to 88%. The reading scores rose from 59% to over 92%. The discipline problems
among students dramatically decreased. These results ranked Moten, which is located in one of the city’s poorest neighborhoods, alongside some of the top public and private schools in the District (Single-Sex Education, 2003).

Summary

Single-gender education is not a new concept. Historically, males and females have been educated separately in many cultural and religious groups around the world. However, since the adoption of Title IX of the Education Amendments of 1972, which prohibits sex discrimination in education programs that receive federal funds, single-gender education has been virtually unavailable in the public school sector in the United States. The No Child Left Behind Act of 2001 and the accompanying regulations have now made it possible to implement single-gender education in public schools.

Opponents of this movement fear regression into a male-dominated culture and loss of progress made toward gender equity. Proponents believe the current brain research, made possible with modern technology, verifies that from birth boys and girls are hardwired differently; thus, they learn differently and should be taught differently (Sax, 2005, March 2). Supporters see single-gender education as the vehicle for expanding educational opportunities through custom-tailored learning and instruction.

Education Secretary Rod Paige considers the research to be incomplete and inconclusive, but believes that it does indicate single-sex educational programs
produce positive results for some children in some settings. Most of the research to date has been in other countries and in private or parochial schools instead of American public schools. In funding the first comprehensive study of public single-sex schools, the U.S. Department of Education hopes to learn more about how effective single-gender education can be. Michael J. Petrelli, as associate deputy undersecretary of the U.S. Department of Education, said it is unreasonable to expect educators to hold off on single-gender education efforts until the research is done. “I don’t think it’s fair to say we can’t try new things until they are absolutely effective,” Petrelli said. “You can’t prove it’s effective until you try it out and experiment with it” (Davis, 2004, March 24).
CHAPTER III

METHODOLOGY

The review of the literature has explored the status of single-gender education in this country and around the world. Substantial evidence has been offered to support positive outcomes in other countries. There is, however, limited evidence from studies in American public schools either to verify these outcomes, or to substantiate the need for and public tolerance of single-gender education. In order to comply with the four pillars of NCLB (i.e., accountability for results, research-based educational practices, expanded parental options, and expanded local control and flexibility), application and review of new practices must take place. The goal of this research was to examine one such practice in light of two basic questions: (a) What were the perceptions of the stakeholders involved in the single-gender classroom experience, and (b) what was the impact of single-gender classrooms on the performance of fifth-grade students? This chapter describes the methods used in the study. The information is organized as follows: the research design, a description of the participants, a description of all instrumentation used, the procedures followed in data collection, and the statistical methods used in data analysis.
Research Design

The research design for this study combines qualitative and quantitative research in a mixed methods approach. Gall, Borg, and Gall (1996) defined qualitative research as:

. . . inquiry that is grounded in the assumption that individuals construct social reality in the form of meaning and interpretation, and that these constructions tend to be transitory and situational. The dominant methodology is to discover these meanings and interpretations by studying cases intensively in natural settings and by subjecting data to analytic induction (p 767).

Quantitative research is defined as inquiry in which “the investigator primarily uses post positivist claims for developing knowledge through cause and effect thinking, reduction to specific variables, hypotheses and questions, use of measurements and observation, and the testing of theories” (Creswell, 2003, p.18).

Qualitative research differs from quantitative research in numerous ways. Qualitative research occurs in natural settings where human behavior and events occur, rather than being based on theory or hypothesis. The researcher himself is the primary instrument in data collection. The data that emerge from a qualitative study are descriptive—words or pictures rather than numbers. Quantitative research, on the other hand, includes experimental and quasi-experimental designs with many variables and treatments. The data emerges from experiments, questionnaires, and structured interviews.
The focus of qualitative research is on the participants’ perceptions and experiences. The process that is occurring is equally important to the product or outcome. Qualitative research is emergent in nature and relies on the utilization of tacit knowledge (intuitive and felt knowledge) to interpret the results. Conversely, quantitative research utilizes structural equations and statistical analyses to interpret results. Merriam (1998) differentiates between the two: “Quantitative research takes apart a phenomenon to examine the component parts (which become variables of the study); qualitative research can reveal how all the parts work together to form a whole” (p.6).

A third research strategy is the mixed methods approach. Mixed methods inquiry involves collecting and analyzing both quantitative and qualitative data. This procedure utilizes triangulation—“using multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings” (Merriam, 1998, p.204). Creswell (2003) describes the mixed method strategies of inquiry as follows:

1. Sequential procedures in which the researcher seeks to expand the findings of one method with another.

2. Concurrent procedures in which the researcher converges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem.

3. A transformative procedure, in which the researcher uses a theoretical lens as an overarching perspective within a design that contains both quantitative and qualitative data.
This investigation utilized the mixed methods approach to examine the impact of single-gender classrooms on the participants of the study. The group was purposefully selected because they comprised the single-gender classes for the pilot program. The study was confined to the 2004-2005 school year. It focused on the everyday experiences and events of the participants and the perceptions and meaning they attach to those experiences. It also included statistical data related to student performance.

From the qualitative perspective, the researcher employed case study procedures. A case study is defined as “an in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon” (Gall et al., 1996, p. 754). The rationale for using the case study method was that it raises the reader’s level of understanding of the phenomenon. “The primary object of writing a case study is to write in such a way that the product is credible to the respondents in the context” (Erlandson, Harris, Skipper, and Allen, 1993, p. 165).

Merriam (1998) further defines the case study by its special features: particularistic, descriptive, and heuristic. Particularistic describes the case study’s focus on a particular situation, event, program, or phenomenon. Descriptive indicates that the end product of the case study is delivered in a rich, “thick” description. Heuristic means that report of the case study enhances the reader’s understanding of the phenomenon under study.
The phenomenon that was studied in-depth was the initial year of single-gender classes in a public school. The characteristics examined were the attitudes and perceptions of the students, parents, teachers, and administrators involved in the single-gender pilot program. The qualitative phase of the mixed methods investigation (case study) consisted of interviews and observations of the participants throughout the school year. The researcher assumed the role of participant-observer, one who “observes and interacts closely enough with the individuals to establish a meaningful identity within the group . . . yet not engage in activities that are at the core of the group’s identity” (Gall, et al., 1996, p. 345).

The quantitative phase of the mixed methods approach involved a One-Group Pretest-Posttest Design. The design included a pretest measure (fourth-grade statistics) followed by a treatment (single-gender class) and a posttest (fifth-grade statistics) for a single group. The quantitative data were collected from questionnaires, grade reports, attendance records, and discipline records. Statistical analysis of the data compared fifth-grade performance to fourth-grade performance in the areas aforementioned. The qualitative and quantitative data were collected sequentially with qualitative data collection ongoing throughout the year and quantitative data collection in May 2005. Creswell (2003) defines this method:

Sequential Exploratory Strategy—a model characterized by an initial phase of qualitative data collection and analysis, which is followed by a phase of quantitative data collection and analysis. Priority is given to the qualitative
aspect of the study. The findings of these two phases are then integrated during the interpretation phase (p. 215).

Threats to Internal Validity

“To have any effect on either the practice or the theory of education, research studies must be rigorously conducted” (Merriam, 1998, p. 199). This section addresses the issues of rigor the researcher observed during the study. Internal validity deals with the question of how research findings match reality. As the primary instrument of data collection, the researcher sought to understand the perspectives of the participants in the single-gender pilot program and present their views accurately. In order to accomplish this, five basic strategies recommended by Merriam (1998) were employed:

1. Triangulation—using multiple data, multiple sources, and multiple methods to confirm emerging findings.

2. Member checks—taking data and interpretations back to the people from whom they were derived and asking them if the results are plausible.

3. Long-term observation—gathering data over a period of time in order to increase the validity of the findings.

4. Peer examination—as asking colleagues to comment on the findings as they emerge.

5. Participatory research—involving participants in all phases of the research (p. 204).
Threats to External Validity

External validity is the extent to which the results of a research study can be generalized to individuals and situations beyond those involved in the study (Gall et al., 1996, p. 759). There are some aspects of the study that might impact the external validity of the experiment, e.g., the extent to which extraneous variables are controllable by the researcher. During the course of the year, the students’ health, teacher effectiveness, parental support, and life-altering events may have adversely affected the participants’ perceptions or performance.

Reliability in research refers to the extent to which the findings can be replicated. It assumes a study is more valid if it can be replicated with the same results. Given the nature of the qualitative aspect of this mixed method investigation, one cannot assume it is reproducible in the purest sense. Therefore, reliability was evaluated in terms of whether the reported results were consistent with the data collected and with findings of previous studies.

In terms of population validity, the target population to which this study may be generalized is limited to upper elementary to middle school range in this district or other districts with similar characteristics. Replications of this study should consider the personal and ecological variables of age, ethnicity, socioeconomic status, and prior achievement of the participants.

Due to the novelty of the single-gender class structure and the attention it received, the researcher anticipated the Hawthorne effect. According to Gall et al. (1996), “The Hawthorne effect refers to any situation in which the experimental
conditions are such that the mere fact that those individuals are aware of participating in an experiment, or are receiving special attention, improves their performance” (p. 475). The researcher made every effort to avoid any suggestion of “stardom.”

Participants

The participants were an intact group of 73 fifth-grade students at a kindergarten to fifth-grade public elementary school in central Mississippi. School enrollment was 579. The sample consisted of 33 males (45%) and 40 females (55%) ranging in age from 10-12 years at the beginning of the school year. The students were members of regular education classes. There were approximately 25% in the low socioeconomic category, as determined by eligibility for free and reduced lunch. Of the 73 students involved in the study, 69% were Caucasian, 25% were African American, and the remaining 6% were of various cultural backgrounds.

Of the four teachers, two were males and two were females. One of the males was a first year teacher; the other was in his fourth year. The two male teachers were hired specifically to teach the boys’ classes. The female teachers had more classroom experience, 10 and 22 years. The female teachers were on staff previously and were offered the option to teach the girls’ classes. The administrator who initiated the move to implement the pilot program with single-gender classes has been at the school for eleven years. She has an earned Ph.D. in Curriculum and Instruction. Written consent to conduct research was obtained from the administrators of the school and the district.
Written assent was obtained from the students, and written consent from parents and teachers. Participation in the research study was voluntary. The following safeguards as outlined by Creswell (2003, p. 202) were applied to protect the participants’ rights:

1. The research objectives were articulated verbally and in writing so that they were clearly understood by the participants (see Appendixes A, B, and D).
2. Written permission to proceed with the study as articulated was received from the participants (see Appendixes C, E, F, N and O).
3. A research exemption form was filed with the Institutional Review Board of Mississippi State University (see Appendix P).
4. The participants were informed of all data collection devices and activities (see Appendixes G, H, I, J, K, L and M).
5. Verbatim transcriptions and written interpretations and reports were made available to the participants.
6. The participants’ rights, interests, and wishes were considered first when choices were made regarding reporting the data.
7. The final decision regarding participant anonymity rested with the participant.

Instrumentation

The researcher served as the primary data collector. True to the mixed methods approach, the research included qualitative and quantitative data collection. The qualitative research instruments included observations, interviews, and
questionnaires with close- and open-ended questions for measuring the perceptions of
the participants (see Appendixes G, H, I, J, K, L, and M). The quantitative data
collections were based on predetermined instrument-based questions, and
performance data. This included end-of-the-year grade reports of student achievement
as measured by the teachers, written discipline referrals, and records of school
attendance.

**Procedures**

Data were collected from January 6, 2005, through May 25, 2005. This
included interviews with the principal (see Appendix G), the teachers (see Appendix
H), the students (see Appendix J), and the parents (see Appendix K). Parent
questionnaires (see Appendixes L and M) were utilized at the beginning and end of
the study. Formal observations (see Appendix I) were conducted in the four
classrooms. As assistant principal, the investigator interacted with and observed the
participants on a daily basis. The data were compiled and analyzed for the purposes
of measuring participants’ perceptions and student performance.

Letters requesting permission to obtain student data were sent to the
superintendent of the school district and the principal of the school (see Appendixes
A and B). Letters granting permission were obtained prior to the study (Appendixes N
and O). Permission to conduct research was obtained from the Office of Regulatory
Compliance of Mississippi State University (Appendix P).
Data Analysis

The investigation of the single-gender classes at a public school was a mixed methods study that was emergent in nature. Merriam (1998, p.151) describes data collection and analysis as “a simultaneous activity in qualitative research. Analysis begins with the first interview, the first observation, the first document read.” This timing and integration of the analysis help distinguish the qualitative from the quantitative research design. Analysis began at the outset of the study and became more intensive as the study progressed. The first analysis is a descriptive account of how the single-gender program was initiated.

As the study emerged, the researcher used narrative analysis as a technique to study the single-gender classroom experience through the stories of the participants. The first-person accounts of the students, parents, teachers, and administrators form the narrative text for the study. The researcher applied interpretational analysis techniques to the data collected through interviews and questionnaires to discover the themes, patterns, and constructs used to describe the attitudes and perceptions of the participants. Descriptive statistics were also used to further represent the perceptions of the parents.

Observation data were analyzed at a more abstract level using concepts to describe phenomenon. The review of literature yielded reports of the advantages and disadvantages of single-gender education, as well as findings regarding attitude and achievement. The researcher analyzed the observation data for evidence of comparable themes or categories.
The analysis of student performance was done using descriptive statistics to organize and simplify the data. Bar graphs represent the statistical information on attendance, grades, and number of discipline referrals. A paired samples $t$ test was used to test for the statistical significance between fourth and fifth-grade scores and male/female discipline referrals. The computer analysis component of the Accelerated Math and Reading programs produced grade equivalency scores measuring the students’ growth in Accelerated Math and Accelerated Reading.

Ultimately, the researcher utilized reflective analysis. According to Gall et al. (1996), reflective analysis is a process in which “the researcher relies primarily on intuition and personal judgment in order to portray or evaluate the phenomena being studied” (p. 768). The mixed methods research procedures were selected for the investigation of single-gender classrooms. The inclusion of both quantitative and qualitative data served to create a greater understanding of the impact of single-gender classroom organization on the participants. The sequential exploratory design was adopted to structure the data collection and analysis. The sequence included five steps: (1) qualitative data collection, (2) qualitative data analysis, (3) quantitative data collection, (4) quantitative data analysis, and (5) the integration of the qualitative and quantitative data for the final interpretation. The findings and recommendations are reported in the following chapter.
CHAPTER IV
RESULTS

This research used a combination of quantitative and qualitative data in a mixed methods approach to examine the initial impact of implementing gender-based instruction in a public elementary school. The research followed a sequential exploratory design wherein qualitative data were collected and analyzed, then quantitative data were collected and analyzed, and finally the results were integrated to yield the outcome of the investigation. This chapter includes a brief account of the introduction of the single-gender pilot program at the elementary school during the 2004-2005 school year followed by a report of the findings related to the purpose of the study.

The purpose of the study was twofold. The first goal was to discover the perceptions of the various stakeholders with respect to their initial experience with single-gender classrooms. The accounts of the administrator, the teachers, the students, and the parents recorded in this chapter were gleaned through observations (Appendix I), interviews (Appendixes G, H, J and K), and questionnaires (Appendixes L and M). The second goal was to discover the impact of single-gender classes on the participants’ school attendance, classroom behavior, and academic achievement. Pertinent data were collected from school records and analyzed by
means of descriptive statistics and paired samples $t$ tests. The results and interpretation of the analyses are recorded in this chapter.

The Introduction of Single-Gender Classes

Interviews with the principal provided an account of the introduction of single-gender fifth-grade classes. According to her, population growth and the resulting school zone changes within the district caused the school to expand from a kindergarten through fourth grade to a kindergarten through fifth-grade student body for the 2004-2005 school year. Years earlier the school had served the fifth grade. At that time the principal had observed that the majority of discipline problems within the school emanated from the fifth grade. During the 1995-1996 school year, there had been 25 out-of-school suspensions for fifth-grade students. Toward the end of the school year prior to the pilot program, she was beginning to see among the fourth graders an emerging pattern of disruption associated with socialization issues. Instruction and productivity were being affected, especially among students who had repeated one or more grades and were over-age and more mature.

Having experienced these problems, the principal began to explore alternatives that might help alleviate some of the tension that prepubescent students can bring to an elementary school. She was also seeking ways to provide the best possible learning environment for the students. Her research led her to the concept of single-gender education. She conducted informal polling to determine the receptivity of the faculty and the parents and found the results to be quite favorable. The
principal approached the superintendent of education and the school board for approval to divide the fifth-grade classes by gender. She received full support for the implementation of a pilot program. When she announced the plans to the fourth graders in gender-separate meetings, the boys pounded joyfully on the tables, and the girls squealed with delight. News of the plans for the coming school year spread quickly and enthusiasm grew. The local newspapers followed the story throughout the year.

The Perceptions of the Participants

*The Administrator’s Story*

Observations and interviews revealed the principal's perceptions of the program’s pilot year. In preparation for the upcoming year, the principal commissioned Dr. Leonard Sax, founder and director of the National Association for Single-Sex Public Education (NASSPE), to provide the faculty with in-service training on single-gender education. His presentation and materials offered insights into the physical developmental differences between the sexes, male/female brain development, and male/female learning styles, as well as social and emotional differences. According to the principal, Dr. Leonard Sax and the NASSPE website were a valuable source of information in preparing for the introduction of single-gender instruction.

With newly gained insights, the principal and teachers engaged in the task of planning curriculum and class schedules for the coming year. They explored
classroom management and instructional strategies, as well as room design that would best suit the needs of the self-contained, single-gender classes. It was determined that the fifth graders would focus on academics in the morning and the enrichment classes (physical education, music, counseling class, and library) in the afternoon. The team opted to have the students remain in their four homeroom sections throughout the daily schedule. The only time the genders were mixed was at lunch each day and for special programs.

Throughout the 2004-2005 school year, the principal continued to research gender-based education for the benefit of her own professional development and that of the staff. She frequently provided articles and books to support the teachers in the new endeavor. She conducted regular grade-level meetings and observations to monitor the classes and address the needs of the teachers and the students. The principal observed that the students’ level of productivity increased during the year of single-gender instruction as measured by the number of Accelerated Math objectives mastered and the number of pages logged in Accelerated Reader. They exhibited positive behaviors and development toward independence and maturity. There were fewer discipline problems reported to the principal. The boys’ conduct compared to the year before was noticeably improved. The primary behavioral problem reported by the teachers was the friction between the girls. This will be addressed later in the report.

An unanticipated benefit was the extremely high teacher morale. The principal found the teachers to be highly motivated to make certain they and their students had
a productive year. They worked long hours and went beyond the requirements of the job to provide a meaningful learning experience for their students. In single-gender classes, the teachers were able to adapt instruction to meet the gender-specific needs of the students. From the science experiments to the selection of read-aloud books, the teachers focused on the interests of the particular gender they were teaching. When intent forms were issued in the early spring, all fifth-grade teachers requested to remain in their current positions.

When asked if she would opt to offer single-gender classrooms again, the principal’s quick response was yes. She stated, “Single-gender classes are a great idea! They help create a positive environment that works well for this age group of children.” She was considering implementing single-gender classes for the fourth grade as well, but at the time of this report, the final decision had not been made. The fourth-grade teachers expressed a desire to divide by gender for the following school year and even discussed their gender preferences among themselves and with the principal. They began requesting copies of the literature provided for the fifth-grade teachers in order to learn more about gender-based instruction.

In the final evaluation, the principal was pleased with the pilot year of single-gender classrooms and reported no significant difficulties. The community at large was receptive to the idea. No parents requested their child NOT to be in a single-gender class. Had they done so, arrangements were available for the students to be in a mixed class. The principal reported having several parents inquire at the end of the
year how they might influence the introduction of single-gender classes at the middle school the following year.

The principal reported some interest from fellow administrators within the district. She was frequently asked about the status of the program, not only by her immediate peers but also by principals from other districts within and outside the state. She fielded several phone calls during the course of the year from principals who were seeking ways to address the same situations that compelled her to seek creative alternatives for educating the preteen set. When asked what advice she had for administrators, the principal cautioned that gender-based education should not be initiated without forethought and planning. She emphasized the importance of initial and continued training for the teachers. "Without the training and support, our program would not have been effective," she said.

When asked about the future, the principal voiced her intentions to continue research and evaluation of single-gender education. She expressed interest in knowing if the year of single-gender classes had an observable impact as the students advanced to sixth grade. Her intentions were to track the academic achievement and behavior of the students as they transition to middle school next year.

_The Teachers’ Stories_

Two men and two women were selected by the principal to fill the newly created teaching positions for single-gender fifth-grade classes. All four teachers expressed a specific interest in teaching a single-gender class. Men were assigned to
teach the boys, and women were assigned to teach the girls. Four women and one
man taught the five enrichment classes (physical education, gifted education, music,
library, and counseling), as they had the year before. All of the teachers had an
introduction to single-gender education through the workshops presented by Dr.
Leonard Sax and the staff development provided by the principal.

In August, the rooms were carpeted, freshly painted, and furnished with
appropriate furniture and equipment. In order to create a sense of ownership, students
were allowed input in decorating decisions. For example, the boys’ classes chose
frogs and fish for a theme. One group's “hall pass” was a toy frog; the other had a
wooden fish. A raised wooden platform and a curtain provided a stage for
presentations. Beanbag chairs adorned the reading area. The teacher called it “boy
friendly.” The female teachers put curtains on the windows and decorated the walls
for more feminine appeal. They allowed the girls to have “girly things” on their desks
for decorations.

Though the classes were separated by gender, the groups combined for some
activities. They jointly planned a trip to Disney World for the end of the year. The
teachers and students worked together throughout the year toward the common goal
of raising funds for the trip. They also joined ranks for friendly academic
competitions. For example, they monitored each other’s progress through a board
displayed outside their class heralding how many consecutive days 100% of the
students turned in their homework. Highest achievers were recognized.
Boys’ Teachers

The atmosphere in the boys’ classrooms was very relaxed, yet productive. The male teachers reported obvious growth in the self-confidence and the maturity level of the boys. They perceived them as being well focused on their work and more eager to attempt new things. For example, boys were willing to assume roles during “readers’ theater” activities that, according to the teachers, they most likely would not have taken in the presence of girls. An added benefit was “they didn’t act silly about it.” One male teacher stated, “The boys are very open and not afraid to be themselves.”

The sense of camaraderie between the boys and their teachers was quite evident. A keen sense of trust existed between the “guys.” One of the men teachers had young children of his own about whom he shared with the class. His wife helped with room decorations and occasionally provided homemade treats. The other teacher kept his students up to date on his upcoming engagement, and his fiancé volunteered in the classroom from time to time. The boys asked to stay after school to “hang out” with the teachers during their planning time. In fact, that became one of the positive consequences in the classroom management plan. The male teachers voluntarily gave of their own time after school to provide remediation for students who were struggling to meet academic goals.

The men managed the boys somewhat less gently than female teachers typically do, and the boys responded well. For example, when one of the boys scraped a knee on the playground, his teacher playfully responded with “Hey man,
don’t bleed on me!” This helped the boy regain composure and cope with the pain. The male leadership was a positive influence on the boys, some of whom lacked a male role model at home.

The men used friendly competition in the classroom to promote learning. The boys enjoyed challenging each other in “Around the World” math games, Spelling Bees, and Science Quiz Bowls. Toward the end of the year, they competed against the girls in a series of Science Quiz Bowls and won each time. Taylor and Klein (2000) reported that the stress of competition actually enhances learning in males. In this case, it did, and was somewhat disconcerting for the girls.

Both male and female teachers reported using group work more frequently and effectively in a single-gender class. The men implemented what they termed “The TEAM” system for classroom management—Together Each Achieves More. There was openness to sharing ideas and working in teams. Peer tutoring was an important part of the class structure. For example, the boys’ class had team leaders in math. The team leaders were boys who had advanced beyond their classmates in the self-paced Accelerated Math program and could effectively serve as tutors. During practice sessions, a boy who was having difficulty signaled for a team leader to assist.

**Girls’ Teachers**

The female teachers faced more challenges than the men did. They had more highs and lows. As one teacher said, “Every day isn’t perfect, but we’ve had a lot of terrific moments.” The women reported making a concerted effort to find ways to
deliver instructional material that appealed to the girls. They particularly looked for science and math activities that related to the age and interest of the girls. They employed real world experiences such as shopping. The female teachers, like the males, also went the extra mile by allowing small groups of girls to stay after school to work toward academic goals.

The women tried to nurture an atmosphere of ownership and mutual respect by allowing the girls to participate in decision-making whenever possible. The girls and their teachers had their own ways of celebrating success. One teacher had a celebratory handshake she did with her students when assignments were successfully completed. Girls responded well to this type of support. This was consistent with Weiman's (2004) discussion of the tendency for girls to be more motivated and concerned with pleasing adults.

The female teachers used various props to enliven the classroom and encourage participation in literary activities. For example, the girls wore tiaras when they met their academic goals or mastered a challenging task. This signified they “ruled” over it. Additionally, tiaras were used to reinforce classroom etiquette in a fun way. The person wearing her tiara had the floor. Others must wait their turn to speak. This helped control outbursts in class and promoted common courtesy. On occasion one teacher hung a disco ball in the classroom, and the girls wore costumes to present dramatic readings of their own creative writing. Role-playing was popular with the girls.
The girls’ enthusiastic response to language-related activities was consistent with the findings reported by Killgore et al. (2001). Killgore found that girls are more likely to be talkative and expressive, linking emotions with ideas, whereas boys seek action. The teachers, through their own experience, validated Leonard Sax's claim that girls enjoy cooperative learning experiences in a safe, comfortable, welcoming environment (NASSPE, 2004b). In the girls’ classes the female nurturing instinct manifested itself through peer tutoring. They were always willing to help a struggling classmate to improve. The teachers observed firsthand the “tend and befriend” tendency among girls as reported by Taylor and Klein (2000).

According to research, the part of the brain that processes language develops years earlier in girls than in boys (Hanlon et al., 1999). Girls are generally more verbal than boys are (Killgore et al., 2001). The teachers found this to be evident. The amount of talking in the girls’ classrooms created a challenge. On the positive side, the girls were eager to participate in class discussions and make inquiries. They made presentations in class and willingly read aloud in teams. They also liked to talk to each other and had difficulty exercising restraint in choosing the appropriate time and subject matter. One teacher said class could be like an “all day slumber party.” The girls who functioned better in a quiet working environment suffered from the distraction.

The greatest difficulty the girls’ teachers encountered was “girl bullying,” or “mean girl syndrome.” The girls experienced emotional highs and lows on a daily, if not hourly, basis. These emotions often prompted hurtful words to be spoken, cliques
to form, and conflicts to arise within the group. As one teacher voiced it, “Someone cries about something every day, but at least they feel comfortable enough to cry openly.” The administrator, the teachers, the counselor, and the parents were all called upon to deal with these issues. The friction seemed to be more problematic the second semester than the first. It did not appear to significantly interfere with learning at the beginning of the year, but was definitely a distraction from schoolwork as the year progressed. Teachers had to continuously modify classroom management techniques in an effort to diminish some of the “off-task” behaviors.

The female teachers consulted with the NASSPE organization for insights into dealing with the socialization challenges the girls experienced. Dr. Sax referred them to a seasoned administrator of an all-girl school in Illinois from whom they gleaned ideas and resources for classroom management. Among these were a “bullying contract” and several reference books: Why Gender Matters, Sax (2005); Easing the Teasing, Freedman (2002); and The Bully, the Bullied, and the Bystander, Coloroso (2003).

During the last few weeks of school the fifth-grade classes combined for three activities. The whole group went to Disney World; they had Field Day; and on the last day of school, they went skating. The teachers reported they dealt with enough problems with boy/girl issues on those three occasions to make them realize and appreciate the situations they had been able to avoid in the single-gender classes.


**Enrichment Teachers**

In addition to their regular classes, the fifth-grade students attended counseling, physical education classes, music, and library. These classes met once a week for 45 minutes, with the exception of physical education (PE), which met twice weekly. Several of the students were members of the gifted education class that met two half-days a week.

**Counselor**

The school counselor met with each of the four single-gender classes weekly for 45 minutes. Her curriculum included such topics as character education, drug awareness, manners, and interpersonal skills. Her teaching strategies often utilized discussion and role-play. In the all-male class, she found the boys more willing to participate and less likely to “clown around” than they had the previous year in a coed class. She, as were the regular education teachers, was able to tailor instruction to address the needs of each gender group.

She reported difficulty with the girls being overly talkative, complaining, and teasing. As counselor, she invested a significant amount of time and energy throughout the year trying to help the girls develop social skills needed to get along with each other. She maintained an open-door policy and tried to be a sounding board for the girls. The teachers often referred the girls to her for help with conflict resolution. The boys did not have these same issues. Generally, if there were conflicts among the boys, they confronted each other and moved on.
The counselor addressed the issue of social skills with the girls in class and in small group counseling sessions. She also researched and provided materials for the teachers to use and recommend to concerned parents. Two such resources were *Odd Girl Out: The Hidden Culture of Aggression in Girls* by Rachael Simmons (2002) and *Queen Bees and Wannabes: Helping Your Daughter Survive Cliques, Gossip, Boyfriends, and Other Realities of Adolescence* by Rosiland Wiseman (2002). These authors affirmed the conclusion the teachers and counselor had reached. The bullying, also called relational aggression (Crick & Grotpeter, 1995), was not so much a by-product of an “all-girls” class as it was characteristic of girls this age. This was also confirmed in conversations with teachers and administrators in other schools.

**Physical Education Teacher**

The physical education teacher claimed, “PE teachers wish all their classes could be single-gender.” From the outset, when decisions were being made about whether to mix the students for some of the enrichment classes, she requested that they remain separate for PE because of developmental differences and interests. In preparation for the year, she revisited the physical and emotional development of fifth graders in order to better serve their individual needs. Through the course of the year, she found single-gender classes to be more productive than the coed classes with these same students the year before. Physical activities; lessons on nutrition, hygiene, and body image; and classroom management techniques were all structured to fit the group. In her own words, she was “rowdy with the boys and very girly with the girls.”
She found the students participated more willingly and were able to accomplish more within their own gender group.

The PE teacher observed that girls are typically self-conscious of their bodies at this age and physically more mature. When one young lady was asked about advantages of an all-girl class, she declared, “You don't have to worry about your straps showing.” They are more “aware” of the boys than the boys are of them. In a single-gender group, the PE teacher was able to avoid boy/girl issues. She reported being “truly surprised” that in this setting, the boys spoke more freely and participated in class discussions much more openly. Both groups seemed less concerned with their body image. She wholeheartedly supported single-gender classes in fifth grade and requested fourth grade be separated as well.

**Music Teacher**

The music teacher adjusted her program to fit the single-gender format. She endeavored to select for each group, music and activities that would best fit their developing voices and appeal to their interests. She selected small performance groups by audition to perform at various venues throughout the year. In response to the boys’ interests and to help encourage them, she created a male percussion ensemble that performed holiday music in the cafeteria during the lunch hour. She considered this to be an accommodation made to suit the boys’ learning style and interests. The girls had similar opportunities. A mixed choir and coed recorder groups
performed at community events during the year. The students enjoyed the novelty of these opportunities.

The music teacher discovered the groups responded differently by gender. She observed that some of the quieter, less athletic boys became less intimidated about singing as the year progressed. According to her, they sang with "more gusto" without the girls in the class. The girls, too, participated more freely in the single-gender setting. In the book *Boys and Girls Learn Differently*, Gurian and Henley (2001) addressed the developmental differences of the sexes in regard to music. He stated, "Six times as many girls can sing in tune as boys at this age" (p. 30). This may help explain why the boys responded better when music class deviated from strictly singing and girls were more interested in individual performance.

Enthusiasm in music class was typically at a high level, so much so that it sometimes interfered with productivity. The music teacher reported the girls were more difficult to keep on task. She speculated that a coeducational class might be more manageable if the presence of the boys caused the girls to settle down and be more focused.

*Librarian*

The librarian participated in the same single-gender education training as the classroom teachers. She endeavored to apply the strategies she learned to the fifth graders' weekly library classes. She reported appropriate behavior and productivity in both groups. It appeared to her there was less tension in the single-gender groups than
when these same students were in coed classes the year before. Consequently, she felt her relationship with this group of students was better this year than the year before.

**Gifted Education Teacher**

The gifted education teacher for both genders was a man. He reported greater productivity and a calmer atmosphere in his classroom with the girls and boys separated as compared to the same group of students in mixed fourth-grade classes the year before. The commonality of gender seemed to promote a keener focus during work on projects, the primary teaching strategy for his classes. The girls were very social and enjoyed working in groups. As did the regular education teachers, he also found the talking to be somewhat of a problem with the girls' class. The boys were more productive in pairs. Large groups tended to become more competitive.

Though they agreed there was much to learn in order for single-gender instruction to be the most effective, the majority of the teachers said they would choose single-gender classes for fifth grade again. They indicated the advantages outweighed the disadvantages. The teachers expressed interest in broadening the program to include fourth grade at the elementary school and extend through the middle school.

The teachers were often questioned about the progress of the single-gender classes. Parents, community members, and other teachers within the building and across the district expressed interest. The television and newspaper media followed the program intermittently throughout the year. All of the fifth-grade teachers and
several of the students were interviewed by the press. A common question was “Why separate them?” The teachers generally responded that the students are more focused on school and less on boy/girl relationships, are more willing to participate in class without fear of criticism, and are more inclined to have confidence in their abilities. The teachers also acknowledged they have a greater opportunity to tailor instruction to the nature and learning style of a specific gender.

The Students’ Stories

Beginning in the 2004-2005 school year, the fifth graders remained at the elementary school rather than transfer to the middle school as classes before them had. The fifth-grade class numbered 73 students in a student body of approximately 580. There were 33 males and 40 females ranging in age primarily from ten to twelve. Of the 73 students, 69% were Caucasian, 25% were African-American, and the remaining 6% were from various ethnic backgrounds. The participants of this study were enrolled in regular education classes. Twenty-five percent were of low socioeconomic status as determined by eligibility for free and reduced lunch. This was the first time any of the students had been in a single-gender class at school.

Girls’ Story

At the beginning of the year the fifth-grade students were given an assignment to write an essay on single-gender classes. The girls' writings reflected a high level of excitement about the all-girl classes. From essays written in August, it was obvious many felt relief about staying at the elementary school instead of going to the middle
school, which was three to four times larger. Based on their essays, their satisfaction with an all-girl class stemmed from relief from boy pressure and freedom to be themselves. One young lady opined, “I like having all-girl classes because there are no boys to make fun of your clothes and your answers.” Though a few complained they missed the boys, the positive comments far exceeded the negative.

Observations and interviews with the students throughout the year yielded pertinent information. In the spring of the pilot year, 38 of the 41 girls in the fifth-grade class responded to open-ended questions in a written interview (Appendix J). Their responses provided insights as to how they perceived single-gender classes.

**Girls’ Favorite Subject**

The girls chose math as their favorite subject (39%), followed by reading (26%), science (18%), social studies (16%), and language (3%). According to Leonard Sax (NASSPE, 2004b), girls in coeducational classes at this age typically dislike or feel insecure about math. Judging by their responses, the girls in the single-gender setting apparently experienced a measure of success that evoked a positive disposition toward mathematics. These results concur with research findings reported by Colley et al. (1994) that girls are stimulated more effectively in math in a single-gender educational setting.

**Girls’ Work Habits**

In their own estimation, the girls’ productivity in class and their homework habits improved during the fifth grade. A total of 89% of the girls commented
positively on their work habits. They frequently used words like “better” and “more fun.” One young lady said,

My grades are better. I brought my math level up two years. The boys are not the only ones to blame. I wasn't paying attention in class. I knew some of the answers in class. I just didn’t want to say anything cause I didn’t want to get made fun of.

Only two of the girls said they were working at the same level as in previous years in mixed classes, and two said they were doing worse.

**Student and Teacher Relationships**

The majority of the girls (84%) reported having a positive relationship with their teacher. They used words that varied from “okay” and “a little more comfortable” to “wonderful” and “awesome” to describe the relationship. Only 6 of 38 girls interviewed were somewhat less than positive. One student characterized her range of emotions as “Sometimes I like her and sometimes I hate her.”

**Girls’ Classroom Conduct**

The girls’ responses varied when questioned about the difference in the classroom behavior of an all-girl class. Half of them observed favorable differences. They enjoyed the freedom they felt to express themselves without intimidation from the boys. Typical comments were “We can answer and the boys don’t disturb us,” and “It’s easier to be in front of the class.” They found empathy among their classmates and an openness to communicate with their teachers.
Negative behaviors were reported as well. Primarily, the girls cited the prevalence of arguing, name-calling, and gossiping as the element they did not like about an all-girl class. There seemed to be a continual shift of cliques within a class that were at odds with one another over the issue of the day. Not all the girls were involved, but enough were to stir an undercurrent of discontent. As was mentioned earlier, the teachers recognized this was happening and felt virtually helpless to stop it. A segment of the girls seemed to have an ongoing conflict, which some of them referred to as “cat fights” or “PMS-ing.” In one young lady’s estimation, “Girls are brats.” Gurian and Henley (2001) attributes this emotional response to differences in the male and female brain. “Girls' emotional fragility often comes from having so many emotive functions that they are overwhelmed by the emotional material (p.32).” The female brain is more likely to process hurt and get relief from talking about it to others, whereas the male is more likely to become physically aggressive.

In response to the question about how their parents viewed the experience, 26 of the girls (68%) spoke favorably. Four of the girls (11%) said their parents “didn’t like it,” and eight (21%) were neutral or “waiting to see.” The only reason offered for dissatisfaction was, “too much complaining.” Obviously some of the parents were aware of the girls’ conflicts.

Toward the end of the year when asked if they would choose an all-girl class again, the responses were almost equally divided. Fifty percent of the girls were still very much in favor of a single-gender class. Forty-five percent would not opt for single-gender classes again; five percent were undecided. The reasons they offered
for their responses had nothing to do with academics. The most common reasons cited were “too much fighting” or “I miss the boys.”

_Boys’ Story_

The teachers also had the boys write an essay at the beginning of the year about single-gender classes. Most of the responses reflected a positive slant. Following is a sample of the comments: “The best part is no one acts like they have a girlfriend or boyfriend.” “It’s fun having a guy teacher.” “You don’t have to show off on everything.” “Now at PE we can play boy games.” “No girls is paradise.” “Nobody would be embarrassed.” Conversely, there were a few who expressed concern over the absence of girls for such reasons as “I like girls in the room so boys can show off,” and “It stinks because there’s no flirting.”

In the spring of the pilot year, data were collected from the boys through written interviews (Appendix J). Twenty-seven of the 32 boys (84%) in fifth grade responded. The questions examined attitudes or dispositions toward being in single-gender classes and having a male teacher for the first time.

_Boys’ Favorite Subject_

In response to the question about their subject preferences, 33% of the boys named reading as their favorite and 22% chose science. History and math were chosen equally by 19% of the boys. Seven percent preferred spelling. Given the brain research (Phillips et al, 2001) concerning later language development in boys, it is interesting that one third of the boys preferred reading. The teachers were able to
tailor their teaching styles to the needs and interests of the boys. As a result, the boys were very enthusiastic about reading. Sax (NASSPE, 2004a) cited this "custom-tailored teaching" as an advantage of single-gender classes. One young man said it well: “Science is my favorite because we get to break, burn, pop, and explode things.”

Boys' Work Habits

All of the boys except one rated their work habits as improved in the single-gender class. The boys claimed to be doing better for various reasons: “I pay attention more.” “It’s easier because my teacher helps teach to me.” “The work is about the same, but more fun.”

Student and Teacher Relationships

Prior to this year, only the students in the Gifted Education class had been in a male teacher's class. When asked what it was like to have a man teacher, 93% of the boys responded positively. They described it as “cool” and “fun.” One male student said, “Like heaven!” Two of the boys thought the men teachers were “more strict.” Overall, the boys were quite positive about their relationships with the teachers. Their comments included: “He tries to bond with us.” “He understands us better.” “He’s very fun to hang with.”

The men teachers participated actively with the students at recess. They played touch football, basketball, and other games during their breaks. The boys enjoyed the interaction with the teachers in and out of the classroom.
**Boys’ Classroom Conduct**

A discussion of classroom behavior produced equally positive responses. Only four of the boys claimed not to observe any particular differences. The rest noted such behaviors as “not trying to impress the girls,” “not afraid to answer in class and be embarrassed if it’s wrong,” “everybody is nicer to each other,” and “not as much bickering.” These were similar to their comments about what they liked best about the class. Several said, “No girls.” One young man appreciated their absence because after recess girls would say, “You’re stinking!” Girls were also credited with whining, passing notes, and flirting, all of which the boys appeared glad to avoid. One of the students cited competitiveness as a shortcoming of the boys’ class. The others seemed to enjoy the friendly competition that was commonplace in the male classroom.

In the interview, the boys were asked to speculate about their parents’ opinions of the single-gender class. Eighty-one percent said their parents “liked it,” or thought it was “good.” Fifteen percent were neutral and only one student declared his parents said, “It isn’t good.” Four of every five boys (80%) declared they would definitely choose an all-boy class again if they had the opportunity. As one young man expressed it, “It’s the only year I can’t wait for Monday to come around.” Another said, "I think it’s the most awesome thing I’ve ever heard of.”

Observations revealed that generally the boys appeared to have little interest in the girls. Two mentioned having girls as friends that they missed “hanging out with.” A few of the girls claimed to miss their “guy friends.” Although the girls did have some discussions about which boys were cute, they did not pay much attention
to them during the school day. Neither group seemed overly concerned about appearance or actions around each other. There was little conversation about boy/girl pairing. They coexisted in the same hall of the school building with minimal interaction.

*The Parents’ Story*

Toward the end of the students’ fourth-grade year, the principal held a meeting for the parents to discuss the proposition of single-gender classes for the coming fifth-grade year. Approximately 20 parents attended. The meeting was an open forum in which parents and school personnel discussed the prospects of implementing the change. The purpose of the meeting was not so much to get approval from the parents as to inform them and give them an opportunity for dialogue. According to the principal, the general response to the idea was positive. When school began in August, the program was in place.

Early in the year the parents were asked about their expectations in regard to single-gender classes. Data were collected from the parents of the fifth-grade students through an initial questionnaire (Appendix L). Responses were collected from 58 of the 73 parents (81%).

Toward the end of the year, the parents completed a summative evaluation of single-gender classes through a follow-up questionnaire (Appendix M). Sixty percent of the parents responded. Of these, 59% were the parents of girls and 41% were the parents of boys. The instrument contained several close-ended questions that measured the perceptions of the parents using a five-point scale. In some areas there
was a notable difference in the responses of parents of girls and parents of boys. There were also some obvious changes in parents’ opinions during the course of the year.

To better interpret the perceptions of the parents, descriptive statistics were used to represent areas of performance. On the initial questionnaire parents were asked to what extent they expected each area of performance to be affected by a single-gender class. On the follow-up questionnaire they were asked to evaluate each area of performance.

Child's Grades

The majority of all parents (72%) expected their child’s grades to improve to some extent and collectively 69% registered they believed the grades had improved by the end of the year. Twenty-six percent of the parents neither expected nor judged their child’s grades to have been affected. Two percent expected the grades to be worse, and four percent deemed the grades had suffered.

Figures 1 and 2 reflect the opinions registered by the girls’ parents and the boys’ parents. More of the boys’ parents (78%) claimed academic improvement in a single-gender class than did the girls’ parents (64%). None thought their son’s grades had suffered. Two of the girls’ parents did report a decline in their daughter’s grades.
Figure 1. Parents’ Perceptions of Their Daughter’s Grades

Figure 2. Parents’ Perceptions of Their Son’s Grades

**Child's Conduct**

The parents were asked how they expected their child’s conduct in class to be affected by a single-gender classroom. Forty-three percent of the parents anticipated improvement in their child’s conduct, 46% expected no change, and 11% registered
an opinion that single-gender classes may have an adverse affect on their child’s conduct. At the end of the year, parents reported 61% had improved, 36% remained the same, and 3% were worse.

Separating the data according to gender revealed that the girls’ parents recognized their child’s conduct was somewhat better than anticipated, though about 45% of them remained the same (see Figure 3). The boys’ parents, on the other hand, considered 28% of their sons had stayed the same; the majority (72%) had performed slightly better or much better in single-gender classes (see Figure 4).

Figure 3. Parents' Perception of Their Daughter’s Conduct
Because attitude is an indicator of success, parents were questioned about their child’s disposition toward single-gender classes. The parents’ perceptions of the students’ attitudes were far more positive than negative and remained relatively consistent as the year progressed. Seventy-two percent of all parents anticipated a positive or very positive attitude in their child, and at the end of the year 74% were reported to be positive. Initially, 22% were neutral, 6% negative; and in the final analysis, 19% remained neutral, and 7% were negative.

Although the majority of the girls’ parents (62%) said their daughters still felt positive at the end of the year, the girls’ attitudes experienced more of a decline than the boys’ did. As reflected in Figure 5, there was a shift from 45% very positive
attitudes to 12%. In interviews with the parents, it was suggested the disillusionment stemmed from the friction between the girls. Positive and neutral attitudes increased.

![Girls' Attitude](image)

**Figure 5. Parents' Perceptions of Their Daughter's Attitude**

According to the parents of boys, the boys experienced a progressively more positive disposition toward their all-boy classes, as is shown in Figure 6. In the final evaluation, 89% of the parents said their sons felt positive or very positive about school.
Parental support is summarized in Figure 7, which reflects how parents responded to the decision to implement single-gender classes and how they judged them in the final analysis. Eighty-three percent of the parents registered a positive or very positive attitude at the outset of the pilot program and 74% after the fact. There is evidence of a slight trend toward a more neutral position as the year progressed. In the end, only 5% of the parents expressed negative feelings.
It is interesting to note the difference in the attitudes of the parents of the gender groups. The parents of girls shifted away from very positive to positive, whereas the parents of boys expressed a very positive disposition in the final evaluation (see Figures 8 and 9).

Figure 7. Parental Support of Single-gender Classes

Figure 8. Attitude of Girls’ Parents Toward Single-gender Classes
Potential Benefits

In addition to the close-ended items, the initial questionnaire contained four open-ended questions. The parents were asked how they expected their child might benefit from a single-gender class. The dominant pattern that emerged from their responses indicated they expected the students to be more focused and better able to learn, thus earning better grades. Several parents of boys appreciated the opportunity to have a positive male role model. The potential for gaining confidence was mentioned by parents of both genders.

Reservations

When asked what reservations they had about single-gender classes, 35 of the 58 parents (60%) stated they had no reservations. The others offered a variety of responses, the most frequent being “What good will one year of single-gender classes
do?” There was some concern about the “lack of interaction with the opposite sex.” Three of the parents of girls feared the single-gender setting might cause their daughters to become shy around boys in the future. Two parents of boys expressed reluctance about the level of competitiveness that might exist in an all-boy classroom.

Prior Knowledge

In response to a question about prior knowledge, 47 of the 58 parents (81%) felt they received adequate information regarding the change to single-gender classes. Two said they did not. Nine did not respond.

Questions for the Administrator

When asked if they had any questions for the administrator, most parents said no. The few questions submitted on the initial questionnaires pertained to interest in continuing the program in middle school, a desire to know about the results of the pilot year, and the legality of single-gender classes. The recurring question emanating from the interviews and informal conversations with parents was “What can we do to initiate single-gender classes for next year?” When polled, 85% of the parents said they would recommend extending single-gender classes to include other grades. The most common suggestion was fourth grade through middle school.

Problems

When asked if they had experienced any problems that could be associated with the single-gender classes, 88% of the boys' parents and 73% of the girls' parents
identified no specific problems with single-gender classes. Twenty-seven percent of
the parents of girls were concerned about the talking and arguing among the girls.
Twelve percent of the parents of boys expressed concern over the level of
competitiveness or aggression that emerged in an all-boy environment.

*Interview Responses*

In addition to the questionnaires, interviews were conducted with parents of
the fifth-grade students. Generally the conversations reaffirmed the opinions
registered on the questionnaires. One parent, whose older child had attended fifth
grade at the middle school, declared staying at the elementary for fifth grade was
“much better.” She cited changing classes, puberty, and boy issues at the middle
school as too much for fifth graders to handle all at once. Her second daughter’s
grades remained higher than those of the older daughter, whose grades suffered when
she went to the middle school for fifth grade. The mother attributed the improved
grades to both single-gender classes and postponing the middle school experience for
another year. Another parent who was new to the pilot school said that her daughter
had not experienced the friction among the girls in her previous school. She attributed
the disruptions to a small number of girls who had dominant personality traits.

Patterns emerged from the parents’ responses to the open-ended items on the
questionnaire administered at the end of the school year. The parents' overall
perception of the year of single-gender classes was positive. Recurring comments
affirmed that all but one of the parents of boys considered single gender classes
beneficial. The most commonly expressed positive outcomes were fewer distractions, meaningful relationships with teachers, and a positive attitude toward school. The parents of girls were less enthusiastic in their final evaluation. Nearly half failed to name any benefits; however, the other half observed such improvements in their girls as a keener focus on school, an increased comfort level in class, and better grades.

The Impact of Single-Gender Classes on Student Performance

The second area investigated in this study was the impact of single-gender classes on the performance of the students. For the purposes of this study, performance was measured in terms of the students' school attendance, their conduct at school, and their academic achievement during the pilot year of single-gender classes. The quantitative data yielded the following results.

School Attendance

Regular attendance can be a determiner of success in school. Attendance can impact a student's grades and affect the growth and development of productive work habits. On the initial questionnaire parents were asked whether they expected the single-gender classes to impact their child’s school attendance. Most parents (74%) did not anticipate any change. Twenty-six percent of the parents thought attendance might improve.

Attendance records for the pilot year and the previous year were examined. Results showed the student participants had an average daily attendance (ADA) of 96.8% in fourth-grade coed classes and 96.7% in fifth-grade single-gender classes.
Based on these findings, participation in a single-gender class had no significant impact on student performance in the area of attendance: Absences $t(63) = -.309$, $p = .758$.

The participating students' ADA was compared to the fifth-grade students throughout the school district. Table 1 shows the comparison. The pilot school (D) with a fifth grade ADA of 96.7 exceeded all fifth grades in the district. The ADA of the pilot school (D) was also 1.1 percentage points higher than the district-wide ADA (95.6) for fifth grade.

Table 1

Average Daily Attendance for Fifth Grade

<table>
<thead>
<tr>
<th>Schools</th>
<th>5th Grade ADA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>96.4</td>
</tr>
<tr>
<td>B</td>
<td>95.6</td>
</tr>
<tr>
<td>C</td>
<td>95.7</td>
</tr>
<tr>
<td>D</td>
<td>96.7</td>
</tr>
<tr>
<td>E</td>
<td>95.8</td>
</tr>
<tr>
<td>F</td>
<td>96.5</td>
</tr>
<tr>
<td>G</td>
<td>95.2</td>
</tr>
<tr>
<td>H</td>
<td>95.5</td>
</tr>
<tr>
<td>I</td>
<td>94.7</td>
</tr>
<tr>
<td>J</td>
<td>94.9</td>
</tr>
<tr>
<td>K</td>
<td>94.2</td>
</tr>
<tr>
<td>District</td>
<td>95.6</td>
</tr>
</tbody>
</table>
Finite records of the number and the nature of behavioral issues within the classroom were not available. Interviews with regular education and enrichment teachers provided the most pertinent information about the students’ routine behaviors. Formal discipline referrals were typically made only when a teacher or bus driver felt reinforcement from an administrator on a particular issue was beneficial. By the end of the year, there were 22 such incidences referred to the principal or assistant principal at the pilot school. To understand the significance of this number, it was compared to all other schools in the district.

An analysis of District-wide fifth-grade discipline referrals for the school year is reflected in Table 2 and Figure 10. The district mean was 1.0 referral per student (number rounded). The individual school mean of discipline referrals for fifth-grade students ranged from .30 per student (School D) to 2.39 per student (School I). The pilot school, School D, had the lowest number of discipline referrals (a mean of .30 per student) in the school district. Only School G approximates having as few referrals as the pilot school (.31 per student).
Table 2

District-wide Discipline Referrals for Fifth Grade

<table>
<thead>
<tr>
<th>School</th>
<th>Fifth-grade Enrollment</th>
<th>Total Referrals</th>
<th>Mean per Student</th>
<th>% Female</th>
<th>% Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>325</td>
<td>331</td>
<td>1.02</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>B</td>
<td>162</td>
<td>139</td>
<td>.86</td>
<td>14</td>
<td>86</td>
</tr>
<tr>
<td>C</td>
<td>103</td>
<td>118</td>
<td>1.15</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>D</td>
<td>73</td>
<td>22</td>
<td><strong>.30</strong></td>
<td><strong>45</strong></td>
<td><strong>55</strong></td>
</tr>
<tr>
<td>E</td>
<td>115</td>
<td>108</td>
<td>.94</td>
<td>11</td>
<td>89</td>
</tr>
<tr>
<td>F</td>
<td>85</td>
<td>70</td>
<td>.82</td>
<td>11</td>
<td>89</td>
</tr>
<tr>
<td>G</td>
<td>106</td>
<td>33</td>
<td>.31</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>H</td>
<td>47</td>
<td>42</td>
<td>.89</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>I</td>
<td>41</td>
<td>98</td>
<td>2.39</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>J</td>
<td>51</td>
<td>31</td>
<td>.61</td>
<td>39</td>
<td>61</td>
</tr>
<tr>
<td>K</td>
<td>126</td>
<td>239</td>
<td>1.90</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>Total</td>
<td>1234</td>
<td>1231</td>
<td>1.00</td>
<td>22</td>
<td>78</td>
</tr>
</tbody>
</table>

Figure 10 reflects the actual number of male and female discipline referrals for Schools A through K. Males in the district exceeded females in the number of discipline referrals in every school. In the pilot school (D), the only one in the district with single-gender classes, the ratio of male-female referrals was much closer. The effect was highly significant (p < 0.001).
Figure 10. District-wide Comparison of Male/Female Discipline Referrals

The comparable number of male/female referrals was considered evidence that the boys behaved as well as the girls when taught in a single-gender environment. The principal and the teachers involved in this study believed that, although there were other factors that affected student behavior, the positive results were directly attributable to the single-gender classroom structure. The presence of men teachers also had a positive impact on the behavior of the boys.

The researcher observed that when behavioral problems arose in the boys’ classroom or on the playground, they seemed to be easily resolved and handled by the teachers. There were two out-of-school suspensions during the year; one for fighting and one for disrespect toward a substitute teacher. All other referrals were for typical types of misconduct such as disruption of class and incomplete work.
The playful competitiveness among the boys was managed efficiently by the teachers and was not reported to be a problem. Neither did it appear to be detrimental to their learning. One of the male classes appeared to have a "pecking order," of a sort, among the boys. There were a few strong personalities that emerged as leaders. The other male teacher described his class as "very even." In late spring, when he enrolled a new student, who immediately began to try to initiate conflicts (he was a bully), he called on the boys to explain to the new student the expectations of their classroom. The new student immediately stopped the misconduct and began to blend in with the class.

The teachers used a variety of classroom management strategies. The boys worked in teams with a peer accountability system to manage classroom behavior. The boys earned an extra recess by completing assignments on time and observing classroom rules. Staying on task and completing written assignments was a challenge for some of the boys. They wanted the extra physical activity and were willing to work more conscientiously in order to carve time out of their day for unstructured play. The principal supported the teachers in scheduling an additional outdoor break to help meet the physical needs of the boys.

Discipline issues among girls stemmed mainly from the interpersonal conflicts. The girls tended to have more precarious relationships. An example of a behavioral problem that arose among the girls involved a “Burn Book” inspired by a popular movie. The book was circulated throughout the class (without the teacher’s knowledge) to record insults about the girl who was being "burned" on a given day.
Feelings were hurt, tempers flared, and tears fell. The repercussions lasted for days. Such books, of course, were banned by the teachers; but the girls commonly used notes, “the look,” and gossip to get their message across and create friction in the classroom.

Conversely, the girls could be full of sympathy and compassion for the underdog at a moment’s notice. The girls’ teachers, the administrators, and the school counselor invested time and energy counseling the girls in conflict resolution and interpersonal relationships. The relationship of trust built between the teachers and the students paved the way for such discussions. As one student said, “Our teacher tries to teach us to all be friends, but at the end of the day we’re fighting.” As was mentioned in the teachers’ stories, the socialization problems were one of the greatest challenges in working with the fifth-grade girls.

The female teachers focused intensely on teaching the girls to communicate with each other. They emphasized problem-solving strategies and valuing the uniqueness of each individual. The teachers reported progress in learning what did and did not work effectively in managing a single-gender classroom and continually modified their approach to improve classroom climate. They tapped the resources recommended by the counselor and the principal to help them understand the developmental level and the emotional needs of their students.

The teachers concurred that the first year of single-gender classes had been a learning experience. As the year drew to a close they began to make plans for the coming year. A top priority was to continue to research and formulate the most
appropriate classroom management plan for a single-gender class. Through the course of the year all four classroom teachers had come to the conclusion that they would begin the next school year with more structure. The men realized that a class of all boys could easily become lax in their manners and intended to focus more in that area. The women determined they would establish classroom rules quickly and enforce them firmly from the very beginning of the year. In the principal’s words, “We have ‘massaged’ the situation with the girls too long.” The teachers realized the need to establish immediate consequences for undesirable behavior. They found the girls could not merely be “talked out of” being unkind.

The classroom management plans for the new year included an “Anti-Bullying Contract,” complete with consequences, to be signed by the students and their parents. The teachers planned to initiate it from the first day of school. The students would be required to call or write their parents if they “broke” the contract, thereby assuming responsibility for their own behavior. The teachers also planned to use positive reinforcement for behavior modification.

*Academic Achievement*

The impact of single-gender classes on the academic achievement of the students was measured through a One-Group Pretest-Posttest Design. The pretest measure was the fourth-grade mean score (yearly average) in each subject. The treatment was the year of single-gender classes. The posttest was the fifth-grade mean score (yearly average) in each subject. Data were collected on the 65 students who
attended the pilot school for the entire fourth and fifth grade years. There were 38 females (58%) and 27 males (42%) in the test sample. Table 3 indicates the mean score on the pretest and posttest by gender and by subject. The gain/loss column reflects the net difference between the fourth-grade mean score and the fifth-grade mean score in each subject. Gains and losses were slight in every area.

Table 3

Comparison of Mean Student Score by Subject

<table>
<thead>
<tr>
<th>Subject</th>
<th>Girls' Pretest</th>
<th>Girls' Posttest</th>
<th>Girls' Gain/Loss</th>
<th>Boys' Pretest</th>
<th>Boys' Posttest</th>
<th>Boys' Gain/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>89.95</td>
<td>89.43</td>
<td>-.52</td>
<td>90.85</td>
<td>91.63</td>
<td>+ .78</td>
</tr>
<tr>
<td>Math</td>
<td>87.95</td>
<td>86.83</td>
<td>-1.12</td>
<td>85.85</td>
<td>87.24</td>
<td>+ 1.39</td>
</tr>
<tr>
<td>Reading</td>
<td>89.87</td>
<td>89.33</td>
<td>-.54</td>
<td>90.89</td>
<td>91.17</td>
<td>+ .28</td>
</tr>
<tr>
<td>Science</td>
<td>88.71</td>
<td>89.85</td>
<td>+1.14</td>
<td>92.30</td>
<td>91.00</td>
<td>- 1.30</td>
</tr>
<tr>
<td>Soc.Studies</td>
<td>90.74</td>
<td>90.90</td>
<td>+.16</td>
<td>93.85</td>
<td>92.85</td>
<td>- 1.00</td>
</tr>
</tbody>
</table>

Note: n = 65

Of the 73 fifth-grade students participating in this study, 65 (90%) attended the school in the fourth grade. The students experienced very little change in the school environment from fourth grade to fifth grade other than the change to single-gender classes. The curriculum remained the same, only the level changed from fourth to fifth. There were no major changes in the culture and climate of the school. Routines, rules, and expectations were consistent from one year to the next. The
principal and the enrichment teachers, with the exception of one, were the same as the previous year. The constancy of these factors from year to year may have diminished their potential impact on grade outcomes in fifth grade and strengthened the case for attributing grade differentiation to the implementation of single-gender classes.

A statistical analysis was performed on the data to determine the statistical significance of the difference in the students' mean scores from fourth to fifth grades. A Paired Samples *t* Test was conducted using mean scores in the five major subject areas. The results shown in Table 4 indicated that the year of single-gender classes had no statistically significant impact on the mean scores of the fifth-grade students in the five major subject areas considered: Language *t* (128) = -.031, *p* = .975, two-tailed. Math *t* (128) = .105, *p* = .917, two-tailed. Reading *t* (128) = .606, *p* = .547, two-tailed. Science *t* (128) = .013, *p* = .99, two-tailed. Social Studies *t* (128) = .448, *p* = .656, two-tailed.

Table 4

**Paired Samples *t* Test on Participants' Mean Score by Subject**

<table>
<thead>
<tr>
<th>Subject</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>Diff</th>
<th><em>p</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>65</td>
<td>90.32</td>
<td>5.86</td>
<td>90.35</td>
<td>5.98</td>
<td>0.03</td>
<td>.975</td>
</tr>
<tr>
<td>Math</td>
<td>65</td>
<td>87.08</td>
<td>12.61</td>
<td>86.89</td>
<td>7.93</td>
<td>0.18</td>
<td>.917</td>
</tr>
<tr>
<td>Reading</td>
<td>65</td>
<td>90.71</td>
<td>5.73</td>
<td>90.11</td>
<td>6.52</td>
<td>0.61</td>
<td>.547</td>
</tr>
<tr>
<td>Science</td>
<td>65</td>
<td>90.20</td>
<td>6.59</td>
<td>90.22</td>
<td>7.42</td>
<td>0.02</td>
<td>.99</td>
</tr>
<tr>
<td>Social Studies</td>
<td>65</td>
<td>92.03</td>
<td>6.89</td>
<td>91.35</td>
<td>8.84</td>
<td>0.68</td>
<td>.656</td>
</tr>
</tbody>
</table>
As part of the curriculum, the pilot school used the computerized software programs, Accelerated Math (AM) and Accelerated Reader (AR) published by Advantage Learning Systems, Inc. The programs are designed to initially establish the approximate reading and math levels of students by means of a norm-referenced test (pretest). The students utilize the program throughout the year and retest at the end of the year (posttest). The resulting Growth Report provides a measure of relative growth. Tables 5 and 6 compare the students’ growth during the fourth-grade coed classes and the fifth-grade single-gender classes. The data is reported in Grade Equivalent (G.E.) scores: the grade for which a given score is the real or estimated average. For example, a G.E. of 5.6 indicates a student is performing at a fifth grade, sixth month level. According to this assessment, the students averaged approximately one year of growth in Accelerated Reading per year. More notable gains were reflected in Accelerated Math. The girls produced a two-year, six-month gain; and the boys produced a two-year, seven-month gain during the year of single-gender classes.

Table 5

Accelerated Reading Growth Summary

<table>
<thead>
<tr>
<th></th>
<th>Girls’ Reading Grade Equivalent</th>
<th>Boys’ Reading Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fourth</td>
<td>Fifth</td>
</tr>
<tr>
<td>Pretest Mean</td>
<td>4.8</td>
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</tr>
<tr>
<td>Posttest Mean</td>
<td>5.6</td>
<td>6.5</td>
</tr>
<tr>
<td>Change</td>
<td>0.8</td>
<td>0.9</td>
</tr>
</tbody>
</table>
Summary of the Results

The purpose of this study was to explore two major questions: (a) What were the participants' overall perceptions of their initial experience with single-gender classes in a public school, and (b) what was the impact of single-gender education on the performance of fifth-grade students in terms of school attendance, classroom conduct, and academic achievement? Answers to these questions were found in qualitative and quantitative data collected over the course of the 2004-2005 school year.

Perceptions of the Participants

In the final analysis, the principal and the teachers surmised that both they and the students benefited from the program. For the principal, the most positive outcomes were linked to the high morale and productivity of the teachers. Teachers were more enthusiastic about their own professional development and were inspired
to rise to the new challenge of teaching single-gender classes. Enthusiasm spread, creating a desire among fourth-grade teachers to experiment with single-gender classes in an effort to better serve their students. The teachers were willing to do what they considered to be best for the children.

Another major advantage for the principal was the decrease in the number and severity of discipline referrals. In spite of the challenges, the teachers said the students were easier to manage and exhibited fewer behavioral problems in the single-gender setting. They preferred the situations they faced each day to the boy/girl issues that commonly manifest in fifth grade. The reduction in discipline problems was attributed to the students’ enjoyment of school and greater focus on academics.

Young (2002) reported on the educational problems that disproportionately affect students of this age. She spoke of boys' deficits in reading and girls' underachievement in science and math. In the single-gender setting the teachers were able to structure the classroom environment and custom-tailor their instructional styles to meet the needs of their students. The participants performed well in these subjects, contrary to Young’s (2002) report.

Phillips, et al. (2001) reported studies that showed males and females listen, read, process information, and experience emotions differently. The teachers observed this to be true and, in their gender-separate groups, could better address the uniqueness of the gender they taught. The boys' classes were informal places, sometimes active and noisy, where learning took place effectively through active participation and sometimes competition. The girls' classes were more structured,
quieter, and heavily engaged in meeting the emotional needs of the students. Both environments were consistent with the description of gender characteristics reported in previous studies.

According to Gentry, et al. (2002), boys at every age are less enthusiastic about school than girls. The teachers and the parents found that not to be the case in this year's single-gender setting. The boys appeared to be enthusiastic about school and spoke frequently about how “cool” their classes were. At the end of the year, the majority of parents of boys repeatedly credited the all-boy class for their son's satisfaction and engagement with school during the year. In a study of attitudinal differences of males and females, Rowe (2000) reported that patterns of positive behavior among males in single-gender settings could be attributed to their perceptions of teacher responsiveness, curriculum usefulness, and enjoyment of school. This case study confirmed those findings.

Impact on Student Performance

*School Attendance*

This study likewise revealed some promising results from an analysis of the students' attendance, behavior, and grades. The data collected indicated fifth-grade average daily attendance (ADA) remained steady during the pilot year in comparison to the previous year. An ADA of 97% (rounded) is considered strong for both years. In comparison to the other fifth-grade coeducational classes throughout the district,
the average daily attendance at the pilot school was slightly higher. It also exceeded the district-wide ADA for fifth grade by 1.1%.

**Classroom Conduct**

In regard to behavior, the study revealed the fifth-grade students at the pilot school logged a smaller ratio of discipline referrals per pupil than the fifth-grade students at any other school in the district. Additionally, the data revealed that unlike the other schools in the district, the male discipline referrals did not exceed the females. This is a noteworthy finding and is consistent with reports from previously mentioned schools in Seattle and Washington, D.C., that report significant improvement in behavior in single-gender classes.

**Academic Achievement**

Feingold (1994) reported that girls typically outperform boys in all subjects (as measured by grades) and age groups, and are more motivated. In the single-gender setting, the students' grades revealed a very similar level of productivity in males and females. A pretest (fourth-grade mean) and posttest (fifth-grade mean) were used to evaluate performance in each subject. Because the researcher did not hypothesize which of the two mean scores would be greater in advance of data collection, a two-tailed test was used (Gall, et. al, 1996). Results of the paired samples $t$ test revealed no significant difference in students' mean scores during the pilot year of single-gender classes as compared to coeducational classes the year before. Growth Reports
in Accelerated Math indicated the students averaged a 2.65 grade equivalent gain
during the fifth-grade year.

Rowe (2000) reported finding the achievement of students in single-gender
environments was typically higher than their counterparts in coeducational settings.
Since the students in this study were compared only to their own prior performance in
fourth grade, and not to other fifth-grade students, it is undeterminable how they
compare to other fifth-grade coeducational students in the district.

Attendance and grades remained consistently strong as compared to the
fourth-grade. In the area of discipline, the participants were compared to their peers
throughout the district and determined to exhibit fewer behavioral problems. Of the
three areas reviewed (school attendance, classroom conduct, and academic
achievement) the most measurable differences were observed in the conduct of the
students.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter consists of three sections. The first is a brief summary of the mixed methods study of single-gender education. The summary is followed by a discussion of the conclusions drawn from the examination of the pilot year of single-gender classes in a public school. The final section will offer some practical suggestions for generalizing these findings to a larger, but defined, population.

Summary

Federal legislation, in the form of The No Child Left Behind Act of 2001 (NCLB), increased accountability for school districts and states by mandating intense measurement of the academic growth of individual students. At the same time, NCLB released public schools to explore innovations for enhancing student performance. One such effort involves organizing schools/classes according to gender. In response to this new development, an elementary school in Central Mississippi became one of 143 schools in the public sector that implemented single-gender classes during the 2004-2005 school year (NASSPE, 2004e). The pilot program was conducted with 73 fifth-grade students divided into four single-gender classes: two for boys and two for girls.
One purpose of this study was to examine the initial impact of implementing gender-based instruction in a public school. The impact was assessed in terms of the attitudes and perceptions of the administrator, teachers, students, and parents involved in the pilot program. Secondly, the study was designed to measure the impact of single-gender classes on the performance of the students. An examination of the students' academic records, conduct, and school attendance was considered key to evaluating the single-gender experience and measuring its impact on the performance of the students.

A review of the literature created a lens through which to view single-gender education. Opinions were divided on whether single-gender classes are a key to enriching the educational experience for students or if they tend to recreate inequities among the sexes that Title IX of the Education Amendments of 1972 was designed to alleviate. Opponents, or those who are at least skeptical of single-gender education, include Amanda Datnow, The National Coalition for Women and Girls in Education, The National Women's Law Center, and the American Civil Liberties Union. Support for the effort to explore the benefits of single-gender education was found in former Secretary of Education Rod Paige and Senators Kay Bailey Hutchinson and Hillary Clinton, as well as a host of researchers and educators worldwide.

Studies conducted within the United States and around the world were examined to establish a framework for this study. Some of the research addressed the differences in the brain development of males and females and how these differences affect learning (e.g., Kimura, 1996; Achiron et al., 2001; Phillips et al., 2001; and
Hanlon et al., 1999). The physical and emotional variances of the sexes were examined in light of their impact on a child's educational needs (e.g., Cassidy and Dity, 2001; Killgore et al., 2001; Taylor & Klein, 2000; and Costa et al., 2001). Weiman (2004), Feingold (1994), and Sax (2004a) reported some distinct advantages of educating boys and girls separately, the most significant being the freedom to custom-tailor instruction to suit the gender being taught. Colley et al. (1994), Rowe (2000), and Dean (1998), among others, reported the beneficial impact of single-gender classes/schools on the attitude and the achievement of the students.

Some of the studies examined were less than favorable toward single-gender education. Harker and Nash (1997) reported that when adjustments were made for individual characteristics (such as socioeconomic status), the differences that were attributed to single-gender classes disappeared. The AAUW (1998) and Gentry et al. (2002) also contributed observed improvements to factors other than single-gender grouping. Datnow et al. (2001), in a review of single-gender public schools in California, reported that although single-gender academies addressed educational needs, they did little to influence gender-equity.

Of the single-gender programs available for examination in the United States, most involved private or parochial schools. This study's mixed methods approach combined qualitative and quantitative research in a case study involving a public school. The study was designed to utilize a Sequential Exploratory Strategy. This consisted of an initial phase of qualitative data collection and analysis, followed by
quantitative data collection and analysis. The results were then integrated to measure the overall impact.

In the qualitative phase, data were collected through interviews, questionnaires, and observations. The data were subjected to interpretational analyses to discover the patterns used to convey the attitudes and perceptions of the participants. With very few exceptions, the administrator, teachers, students, and parents related a positive overall experience. Positive outcomes included the increased development of self-confidence in the students, the relaxed and productive atmosphere in the classrooms, and the decrease in discipline problems. Very few negative opinions emanated from the study. The primary concern expressed was the frequency of personal conflicts among the girls.

Student performance was measured in three areas: attendance, conduct, and academic achievement. The students maintained an average daily attendance (ADA) rate of 96.7% during the fifth grade, comparable to their ADA of 96.8% in fourth grade. They exceeded the ADA of the fifth graders district-wide by 1.1%. The most significant findings pertained to the conduct of the fifth-grade students. The students involved in the pilot program were better behaved than the students in all other schools in the district, based on district discipline records. The behavioral record of males in the single-gender classes was comparable to the behavioral record of the females. This finding was in contrast to the ratio of male/female referrals in every other school in the district. There were no comparisons made to the students’ own fourth-grade behavior because discipline records were unavailable. The study further
revealed there was not a significant statistical difference in academic achievement from fourth-grade coeducational classes to fifth-grade single-gender classes as measured by the students’ final averages in the five major subject areas.

Conclusions

This study utilized a mixed method approach to investigate the perceptions of the participants regarding their first experience with single-gender classes in a public school. It also sought to measure the impact single-gender classes had on the performance of the students. The data collected were both qualitative and quantitative in nature. Whereas the quantitative data collection and analyses were rather straightforward, the qualitative data collection and analyses were dependent upon the interpretation and reflection of the researcher. Immersion into the case study provided a sense of how the participants perceived their experience.

Based on the findings of this study, the pilot program of single-gender classes in a public school was judged a success. In the final evaluation, the overall attitudes and perceptions reported by the participants were positive. The administrator and the majority of the teachers, the students, and the parents registered a favorable disposition toward continuing single-gender fifth grade classes. With very few exceptions, the program, likewise, earned a positive reception in the school and the community.

The principal considered the positive disposition of the teachers, students, and parents toward the single-gender classes to be an asset. Teacher morale and
productivity remained high throughout the year. Teachers responded enthusiastically
to the opportunity to create a learning environment in the classrooms that tailored
instruction specifically to the gender they taught. Sax (NASSPE, 2004b) touted
“expanded educational opportunity” and “custom-tailored teaching” as two major
advantages of single-gender educational settings.

The students appeared to thrive in their single-gender classes. Colley et al.
(1994) reported that girls from single-gender schools showed stronger preferences
than their female coeducational peers for stereotypical “masculine” subjects such as
mathematics and science. Similar findings regarding math were reported by Culley
(1993) and Newton & Beck (1993). The girls’ enthusiasm for math and their level of
accomplishment in the single-gender math class was notable—a 2.6 year gain in
Accelerated Math in one year. Similarly, the boys excelled with a 2.7-year gain in
Accelerated Math. The male students' participation and enjoyment of reading was one
of the most obvious benefits, as evidenced by more boys selecting reading as their
favorite subject. More girls chose math as their favorite subject. This was indicative
of the teachers' success in making traditionally less-liked subjects more enjoyable.

The level of satisfaction, especially among the male students, was considered
one of the most significant outcomes of the pilot program. Gentry et al. (2002) opined
that boys at every age are less enthusiastic about school than girls. Conlin (2003)
reported on what British educators have termed “laddism”: the disengagement of
boys in school. He cited the prevalence of women exceeding men in the number of
earned college degrees. Gurian and Stevens (2004) found that boys are losing interest
in school and expressed a need to find ways to reengage them that is not detrimental to girls. Gentry (2002) noted that boys perceive coed schools as institutions run largely by women and according to women’s rules, with girls earning the top grades, thus causing the boys to devalue academic excellence. Given these previous findings, the attitude exhibited by the male students throughout the year attests to the success of the program.

Due to the influence of attitude on performance, the old adage, “Contented cows give more milk,” applies here. The male students involved in the single-gender classes were happy in their environment and maintained a high level of engagement and productivity throughout the year. According to Sax (NASSPE, 2004a), in order to teach boys effectively, the teacher’s first task is to get them interested. In the single-gender setting, the men teachers were able to provide an energized classroom environment in which the boys thrived.

In a gender-separate class, the teachers were able to customize instruction and classroom climate to meet the cognitive, physical, and psychological needs of their students. Hanlon et al. (1999) reported the differing rates of brain development in males and females as it relates to spatial memory, language development, and socialization skills. Cassidy and Ditty (2001) addressed the issue of how the differences in hearing affect the needs of males and females in the classroom. Sax (NASSPE, 2004b) and Killgore, et al. (2001), reported on the differences in the emotional development of males and females. The teachers observed firsthand how
these differences impacted learning, and attempted to make the necessary accommodations in their classrooms.

Girls respond better to a non-threatening, comfortable environment (NASSPE, 2004b). It seemed the girls’ greatest threats were each other. The female teachers worked toward keeping the girls focused. The challenge of the socialization issues faced by the girls caused the teachers to seek support. Books by Freedman, Salomone, Wiseman, and Simmons provided valuable insights into the girls’ emotional development. The NASSPE web site of Dr. Leonard Sax was a ready source of information and support.

The performance of the students was considered an important factor in measuring the success of the program. The fact that there were no major differences in some of the observed areas was viewed as positive. Had the students regressed or rebelled in any of the measured areas, it would have been considered detrimental to the success of the program.

The fifth-grade students’ attendance and academic achievement were consistent with, or better than, their performance in fourth-grade coeducational classes. The students’ conduct and attendance records were superior to their coeducational peers throughout the district. The boys logged only slightly more discipline referrals than the girls, unlike most other schools in the district that had a disproportionate number of male discipline referrals. Gurian and Stevens (2004) called for “a new movement to alter classrooms to better suit boys’ learning patterns if we are to deal with the gaps in grades, discipline, and reading/writing . . .” (p. 24).
The single-gender classrooms at the pilot school appeared to address these needs effectively.

Free of the distractions of male/female relationships, the students were better able to focus on academics during class hours. Students had ample opportunities outside of class and school to maintain boy/girl friendships with their peers. Sax (NASSPE, 2004b) cited “greater autonomy, especially in heterosexual relationships,” as a distinct advantage of single-gender classes. All of the teachers, the principal, and many of the parents judged the separation to be appropriate for the students at this age and recommended extending the single-gender classes through sixth grade and possibly middle school.

In the principal’s opinion, the success of the program lies in the teachers. Teacher “buy-in” is imperative. Those who teach single-gender classes must necessarily regard their job differently from teaching a coeducational class and take advantage of the opportunity to “specialize.” If the teacher’s educational background did not address gender-specific learning characteristics and teaching strategies, professional development is vital. Likewise, classroom management strategies appropriate for the gender group and the grade level are essential. Single-gender education is more than separating the boys from the girls; it is an opportunity to improve instruction.
Recommendations

The following recommendations are based on the findings of this case study:

1. It is recommended that the fifth-grade single-gender classes continue for another school year in order to more thoroughly assess the long-term success of the organizational strategy.

2. It is recommended that the administration continue to inform the parents and the community of the status of the current program and of any intentions to expand to other grades. Communication should be two-way between parents and school officials.

3. It is recommended that special attention be given when assigning teachers to a single-gender class. Certain personalities and teaching styles are more compatible with one gender than the other. It is important to match the teacher and the gender group in order to provide the most effective learning environment.

4. It is recommended that teachers assigned to single-gender classes be willing to accept the responsibility of learning about the unique cognitive, physical, and psychological characteristics of each gender and adapting their teaching styles to best serve the gender they are teaching.

5. It is recommended that the middle school investigate the possibility of continuing single gender classes beyond the fifth grade.

6. It is recommended that professional development be provided to teachers of coeducational classes and that they also be encouraged to routinely apply gender-specific teaching strategies in their classrooms.
7. It is recommended that further research focus on gender-appropriate teaching and classroom management strategies for single-gender classes.

8. It is recommended that further research examine the fifth-grade students’ Mississippi Curriculum Test scores in light of the impact of a single-gender class on student achievement.

9. It is recommended that further research examine sub-groups within the sample (Black, Hispanic, lower-income) to measure their achievement in single-gender classes compared to their coeducational counterparts.

Education is a service. The students are the consumers. In order for educators to best serve their clients, we must recognize the needs of an ever-changing society. Current legislation (NCLB) has enabled educators to explore better methods of teaching students and holds them more highly accountable than ever for the results.

Current brain research has revealed significant differences in the brains of males and females. Studies have likewise provided information on the cognitive, social, and developmental growth rates of male and females. These developments have opened up an opportunity for a paradigm shift toward gender-based instruction. This study has endeavored to investigate one application of this alternative method of teaching. Further research is merited in order to determine the long-term impact of single-gender classes and the extent to which single-gender instruction can be applied effectively.
REFERENCES


APPENDIX A

LETTER OF REQUEST TO SUPERINTENDENT
September 3, 2004

Dr. Lynn Weathersby, Superintendent
Rankin County School District
1220 Apple Park Place
Brandon, MS 39042

Dear Dr. Weathersby:

I am a doctoral student in the Department of Educational Leadership at Mississippi State University. For my dissertation, it is my hope to conduct a case study of the single-gender fifth-grade classrooms at Flowood Elementary School. I am in need of your written permission to engage in the research during the pilot year, 2004-2005. I am asking your permission to examine grades, attendance records, and discipline reports, as well as biographical and demographical data of the fifth-grade students. Through interviews, observations, and questionnaires, I will document the impact of the program on the students, teachers, and the school.

The study may be regarded as “research not involving more than minimal risk” to the participants, according to the standards of the Institutional Review Board (IRB) of Mississippi State University. There will be no harm, discomforts, inconvenience or risks associated with the research activity. In accordance with the IRB, student records may be disclosed in compliance with FERPA code section exception 99.31. Sub sections 6i, (A) and (C) allow organizations to conduct certain studies for, of on behalf of, educational agencies and institutions to develop, validate, or administer predictive tests, and to improve instruction. Responsibility for all data disclosed lies within the Rankin County School District, not Mississippi State University. All personally identifiable private information will be held in confidence.

It is my hope that an examination of the impact of the single-gender classrooms on student performance and teacher effectiveness can provide valuable information to Flowood Elementary School and to the Rankin County School District concerning the future direction of the program. If you have any questions or concerns regarding this proposed research, please contact me at 601-845-5580 or Tracy Arwood, Regulatory Compliance Officer, at 662-325-0994 or email Tracy at tarwood@research.msstate.edu. Thank you for your cooperation in this matter.

Sincerely,

Myra Gillis
Doctoral Candidate
Mississippi State University
APPENDIX B

LETTER OF REQUEST TO PRINCIPAL
September 3, 2004

Dr. Barbara McCool, Principal
Flowood Elementary School
103 Winner’s Circle
Flowood, MS  39232

Dear Dr. McCool:

I am a doctoral student in the Department of Educational Leadership at Mississippi State University. For my dissertation, it is my hope to conduct a case study of the single-gender fifth-grade classrooms at Flowood Elementary School. I am in need of your written permission to engage in the research during the pilot year, 2004-2005. I am asking your permission to examine grades, attendance records, and discipline reports, as well as biographical and demographical data of the fifth-grade students. Through interviews, observations, and questionnaires, I will document the impact of the program on the students, teachers, and the school.

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It is my hope that an examination of the impact of the single-gender classrooms on students, teachers, and the school can provide valuable information to Flowood Elementary School and to the Rankin County School District concerning the future direction of the program. If you have any questions or concerns regarding this proposed research, please contact me at 601-845-5580 or Tracy Arwood, Regulatory Compliance Officer, at 662-325-0994 or email Tracy at tarwood@research.msstate.edu. Thank you for your cooperation in this matter.

Sincerely,

Myra Gillis
Doctoral Candidate
Mississippi State University
APPENDIX C

INFORMED CONSENT FROM PRINCIPAL/TEACHER
INFORMED CONSENT TO BE A RESEARCH PARTICIPANT
Interviews/Observations (Teachers/Principal)

PURPOSE

I understand that I am being invited to participate in a research study. Myra Gillis, a doctoral student in Educational Leadership at Mississippi State University, is conducting the study. The purpose of the study is to examine the impact of single-gender classrooms on students and teachers at Flowood Elementary School.

PROCEDURES

I understand that I may be asked to participate in an interview and be observed during classroom activities periodically throughout the year. The observations are impromptu and generally 30 – 45 minutes in duration. The interviews will be scheduled at my convenience and that I will be allowed to review the transcription of the interview.

RISKS AND BENEFITS

I understand that my participation is voluntary. I am free to terminate my participation at any time without penalty. I understand that my name will not be disclosed, and I will not be identified other than by gender, although some of my written comments may be quoted. These interviews and observations are in no way punitive and are not for the purpose of evaluation.

QUESTIONS

I have had all questions pertaining to this study sufficiently answered and I understand the answers. If I have additional questions about the research or my rights, I may contact the researcher, Myra Gillis or Dr. McCool at (601) 992-6277.

______________________________              _______________________________
Participant’s signature/Title                              Researcher’s signature

____________________________________________________
Date                                                                    Date
APPENDIX D

LETTER TO PARENTS
January 6, 2005

Dear Parents:
I am a doctoral student in the Department of Educational Leadership at Mississippi State University. As a part of my degree program, I am conducting a research study on the single-gender fifth-grade classes at Flowood Elementary School. My research will involve observing and interviewing the teachers and students in the school setting during the 2004-2005 school year. I will also solicit parent input during the year. This is a new experience for all of us and I want to document how it impacts the students, the teachers, and the school.

I will examine the students’ records for age, gender, attendance, grades, and performance. There will be no risk involved for your child; no interference with the educational process; and no personal identification beyond the fact that they are a male or a female fifth-grade student in a single-gender classroom.

It is the policy of Mississippi State University for researchers to secure parental permission when student information is used for the purpose of research. If this is acceptable to you, please sign the attached consent form and return it with your child as soon as possible. No penalty will occur as a result of either not participating or withdrawing at any time.

Thank you for helping me fulfill my goal of being a lifelong learner. If you have any questions or concerns about my research project, feel free to call me at the Flowood Elementary School office (992-6277).

Sincerely,

Myra Gillis, Assistant Principal
Flowood Elementary School
APPENDIX E

INFORMED CONSENT FROM PARENTS
INFORMED CONSENT TO BE A RESEARCH PARTICIPANT
Questionnaires/Interviews (Parents)

PURPOSE

I understand that I am being invited to participate in a research study. Myra Gillis, a doctoral student in Educational Leadership at Mississippi State University, is conducting the study. The purpose of the study is to examine the outcomes of the pilot year of single-gender classrooms on students and teachers at Flowood Elementary School.

PROCEDURES

I understand that I will be asked to complete a questionnaire at home and return it to the school sealed in the envelope provided. My child’s teacher will collect the envelopes and submit them unopened to the researcher. The questionnaires will be coded “parent of boy” or “parent of girl” in order to preserve anonymity.

I understand that Mrs. Gillis may call upon me or I may volunteer to discuss questions and opinions concerning my child’s class. Additionally, Mrs. Gillis may talk with my child about his or her experience in a single-gender classroom. Students’ academic, attendance, and behavioral records will be examined for the purposes of this study, but will be identified by gender only, not by name.

RISKS AND BENEFITS

I understand that my and my child’s participation is voluntary. I am free to terminate my participation at any time without penalty to my child or me. I understand that my child’s name and/or my name will not be disclosed, or identified, although some of our written or spoken comments may be quoted.

QUESTIONS

I have had all questions pertaining to this study sufficiently answered and I understand the answers. If I have additional questions about the research or my rights, I may contact Mrs. Gillis or Dr. McCool, the principal at (601) 992-6277.

Participant’s signature/Date          Researcher’s signature/Date

___________________________________
Student’s Name
APPENDIX F

INFORMED ASSENT FROM STUDENTS
INFORMED ASSENT TO BE A RESEARCH PARTICIPANT
Questionnaires, Interviews and Observations (Students)

PURPOSE

I understand that I am being invited to participate in a research study. Mrs. Gillis is working toward a degree at Mississippi State University and is sponsoring the study. The purpose of it is to examine the outcome of having “all girl” and “all boy” fifth-grade classrooms at Flowood Elementary School for the 2004/2005 school year.

PROCEDURES

I understand that I will be asked to answer some questions during the school year. I may answer all, part, or none of the questions. I may stop participating any time I choose. I also understand that Mrs. Gillis will visit my classroom from time to time to learn about the class.

RISKS/BENEFITS

I understand that Mrs. Gillis may use some of the things I say in her report, but she will not use my name. There will be no penalty or reward for answering or not answering the questions. My answers will not be graded.

QUESTIONS

If I have any questions, I may ask Dr. McCool, Mrs. Gillis, my teacher, or the school counselor.

________________________________     __________________________________
Student’s Signature                      Researcher’s Signature

________________________________     _________________________
Date                                    Date
APPENDIX G

PRINCIPAL INTERVIEW QUESTION
PRINCIPAL INTERVIEW QUESTIONS
SUBJECT: FIFTH-GRADE SINGLE-GENDER CLASSES

Script: “Thank you for talking with me about your administrative experience with all boy/all girl classrooms this year. I am in graduate school at Mississippi State University working toward a doctorate and I have chosen to do a research study on the single-gender classes at our school. I want to try to determine the impact that dividing the boys and girls in fifth grade might have on the educational experience. Would you be willing to answer a few questions for me? _______

You will be identified in the report of my findings as school administrator. May I use some of your comments or opinions for the purpose of reporting results? _______You may stop the interview at any time or decline to comment on any question you choose. May I continue the interview? ________

1. Is this your first experience with single-gender classes?

2. Were you instrumental in making the decision to have single-gender classes this year?

3. Did you offer any particular training or staff development to prepare the staff for single-gender classes?

4. What preparations did you make specifically to introduce single-gender classes to your school?

5. Generally speaking, how is the school year going for you as an administrator?

6. Have you encountered any difficulties related to the single-gender classes?

7. What positive outcomes can you attribute to single-gender classes?

8. How would you describe the atmosphere in your school this year?

9. How would you describe the level of productivity or enthusiasm in the single-gender classes?

10. How would you describe the response of the teachers?

11. What kinds of reactions have you received from the fifth-grade parents concerning the single-gender classes?
12. Is there a dominant response or feeling?

13. What reactions have you received from the community at large?

14. What kind of reactions have you received from other teachers?

15. Has this new class structure affected your relationship with other administrators in the district?

16. What type of discipline problems have you encountered? Is this any different to managing mixed-gender classes?

17. Do you perceive any differences in the teaching methodology of the single-gender teachers this year as compared to a mixed-gender class?

18. Are you satisfied with your level of expertise on single-gender education?

19. Do you have any unanswered questions that you would like to explore or have addressed?

20. At this point in the year, do you think single-gender classrooms are a good idea or a bad idea or are you waiting to see? Why?

21. Would you implement single-gender classes for fifth grade again?

22. Would you implement single-gender classes for other grades? Which ones?

23. Would you recommend single-gender classes to your fellow administrators?

**Script:** Thank you for talking with me. I am really interested in knowing your opinions about single-gender classes at Flowood Elementary School this year. You have been very helpful. Please remember you will be identified as the administrator of the school in which the pilot program is taking place. I will provide written transcripts of our conversation for your review. Thanks, again.
APPENDIX H

TEACHER INTERVIEW QUESTIONS
TEACHER INTERVIEW QUESTIONS
SUBJECT: FIFTH-GRADE SINGLE-GENDER CLASSES

Script: “Thank you for talking with me about your teaching experience in an all boy/all girl classroom this year. I am in graduate school at Mississippi State University working toward a doctorate and I have chosen to do a research study on the single-gender classes at our school. I want to try to determine the impact that dividing the boys and girls in fifth grade might have on the educational experience. Would you be willing to answer a few questions for me? _______

You will not be identified in any way in the report of my findings beyond “teacher of girls” or “teacher of boys”. What you say is confidential. I may use some of your comments or opinions for the purpose of reporting results, but there is no risk or penalty to you. You may stop the interview at any time or decline to comment on any question you choose. May I continue the interview? _______

1. Is this your first experience with an all boy/all girl class?

2. Did you have any input in the decision to teach a single-gender class this year?

3. Were you offered any particular training or staff development to prepare you for a single-gender class?

4. What preparations did you make specifically to teach a single-gender class?

5. Generally speaking, how is the school year going for you as a teacher?

6. What difficulties are you encountering related to an all boy/girl class?

7. Have you had any positive or negative experiences that could be directly attributed to an all boy/girl class?

8. How would you describe the atmosphere in your classroom this year?

9. How would you describe the level of productivity or enthusiasm in the class?

10. How would you describe your relationship with the students?

11. What kinds of reactions have you received from the parents concerning the single-gender classes? Is there a dominant theme or feeling?
12. What reactions have you received from the community at large?

13. What kind of reactions have you received from other teachers? Has this new class structure affected your relationship with other teachers in the building or in the district?

14. What method of discipline or classroom management do you use? Is this any different to managing a mixed-gender class?

15. Do you perceive any difference in your teaching methodology this year as compared to a mixed-gender class?

16. Do you perceive difference in the way you structure the classroom? Assignments, projects, grouping, etc.?

17. Are you satisfied with your level of expertise on single-gender education?

18. Do you have any unanswered questions that you would like to explore or have addressed?

19. At this point in the year, do you think single-gender classrooms are a good idea or a bad idea or are you waiting to see? Why?

20. If you had a choice would you choose a single-gender class for fifth grade again?

21. Would you choose single-gender classes for other grades? Which ones?

22. Would you recommend it to other teachers? Parents? ________

Script: Thank you for talking with me. I am really interested in knowing your opinions about all boy/all girl classes at Flowood Elementary School this year. You have been very helpful. Please remember I will not identify you in any way in my report of findings other than as a teacher of girls/boys and there is no risk or penalty to you. Thanks, again.
APPENDIX I

CLASS OBSERVATION CHECKLIST
CLASS OBSERVATION CHECKLIST
SUBJECT– FIFTH-GRADE SINGLE-GENDER CLASSES

Date: ____________________________ Time: ____________________________
Setting: _________________________ Gender: _______________________

Classroom Climate:
Engagement/Time on Task:
Teacher/Student Rapport:
Voluntary Participation:
Gender-appropriate teaching methods:
Evidence of Learning:
Display of Student Work:
Classroom Management Style:
Use of Multiple Intelligences:
Attention to Learning Style:
APPENDIX J

STUDENT INTERVIEW QUESTIONS
STUDENT INTERVIEW QUESTIONS
SUBJECT: FIFTH-GRADE SINGLE-GENDER CLASSES

Script: Would you talk to me about what it is like to be in an all boy/all girl classroom this year? I am in graduate school at Mississippi State University working toward a doctorate and I am doing a research study on the all boy/all girl classes at our school. I want to learn how dividing the boys and girls in fifth grade affects you in school. Would you be willing to answer a few questions for me? _______

You will only be identified in my report as a girl or a boy. What you say is confidential. I may use some of your answers in my report, but you won’t get in trouble or get graded on your answers. You may stop talking with me at any time or just not answer any question you choose. Is that OK with you?

1. Boy_______Girl________

2. What is your favorite subject this year? Why?

3. How would you describe your work habits on homework and in class this year compared to fourth grade?

4. (Boys) Have you ever had a man teacher before? What is it like?

5. How would you describe your relationship with the teacher?

6. Is there anything different about the way students behave in class with no boys/girls?

7. What is your favorite class activity?

8. What is your favorite chapter book your teacher has read aloud this year?

9. Does your teacher seem to teach any different this year from your other teachers?

10. Tell me what you like the best about being in a class with all boys/all girls.

11. Is there anything you do not like about an all boy/all girl class?

12. What do other students say about your all boy/girl class?

13. How do you think your parents feel about the all boy/girl class?
14. Do you have any questions that you would like the teacher or the principal to answer about the all girl/all boy classes?

15. If you had a choice would you choose an all girl/boy class again?
   YES______________NO____________

**Script:** Thank you for talking with me. I am really interested in knowing your opinions about all boy/all girl classes at Flowood Elementary School this year. You have been very helpful. Please remember, what we have talked about is just to help me report about the new program, not to tell on you or get you in trouble in any way. Thanks, again.
APPENDIX K

PARENT INTERVIEW QUESTIONS
Script: “Thank you for talking with me about your child’s experience in an all boy/all girl classroom this year. I am in graduate school at Mississippi State University working toward a doctorate and I have chosen to do a research study on the single-gender classes at our school. I want to try to determine the impact that dividing the boys and girls in fifth grade might have on the educational experience. Would you be willing to answer a few questions for me? ______

You and your child will not be identified in any way in the report of my findings beyond “parent of girl” or “parent of boy”. What you say is confidential. I may use some of your comments or opinions for the purpose of reporting results, but there is no risk or penalty to your child. You may stop the interview at any time or decline to comment on any question you choose. May I continue the interview? ______

1. My fifth-grade student is a boy or a girl? ___________________

2. As a parent, what is your impression of the school year thus far? Can you tell me why?

3. Have you encountered any difficulties related to an all boy/all girl class?

4. Have you had any positive experiences that could be directly attributed to an all boy/all girl class?

5. How would you describe your child’s overall satisfaction with school this year?

6. How would you describe his/her level of productivity or enthusiasm for school?

7. How would you describe his/her relationship with the teacher?

8. Is there anything your child has mentioned that is different about class other than “no boys/no girls”?

9. Do you perceive any difference in the way your child is being taught this year as compared to every other year?

10. Do you perceive any difference in the way the teacher is managing the classroom? (Assignments, discipline, etc.)
11. Are you satisfied with the amount of information you’ve received in regard to the single-gender classes?

12. Do you have any unanswered questions that you would like the teacher or the principal to address?

13. If you had a choice would you choose a single-gender class for fifth grade again?

14. Would you choose single-gender for other grades?

15. Would you recommend single-gender classes to your friends and neighbors?

**Script:** Thank you for talking with me. I am really interested in knowing your opinions about all boy/all girl classes at Flowood Elementary School this year. You have been very helpful. Please remember I will not identify you in any way in my report of findings and there is no risk or penalty to your child. Thanks, again.
APPENDIX L

INITIAL PARENT QUESTIONNAIRE
INITIAL PARENT QUESTIONNAIRE
5th Grade Parents
The purpose of this questionnaire is to assess your initial impressions as a parent of a fifth-grade student in a single-gender classroom. Your response will be confidential, for research purposes only. Thank you for your time and feedback. If you have any questions or concerns, please contact Myra Gillis at 992-6277.

1. Has your child ever been in a single-gender classroom before this year?
   ____Yes   ____No

2. How do you expect your child’s grades to be affected by the single-gender classroom?
   Much Worse   Slightly Worse   Same   Slightly Better   Much Better
   1            2                3            4            5

3. How do you expect your child’s conduct in class to be affected by the single-gender classroom?
   Much Worse   Slightly Worse   Same   Slightly Better   Much Better
   1            2                3            4            5

4. How do you expect the other students’ conduct in class to be affected by the single-gender classrooms?
   Much Worse   Slightly Worse   Same   Slightly Better   Much Better
   1            2                3            4            5

5. How do you expect your child’s attendance to be affected by the single-gender classrooms?
   Much Worse   Slightly Worse   Same   Slightly Better   Much Better
   1            2                3            4            5

6. What was your child’s attitude going into the single-gender 5th grade classroom?
   Very Negative   Negative    Neutral   Positive    Very Positive
   1                2            3            4            5
7. What was your attitude as a parent toward the single-gender classroom setting?

Very Negative  Negative  Neutral  Positive  Very Positive
1  2  3  4  5

8. At this point, do you support the decision to implement single-gender classrooms for fifth grade?

Very Negative  Negative  Neutral  Positive  Very Positive
1  2  3  4  5

9. In an effort to examine the impact of the single-gender classes, we hope to identify any outside variables that affect students’ performance. Has your child experienced any significant or life-changing events over the summer that might impact his/her performance in school this year?

___Yes  ___No

10. How do you expect your child to benefit from the single-gender classroom?

11. What reservations, if any, do you have toward the single-gender classrooms?

12. Do you feel you have received adequate information from the school regarding the change to single-gender classes for fifth grade?

13. Do you have any questions you would like for the administration to answer?

14. Is your child a male or a female?____________________

Additional comments are welcomed. Write on the back or attach as needed.

Please return the survey to your child’s teacher sealed in the envelope provided.

Thank you for your participation.
APPENDIX M

FOLLOW-UP PARENT QUESTIONNAIRE
FOLLOW-UP PARENT QUESTIONNAIRE
May 12, 2005

The purpose of this questionnaire is to assess your overall impressions as a parent with a student in a single-gender classroom this year. Your response will be confidential, for research purposes only. Please return this questionnaire to your child’s teacher sealed in the envelope provided. Thank you for your time and feedback. If you have a question or concern, please contact Myra Gillis at the Flowood Elementary School office. (Phone - 992-6277)

1. How would you rate the overall experience of having your child in a single-gender classroom this year?

<table>
<thead>
<tr>
<th>Very Negative</th>
<th>Negative</th>
<th>Neutral</th>
<th>Positive</th>
<th>Very Positive</th>
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<td>3</td>
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</table>

2. How were your child’s grades during the year of single-gender classrooms compared to previous years?

<table>
<thead>
<tr>
<th>Much Worse</th>
<th>Slightly Worse</th>
<th>Same</th>
<th>Slightly Better</th>
<th>Much Better</th>
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<td>1</td>
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</tr>
</tbody>
</table>

3. How was your child’s conduct (discipline referrals) during the year of single-gender classrooms compared to previous years?

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<tr>
<th>Much Worse</th>
<th>Slightly Worse</th>
<th>Same</th>
<th>Slightly Better</th>
<th>Much Better</th>
</tr>
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<td>1</td>
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</tr>
</tbody>
</table>

4. How did your child respond to schoolwork/assignments during the year of single-gender classrooms compared to previous years?

<table>
<thead>
<tr>
<th>Much Worse</th>
<th>Slightly Worse</th>
<th>Same</th>
<th>Slightly Better</th>
<th>Much Better</th>
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</table>

5. What kind of impact did the single-gender classroom setting have on your child’s attitude toward school?

<table>
<thead>
<tr>
<th>Very Negative</th>
<th>Negative</th>
<th>Neutral</th>
<th>Positive</th>
<th>Very Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
6. How has your opinion of single-gender classrooms changed during the year?

Very Negative  Negative  Neutral  Positive  Very Positive
1          2          3          4          5

7. In an effort to examine the impact of the single-gender classes, we hope to identify any outside variables that might affect students’ performance. Has your child experienced any significant or life-changing events during the school year that might have impacted his/her performance in 5th grade?

_____ Yes   _____ No

8. For research purposes, what gender is your fifth-grade student?

_____ Male   _____ Female

9. In what way did your child benefit from the single-gender classroom setting?

10. Has your child shown an increased interest in any particular subject? Which one?

11. What problems, if any, did you have regarding the single-gender classes?

12. What suggestions, if any, do you have for future single-gender classes?

13. Would you recommend this class setting for other children? If so, at what level?

_____ Yes   _____ No   ____________________ Grade(s)

Thank you for your participation. Please return this survey to your child’s teacher sealed in the envelope provided.
APPENDIX N

SUPERINTENDENT'S LETTER OF PERMISSION
September 10, 2004

To Whom It May Concern:

I would like to take this opportunity to thank Mrs. Myra Gillis for her interest and commitment to improving instruction for students in the Rankin County School District. I would appreciate information that would assist with the future direction of the single-gender program, and understand that the information obtained could be used to monitor student performance and teacher effectiveness.

Please accept this letter as permission for Mrs. Gillis to conduct a case study of the single-gender fifth grade classrooms at Flowood Elementary School during the pilot year, 2004-2005. I understand that all personally identifiable private information will be held in confidence during this study.

If my office can be of further service, please do not hesitate to call.

Sincerely,

Lynn Weathersby, Ph.D.
Superintendent

Iwg
September 15, 2004

Myra Gillis
479 Mullican Rd.
Florence, MS 39073

Dear Mrs. Gillis:

I am writing in response to your request to conduct a case study of the single-gender fifth grade classrooms at Flowood Elementary School during the pilot year, 2004-2005. You have my permission to examine grades, attendance records, and discipline reports, as well as biographical and demographical data of the fifth grade students. I understand you will be gathering information through interviews, observations, and questionnaires.

I understand that the study may be regarded as "research not involving more than minimal risk" to the participants, according to the standards of the Institutional Review Board (IRB) of Mississippi State University. There will be no harm, discomforts, inconvenience or risks associated with the research activity. In accordance with the IRB, student records may be disclosed in compliance with FERPA code section exception 99.31. Sub sections 6i, (A) and (C) allow organizations to conduct certain studies for, of on behalf of, educational agencies and institutions to develop, validate, or administer predictive tests, and to improve instruction. I also understand that responsibility for all data disclosed lies within the Rankin County School District, not Mississippi State University. All personally identifiable private information will be held in confidence.

I, too, am interested in examining the impact of the single-gender classrooms on students, teachers, and the school. The study should provide valuable information to Flowood Elementary School and to the Rankin County School District concerning the future direction of the program.

Sincerely,

Dr. Barbara McCool, Principal
Flowood Elementary School
APPENDIX P

INSTITUTIONAL REVIEW BOARD APPROVAL
January 6, 2005

Myra Gillis
479 Mullican Road
Florence, MS 39073

Re: IRB Docket #04-313: Gender-based Education: An Investigation of the Pilot Year of Single-gender Classrooms at Flowood Elementary School

Dear Ms. Gillis:

The above referenced project was reviewed and approved via expedited review for a period of January 6, 2005 through December 15, 2005 in accordance with 45 CFR 46.110 #7. Please note the expiration date for approval of this project is December 15, 2005. If additional time is needed to complete the project, you will need to submit a Continuing Review Request form 30 days prior to the date of expiration. Any modifications made to this project must be submitted for approval prior to implementation. Forms for both Continuing Review and Modifications are located on our website at http://www.msstate.edu/dept/compliance.

Any failure to adhere to the approved protocol could result in suspension or termination of your project. Please note that the IRB reserves the right, at anytime, to observe you and any associated researchers as they conduct the project and audit research records associated with this project.

Please refer to your docket number (#04-313) when contacting our office regarding this project.

We wish you the very best of luck in your research and look forward to working with you again. If you have questions or concerns, please contact me at 325-3294 or at tarwood@research.msstate.edu.

Sincerely,

Tracy S. Arwood
Director

cc: Teri Brandenburg