



Do Single-Sex Classes and Schools Make a Difference?

Vincent A. Anfara, Jr. & Steven B. Mertens

Until the late 19th century, education in the United States was single-sex education. Coeducation gradually entered the American educational landscape in the late 1800s (Bureau of Education, 1883; Butler, 1910; Kolesnik, 1969), and since that time, single-sex education mainly has been confined to private and denominational (mostly Catholic) schools. According to Tyack and Hansot (1990) and Hawtrey (1896), economic factors were the major impetus for the rising “tide of coeducation.” Simply put, it was cheaper to educate boys and girls together than to operate separate schools, which would have required duplicating expensive facilities, equipment, and personnel. Feminists of the day also valued coeducation as a necessary step in the women’s rights movement and their influence contributed to the passage of Title IX of the Education Amendments of 1972, aimed at guaranteeing gender equity in federally financed schools, colleges, and universities. Finally, coeducation was considered “natural” in that it facilitated the development of positive relations with members of the opposite sex, allowed boys and girls the opportunity to learn to work together, and was conducive to happier marriages (Atherton, 1972; Hale, 1929).

In the second half of the 19th century, William Harris, superintendent of the St. Louis schools and later U.S. Commissioner of Education, argued that mixing the sexes improved instruction and discipline for boys and girls by merging their different abilities and allowing students of each gender to serve as a “counter-

check” on the other (Harris, 1870). As we have seen with most educational reforms and innovations, the fanfare that welcomed coeducation very soon led to concerns and indictments. In his book, *Sex in Education*, Clarke (1873) purported that academic competition with boys overloaded girls’ brains and interfered with the development of their reproductive organs.

Single-sex education (also less frequently called single gender and SS) garnered renewed interest in the 1990s from researchers, advocacy groups, and policymakers; and since 2003, there has been an extraordinary surge in interest in single-sex public education. The new regulations, issued by the U.S. Department of Education on October 25, 2006, fueled the fire of this renewed interest. Secretary Spellings, commenting on the “final rule,” noted that

Research shows that some students may learn better in single-sex education environments. The Department of Education is committed to giving communities more choice as to how they go about offering varied learning environments to their students. These final regulations permit communities to establish single-sex schools and classes as another means of meeting the needs of students. (U.S. Department of Education, 2006)

Assessing the relative advantages and disadvantages of single-sex classes and schools is difficult. As single-sex education gains interest and appeal, educators, policymakers, and advocates continue to search for research evidence to legitimize this approach to

This article reflects the following *This We Believe* characteristics: High expectations for every member of the learning community — Multiple learning and teaching approaches that respond to student diversity — Organizational structures that support meaningful relationships and learning

improving student outcomes (e.g., academic, behavioral, social, attendance, self-esteem). While this review of the research will not be limited solely to middle grades schools, many of the studies that are reviewed were conducted in middle grades schools. Considerable exploration of single-sex education has occurred in the realm of legal and political issues, but there has been comparatively little examination of student outcomes and other educational implications. Salomone (2006), recognizing the problematic and inconclusive nature of this research literature, noted that most of the research originates from private and denominational schools and from abroad and tends to be anecdotal reports and scattered studies that lack scientific rigor. This installment of *What Research Says* will focus on what we currently know about single-sex education. Specifically, it will critically review in relation to single-sex education (a) what proponents and critics claim, (b) what researchers say about school culture and academic climate, (c) the attitudinal effects, (d) academic issues, and (e) problems with the research.

The proponents and critics of single-sex programs speak

Proponents of single-sex education cite a variety of reasons such classes or schools would be more appropriate than coeducational schools. These reasons are supported to some extent by experiential knowledge, ideological beliefs, and data and include (a) the “boy crisis,” (b) biological differences, (c) achievement gaps, and (d) distractions. While concerns were expressed in the late 1990s about short-changing girls, especially in regard to mathematics, science, and technology classes,

and girls are “wired” differently, which supported the contention that they should receive differentiated educational experiences to meet their special needs. In support of biological differences, Salomone (2006) stated,

We know that girls, as a group, enter school with more advanced verbal and fine-motor skills, have longer attention spans, and greater impulse control. This ... puts many young boys at a disadvantage in the lower grades. At the same time, boys tend to have more advanced visual-spatial skills through much of schooling, which puts them at an advantage in math and science. (p. 787)

Another reason to consider single-sex education relates to the achievement gap that exists between the performance of boys and girls. Frequently, the focus of this achievement gap is on the educational needs of a targeted group of students like African American and Hispanic males. Finally, removing distractions by dividing the sexes has been offered as an argument in favor of single-sex education. Gurian and Henley (2001) asked teachers to discuss their experiences in single-sex classes and schools and were told that fewer discipline problems were evident. Ferrara and Ferrara (2004), studying a New York middle school, found that participation was more widespread and students were less self-conscious in single-sex classes. Bracey (2006) added some additional reasons for implementing single-sex educational programs, including: (a) improving girls self-esteem, confidence, and leadership skills; (b) increasing attention to pedagogically significant gender differences, particularly those found through brain research, and (c) controlling the behavior of boys.

Although most of the research has focused on females, more recent attention has been given to the academic failure of males, particularly African American males.

evidence began to surface that documented a “boy crisis.” This crisis was characterized by lower scores by males on the National Assessment of Educational Progress (National Center for Educational Statistics, 2005), higher dropout and suspension rates for boys (Mead, 2006), a higher incidence of classification of learning disabilities, and lower test-taking rates on assessments like the SAT and ACT. In the realm of biological research, advances in brain-based research highlighted that fact that boys

Some critics of single-sex education note that separate is always “inherently unequal.” They take this phrase from the famous *Brown v. Board of Education* decision. Greenberger, from the National Women’s Law Center, characterized single-sex education as “an invitation to discriminate” (cited in Green, 2006, online). The National Coalition for Women and Girls in Education also expressed opposition to single-sex education and wrote,

Single-sex education does not guarantee improved schools. Rather, the elements that enable children to succeed in single-sex education can be replicated in coeducational settings. These elements include a focus on core academics, small class size, qualified teachers, sufficient funding, and parental involvement. (2002, online)

Additional concerns deal with the limited opportunities for male and female students to work together and socialize, the potential for limited course offerings with honors and AP courses usually not being offered in single-sex schools, and the possibility for teasing to occur. Datnow, Hubbard, and Woody (2001) noted that students in their study reported “a significant amount of teasing ... and being labeled as bad kids, or preppy, or ... gay” (p. 7).

The research

For most of the 20th century there has been little interest for researchers in the United States to study the effects of single-sex schooling in contrast to coeducational setting. Single-sex schooling was a perfectly legitimate option, but one that mainly existed within the context of private and denominational schools. Jill (1993) commented that the findings on single-sex education are a mix of “passionate conviction and rather ambiguous research results” (p. 90). While this certainly seems to be an accurate characterization, what is indisputable is that research about the merits of single-sex classrooms and schools has an international flavor. Researchers in England and Wales (Bell, 1989; Byrne, 1993; Dean, 1998;

Gorard, 1998), South Africa (Lee & Lockheed, 1990; Mallam, 1993), the United States (Kumagai, 1995; Lee & Marks, 1992; LePore & Warren, 1997), New Zealand (Harker & Nash, 1997; Scott, 1991), and Australia (Smith, 1994; Willis & Kenway, 1986; Young & Fraser, 1992) have all added to the debate on the relative merit of single-sex education. Other countries, including Nigeria, Thailand, and Jamaica, have single-sex schools that have been researched.

Although most of the research has focused on the benefits for females, more recent attention has been given to the academic failure of males, particularly African American males. Research on single-sex education has sought to measure the effects of single-sex schooling on student outcomes like academic performance, self-esteem, attitudes toward academic subject matter, as well as students’ preferences for single or coeducation schooling. Let us turn our attention to what we know about the relationship between single-sex schooling and these student outcomes.

Student culture, academic climate, and single-sex education

More than 40 years ago, sociologist James Coleman was one of the first researchers to question coeducational schools in the United States. In his book, *Adolescent Society*, he noted that “coeducation may be inimical to both academic achievement and social adjustment” for adolescents (1961, p. 51). After examining the value systems of adolescents in 10 secondary schools, he found that many more students would rather be good athletes or leaders in extracurricular activities than excellent students. He concluded that this “youth culture” (which he called a “cruel jungle of rating and dating,” p. 51) exerted a negative influence on intellectual endeavors. From this conclusion it was determined that this coeducational environment was particularly harmful to girls, who were overly concerned about making themselves “desirable objects for boys” (p. 52). Twenty years later, John Goodlad, in *A Place Called School* (1984), agreed with Coleman’s earlier assessment. While it must be acknowledged that much has changed in light of Title IX, researchers like Salomone (2003) claimed that most of what Coleman and Goodlad found is still true in high schools and middle schools today. What is important about this discussion is that these findings have resurfaced in recent years to support single-sex education, particularly for girls and minority boys. The



Several factors need to be taken into account in creating single-sex learning experiences.

argument is that, at least for some middle and high school students, coeducation fosters nonacademic values and heightens social pressures that distract students from the work of school. Studies conducted in New Zealand, Canada, and the United States (Jones, Shallcrass, &

females in coeducational settings. In contrast, Stables (1990) studied 2,300 students (ages 13–14) and found no differences in the perception of subject importance by sex or school type. He concluded that single-sex schools reduce the polarization of attitudes between the sexes.

Sex stereotyping occurs with as much frequency in single-sex schools as in coeducational environments.

Dennis, 1972; Schneider & Counts, 1982) underscore the more academic orientation of single-sex schools and document more time spent on homework and a desire on the part of the students to be remembered for their academic abilities rather than their social popularity or involvement in extracurricular activities.

Attitudinal effects and single-sex schooling

A few published studies have investigated the hypothesis that girls in single-sex schools have higher self-esteem. Cairns (1990) investigated self-esteem for 2,295 students in 76 grammar and secondary schools in Northern Ireland. He concluded that single-sex schools provide benefits in terms of self-esteem. Supporting the opposite conclusion, Foon (1988) surveyed 1,675 secondary students in private coeducational and single-sex schools in Australia and found no significant differences in self-esteem between girls from coeducational and single-sex schools, although she reported higher self-esteem for boys attending single-sex schools. In Belgium, Brutsaert and Bracke (1994) found that girls do not seem to be influenced by the gender organization of the school and that boys were negatively affected because of the preponderance of female teachers, who unwittingly contribute to lowering the boys' overall sense of well-being.

There is something of a consensus among researchers that girls in single-sex schools tend to perceive math and science classes as less “masculine,” and, therefore, have stronger preferences for them. Vockell and Lobonc (1981) administered a questionnaire to 476 single-sex and 280 coeducational students in U.S. high schools. They found that girls in single-sex schools rated physical sciences as less masculine than did

In regard to sex stereotyping, no consistent relationship has been found between school type and degree of sex stereotyping. Lee and Marks (1994) found that sex stereotyping occurs with as much frequency in single-sex schools as in coeducational environments. Gill (1996), studying single-sex schools in New Zealand, also noted that “teacher awareness is of much more significance than school gender context in producing or overcoming stereotypical gender limitations on students” (p. 17).

Supporters of single-sex schools and classes maintain that they offer girls a “safe place” for learning. Similar arguments hold that single-sex schools allow teachers to challenge students' gendered perceptions and enhance their self-confidence in nontraditional subjects. The evidence generated in the United States in support of these claims is largely anecdotal, with much being reported in the popular press and conference presentations. Research from abroad (e.g., Parker & Rennie, 1997), though, reports girls having more positive attitudes toward math, science, and technology, along with a higher level of comfort, in classes that do not contain boys. According to Leslie (1999), girls describe their experiences in single-sex classes as “freedom to excel without social pressure” (online). More generally, the research suggests that girls show personal growth through improved confidence (Arbor, 1998), a positive self-image (Lee, 1986), and higher self-esteem (Mael, 1998). In the classroom, girls take more risks (Streitmatter, 1997) and ask more questions (Stutler, 1997). They also show a great interest in academics (Lee, 1986) and an increased educational ambition (Lee, 1986). Boys also benefit from improved self-esteem (Mael, 1998) and tend to ask more questions in class (Arbor, 1998).

Academic issues and single-sex schooling

While girls tend to perceive single-sex classes and schools to be superior, there are a number of studies that point to the fact that these perceptions have not translated into improved academic performance for girls in single-sex schools. Among the studies that have been conducted, Rowe (1988) examined 398 middle school students in Australia and found no significant differences in mathematics achievement. These findings have been supported by the research of Leder and Forgasz (1994), Workman (1990), Young and Fraser (1992), and Harker and Nash (1997).

Some studies, though, do show gains in academic achievement. These include the work of Lee and Bryk (1986), Marsh (1989), Lee and Marks (1990), Riordan (1985), and Lee and Lockheed (1990). Riordan tested for differences between Catholic single-sex schools and public coeducational schools in relation to reading and math. He found that while Catholic single-sex schools scored consistently higher than coeducational public schools, Catholic coeducational schools differed little from public coeducational schools.

Problems with the research

This corpus of research is not without problems. Findings conflict, as exemplified by studies done by Kenway (1995) and Sukhnandan, Lee, and Kelleher (2000). While Kenway reported that boys in mathematics

2004) opened with single-sex classes and is considered the largest experiment in single-sex schooling in the United States. It serves a low-income, urban population of students of color. It was described as “an elaborate experiment to determine whether adolescent boys and girls learn better if separated from one another” (Haynes, 1999). SSA was a reconstituted school that was under extreme pressure to improve the low ranking on the Academic Performance Index, primarily determined by student scores on standardized tests. With no staff development related to single-sex education, teachers were left to do the best they could. Herr and Arms concluded that although SSA was deemed to be a success supporting single-sex schooling, there is no way of actually attributing the improvement to the gender composition of the school. More likely, this improvement was due to substantial changes in curriculum and instruction and other variables related to being reconstituted.

In 2005, the United States Department of Education, along with the American Institute for Research, tried to weigh in on the topic, publishing a meta-analysis comparing single-sex and coeducational schools (U.S. Department of Education, 2005). The authors started with 2,221 citations, which yielded 40 usable studies. Of these 40 studies, 41% favored single-sex schools, 45% found negative effects, and 6% had mixed findings.

Many of the studies from outside the United States (e.g., England) raise concerns about internal validity due to selection bias. Single-sex schools in these studies

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classes were noisier in the classroom, spent less time on task, and complained about missing girls who could help them with their work, Sukhnandan, Lee, and Kelleher found that boys viewed single-sex classes positively and reported being more interested and motivated in their work and that the absence of girls helped improve confidence and involvement levels.

There are numerous studies, but few high-quality ones that use comparison groups, control for confounding variables, or use national databases. As an example, in 1999 a California middle school (referred to as Single Sex Academy or SSA, see Herr & Arms,

and contexts traditionally involve private schools with brighter students from more privileged backgrounds. The schools are populated with students who self-select, and the schools engage in a process referred to as “academic weeding-out” (Salomone, 2003, p. 190). Lee and Lockheed (1990) called this validity threat a “social phenomenon and a statistical nuisance” (p. 228).

Conclusion

The benefits of single-sex schooling remain unclear (Harker, 2000; Warrington, 2002). The research comparing the merits of single-sex education and

coeducation has not yielded definitive answers. In spite of this conclusion, in 2002 and again in 2004, the Bush administration signaled its intent to promote single-sex schools through the easing of a “rigid” interpretation of Title IX (Davis, 2002). Simply put, when a single-sex school works, we are not exactly sure why it works. The research seems to point in the direction of benefits for poor and minority students and girls. But the presumption in favor of coeducation is found in both the law and in the minds of most Americans.

Salomone (2003) noted that single-sex education has been ideologically tied to racial segregation, which, in effect, causes us to be more critical of it and demand far more of it than we do of other “uncertain” educational innovations. As single-sex education gains more interest and appeal, policymakers, educators, and advocates must continue to search for empirical findings to legitimize this departure from what is considered the “norm.” What seems to get lost in the search for definitive evidence is that the exact nature and benefits of single-sex education are highly contextual. School characteristics (e.g., class size, percentage of male and female teachers), teaching styles and instructional practices, and the curriculum, among other factors, all have significant effects on students’ achievement. It depends on the students, their backgrounds, abilities, and needs, and it also depends on what we are looking for as the desired outcome of this initiative. Findings about single-sex education must be viewed and interpreted with a healthy dose of caution. As a number of researchers (Jackson & Smith, 2000; Marsh & Rowe, 1996) cautioned, the better performance of students in single-sex classes and schools is mainly attributable to a plethora of factors like student ability, socioeconomic status, type of school (private vs. public), school characteristics (e.g., size, organizational structures), selection bias, and effective teaching. When these factors are controlled for, the academic differences between students in single-sex education and coeducational schools are neither significant nor conclusive (Lingard et al., 2001).

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Under certain circumstances single-sex groupings can lead to better learning outcomes.

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