

Single-Sex Education in the 21st Century

Kelly E. Cable and Terry E. Spradlin

VOLUME 6, NUMBER 9, FALL 2008

CONTENTS

Introduction.....	1
History of Single-sex Education	2
The Genesis and Legality of Single-sex Education in the U.S.....	2
Arguments in Favor of Single-sex Classrooms: Leonard Sax and the National Association for Single-sex Public Education.....	4
NASSPE-Cited Studies and Others.....	5
Benefits for Underserved Student Groups.....	5
Conflicting Findings: Evaluating Outcomes and the Other Side	6
Prevailing Issues and Questions	9
Sex-Based Tracking	9
Cost.....	10
Conclusions and Recommendations.....	10
Authors	11
Acknowledgements	11
References.....	11
Web References.....	12

UPCOMING POLICY BRIEFS . .

- ✓ *The Excellence Gap Examined*
- ✓ *The Advantages and Disadvantages of Multi-Age Classrooms in the Era of NCLB Accountability*
- ✓ *Public Law 221: Is Indiana's Accountability Law Working or is it Another Passing Education Reform Fad?*

INTRODUCTION

Single-sex schools and classrooms have long existed in educational institutions such as religious, private, and preparatory schools, particularly in the United Kingdom. Single-sex education describes a diverse range of situations, including individual classes, programs after school, required programs, voluntary programs, and programs to remedy gender inequities and encourage cultural and racial pride. Therefore, the topic of single-sex classrooms resists most generalizations (AAUW, 1998). Most research in the U.S. has involved private girls' schools or Catholic schools. There has been less experimentation with same-sex education since the 1970s, when same-sex public schooling became prohibited for most situations by federal law.

The option of single-sex schooling in public schools has emerged once again through federal policies associated with the No Child Left Behind Act of 2001, allowing some parents who are disillusioned with their children's current educational experiences to explore a broader array of educational choices. Many parents are particularly worried about their male children because of recent reports proclaiming a "boys' crisis" (Mead, 2006). One concern, out of many necessitating a crisis, is a belief that boys are far behind girls in achievement. In 2006, Doug Anglin, a 17-year-old student in the U.S., filed a federal civil rights complaint contending that his high school favors females and discriminates against males (Jan, 2006).

The perceived gap in achievement between girls and boys, the media's attention to the subject, and positive results such as those found by the Young Women's Leadership

School in East Harlem have renewed interest and experimentation with single-sex classrooms and schools. Thus, single-sex education has become a desirable alternative for many students and is offered by an increasing number of school districts. The Young Women's Leadership School was created in 1996 by Ann Rubenstein Tisch to provide an opportunity otherwise unavailable to inner-city girls (McDowell, 2006). The school's consistent 100 percent graduation rate has attracted much attention and excitement for replication of the results within other urban schools. The school particularly impressed and inspired Senator Hillary Clinton, who, in 2001, joined Senator Kay Bailey Hutchison in proposing an amendment to the No Child Left Behind Act that would eventually pass and allow any public school to implement single-sex programs with only a few regulations (Sax, 2002).

The legality and ethics involved in single-sex classrooms have also generated a lot of attention and created a heated debate between supporters and critics. Some scientific research claims that profound biological differences exist between boys' and girls' cognitive, social, and emotional development, styles of learning, and educational needs. However, critics of single-sex education compare single-sex education to segregation, recalling advocates who claimed racial differences in intelligence were based on scientific research. Critics further worry that any segregation sends a message of inferiority. There is not a lack of opinions on this subject, but a need for valid research either supporting or refuting single-sex education. Supporters of single-sex schooling in low-income areas believe that their students should have a right to opportunities that were generally only available to upper and middle class students. Many would agree that single-sex

education in private or religious schools has promoted students' achievements more than hindered them, but the question is whether students at these schools have succeeded because of the specific structure of single-sex schooling or because of other factors, like the socioeconomic status of the students. Educators, especially those in struggling inner-city schools, wonder if separating the sexes is right for *their* school, and for *their* students.

We chose to examine this complex issue because it is relevant to educators and parents alike, and it is an initiative back in vogue. This brief addresses the genesis and legality of single-sex classrooms, as well as the merits and critiques of single-sex education, and aims to avoid research or claims that are based on gender stereotypes. Furthermore, the research that supports and opposes single-sex education will be examined. Finally, recommendations concerning single-sex education for educators and policymakers to consider are offered.

HISTORY OF SINGLE-SEX EDUCATION

There were some examples of coeducation in the late 17th century, but there was no general trend until the mid-1800s during the great expansion of public education in the United States (Coeducation, 2008). Distinguished preparatory schools in Europe and early America were single-sex. Present-day defenders of single-sex schooling argue that there are more teenage pregnancies and sexual harassment cases in coeducational schools.

Many people strongly believed separating students by sex was appropriate, and single-sex classrooms were in place up to the 1960s and even early 1970s to teach different lessons often in parallel subject matter (Pollard, 1999). Classes were intended to prepare boys and girls for different roles in life; for example, boys were taught agriculture or industrial arts while girls were taught home economics (Cuizon, 2008). At present, the gap between the different roles or careers that men and women occupy has narrowed greatly, and legally has nearly closed. Wendy Kaminer, a graduate of all-female Smith College, keenly noted that American women won the right to be educated nearly 100 years before winning the

right to vote. She says, "In the beginning women were educated for the sake of family and society: the new republic needed educated mothers to produce reasonable, responsible male citizens. But although the first all-female academies, founded in the early 1800s, reflected a commitment to traditional gender roles, which reserved the public sphere for men, they reinforced a nascent view of women as potentially reasonable human beings — endowed with the attributes of citizenship" (Kaminer, 1998). Women's colleges were also created and, appropriately, represented affirmative action. Oberlin Collegiate Institute in Ohio was the first coeducational college in 1837 (Kaminer, 1998). Though single-sex structures have been retained in some private and religious schools, coeducational schools are currently the predominate model without much challenge in the United States.

"... reports indicating achievement gaps for both boys and girls alternately, legal changes, and successful single-sex schools have renewed a public dialogue and interest in single-sex schools."

In traditional Christian communities in particular, single-sex schools are still maintained privately. When speaking about coeducation, Catholics sometimes refer to the teachings of Pope Pius XI contained in his 1929 "Christian Education of Youth." Addressing the topic of coeducation, he said, "False also and harmful to Christian education is the so-called method co-education. This too, by many of its supporters is founded upon naturalism and the denial of original sin; but by all, upon a deplorable confusion of ideas that mistakes a leveling promiscuity and equality, for the legitimate association of the sexes" (McCloskey, 1994). This strain of thought has weakened over the years, however. In 1988, for example, half of the Catholic schools in the United States were single-sex, but 10 years

later, only 40 percent remained separated (Single-Sex Schools, n.d.).

However, beginning in the 1970s, educators, feminists and others worried that girls in coed schools were not receiving an equitable education (Kaminer, 1998). Currently, reports indicating achievement gaps for both boys and girls alternately, legal changes, and successful single-sex schools have renewed a public dialogue and interest in single-sex schools.

THE GENESIS AND LEGALITY OF SINGLE-SEX EDUCATION IN THE U.S.

Title IX, which was enacted in 1972, states, "No person in the United States shall, on the basis of sex, 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" (Title IX, 2005). Former Indiana Senator Birch Bayh sponsored and coauthored Title IX. Historically, Title IX has been chiefly concerned with gender equity in athletics. Before Title IX, for example, it was not unusual for a high school to devote 90 percent or more of their athletic budget to boys' sports (Sax, 2002). Those responsible for enforcing Title IX must evaluate proportionality in participation, financial resource allocation, and coaches' salaries to ensure gender equity (Chamberlin and Eckes, 2003).

Title IX also made public single-sex classrooms and schools illegal in most situations. For example, 34 C.F. R 106-34 states, "A recipient shall not provide any course, or carry out its programs or activities separately on the basis of sex, or require or refuse participation therein by any students on such a basis, including health, physical education, industrial, business, vocational, technical, home economics, music, and adult education courses" (McDowell, 2006). However, while Title IX restricted single-sex based activities, it did not mandate that all educational activities be coeducational. For example, youth organizations such as Girl Scouts or Boy Scouts, which are exempt from taxation, have traditionally been limited to persons of one sex and principally limited to persons less than 19 years of age (McDowell, 2006). Also, there are exemptions for boys or girls conferences such as Boys' or Girls'

State (a summer leadership and citizen program), father/son or mother/daughter activities, sex education, and choir, provided there are comparable activities for both sexes (McDowell, 2006).

Title IX was patterned after the Civil Rights Act of 1964, which guaranteed equal rights for ethnic minorities. Chamberlin and Eckes, in an Education Policy Brief written for the Center for Evaluation and Education Policy (2003,) said of Title IX:

Few federal education laws and policies have been as controversial or, as supporters contend, as successful as Title IX of the Education Amendment Act. Supporters assert that although female athletes have made great strides as a result of Title IX participation opportunities, scholarships, and financial resources for women's athletic programs still lag behind those for men. Title IX legislation prevents discrimination in all aspects of education and applies to any education program or activity receiving federal financial assistance, including athletic programs (Chamberlin and Eckes, 2003).

On January 8, 2002, 30 years after passage of Title IX, President Bush signed the No Child Left Behind (NCLB) Act into law. Subchapter V, "Promoting Informed Parental Choice and Innovative Programs," made funds available to local public school districts to be used for innovative programs, including single-sex classes and schools (McDowell, 2006). This provision, which was included in the education bill, was co-authored by Texas Senator Kay Bailey Hutchison and New York Senator Hillary Clinton as an additional option for students (Sax, 2002). In June of 2001, Senator Hillary Clinton said, "Our long-term goal has to be to make single-sex education available as an option for all children, not just for children of parents wealthy enough to afford private schools" (Single-Sex Education, n.d.).

On May 3, 2002, the Office for Civil Rights (OCR) of the U.S. Department of Education, the entity responsible for the enforcement of Title IX requirements, issued "Guidelines on Current Title IX requirements related to Single-Sex Classes and Schools" (McDowell, 2006). OCR noted the general prohibition against single-sex classes and schools; however, it offered exceptions such as separating the

sexes when it constitutes remedial or affirmative action or when separating the sexes for physical education activities that involve bodily contact (McDowell, 2006). Non-vocational schools, which offer courses other than those which normally lead to an occupational objective, such as music, bridge, homemaking, dancing, and driving, are also exempt. However, a Local Education Agency (LEA) can exclude a person if they can provide a comparable course, service, and facility (Miller, 2008). Any school district receiving tax dollars for an educational program cannot establish, for example, a girls' school that provides the only performing arts curriculum in the district (McDowell, 2006).

Similarly, a school district cannot convert all of the schools in its district to single-sex, as Greene County, Georgia, proposed to do (Associated Press, 2008). The school board approved the measure the first week of February, 2008 (Atlanta Journal-Constitution, 2008). Before having to address any legal issues, however, Greene County dropped its plan when parents subsequently opposed the change and were upset that they were not involved in the decision making (Associated Press, 2008). However, a school district can provide a girls' school without offering a boys' school as long as there is a coeducational school in the district.

Concerning single-sex education, the Office for Civil Rights also published a Notice of Intent to Regulate in May 2002 (McDowell, 2006). The proposed rules were published in 2004, and the following final rules were published on October 25, 2006. According to Secretary of Education Margaret Spellings, the new regulations permit single-sex classes; however:

... [they] must be substantially related to the achievement of students, providing diverse educational opportunity, or meeting the particular, identified needs of students ... In some cases, a substantially equal single-sex class in the same subject may be required in addition to the coeducational class. The new regulations also require...that schools conduct evaluations of their single-sex classes every two years to ensure their compliance to regulatory requirements. (Spellings, 2006)

Explicitly, the regulations state that coeducational schools that want to provide **single-sex classrooms** within the coed school must produce the following:

1. Provide a rationale for offering a single-sex class. A variety of rationales are suitable, including, for example, a demonstrated need to increase enrollment for girls in certain courses or a need to better control boys' behavior.
2. Provide a coeducational class in the same subject at a geographically accessible location. The coeducational alternative may be provided within the same school, or it may be offered at a different school which is geographically accessible. The term "geographically accessible" is not explicitly defined in the regulations.
3. Conduct a review every two years to maintain that the program is not based upon generalizations regarding the abilities, talents, or preferences of either sex, but are related to achievement (Spellings, 2006). The review should also determine whether single-sex classes are still necessary to remedy the previous inequity.

Single-sex schools — either all-boys' or all girls' schools — do not need to provide a rationale (provision 1) or conduct a review (provision 3). They only need to contend with the second provision. For example, if a district wants to open an all-girls' school, then there must be either an all-boys' school or a coeducational school available. Since single-sex schools only need to adhere to one provision, this may act as an incentive for school districts to offer single-sex schools rather than single-sex classrooms within coed schools. Furthermore, charter schools do not need to comply with any of the three regulations above (National Association for Single-Sex Public Education, 2006). The new regulations also address extracurricular activities: a public school can provide an activity for one sex only if there is an important established objective.

Since the additional regulations issued in 2006, any course in a coeducational school could hypothetically be separated by sex if the school provides a rationale behind the need for the change, as long as there is a comparable coeducational course within the school or within a geographically accessible location, and as long as they conduct a review after two years. If a rationale cannot be proven, the separation can-

not occur. Such was the case in Detroit where educators planned to open three all-male schools for mainly African-American males (90 percent of students in Detroit's public schools are African-American) but were stopped because they failed to prove why excluding girls was necessary for the all-male academies to be successful (Wilkinson, 1991). The court required Detroit to prove that it was the coeducational factor that caused failure, as educational failure alone is not enough to validate gender-specific education (Stamm, 1998). Consequently, Detroit abandoned the project.

Critics unhappy with the changes to Title IX prompted by NCLB recall the phrase "Separate but equal," (Plessy v. Ferguson) which was popular before the Civil Rights Act but now denotes segregation. "You could say that parents could choose to send their kids to racially segregated schools as well, but that is not something we'd want to have in the public school system," says Kim Gandy, president of the National Organization for Women (Sax, 2002). Some feminist critics fear that sex discrimination, stereotypes, and inequality are inescapable evils of institutions which allow for the separation of sexes. "The Bush administration's proposal for single-sex schools is a giant step backward in the struggle for girls' and women's equality," Gandy proclaimed (Sax, 2002).

ARGUMENTS IN FAVOR OF SINGLE-SEX CLASSROOMS: LEONARD SAX AND THE NATIONAL ASSOCIATION FOR SINGLE-SEX PUBLIC EDUCATION

Single-sex classrooms have become an educational topic of debate and interest due in part to Leonard Sax, founder and executive director of the National Association for Single-Sex Public Education (NASSPE). His first book, *Why Gender Matters: What Parents and Teachers Need to Know About the Emerging Science of Sex Differences*, was published in 2005, and emphasizes the profound differences between boys and girls (Sax, n.d.). Sax claims that scientists have found that some of these differences appear early on while some are manifested later. Furthermore, he maintains that a female's brain remains more mature than a male's brain until 30 years of age. Sax's findings which affect education include:

1. The brain develops differently. Researchers at Virginia Tech used electrophysiological imaging of the brain to examine brain development in 508 children (224 girls and 284 boys) ranging from two months to 16 years of age. They found that areas in the brain involved in language and fine motor skills developed four years earlier in girls than in boys, and areas in the brain involved in geometry and spatial reasoning mature four years earlier in boys than in girls.
2. The brain is wired differently. Emotion and language are processed in the same area of the brain for girls, so it is easier for most girls to talk about their emotions, but for boys, emotions and language are processed in separate areas of the brain. It is difficult for boys to give an answer to: "Tell me how you feel."
3. Girls have a more sensitive sense of hearing than boys do. The typical 12-year-old girl has a sense of hearing seven times more acute than a young boy. Girls are distracted by noise at sound levels 10 times lower than boys.
4. Females and males respond to stress differently — not just in our species, but in every mammal scientists have studied. Stress enhances learning in males. The same stress impairs learning in females (Sax, n.d.).

Also according to Sax, girls thrive in non-competitive, collaborative learning environments, while boys are more motivated by competition. Girls, unlike boys, are more likely to set goals and consult adults for help. When learning basic math skills, girls use overt methods, while boys use covert methods. Girls prefer short stories and novels, while boys would rather read factual accounts of real events or illustrated descriptions of how things work (NASSPE, 2006). According to Sax, the proportion of girls studying subjects such as physics and computer science has dropped in half, and boys are much less likely to study subjects such as foreign languages, history, and music compared to 30 years ago. Sax contends that the "problem" with boys, which generally ended in evaluations for attention deficit disorder (ADD) or attention deficit hyperactive disorder (ADHD), was actually "the school's failure to recognize the differences in the auditory acuity of boys and girls, and the school's failure to recognize the differences in the developmental timetables of boys and girls" (Sax, 2002).

Sax says that no coeducational class can be gender neutral; teachers will accommodate the learning style of one gender or the other (NASSPE, 2006). He asserts that in coeducational schools, boys are encouraged to solve problems on their own while teachers typically help girls. Boys are called on eight times as often as girls and are praised rather than reprimanded for speaking out of turn in class. Advocates of single-sex classrooms also believe that coeducational classrooms reinforce stereotypes through "gender intensification," as the pressure to act in gender appropriate ways intensifies during adolescence (NASSPE, 2006).

Responding further to the "boys' crisis," Sax's second book, *Boys Adrift*, claims that the "five factors driving the decline of boys" are: video games, teaching methods which turn boys off of school, prescription drugs such as ADD or ADHD medication, endocrine disruptors such as environmental estrogens from plastic bottles and food sources that may be lowering boys' testosterone, as well as devaluation of manhood (Sax, 2007).

"Advocates of single-sex classrooms also believe that coeducational classrooms reinforce stereotypes through 'gender intensification,' as the pressure to act in gender appropriate ways intensifies during adolescence."

In single-sex classes, advocates contend that teaching can be tailored to fit the different needs of male or female students and can help both sexes to attain higher levels of achievement. For example, a study endorsed by the National Association for Single-Sex Public Education (NASSPE) found that girls who graduate from girls' high schools are six times more likely to major in a math or science field than girls from coed schools. Similarly, boys are more likely to pursue interests in art,

music, drama, and foreign language (NASSPE, 2006). NASSPE also claims that girls in single-sex classrooms are more likely to compete in competitive sports. Another study cited by NASSPE finds that graduates of single-sex schools are more confident and are more serious about academics (NASSPE, 2006).

Specifically important to parents is research on sexual harassment. Sax claims that there is a lower rate of teenage pregnancy and greater autonomy in heterosexual relationships, as well as a lower risk for drug abuse in single-sex classrooms. In coed schools, he says, “there is a good deal of gawking, speculating, and general preoccupation with those of the opposite sex who are most proximate.” Single-sex schools then possibly allow for more focus on academics. Put another way, “students may pursue their studies, classroom discussions, and school activities without needing to be confronted on a daily basis with male-female socialization issues” (Single-Sex Classes, n.d.).

Carole B. Shmurak of Central Connecticut State University suspected that the structure does make a difference; she said of Philadelphia Girls High, a girls’ public school with 90 percent students of color, “[It] felt very much like the independent girls’ schools in New England. There was a feeling ... an emotional expressivity that I didn’t see in the coed schools” (AAUW, 1998). Trickett, Castro, and Schaffner, based on their research, add, “Single-sex schools were perceived as having a more academic orientation, with greater task emphasis and competition, than coeducational [schools]” (Single-Sex Classes, n.d.). Jill Rojas, principal of Jefferson Leadership Academies, the first public middle school in the country to offer single-sex instruction for boys and girls (a “third generation” single-sex school), said, “We have seen many students start to focus heavily on academics. They no longer clown or try to impress the opposite sex. Girls are more apt to answer questions aloud in class as well as ask them. Girls are learning to be more academically competitive, and boys are learning to collaborate” (Single-Sex Classes, n.d.).

NASSPE-Cited Studies and Others

Researchers at Stetson University compared the test scores of two Grade 4 classes at Woodward Avenue Elementary School in Florida — one single-sex class and one coed. The classes had comparable student demographics, the same number of students, and the teachers had equivalent training. After three years of the pilot program, the researchers compared results of the Florida Comprehensive Assessment Test (FCAT) and found:

- Boys in coed classes: 37 percent scored proficient;
- Boys in single-sex classes: 86 percent scored proficient.
- Girls in coed classes: 59 percent scored proficient;
- Girls in single-sex classes: 75 percent scored proficient;

In January of 2008, Piechura-Couture reported that after the fourth year of the study, 55 percent of boys in coed classrooms scored proficient on the FCAT compared with 85 percent of boys in the all-boys classes (Piechura-Couture, Tichenor, & Heins, 2007).

Furthermore, the National Association for Single-Sex Public Education highlights an elementary school in Seattle as another example of single-sex schooling’s success. Seattle’s Thurgood Marshall Elementary School used to be a failing school in one of the city’s poorest neighborhoods until the principal reconstituted the school as a dual academy with separate classrooms. The students’ scores changed drastically; for example, on the Washington Assessment of Student Learning (WASL), boys’ scores increased from the 10th percentile to the 66th. Before the change, no girls had passed the math portion of WASL; after the separation, 53 percent of the girls earned passing scores. Student behavior improved as well with discipline referrals going from 30 to fewer than 2 per day (Sax, 2005). Sax argues that when schools fail after they have adopted single-sex education, it is because their teachers have not been adequately trained for gender-specific teaching. He contends that schools cannot simply adopt the format and expect success.

Teachers at the Nathan Hale Elementary School in Roxbury, Massachusetts, which experimented with single-sex classes at Grade 5 for two years, adapted their teaching styles for each gender. One instructor, Sabrina Gray, gave her all-male classes more breaks and allowed them to stand up in class while reading. She also gave directions one at a time to her male students and asked them to repeat her instructions. At first, parents were against the experiment, but they eventually supported it. The school had to end the project the following year because half of the Grade 5 students did not enroll; however, afterwards some parents said that they miss the single-sex classrooms. “I saw a difference in how they carried themselves,” said Felicia Gay, whose son was in a single-sex class. “Now, the girls doll themselves up, put on their lip gloss, and bloom for the boys” (Jan, 2008).

There is some support for higher test scores and self-concept in single-sex education. Two studies of girls’ schools found positive results, including a decrease in dropout rates, a subsequent reduction in unemployment rates, an increase in females that chose non-traditional majors, and an increase in females who were politically active (NASSPE, 2006). Furthermore an Irish study found that the best predictor of self-esteem for girls at coed high schools was their opinion of their personal appearance, whereas girls at single-sex schools were less concerned with appearance. Parents may prefer single-sex schooling because they believe girls will be more self-confident, more likely to have female role models in leadership and in traditionally male subjects, and less likely to choose stereotypical subjects.

Benefits for Underserved Student Groups

Many researchers agree that single-sex schooling does have positive impacts for some students in some settings, particularly for females (AAUW, 1998). Cornelius Riordan discovered these positive impacts are even more dramatic for African-American and Hispanic children, male and female. His studies found positive effects on achievement for disadvantaged students, including non-affluent girls (AAUW, 1998). Riordan summarized the status of research on the relative benefits of single-

sex schooling in 1997, as part of an American Association of University Women organized roundtable:

The academic and developmental consequences of attending one type of school versus another type of school are virtually zero for middle-class and otherwise advantaged students; by contrast, the consequences are significant for students who are or have been historically or traditionally disadvantaged — minorities, low- and working-class youth, and females (so long as the females are not affluent).

Riordan found that the performance of African-American and Hispanic students in single-sex schools is stronger on all tests, scoring on average almost a year higher than similar students in coeducational settings.

Riordan offers possible rationales to explain the positive effects of single-sex schools: including the characteristics of the students attending themselves, a greater

degree of order and control, a reduction of sex bias in teacher/student interaction, a reduction of sex stereotypes in curriculum and opportunities, and an elimination of sex differences in a school setting. The students and parents may be making a pro-academic choice when choosing a single-sex school. Riordan suggests that the parents and students are rejecting the anti-academic youth culture that typically dominates coed schools. However, some say that the anti-academic culture may not be a part of youth culture but of male culture and that this would explain why girls may perform better in single-sex schools and boys may not.

Diane Pollard of the University of Wisconsin-Milwaukee researched voluntary after-school single-sex programs at two African American schools. She particularly emphasized not losing cultural issues when discussing gender (Pollard, 1999). Regarding her own research, Pollard felt that the positive results she found were due to the stigma that traditional schools fail urban

African Americans, whereas single-sex classes consequently offer closer interactions with African American culture and community (Pollard, 1999). Since the purpose of single-sex classes was to promote achievement for predominately low-income African American kids, she found that the focus was more on culture. Positive effects then may not be a result of the structure of single-sex schooling but results of influences such as the focus on culture, a strong supportive community, the provision of more successful role models, and the provision of a greater number of leadership opportunities.

CONFLICTING FINDINGS: EVALUATING OUTCOMES AND THE OTHER SIDE

Not everyone agrees that a “boys’ crisis” exists or that single-sex education is a proven, necessary education reform strategy. The American Association for University Women (AAUW) contends in their

Arguments In Favor of Single-Sex Education	Arguments Opposed to Single-Sex Education
<ul style="list-style-type: none"> • Male and female students have different needs, abilities, interests, and modes of learning. For example, many males prefer learning tasks which involve competition whereas female students prefer to collaborate. With single-sex classrooms, teaching can be tailored to fit the needs of each group of students. • Male and female students are preoccupied and distracted by the opposite sex. Learning often takes a backseat to socialization. Students are very concerned with looks and reputation in coeducational environments. A single-sex education provides a more academic orientation. • After the change to single-sex education, many schools have found that students' scores have risen and discipline problems have lessened. • Female students in a single-sex structure are less concerned with appearance and have greater academic confidence particularly in traditionally male subjects. • Single-sex education has succeeded in private spheres; this is an opportunity that should be open to students in public schools as well, including those who cannot afford the option any other way. • There are positive consequences for traditionally disadvantaged students when in a single-sex structure. • The Young Women's Leadership School in Harlem, which has a 100 percent graduation rate, is proof of the kind of change a single-sex education can provide. 	<ul style="list-style-type: none"> • Any segregation sends a message of inferiority. Single-sex education perpetuates stereotypes, which dangerously, may be seen as real biological differences. • The work of boys' crisis proponents, such as Sax, is based on gender stereotypes or mistaken notions of the sex/gender distinction. • The differences within a sex are much bigger than the differences between sexes. Family income and parental educational attainment are still considered the biggest predictors of achievement; not gender. • Success of single-sex education, when it occurs, is likely due to other factors such as the class of faculty and students, high achievement of students or parents who believe they are making a pro-academic choice, highly motivated and/or well-paid staff, or small class sizes or schools. • Funds would be better spent investing resources in training teachers, working with curriculum, or other methods that we know work than putting money into an under-researched idea. • Single-sex schooling may further glamorize the opposite sex or foster sexism. Discipline problems may escalate. Scores may lower or there may be no change at all. • In single-sex schools or classrooms, it is not certain where students who do not associate with their sex or who are transgendered fit into the picture. These students' interests may not correspond with the curriculum that is set out for their particular sex. • Instead of tracking based on ability, single-sex schooling tracks by whether one is male or female.

2008 report girls' successes do not come at the expense of boys' (AAUW, 2008). Sara Mead, the senior policy analyst at Education Sector, found that American boys are scoring higher and achieving more than ever (Mead, 2006). The report found that both boys and girls are more likely to graduate than in 1976 (Mead, 2006), and both sexes' standardized test scores have risen or have remained stable (AAUW, 2008). Mead also points out that in the 1980s and 90s when 9- and 13-year-old boys pulled ahead of girls, there was no "girls' crisis" (2006). When analyzed by race and income level, AAUW found that students from the lowest income level on average have the lowest test scores. A rise in income level is associated with a rise in test scores (AAUW, 2008). AAUW also found that African American and Hispanic students score less than white and Asian American students. Mead also found that African American and Hispanic boys are more likely to be retained (2006). However, the academic achievement of minority boys is steadily improving, though the achievement gap remains wide (Mead, 2006). The report suggests that the focus on separating the sexes and escalating concern for male students is distracting from the students who need real help: African American, Hispanic, and low-income students (AAUW, 2008). Mead agrees that although boys from these three groups are in the most trouble, the issues here are achievement gaps, clearly evident by race and socioeconomic status, not gender (2006). Mead suggests that closing these gaps would do more good for students than closing a slight gender gap only found in some cases. Schools should be changed to meet all students' needs.

David Sadker, a professor at American University who has published many articles concerning gender in education, agrees that:

Research shows the differences within a sex are much bigger than the differences between sexes. Assuming that all boys like war games and all girls like dolls is a very big assumption. You have to ask, why is this so suddenly popular? It's because we're re-segregating our schools-by race, by economics, and now, by boys and girls. (Flannery, 2006)

Researchers at a summit regarding single-sex schooling put together by AAUW

agreed that there is no evidence to suggest that single-sex schooling is better or "works" compared to coeducation (AAUW, 1998). Sadker believes that the superiority of single-sex classrooms or schools, when it appears, occurs because of pedagogical factors one would find in any effective school, single-sex or coed (Bracey, 2006). Terri Battaglieri, executive director of The Great Lakes Center for Education Research and Practice, believes that educators should work on what we know works: hiring and retaining quality teachers, providing professional development training, having smaller class sizes, and providing effective early childhood education (Battaglieri, 2006). Race and class are still the two biggest predictors of achievement in almost every study, claims Rosalind Barnett, a senior scientist at Brandeis University. "Of all the things you could think about doing to improve educational outcomes, separating kids by gender is really low on the list," said Barnett (BBC, 2006). Mead contends that some have clung to the "boy crisis" in order to highlight their own agendas; they blame classrooms with too much structure, lack of discipline, "misguided feminism," or "myths of masculinity."

When acknowledging some encouraging results on behalf of single-sex classrooms, it is equally imperative to acknowledge the difficulty in sifting through all the data to conclude that positive outcomes are the direct result of single-sex schooling. Roridan and others assert that the effects of single-sex classrooms on student achievement are small in comparison to other factors (AAUW, 1998). Studies from Australia, North America, New Zealand, Ireland, and the United Kingdom reviewed by Alan Smithers and Pamela Robertson of Buckingham University found that gender is not an important factor in education; rather, the main determinants of success are ability and family background. "While both single-sex and coeducation have passionate advocates, half a century of research has so far revealed no striking or consistent differences one way or the other" (AAUW, 1998). As aforementioned, success within schools generally correlates to small class sizes, small school size, highly trained and motivated teachers, and socioeconomic status of the students and faculty. Other variables that must be considered in gauging the success or promising change at a

school are admission policies, students' prior learning, and the community and parents' involvement.

Schools may conceive that they have only changed the gender format of the courses, but they may have actually hired better trained and motivated teachers for these courses. Furthermore, if the students voluntarily sign up for the course, typically with the permission of their parents, then it is reasonable to suggest that the parents and students who choose to be in these classes may demonstrate higher levels of interest and involvement. The results of an experiment with single-sex schooling may be compromised, on account of the multitude of interconnected and interacting variables, including: class, ethnicity, teachers' experience, a school's strong academic emphasis, authentic activities, critical thinking, and highly motivated students (AAUW, 1997).

Jannette Elwood, a co-editor of *Failing Boys: Issues in Gender and Achievement* and co-author of *Review of Recent Research on the Achievement of Girls in Single-Sex Schools*, also argues the aim should be improving the education of both sexes (BBC, 2000). Elwood conducted a research report in the U.K. on girls in separate classes and found they earned good grades because they were high-achieving pupils, and not because of the single-sex structure. Ability, social class, history, and tradition of the school, according to Elwood, are the most important predictors of success. Whether a school was independent, selective, or comprehensive made much more of a difference than if it was single-sex or mixed (BBC, 2000). Many agree that the learning differences of boys and girls are slight and contend that it does not make sense to try to further the gender divide by focusing on differences between the sexes than between any other category.

Advocates of coeducation believe that much of the work of boys' crisis proponents, such as H.H. Summers and Sax, is based on gender stereotypes or mistaken notions of the sex/gender distinction. They would also argue that single-sex classrooms are, in fact, structured to perpetuate gender stereotypes. If researchers claim girls are better than boys in verbal skills but are behind in math, and vice versa, then the students will believe it. This claim would then justify Harvard past president Lawrence H. Summers' argument that the lack of female

scientists in elite universities such as Harvard may stem from “innate” differences in ability between men and women and the aptitude of females (2005). This kind of stereotyping would promote similar thinking. There is concern that stereotypes will be treated as real biological differences, which would have negative consequences, particularly concerning students’ confidence, motivation, and classroom engagement. Many fear a future of schools catering to stereotypes and unequally distributing resources, which is what Title IX was put in place to counteract.

Besides upholding stereotypes, some critics argue single-sex schooling does not resemble real life or life in the workplace. Separating the sexes does not promote a “fair and harmonious relationship” between the sexes or foster understanding (McCloskey, 1994). Also, separating the sexes in schools may further glamorize the opposite sex to adolescents, advance unhealthy curiosity (McCloskey, 1994), or lead to sexism. Sadly, no learning environment provides a sure escape from sexism, and Leonie Rennie, an Australian researcher, and Helen Marks, a U.S. researcher, both agreed that single-sex classes do have rampant sexism (AAUW, 1998). Sadker says that some studies show that men become more sexist in separate classrooms. Patricia Campbell of Campbell-Kibler Associates, Inc., noted that feminist-oriented females performed better than girls in similar programs where students never discussed questions of men’s and women’s relative status in society (AAUW, 1998). Sadker points out that instead of separating sexes, sexism should be addressed in coed classes.

Another negative issue encountered in single-sex education is discipline problems. Some educators experienced higher discipline problems with their single-sex education programs and eventually returned to coeducation. For example, Newport Middle School in Kentucky and Eagle Rock Junior High School in Idaho abandoned single-sex classrooms after just one year. There was no significant improvement in test scores or grades at either school and, for the boys, discipline problems escalated. One teacher, Becky Lenihan, said that she wrote up more boys during the year than in all her previous 13 years combined.

In 2005, eighth-year students at one school in Wales were split into single-sex groups for math, English, science, and history. The head teacher said the trial sometimes led to discipline problems and that the change did not lead to a decline, yet it did not lead to an improvement either. In speaking of the groups, the head teacher said:

We found the boys were a bit of a nightmare to teach initially, and unless you adapted the work that was done for them, they were very hard groups. We found girls’ classes were very compliant, very well behaved, and got on with their tasks and showed great concentration in lessons.

The boys felt more confident about their education, but they did not do much better. The Welsh girls still outperformed boys with 66.5 percent passing with C’s and above compared to 59.3 percent of boys (Hume, 2007). Similarly, Mario Umana Middle School Academy in East Boston began separating boys and girls in their afternoon math and English classes as part of a new extended-day program. Teachers at the Umana School had mixed feelings about the outcomes of the experiment. English teacher Virginia Fosnock said that boys usually receive the most attention in coed classes because they are louder, but she said, in single-sex classes, “all the girls can shine.” However, some of the teachers are afraid that an all-boys’ classroom could take on the atmosphere of a fraternity house (Jan, 2008). Joseph DeCelles, another English teacher who teaches an all male class, said he misses the dynamics of a coed classroom. He said, “Girls are more mature in middle school ... and are usually better students who can be used as role models in the classroom” (Jan, 2008).

During 2006 in the Birstall and Batley areas of the UK, 1,500 students left their single-sex secondary schools, the only schools available in their areas, and went to coeducational schools in Bradford and Leeds further away. Educators in Birstall and Batley believed the students’ migration was damning evidence for single-sex schools and have considered changing to coed schools. The council leader in the area said confidence was failing in the schools and 90 percent of students were seeking education elsewhere (BBC, 2007). The head teacher at Lewis School in Pengam, an all-boys’ school since 1729, believes

that the curriculum should be examined because the boys just are not interested in the curriculum. The Education Minister Jane Hutt commissioned a report on the gap between males and females and subsequently announced major changes to the national curriculum and a greater concentration on skill. The Director of Examinations and Assessments believed the change could benefit both boys and girls.

“Besides upholding stereotypes, some critics argue single-sex schooling does not resemble real life or life in the workplace. Separating the sexes does not promote a ‘fair and harmonious relationship’ between the sexes or foster understanding.”

Many studies on single-sex classrooms or schools produce inconsistent and inconclusive results. The U.S. Department of Education’s Executive Summary of their Single-Sex Versus Coeducation Schooling Systematic Review has mixed results. Many studies in the summary found no difference between coeducational and single-sex schooling and very few were in favor of single-sex schooling. One third of their findings regarding elementary and high school age male and females found positive results for single-sex education and two thirds found null or mixed results. Two studies found no differences in postsecondary test scores or in high school or college graduation rates. Regarding students’ self-esteem, one-third of studies found positive results in favor of coeducational schools for males and half found no difference. Bracey states that the overwhelming majority of studies examine high school students, while only a small minority use elementary school students. Males were also underrepresented in most research. Additionally, he states that most single-sex research has been conducted in Catholic schools, in which students are separated by

sex only when entering adolescence (Bracey, 2006). Valerie Lee of the University of Michigan found in her 1998 analysis of random samples that single-sex classes produced consistent positive results for girls in course enrollment, achievement, educational aspirations, and attitudes toward academics compared to coed schools (NASSPE, 2006). However, Lee found no differences for boys in single-sex Catholic schools, and in independent schools she found no differences for either boys or girls. Lee found that the qualities of the most “effective” education include all-academic course offerings with fewer offerings in non-academic subjects, smaller schools, a more communal school organization, and more female principals (NASSPE, 2006). Lee credits the success of the Catholic girls’ schools to organizational and administrative characteristics.

Overall, the largest number of studies found no difference between single-sex and coed classes (Bracey, 2006). Elwood and Gipps argue that there is “no conclusive evidence to suggest that single-sex schooling is better” (Education: Why Girls Do Well, 2000). The body of research is also restricted by the dearth of studies that have addressed teen pregnancy, teacher differential treatment, or parental satisfaction, among other areas. There is also a lack of longitudinal data on the effects of single-sex education. For socio-emotional development, results are mixed. One study of girls’ education found an increase in eating disorders, which would suggest girls’ concern for appearance in an all-female environment actually increases rather than decreases, as other studies have claimed.

PREVAILING ISSUES AND QUESTIONS

One area in which further attention is required is in regard to gender-atypical children. What happens to the boys and girls who do not fit in or have the same interests as their classmates? Sax admits that “some boys would rather read a book than play football and some girls would rather play football than with Barbies.” He believes that if educators understand these differences then they can inspire each child to learn to the best of his or her ability. However, the question of how to address

the differences in these boys and girls is not elaborated upon. In single-sex high schools specifically, it is not certain where students who do not associate with their sex or who are transgendered fit into the picture. Single-sex classrooms may keep boys from having preferential treatment over girls but is categorizing unavoidable in the classroom? Would the seemingly “more boyish” get preferential treatment over the boys that are more effeminate? In short, would some boys be treated like the “girls?”

Another question that concerns educators is: “If students should be separated, should the sex of the teacher match the students?” Legal challenges would likely result in such a policy. However, if boys and girls are so completely different then how could a female educator possibly teach, motivate, and keep the attention of a classroom of boys in an effective manner? Single-sex classes may create problems between teachers who prefer teaching one sex over the other (AAUW, 1998). Logistically, there are not nearly enough male teachers to teach every class of boys. The American education system has a significant gender division in teaching professionals: only one-fourth of the United States’ 3 million teachers are male, and male teachers are least common in elementary schools (Johnson, 2008). There is only one male elementary school teacher for every 10 elementary classes (Johnson, 2008). Indiana actually fares better than most states, ranking fourth in the nation with 30 percent male teachers in its public schools during the 2005-06 school year (Johnson, 2008).

Researchers argue that the lack of male teachers itself actually undermines gender equity and social justice. Shaun Johnson, an associate at the Center for Evaluation & Education Policy, contends, “Encouraging men to teach and care for children is an essential front in the struggle against restrictive gender roles and may ultimately support the expected promotion of democratic and egalitarian values in public schools” (Johnson, 2008). Having a similar number of male and female teachers may be better for students, but legally suggesting that only female teachers can teach female students and vice versa appears on its face discriminatory and based on gender stereotypes. Legally, one would think this would be viewed as sex bias and unfair in the workplace due to the Equal Opportunity laws. However, if girls and boys are so

different, perhaps male teachers would be best suited to teach all-male classes and vice versa.

There is very little research on the effect of single-sex schooling on students in post-secondary education, or what it means for men and women later on in the workplace. One type of single-sex school that has always excluded males is schools for pregnant young girls. This topic is not often addressed within the subject of single-sex schools. Pregnant students have the right to remain in school and any move to attend a separate program must be voluntary (Stamm, 1998). The law calls for the separate program to be comparable to that of non-pregnant students (Stamm, 1998). However, not much research has been conducted to compare the two.

Sex-Based Tracking

Single-sex classrooms raise many questions similar to those regarding tracking or ability grouping. In single-sex schooling, boys and girls are being put on two different tracks because of their alleged profound biological learning differences. This tracking is similar to children who are tracked in public school based on their academic ability and are placed accordingly, for example, as “Cardinals” (advanced track) or “Bluebirds” (remedial track). In single-sex classes boys are set on a track that is supposed to cater to their needs and further their achievement and the same is set up for girls. For example, in the boys’ track, math classes will be more advanced than those in the girls’ track, and their language or reading classes will be less advanced than the girls. Instead of tracking based on individual strengths and weaknesses, single-sex schooling tracks by whether a student is male or female. It is assumed that by tracking a student this way, he or she will fit into their appropriate track. Different qualities will likely be cultivated and praised in sex-segregated tracks. The same problems occur with single-sex tracking as with other tracking: fear of unequal distribution of resources, concerns that tracking promotes and gives fuel to negative self-fulfilling prophecies, and concern that students will not meet others that are different from them. There is not yet conclusive research that suggests it is the structure of single-sex classrooms that improves students’ achievement, but for

some educators, as in ability grouping, separating the sexes may make their lives easier. Other teachers fret over a loss of creativity in the classroom regarding boys' and girls' different ideas and responses to questions and activities.

Cost

Principals in a bind may see single-sex education as a cheap reform method; realistically, they could separate students by sex and rearrange teachers without any added cost. Leonie Rennie felt that the Australian government's involvement in promoting single-sex schooling had more of a political appeal rather than an educational one (AAUW, 1998). Describing a particular Australian initiative, Rennie said:

I don't think it would be cynical to say that the Education Department supported the introduction of single-sex classes in schools where teachers wanted it to happen. It was a political move...An election was coming up and it looked as if something was actually going to be done in education but it wasn't going to cost anything. (AAUW, 1998)

According to Leonard Sax, however, this would set a school up for possible failure because the teachers need special training. Single-sex schooling may actually be more expensive than educators assume because, besides more training, schools may need to hire more teachers — two for the single-sex classes and possibly one for the coed class. In many cases, schools will have additional administrative burdens, professional training costs, and evaluation and legal costs. Coeducation may be more economically feasible, requiring fewer teachers, buildings, and classes (McCloskey, 1994). Instead of using funds for single-sex education, redirecting funding to reduce class size, increasing other resources, and providing additional training for teachers to meet their students' academic, social, and emotional needs and to avoid sex discrimination and stereotyping could well produce better outcomes for districts with large numbers of underachieving students (National Coalition for Women and Girls in Education, 2008).

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Better research is needed. There are many aspects of single-sex education that require further research. The only consistent finding on single-sex classrooms is that the findings are not consistent. At some schools there have been amazing results; at others, problems such as discipline issues and student tracking worsen or there is no change at all in academic results.

Recommendations

Research should be standardized through use of a randomized control trial so that there will be no question as to whether positive or negative results are due to single-sex education or other factors. Research should focus on schools with a majority of minority students and/or in schools with a high rate of poverty to determine whether the structure of single-sex classes can improve academic achievement.

Furthermore, politicians, educators, and parents need to be secure that they are not being easily swayed by research that at its most positive comes from affluent, private schools. Educators are not wrong in wanting to emulate the progress and success of these renowned schools, but compelling research must be produced to determine what aspects of the schools should be replicated. For educators considering use of single-sex education, research from other countries on best practice should be considered, too. Single-sex education and coeducation do not need to be in conflict. If there is a particular technique used for single-sex classes or schools, it should be determined whether that can be used to improve coed schools as well.

Conclusion

Research has found that achievement gaps between groups of students based on race, income, English proficiency, and disabilities persist and remain large. The reporting of disaggregated data by these groups of students as required by NCLB has heightened concern for the need to eliminate achievement disparities.

Recommendations

Educators should work on better educating groups that are without question struggling in schools. When raising expectations and with implementation of proven interventions, the outlook for these students is positive. African American and Hispanic students' achievement has shown improvement and when there is an incremental rise in income, low-income students' achievement improves as well. However, research does suggest that help is needed for both males and females in these groups. Neither boys nor girls should be kept from receiving a great education due to their sex.

Conclusion

Professional development is necessary for educators in single-sex education to prepare for the differences between a coeducational and a single-sex environment. With proper preparation, teachers in single-sex classrooms will be empowered with productive pedagogical and differentiated instruction techniques. It is also needed in order to guarantee single-sex education is not ruled by gender stereotypes or faulty information on sex differences.

Recommendations

If schools do choose to incorporate single-sex classrooms or move from coeducational to single-sex schools, the changes must be reinforced by proper professional development for teachers, as well as support for students and parents.

AUTHORS

Kelly E. Cable

(kecable@indiana.edu) is an undergraduate research assistant at the Center for Evaluation & Education Policy.

Terry E. Spradlin

(tsradli@indiana.edu) is Associate Director for Education Policy at the Center for Evaluation & Education Policy.

ACKNOWLEDGEMENTS

The author would like to thank **Christian Jennings** of Stanford University and Professor **Thomas Leahy**, Professor of English at Indiana University, for their document review and edit suggestions. We would also like to thank **Nathan Burroughs**, Research Associate, **Megan Musser**, Project Associate, **Michael Holstead**, Graduate Research Assistant, **Shawn P. Johnson**, Graduate Research Assistant and **Leigh Kupersmith**, Publications Coordinator, from the Center for Evaluation & Education Policy.

REFERENCES

American Association of University Women Educational Foundation. (1998). *Separated by sex: A critical look at single-sex education for girls*. Retrieved May 26, 2008, from <http://www.aauw.org/research/upload/SeparatedbySex-2.pdf>

Associated Press. (March 26, 2008). *Georgia county drops single-sex schools plans*. Retrieved June 24, 2008, from <http://www.msnbc.msn.com/id/23819601/>

Battaglieri, T. (November 13, 2006). *Research reveals little proof that single-sex education works*. Press Release. Great Lakes Center for Education Research and Practice. Retrieved May 14, 2008, from http://greatlakescenter.org/docs/Policy_Briefs/Bracey_Gender.htm

Bombardieri, M. (January 17, 2005). *Summers' Remarks on Women Draw Fire*. *The Boston Globe*. Retrieved June 25, 2008, from http://www.boston.com/news/local/articles/2005/01/17/summers_remarks_on_women_draw_fire/

Bracey, G.W. (November 2006). *Separate but superior: A review of issues and data bearing on single-sex education*. Tempe, AZ: Education Policy Research Unit. Retrieved May 27, 2008, from <http://eps1.asu.edu/epru/documents/EPSSL-0611-221-EPRU.pdf>

Brighter choice charter schools. (n.d.). *Single-sex classes*. Albany, NY: Brighter Choice charter Schools. Retrieved October 9, 2008, from <http://www.brighterchoice.org/index.php?id=29#girls>

Chamberlin, M., & Eckes, S. (2003). *Title IX and women's athletic opportunities in Indiana colleges and universities*. Bloomington, IN: Center for Evaluation & Education Policy. Retrieved June 9,

2008, from http://ceep.indiana.edu/projects/PDF/PB_V1N6_Title_IX.pdf

The Columbia Encyclopedia (6th ed.). (2008). *Coeducation*. Retrieved July 17, 2008, from <http://www.encyclopedia.com/doc/1E1-coeducat.html>

Corbett, C., Hill, C., & St. Rose, A. (2008). *Where the girls are: The facts about gender equity in education*. Washington, DC: AAUW Educational Foundation. Retrieved October 7, 2008, from http://www.aauw.org/research/upload/whereGirlsAre_execSummary.pdf

Cozzens, L. (1999). *Plessy V. Ferguson*. Retrieved September 18, 2008, from <http://www.watson.org/~lisa/blackhistory/post-civilwar/plessy.html>

Cuizon, G. (April 15, 2008). *Single-sex classrooms*. Retrieved June 3, 2008, from <http://www.socyberty.com/Education/Single-sex-Classrooms.109784>

BBC News. (August 12, 1999). *Education: Why girls' schools do well*. Retrieved July 7, 2008, from http://news.bbc.co.uk/2/hi/uk_news/education/418562.stm

Flannery, M.E. (April 2006). *Single-sex education: No girls allowed*. National Education Association. Retrieved June 10, 2008, from <http://www.nea.org/neatoday/0604/singlesex.html>

Georgia county plans to convert to single-sex schools district wide. (February 14, 2008). *Atlanta Journal-Constitution*. National School Boards Association. Retrieved November 4, 2008, from <http://www.nsba.org/MainMenu/School-Law/Issues/Equity/News/Georgiasinglesexdistrict.aspx>

Hume, C. (October 18, 2007). *Single sex studies fail the test*. BBC News. Retrieved June 24, 2008, from http://news.bbc.co.uk/2/hi/uk_news/wales/south_west/7050436.stm

Jan, T. (2006, January 26). *Schoolboy's bias suit*. *The Boston Globe*. Retrieved September 8, 2008, from http://www.boston.com/news/local/articles/2006/01/26/schoolboys_bias_suit/

Jan, T. (May 9, 2008). *Keeping the boys away from the girls*. *The Boston Globe*. Retrieved August 20, 2008, from http://www.boston.com/news/local/articles/2008/05/09/keeping_the_boys_away_from_the_girls/

Johnson, S.P. (2008). *The status of male teachers in public education today*. Bloomington, IN: Center for Evaluation & Education Policy. Retrieved August 12, 2008, from http://www.ceep.indiana.edu/projects/PDF/PB_V6N4_Winter_2008_EPB.pdf

K12 Academics. (n.d.). *Single sex education: History*. Retrieved June 17, 2008, from http://www.k12academics.com/single_sex_ed_history.htm

Kaminer, W. (1998). *The trouble with single-sex schools*. *Atlantic Monthly*. Retrieved May 19, 2008, from <http://www.theatlantic.com/doc/199804/single-sex>

McCloskey, Father John (1994). *Coeducation revisited for the 21st century*. Retrieved June 11, 2008, from <http://www.catholicity.com/mccloskey/singlesexedu.html>

McDowell, K.C. (October, 30, 2006). *Legal issues in education: Title IX; Foreign exchange students; Student records*. General Counsel Indiana Department of Education, pp. 2-5. Retrieved May 14, 2008, from www.doe.state.in.us/legal

Mead, S. (June 2006). *The truth about boys and girls*. Washington, DC: Education Sector. Retrieved October 7, 2008, from http://www.educationsector.org/usr_doc/ESO_BoysAndGirls.pdf

Miller, T. (February 21, 2008). *Local Education Agency (LEA)*. Stillwater, OK: Oklahoma Department of Career and Technology Education. Retrieved June 12, 2008, from <http://cms.okcareertech.org/glossary/local-education-agency-lea>

National Association for Single-Sex Public Education. (2006). *Single-sex education*. Retrieved May 15, 2008, from <http://www.singlesexschools.org/>

National Coalition for Women and Girls in Education. (2008). *Executive summary: Title IX at 35: Beyond the headlines*. Retrieved July 8, 2008, from <http://www.ncwge.org/PDF/TitleIXat35-summary.pdf>

Paulson A., & Teicher S. (October 26, 2006). *Move to single-sex classes fans debate*. *The Christian Science Monitor*. Retrieved June 18, 2008, from <http://www.csmonitor.com/2006/1026/p02s01-legn.html>

Piechura-Couture, K., Tichenor, M., & Heins, E.D. (2007). *A study of elementary school students' achievement in single-gender versus mixed-gender classrooms*. Unpublished manuscript

Pollard, D.S. (October 1999). *Single-sex education*. WEEA Equity Resource Center. Retrieved June 18, 2008, from <http://www2.edc.org/WomensEquity/pubs/digests/digest-singlesex.html>

Sax, L. (2002). *The odd couple*. *The Women's Quarterly*. Retrieved June 25, 2008, from http://www.singlesexschools.org/odd_couple.html

Sax, L. (n.d.). *Why gender matters*. NASSPE. Retrieved May 28, 2008, from <http://www.whygendermatters.com/>

Sax, L. (2001). *Single-Sex Education: Ready for Prime Time? The World and I Online*. Retrieved June 2, 2008, from <http://www.singlesexschools.org/worldandi.html>

Sax, L. (March 2, 2005). *The promise and peril of single-sex public education: Mr. Chips meets Snoop Dogg*. *Education Week*. Retrieved May 29, 2008, from <http://www.singlesexschools.org/edweek.html>

Sax, L. (2007). *The five factors driving the decline of boys*. *Boys adrift*. Retrieved October 9, 2008, from <http://www.boysadrift.com/>

Single sex classes not the answer. BBC News. Retrieved June 24, 2008, from http://news.bbc.co.uk/2/hi/uk_news/education/893293.stm

Spellings, M. (October 25, 2006). *Secretary Spellings announces more choices in single sex education amended regulations give communities*. Retrieved May 20, 2008, from <http://www.ed.gov/news/pressreleases/2006/10/10242006.html>

Stamm, M.J. (June, 1998). *A skeleton in the closet: Single-sex schools for pregnant girls*. *Columbia Law Review*, 98(5). 1203-37. Retrieved July 15, 2008, from <http://www.jstor.org/stable/1123381?seq=11>

Title IX: I Exercise my rights. (2005). Retrieved May 15, 2008, from <http://www.titleix.info/>

Wilkerson, I. (1991, August 14). *Detroit's boys-only school facing bias lawsuit*. *The New York Times*. Retrieved July 16, 2008, from <http://query.nytimes.com/gst/fullpage.html?res=9D0CE7DD1430F937A2575BC0A967958260&sec=&spon=&pagewanted=all>

WEB RESOURCES

American Association of University Women Educational Foundation: Separated by Sex
<http://www.aauw.org/research/>

Education Sector
http://www.educationsector.org/usr_doc/ESO_BoysAndGirls.pdf

Great Lakes Center for Education Research and Practice
www.greatlakescenter.org

Indiana Department of Education
www.doe.state.in.us/legal/pdf/quarterly_reports/2006_julsep.pdf

National Association for Single-Sex Public Education
<http://www.singlesexschools.org/>

National Coalition for Women and Girls in Education
<http://www.ncwge.org/PDF/TitleIXat35-summary.pdf>

Why Gender Matters
<http://www.whygendermatters.com/>

Women's Educational Equity Act (WEEA) Equity Resource Center
<http://www2.edc.org/WomensEquity/pubs/digests/digest-singlesex.html>

Education Policy Briefs are executive edited by Jonathan A. Plucker, Ph.D. and published by the

Center for Evaluation & Education Policy

Indiana University
1900 East Tenth Street
Bloomington, IN 47406-7512
812-855-4438

More about the Center for Evaluation & Education Policy
and our publications can be found at our Web site:
<http://ceep.indiana.edu>

