

Teachers College Record

Single-Sex Programs: Resolving the Research Conundrum

by [Rosemary C. Salomone](#) — November 19, 2004

In March, 2004, the federal Department of Education issued proposed Title IX regulations that promise to provide public school districts and charter school organizers considerable flexibility in establishing single-sex classes and schools. At the same time, however, as part of the No Child Left Behind Act, the Department has called for "scientifically-based" research to guide educational practices while the Supreme Court has ruled that state actors need an "exceedingly persuasive" justification for drawing distinctions on the basis of sex. Yet both sides concur that research findings supporting single-sex schooling are inconclusive. The dramatic turnaround in federal policy and the seeming inconsistencies in the law have sparked heated debate that has plumbed the depths of gender, race, and ideology. This article works through this conundrum, maintaining that social science evidence has far more to offer the debate than either supporters or detractors of single-sex schooling recognize. To validate that assertion, it examines data on academic performance and social deficits across gender and race as well as tentative evidence from existing programs. Based on these findings, the author draws the critical connection among program planning, implementation, and assessment and urges educators and researchers to explore a broad range of questions and methods both in their search for evidence to inform and guide program development and in their efforts to generate new findings that will prove instructive if not definitive in measuring the overall effects of these programs.

For almost three decades, the Office for Civil Rights in the Department of Education adhered to a policy prohibiting public schools from separating girls and boys for all or part of the school day with few exceptions. That position relied primarily on OCR's reading of Title IX,^[1] the 1972 sex-discrimination statute, and more specifically on regulations adopted in 1975 that remain in force today. ^[2] In recent years, an increasing number of programs have defied this interpretation primarily to address the needs of at-risk students. Since 2000, 15 single-sex public schools have opened, mainly in urban areas. In all but three of them 85 percent of the students are non-white. Some of these are new upstarts including charter schools. Others are reconstituted schools that were formerly coeducational and failing. Some educate girls and boys in separate classrooms within the same facility. Others are totally single-sex. In addition, a number of coed schools have initiated separate classes in certain subjects, particularly math and science, where girls traditionally have lagged behind boys.^[3] The exact number here is uncertain, as schools have avoided media attention to remain under the radar screen of federal enforcement. All of these programs continue to exist under a cloud of legal uncertainty.

The first official sign of change appeared in 2001 when, as part of the No Child Left Behind Act, Congress approved federal funds for innovative educational programs, including "same-gender schools and classrooms, consistent with applicable law." At the same time, Congress directed the Department of Education to issue guidelines within 120 days.^[4] The guidelines published the following May merely restated the government's existing interpretation of Title IX,^[5] although the Department simultaneously reported that it was considering revisions in the regulations that would afford greater flexibility.^[6] A potentially dramatic turnaround came in March 2004 when OCR issued proposals that would permit public single-sex schools and classes with few limitations.^[7]

School districts and charter school organizers nationwide are now planning new single-sex initiatives with a view toward these changes in the law. In

New York City alone, four new schools are slated to open in Fall 2004, including two boys' public schools, a girls' public school, and a boys' charter elementary school.^[8] A similar girls' charter school is planned for the following year. All of these are targeted towards underprivileged minority students.

If the legal constraints are lifted presumably in the coming year, the predictable increase in these programs will provide a fertile field for educational research and assessment. Given the controversy surrounding this novel spin on a not so novel idea, and the lack of conclusive findings to sustain it, supporters and opponents inevitably will rush to gather empirical evidence to prove or disprove whether various approaches to single-sex education actually deliver on their promise however defined. Part of the incentive will come from another provision in the No Child Left Behind Act calling for "scientifically-based research" to guide educational practices.^[9] Depending on the questions asked, the methodology employed, and the educational quality of the particular programs, these efforts could generate useful information in determining the merits of single-sex as compared with coeducation. Critics of single-sex schooling, nevertheless, question the seeming inconsistency in federal policy. How, they ask, can

Washington justify providing federal funds for an "unproven" educational practice in the first instance? The Department of Education seems to be putting the "cart" of program implementation before the "horse" of research evidence, as they say.

Critics further maintain that the Supreme Court's 1996 decision striking down the all-male admissions policy at the Virginia Military Institute presents serious legal impediments. There the Court affirmed that state actors must present an "exceedingly persuasive" justification when drawing distinctions on the basis of sex.^[10] If not, they run the risk of violating the Fourteenth Amendment guarantee to "equal protection of the laws." In fact, parsing the Court's lengthy and carefully developed opinion, we find emerging from the VMI case four key questions: 1) Is the decision to separate students on the basis of sex grounded in sufficiently important justifications that have some basis in research? 2) Does the program aim at achieving clearly defined educational and social outcomes related to these justifications? 3) Does the program have academic merit, that is, is there evidence that it is likely to produce the desired outcomes? 4) As a matter of process, does the program undercut gender equity either by allocating resources unequally or by promoting sex stereotypes?

These legal and policy arguments, taken together, have sent educators and policymakers in frantic search of evidence to justify programs that, critics claim, rest solely on anecdotal reports and scattered studies. Most of the studies come from private schools and abroad. Many of them lack the scientific rigor that the Department of Education now requires to support educational reform measures. Both sides in the debate concur that the findings are inconclusive and that further research is needed. And so critics now argue that federal law is on a collision course.

Washington appears to be on the brink of officially approving an educational approach that lacks an "exceedingly persuasive" justification backed by "scientifically-based research."

In the discussion that follows, I work through this conundrum, examining the role that research findings play in the total picture of single-sex schooling both as a source of information for initially determining underlying rationales and identifying potential programmatic outcomes and as a means for evaluating the relative benefits gained. I discuss in particular the place of gender equity and the seeming controversy over its importance. In underscoring the crucial connection between research and program design, implementation, and assessment, I maintain that social science evidence has far more to offer the debate than either the supporters or detractors of single-sex schooling recognize. That being said, I urge educators and researchers to explore a broad range of questions and methods both in their search for existing evidence to inform and guide program development and in their efforts to generate new findings that will prove instructive if not definitive in measuring the overall effects of these programs.

THE CONTEXT

Equal access to education was one of the primary goals of the modern-day women's movement. By the mid-1970s, there was visible success on this front. At that point, prestigious all-male institutions had opened their doors to women, in response to both legal mandates and market demands. Nevertheless, it soon became clear that coeducation itself was not the cure-all for deeply institutionalized attitudes and practices. Discrimination in counseling, hostile classroom environments, and a curriculum devoid of women's experiences and accomplishments soon surfaced as serious obstacles to women's full participation in education and ultimately in society. The inequalities were pervasive, from elementary school through higher education.[\[11\]](#)

Over the following decade, in the wake of these stark revelations, educators across the country and across the globe initiated myriad programs to promote the educational advancement of female students, all in the name of gender equity. In the

United States, the legal and inspirational impetus for these initiatives came from Title IX, the federal law passed in 1972 that prohibits educational programs receiving federal funds from discriminating on the basis of sex. During that same period, school officials and researchers became increasingly concerned with the plight of the underclass in society and the growing achievement gap between white students on the one hand and African-American and Latino students on the other, a gap that seemed to raise unique gender concerns. By the late 1980s, the confluence of gender and race, separately and together, generated renewed interest in single-sex schooling. For girls, initial attention was directed at raising achievement in math and science. For racial minority students, particularly boys, the early focus was on developing positive attitudes and a sense of academic identification that would overcome educational and social deprivation.

This contemporary revival of publicly supported single-sex education has proven highly controversial. In fact, it has provoked rancorous debate plumbing the depths of gender, race, and political ideology. It also has generated an unusual political alliance among social conservatives touting "hard-wired" differences between girls and boys, political conservatives interested in a free market of parental choice, feminists seeking to close the gender gap favoring boys particularly in math and science, and urban educators and activists concerned with the plight of minority students and particularly African-American males. At the same time, it has created a deep rift among those who have championed the cause of equal educational access for women. Here the dividing line roughly falls between women who attended an academically rigorous girl's secondary school or women's college, for whom it was a defining experience, and those who did not.[\[12\]](#)

Some gender equity advocates view such programs against the dark history of women's exclusion from prominent secondary schools and colleges and the hard battles fought to remove those barriers. It is only within the past generation that schools like Boston Latin,

Central High School in Philadelphia, Choate, and Andover as well as universities including Harvard, Princeton, Yale, and the University of Virginia have opened their doors to women. Given that backdrop, critics of single-sex schooling consider the approach Victorian at best and downright harmful at worst, reinforcing archaic sex stereotypes and misguidedly suggesting that girls are inherently deficient in certain curricular areas. For them, separate is always unequal in theory and inevitably unequal in fact as blatant inequalities in access and resources between female and male schools painfully proved in the past.

Litigation brought on behalf of female students against the

Boston and Philadelphia school systems in the 1970s and 1980s brought this historical truth to light. In the first case, a federal court found that Boston Latin offered twice the number of seats that were available at Girls Latin where the admissions standards were higher.[\[13\]](#) In the case of Philadelphia, a state court found even more striking disparities. As compared with Girls' High School, Central High School for Boys had two and half times as many Ph.D.s among the faculty, twice the number of books in the library, twice as

many computers, and almost four times as many courses and seminars for “gifted” students.[\[14\]](#) It was clear that Girls’ High was the under-funded stepchild.

Nonetheless, others see the approach more positively and for a variety of reasons. Ironically, many of those reasons also relate directly or indirectly to promoting gender equity generally for girls but at times indirectly for boys. Proponents argue that single-sex programs offer girls an emotional and physical “safe haven” free of male domination, that they eliminate social distractions and improve overall academic commitment and consequently achievement for both sexes, that they hold the potential for closing not only the gender gap favoring boys in math, science, and technology but perhaps the gap favoring girls in reading, language arts, and foreign languages, and that they result in less gender-polarized interests and participation among students. They maintain that single-sex education may hold the greatest promise, both academically and socially, for inner-city minority students.

Despite the conviction with which each side states its case, the research findings are not definitive. Yet with legal constraints presumably about to be lifted, and with the predictable increase in the number of programs nationwide, it is now critical for educators, policymakers, and researchers to seriously consider the relationship among planning, implementation, evaluation, and research. Researchers in particular will soon have the opportunity to shed light where there now exists more heat on whether single-sex schooling produces positive outcomes and why that may or may not be so. Obviously the questions they ask will have significant bearing on their ultimate conclusions. Those questions, in turn, necessarily must flow from the underlying rationales and specific goals of each program. The importance of this integral connection cannot be overstated.

RATIONALES AND GUIDING PRINCIPLES

In drawing out the broader view, we should begin at the beginning, examining the educational and social justifications for separating girls and boys and the role that gender in particular plays in the changing landscape of schooling. In fact, “gender equity” is the one rationale that seems to have gained widest support, or at least acceptance, for single-sex programming. The use of the term “equity” as compared with “equality” is a distinction with a decided difference. In practice, equity looks beyond mere equal or identical treatment. In the law, it refers to a system of decision-making based in fairness and justice. It does not rest on a distinct set of positive rules. Nor does it look to equal results in a formalistic way but rather to substantive outcomes that take into account differences in the individual circumstances of the parties.

Applying this concept to gender, and specifically considering the role of gender equity in education, suggests that we acknowledge a priori that females and males are not uniformly situated the same at the outset. Therefore, there are times when they require different treatment to carry them along to a clearly defined common end. Programs designed to promote gender equity focus on these differences, whether biologically based or socially constructed. The ultimate success of these programs is measured by how effectively they close the gender gap in some defined outcome, typically academic performance and achievement. All-girls classes in math, science, and technology are a clear example of this approach.

Some organized women’s groups suggest that, as a matter of law and policy, gender equity is, at most, the only acceptable justification for separating girls and boys in school programs.[\[15\]](#) The assumption is that the approach may be permissible for girls solely as a “compensatory” measure to overcome the remnants of sex discrimination in education and throughout society. The implication is that it may not be so for boys. That view, however, not only misreads the law but it is also severely outdated and defies recent findings on gender and schooling. We now understand that gender equity, neutrally defined, cuts both ways on a wide range of social and academic indicators. Over the past decade, a string of popular books by clinical psychologists have revealed the difficulties that young boys experience in adjusting to a school climate that in the early grades is geared toward the faster developmental pace of girls particularly in verbal skills.[\[16\]](#) Even those of us who feel passionately about women’s equity must recognize a simple fact. While girls still have difficulty reaching the top of the academic achievement ladder, especially on standardized tests, or moving into certain science-based careers, these realities pale in comparison to the escalating academic

downslide that has caught many boys in its reach. And so it is reasonable to conclude that single-sex programs for boys also fit under the umbrella of gender equity loosened from its moorings to intentional discrimination.

The claim that Title IX demands gender equity exclusively for girls is further based on questionable legal grounds. Neither the statute nor the current regulations prohibit single-sex schools.^[17] Guidelines published by the Office for Civil Rights in May 2002 as well as the proposed Title IX revisions therefore make clear that OCR has no jurisdiction over the justifications for such schools. The only requirement in the proposed regulations is that school systems offer a “substantially equal” program to members of the other sex.^[18] The case for single-sex classes is more complicated. Although the Title IX statute is silent on this count, the existing regulations prohibit coeducational schools from separating students on the basis of sex in “any course” or “education program or activity” with limited exceptions.^[19] They allow, however, for an “affirmative action” justification “to overcome the effects of conditions which resulted in limited participation ... by persons of a particular sex.”^[20] The proposed regulations, in contrast, do not even suggest gender equity but rather offer considerable flexibility based in either a “diversity” or an “educational needs” rationale as long as the educational opportunities offered to girls and boys are “substantially equal.”^[21]

Conflicting interpretations of Title IX and the impending changes in the regulations while nonetheless important, however, tell only part of the legal story. The bottom line lies in the federal Constitution. In its 1996 decision in *United States v. Virginia*, the Supreme Court set certain ground rules that prove particularly informative. In striking down the all-male admissions policy at the state-operated Virginia Military Institute, the Court made clear that there is a “strong presumption that gender classifications are invalid” and that single-sex programs must have an “exceedingly persuasive” justification. Here the burden of proof is “demanding,” the Court noted, and “rests entirely on the State.”^[22]

In the view of the justices, “sex classifications” are permissible not only to “compensate women” for “economic disabilities” but also where they “advance full development of the talent and capacities of our Nation’s people” (not just women), and provided they do not promote archaic sex stereotypes or “overbroad generalizations about the different talents, capacities, or preferences of males or females.”^[23] Part of this pronouncement is gender-specific based on the history of blatant exclusion and discrimination against women. Yet we cannot overlook the other part which is a broad mandate beyond gender, a subtle nod to single-sex programs for males as well as females. The Court looked at the matter contextually, suggesting that the constitutionality of any program would depend on the specific intent and effects.

The gender equity rationale, therefore, does not appear to be constitutionally required. At the same time, however, the diversity rationale in the proposed Title IX regulations appears constitutionally problematic. In the VMI case, the Court did not have to reach the question as to whether

Virginia’s stated purpose in trying to offer “an array of educational options” was valid in itself since there was no historical or present-day evidence to support the state’s argument in the first instance. Yet judging from the Court’s tone, dicta, and ruling, it is reasonable to conclude that separating students by sex solely on the basis of individual family or student preference would fall short of the required “hard look” review.^[24]

That interpretation, nonetheless, does not prove fatal to single-sex programs as they typically rest on academic and social justifications that indeed can prove “exceedingly persuasive.” Chief among these are related rationales based on educational needs (as the proposed regulations allow) as well as deficiencies in cultural socialization. The first is academic and hinges on personal and social constraints that negatively affect school performance and achievement. The second considers those values, attitudes, and aspirations, lacking in certain student populations that go beyond education and are critical for them to assume productive roles both in mainstream society and in their more immediate communities.

These rationales, in turn, suggest and support a number of legitimate purposes, some of which bear more on the effects of race and poverty than of sex discrimination per se. Several significant and often-cited projected outcomes come to mind: increasing achievement, interest, and career opportunities in math, science, and technology for girls; improving literacy skills among boys; decreasing teenage pregnancy among inner-city minority girls; developing academic identification, increasing college enrollment, and decreasing the drop-out rate and even criminal activity among inner-city minority boys.

That is not to suggest, however, that gender equity is only marginally relevant to the discussion of publicly supported single-sex programs or to their legal status. Quite the contrary. Regardless of underlying rationales or specific purposes, single-sex programs cannot undermine or even compromise gender-equity principles. Among public schools, this proposition in fact is a legal mandate and it covers acts of commission as well as acts of omission. As a stark example, a program designed to improve girls' performance and participation in science cannot teach chemistry through cooking while offering a conventional curriculum to boys. Such an approach clearly perpetuates the stereotype of women as homemakers. Nor can a school district establish an all-boys' school to prepare young men for the corporate world or public service or the military while not offering a similar program for young women. Obviously, to do so would merely validate the dominant role of men as corporate, government, and military leaders while conveying the message that similar education and career aspirations are inappropriate for women. But at the same time, a school cannot offer advanced foreign language classes to girls, based arguably on student interest, while denying them to boys.

Rather than view gender equity as an end in itself, as women's groups apparently do, I suggest that we consider it as an implicit precept and overarching principle that operates more as a negative prohibition than as an affirmative mandate throughout single-sex schooling. Programs that separate girls and boys may, but need not necessarily, aim to *promote* greater gender equity than the status quo of coeducation. Gender inequities per se might not be the real problem that impedes academic or social development for the particular group of students. But at the same time, programs cannot *undermine* gender equity by producing inequities, either relative to other programs or in the absolute.

This shift in focus is crucial to the discussion of research and evaluation. Obviously, if research on single-sex education addressed only educational outcomes related to gender equity, it would deny a wealth of knowledge that these programs potentially could offer the education of at-risk students in particular. It also would have a chilling effect on educators and policymakers and dissuade them from testing this approach on the very students for whom it might hold dramatic benefits – minority boys. At the same time, however, to deny the importance of gender equity principles could potentially turn back the clock on educational opportunities especially for women. These principles must remain ever present in the minds of school administrators and teachers. While there now exist legal safeguards against outright exclusion and unequal resources, the potential dangers of more subtle sex inequalities including sex stereotyping are cause for continued vigilance.

RESEARCH ON LEARNING AND PERFORMANCE: A ROADMAP TO PLANNING

The question of research on single-sex schooling typically brings to mind the measurement of outcomes or programmatic effects. Yet research plays an equally important role at the outset in defining specific rationales and purposes. It is at this fundamental level that we should begin exploring potential justifications for separating students by sex. Here we find a loosely connected but nonetheless rich body of scholarly research and data on student learning and performance. Taken together, these findings point to certain educational and social needs that single-sex programs might effectively address. To fully develop this argument, however, it is important that we acknowledge the cognitive and affective continua as girls and boys develop from young children into adolescents, the impact of these progressive changes on learning, and the implications for teaching and gender organization. We must also consider the intersection of gender, race, and social class to fully identify the educational and social differences that explain why separating some students by sex at any point in their schooling might prove beneficial. Only then can we begin to define goals, develop specific strategies, and ultimately measure outcomes.

Justifications follow overlapping lines of reasoning. One draws on a mixed set of data indicating continued gender gaps in academic achievement, in classroom participation, in course selection within certain curricular areas, and ultimately in career choices. Here girls and boys seem to win or lose depending on subject matter, skills, achievement level, and age factors. Among public schools, this discussion follows a related but separate path, increasingly centered on the combined impact of gender, race, and social class. In this context, underprivileged minority girls fare almost universally better than minority boys but far worse than majority girls.

The forces creating many of these differences appear to be a combination of nature and nurture with a heavy gloss of cultural socialization, and in the case of minority students, social deprivation. Girls and boys are essentially the same at the core in abilities and performance but differ at the margins at various stages in their development. Some also appear to differ in the way they respond to and interact with the learning environment.^[25] Yet we cannot deny the influence of home and school, both of which reinforce initial sex differences by providing children from an early age with activities and experiences suitable to their perceived talents. Children adapt themselves to a normative view grounded in biological reality.^[26] And, of course, there is the powerful influence of the media and popular culture on children's attitudes, interests, and sense of self.

ACADEMIC PERFORMANCE AND ACHIEVEMENT: EXAMINING THE GAPS

We are coming to understand that the academic gender gap is far more nuanced than formerly believed. 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.^[27] This typical although not universal occurrence puts many young boys at a disadvantage in the lower grades. At the same time, boys tend to have more advanced visual-spatial skills through much of schooling, which puts them at an advantage in math and science.^[28] This is not to deny that the gap favoring boys particularly in these two subject areas has narrowed over the years. The change is due in no small measure to increased attention to girls on the part of schools and to changing attitudes in society. That very fact strongly suggests that performance in these areas is changeable and not carved in biological stone.

Nonetheless, girls still have difficulty reaching the highest achievement levels in high-stakes exams like the PSAT and the SAT. In fact, the SAT math gender gap appears largely intractable even while girls' overall math scores have increased. For the past decade, the gender difference in mean scores has hovered between 34 and 36 points. Boys on the average also outperform girls, by a small margin, on the verbal portion of the SAT.^[29] Entrance exams to medical and law school follow a similar pattern in favor of males.^[30] On Advanced Placement exams, boys continue to score higher in all subjects with the exception of foreign languages, some art areas, and more recently computer science where the small numbers of female test takers undoubtedly skew the results. This overall male score advantage remains despite the fact that girls tend to outstrip boys in school grades across subjects from elementary through higher education. Part of the reason lies in the fact that a higher proportion of girls, including many at the lower ranges of ability and achievement, plan to attend college and therefore take high-stakes exams. Boys also tend to dominate the upper and lower ranges of these exams – there are more boys among the exceptionally gifted and more boys among the learning disabled. Yet those facts alone cannot explain why girls' math scores decline on widely administered tests as they approach adolescence.

Advanced Placement data further demonstrate how girls continue to enroll at lower rates than boys in advanced coursework in math, science, and technology. Girls comprise only 35 percent of students taking the BC calculus exam, 32 percent of those taking the physics exam, 14 percent of those taking the computer science A exam (down from a high of 22 percent in 1995), and only 6 percent of those taking the Computer Science AB exam.^[31] The disparities are indeed troubling as these subjects serve as gateways to high-prestige and high-salaried careers.

Meanwhile, the overall differences favoring boys in math and science pale in comparison with the ones favoring girls in reading and writing. The gap here progressively widens as students move from grade four to grade eight and on to grade twelve. The average eleventh grade boy writes with the proficiency of the

average eighth-grade girl.[32] Ability in reading is not surprisingly tied to interest. Females agree more frequently than males that reading is a favorite hobby.[33] According to a recent Gallup Poll, although virtually the same proportions of adolescent girls and boys consider math or science as their favorite subjects, only 5 percent of boys as compared with 22 percent of girls favor English/literature.[34] Boys moreover represent 73 percent of secondary students identified with learning disabilities. Again, the slightly higher SAT verbal scores among boys may be largely a function of the more highly select group taking college entrance exams as compared to girls. It is not surprising, therefore, that females comprise a disproportionate number of college students, which has become a matter of national concern. The female-male ratio has reached a stunning 60-40 at the

University of North Carolina , Boston University , and New York University . [35]

Advanced Placement participation further reflects these gender differences. Only 39 percent of the English Language and 38 percent of the English Literature test takers respectively are male. The figures on Advanced Placement foreign language test takers are similarly striking. Males comprise only 33 percent of those taking the French Language, 38 percent taking the Spanish Language, 24 percent taking the French Literature, and 29 percent taking the Spanish Literature exams.[36] Obviously there needs to be more attention paid to developing literacy skills, as well as a passion for reading, among the numerous male students who are sorted out early in their school years and never make it into the pool of high-stakes test takers. And given the rapid globalization of the economy as well as massive movements of peoples across continents, there also needs to be more attention to increasing interest among boys in foreign language study.

For minority students, the confluence of race and social class puts a particular spin on gender differences and academic success or failure. The achievement gap appears as early as kindergarten in reading and math readiness skills although it is not until the middle school years that educational deficits typically reach a critical point. The test-score gap between white and African-American students has been widening since the mid-1980s in nearly every age group and in every subject, reversing the gains made in the previous decade and a half. Nearly two-thirds of African-American and non-white Latino fourth graders are functionally illiterate. Nearly two-thirds of eighth graders among them lack basic math skills.[37] The deficits are especially striking at the top levels of achievement as Advanced Placement and SAT scores reveal.[38] If current trends continue, as compared with their white classmates, African-American children now in kindergarten will be only half as likely, and Latinos one-third as likely, to have completed college by the time they reach age twenty-nine.[39]

Poor academic performance is closely linked to other indices of social dysfunction as they relate to race and poverty. Children from low-income families drop out of school at six times the rate of those from high-income families.[40] Low test scores and report card grades as early as first grade are reliable predictors of later dropping out.[41] As students progressively fall farther behind in the classroom, they become far more likely to leave. When compared with white students, the dropout rate among African Americans is double while among Latinos it is quadruple.[42] Two-thirds of females in the juvenile justice system are minorities.[43] Moreover, with little hope for the future and few options open to them, young women raised in poverty often resort to early and repeat motherhood to give their lives meaning. Despite the overall decline in teen births in recent years, the raw numbers among African Americans and Latinos are still dramatically higher than for other groups.[44] Children born to teenage mothers are twice as likely to drop out of school while teen sons of adolescent mothers are two and one-half times as likely to end up in prison.[45]

The impact of race and social class on minority boys is especially alarming. The soaring rate of drug, alcohol abuse, and criminal activity within this population is highly correlated with academic failure, delinquency, and accidental deaths. There are now more African-American men in prison than in college. Homicide is the leading cause of death among African-American males between the ages of fifteen and twenty-four. Suicide rates among this group have increased by 100 percent over the past two decades.[46] It is understandable, therefore, that urban educators and parents are increasingly turning to single-sex schooling as a new approach to address these seemingly intractable problems.

THE CLASSROOM ENVIRONMENT: NEGOTIATING LINGUISTIC SPACE

Returning to the more general question of girl-boy academic performance, developmental psychologists have advanced a number of theories including maturational differences and socially reinforced learning styles and interests to explain persistent gender gaps in achievement and participation. Others have looked to the educational process itself, examining the classroom environment and language interchange. Drawing from that research, one of the key arguments supporting single-sex programs is that they create an institutional and classroom climate in which female students can express themselves freely and frequently and develop higher order thinking skills.

Researchers have found that in coeducational classrooms boys monopolize the linguistic space and the attention of the teacher, in effect silencing girls.^[47] Obviously, some of that attention is directed toward maintaining discipline and communicating appropriate behavior. In the early grades in particular, much of it goes toward containing the high energy levels and low impulse-control of young boys. That observation explains to some extent the quantity of teacher initiated interactions in coeducational classes. But it does not explain the level of teacher questioning nor the number and type of interactions initiated by students either with teachers or among themselves especially in small groups.

It is tempting to dismiss the concept of gendered language styles as a relic of the past when society devalued women's intellect and contributions. Yet despite three decades of gender equity programs and dramatic changes in social attitudes toward women, there is still evidence that boys dominate classroom discussion. The problem appears especially acute in those subject areas such as math and science that traditionally are considered "masculine" and where the gender gap in academic achievement persists. Researchers continue to describe middle and secondary school coed settings where teachers are less likely to ask girls high-level questions, and where boys are more likely to volunteer in classroom discussion, to control computer-based collaborative learning activities, and to "hog the resources" in science labs, relegating girls to passive behaviors like making suggestions and taking notes.^[48]

Educators now recognize the educational, motivational, and social value of collaborative talk where students build on each other's ideas. And while it appears that many, although certainly not all, girls both prefer and learn better in cooperative rather than competitive settings in subjects like geography and computers, for example,^[49] mixed-gender groups may have the unintended result of "freezing girls out" from the learning process. Meanwhile, despite the conventional wisdom that boys prefer competition and independent work, there is some evidence that they in fact show even greater gains in performance from collaborative learning activities especially when grouped only with boys. ^[50] All this suggests that both girls and boys may derive educational benefits when they work cooperatively with members of their own sex.

One caveat, nevertheless, is in order here. Reported observations on classroom interaction come largely from white middle-class communities. One rightfully can question whether the same student-teacher or student-student dynamic would hold in inner-city classrooms of African-American or Latino students or among the increasingly diverse group of immigrant students, many from non-western and third world countries, now populating public schools. That issue obviously demands further exploration.

DOES SAME-SEX PROGRAMMING MAKE A DIFFERENCE?

These educational and social observations lead to the obvious question: Why single-sex schooling? Is there any evidence that separating students on the basis of sex might make a positive difference in academic performance and achievement or social adjustment at least for some students?

As already noted, research evidence on the relative benefits of publicly supported single-sex schooling is undeniably inadequate. That fact is quite understandable given that federal policy banned these programs for almost three decades. The field for gathering data simply did not exist. Findings, therefore, come largely from other English-speaking countries and from private and particularly Catholic schools in the

United States . Yet even here, many of these studies are not sufficiently rigorous from a research perspective and lack the necessary statistical controls to meet conventional standards of scientific validity. Moreover, the organizational, cultural, and demographic differences admittedly limit to some extent their predictive value when applied to public schooling in this country.

These limitations obviously run counter to current calls for “scientifically-based” research. Randomized trials, in particular, clearly have gained new momentum in

Washington policy circles.[\[51\]](#) Such studies randomly assign subjects to either experimental or comparison groups. Commonly used in medicine, they have been rare and somewhat controversial in education. The apparent disinclination to use the methodology has stemmed in part from the expense involved and the impractical logistics of designing and monitoring identical learning environments that isolate the particular approach under study. Moreover, assigning students at random to unproven educational programs raises serious ethical concerns. It is not surprising, therefore, that randomized studies on single-sex education cannot be found.

That fact alone, however, need not derail the discussion. In fact, if we are serious about exploring the merits of single-sex schooling, we must think outside the narrow confines of the “what works” box that now captures educational research. Those requirements, while perhaps applicable to practices that have undergone repeated rigorous study in relevant settings, prove futile when rigidly applied in this case. Given that reality, it would be pointless to reject existing findings outright as the critics would prefer. Rather, we should push the bounds of prevailing standards at least for the time being and accept what these studies offer in suggesting specific reasons why single-sex programs are worthy of consideration.

Although some of the research is now somewhat dated and begs for replication, several recent large-scale and statistically controlled studies in particular have generated especially promising results. Added to this is a growing body of case studies and anecdotal reports from public schools in the United States pointing to certain benefits to be gained from various forms of separate classes or schools. Again, while the findings are merely suggestive, they are nonetheless instructive.

There is some indication that single-sex classes may develop greater self-confidence and broader interests especially among adolescents. Girls report that they are more comfortable in single-sex math and science classes, that they interact more with their teachers, that they develop more favorable attitudes toward these subjects, that they are less self-conscious about asking questions and participating in cooperative learning groups, and that they enter upper level coed classes with greater confidence and willingness to take risks even in non-related subjects.[\[52\]](#) We can reasonably speculate that examined over time, these changed attitudes may lead to more advanced course taking and ultimately broader career options. As already noted, there is further evidence that both girls and boys may benefit academically from collaborative learning in same-sex groupings.

There is, in fact, evidence from abroad that single-sex schools increase both interest and course-taking not only in math, science, and technology among girls but also in language arts and foreign languages among boys, academic subjects traditionally less favored by them.[\[53\]](#) A recent study of graduates of all male schools in the

United States confirms these findings. Here single-sex schooling promoted interest in the humanities (English and history), and that interest was reflected in college major and career choices. On the other hand, graduates of coed schools were more likely to major in business than their peers from all male schools.[\[54\]](#) Aside from attitudinal and more long-range effects, findings further suggest that single-sex schooling more immediately may improve academic performance and achievement. Several small experimental programs for disadvantaged minority boys, with male teachers as role models, have reported increased attendance and improved performance in reading and math.[\[55\]](#) Recent large-scale studies from other English speaking countries have yielded similarly positive academic results.[\[56\]](#) And finally there is a growing body of empirical data and anecdotal evidence supporting earlier findings that disadvantaged

students in particular may reap significant academic and social benefits from single-sex schools and classes.[\[57\]](#)

Single-sex schools provide the added possibility for students to engage in the full assortment of extra-curricular activities beyond those typically identified with one sex or the other. Educators report that girls enjoy more leadership opportunities in political and debate clubs while boys are more likely to join the drama club, the choir, the literary magazine, and community service clubs – activities that girls often dominate in coed settings.[\[58\]](#) Perhaps these findings may be at least partially a function of social class. Comparisons typically are made among elite private schools where male students are more apt to be high achievers and drawn to traditionally male activities. The picture within the more general student population may be different. Reports in the popular press, in fact, indicate that girls now dominate student government positions and receive the lion's share of academic awards in many secondary schools.[\[59\]](#)

Nonetheless, regardless of the context – whether rich, middle-class, or poor – it appears that boys in coeducational schools may not engage in the full range of extra-curricular activities. At the high socio-economic and academic end, socially determined interests reinforced by male role models in their lives lock them into conventionally male-gendered activities while at the low end, similarly powerful but different social pressures completely lock them out. If that is so, then perhaps boys across the socio-economic/academic spectrum, as well as girls at the high end, can benefit from the expanded leadership and participation opportunities provided in single-sex schools. At the same time, while females at the low end theoretically enjoy these benefits by male default, they cannot fill that void without the necessary academic identification and motivation. And so they too may have much to gain from the intense academic focus of single-sex schools.

CHARTING A RESEARCH AGENDA ON OUTCOMES

In an ideal world, research and educational reform work in a synergistic pattern, each one advancing in alternating steps with the other. Research findings precede broad scale policy decisions and progressively fine-tune educational practice. Unfortunately, the educational world is not ideal, and at times reform outstrips research. Single-sex schooling is a clear case on point. As already noted, findings to date are concededly inconclusive and merely suggestive. Nonetheless, considered in the aggregate, together with other developmental and social evidence, studies comparing single-sex and coeducation provide useful direction to educators as they initially consider justifications and define goals. Yet this combined body of programmatic, developmental, and social science data is also at least equally informative on the far side of the process, providing a rudimentary road map for researchers to explore and selectively follow in charting a broad and varied research agenda specifically to measure outcomes.

Some of the key studies from other settings beg for replication. But researchers should also formulate new questions that reflect contemporary understandings of teaching and learning as well as the gender gaps favoring girls or boys and how they intersect with race and class. They should consider a range of short- and long-term outcomes beyond the bottom line of school performance and achievement, including changed attitudes and course selection patterns, as well as immediate effects on disciplinary problems, pregnancy, suspension, and dropout rates, and long-range effects on college enrollment and career choices. They also should examine the impact of single-sex versus coeducation on socialization factors including attitudes toward the other sex. It is crucial to consider whether single-sex programs reinforce or dissipate gender stereotypes.

Researchers should further explore the effects of single-sex schools and classes on girls and boys across the grades from elementary through middle and high school, in rural, suburban, and urban contexts, and across socio-economic, racial, and ethnic categories. It could be that the effects, for girls or boys, may vary dramatically among affluent, working-class, and disadvantaged communities. An important question to consider is whether inner-city minority students gain the greatest benefits from the approach as the research suggests. If so, is this a matter more of poverty and/or race than of gender? Or does it lie at the juncture of

all three factors? Would poor white students in rural areas gain similar benefits? What is the effect on various immigrant populations?

There may be specific age levels at which single-sex programs are particularly effective. Perhaps the early grades are more significant for boys whose slower maturation and verbal development as a group initially set at least some of them at a disadvantage relative to girls. On the other hand, the middle grades and secondary school might prove more salient for girls. Pre-adolescence appears to be the time when, for many girls, achievement in math and science declines and social pressures begin to weigh more heavily upon them.

Various approaches should be studied, including single-sex classes in math, science, technology, foreign languages, and language arts in coeducational schools, as well as completely separate schools for girls or boys and dual academies where both sexes are educated in the same facility but in separate classrooms. Numerous questions could be examined. Do single-sex schools or classes break down the gender polarization of course selection and ultimately career choices? Even if achievement test scores and school grades do not improve, does single-sex programming improve students' attitudes and interests in certain courses considered non-traditional for each sex? Are boys educated in all male schools more likely to enroll in advanced foreign language and English classes? Are girls in all female schools more apt to take advanced science and math? Do single-sex schools have a greater impact on achievement than single-sex classes? Perhaps the total separateness of the single-sex school is a critical factor in improving academic performance. Do dual academies effectively combine the best of single-sex and coeducation or do they lend themselves to other problems? Are teachers who teach girls and boys separately within the same school more apt to engage in sex stereotyping? Do girls and boys respond differently to different models? Is the overall impact more significant for girls than for boys?

There should be an attempt at gathering not just quantitative but also qualitative data to develop a clearer sense of educational process along with outputs. We need to learn more about what goes on in single-sex as compared with coeducational classrooms to more fully understand not only whether these programs do achieve their targeted performance, achievement, and attitudinal goals, but also how and why they do so. To that end, researchers should examine curriculum content, teaching styles, classroom interaction among students and between students and teachers, overall classroom and school climate and organization, and other institutional factors that may influence specific student outcomes.

Do boys continue to dominate the "linguistic space" of coeducational classrooms? Is that behavior more pronounced in particular groupings or in particular subjects historically considered male such as math and science? Do girls dominate discussion in English, foreign language, and art classes? Does one sex learn more effectively or participate more actively than the other in either single-sex or mixed-sex collaborative or competitive settings? Does it depend on which sex is numerically dominant? Or does it depend more on the subject matter? Is verbal interaction consistent across racial and socio-economic groups? At the same time, program evaluators in particular should consider such tangible features as resource allocation, facilities, course offerings, curriculum content, instructional materials, extra-curricular activities, counseling and college advisement, as well as classroom dynamics in order to assess whether gender equity principles are undermined or preserved.

Obviously what I am proposing here is a broad and ambitious research agenda. The possibilities are limitless. But, as with life, the absence of limits creates both opportunities and challenges. The wider the research net is cast, the more aspects explored but the thinner the findings on any particular question. This is not pure science, and that inherent deficiency will cause discomfort among hard-core methodologists and even deter some from taking on the task from the start. Given the limited number of such programs, sample sizes inevitably will be small. An equally significant reality is that research on single-sex programs cannot use randomized sampling, the "gold standard" of scientific research. These programs, as a matter of policy and law, must remain voluntary; federal law prohibits the assignment of students to schools on the basis of sex.^[60] Those limits implicitly extend to single-sex classes.

As such, single-sex schools and classes arguably represent a “pro-academic” choice on the part of students and their parents. That constraint clearly undercuts the decided direction of current federal research initiatives. More importantly, it maintains as a given the problem of pre-selection bias. When comparing the results of single-sex and coeducational schools and classes, how can we be certain that the outcomes we find are due to program or school organization itself and not to student background differences such as preparation and motivation; or family education, resources, and involvement; or school, teacher, and classroom related factors? Aside from statistical controls, one possible way to resolve this dilemma is to select students randomly from among volunteers, placing the remaining volunteers in a control coeducational group. Yet parents may insist on a particular placement. Besides, the large data sets that researchers prefer still will be lacking. Research will have to proceed on the micro and not the macro level with inferences drawn from aggregated findings across numerous small studies examining narrowly defined indicators of educational success and social adjustment.

Nonetheless, despite all these limitations and caveats, researchers should eagerly seize this long-overdue opportunity to shed light on an approach that may help to resolve some of the most intractable educational and social problems facing girls and boys and particularly those whom conventional methods historically have failed. The time is ripe and the necessary elements are in place for carefully considered and measured research studies. There exist a small but growing number of programs using a variety of approaches. Yet they are not so deeply entrenched that program organizers and administrators are resistant to contributing to the information base. In fact, they seem to understand that there is still much to be learned and appear eager to engage in well-intentioned and open dialogue. Meanwhile, they themselves can facilitate the process of assessment by clearly articulating their underlying rationales and specific programmatic goals at the outset and by making sure that the curriculum and school environment are geared toward meeting those goals while at the same time preserving gender equity principles.

It is also crucial that researchers, for their part, maintain their objectivity in the face of this politically charged controversy and remain mindful that this is all about children and not ideology. As gender equity advocates and others rush to explore the barely charted territory of single-sex schooling in its new incarnation, they must do so with an open and objective mind. They must resist the temptation to compare single-sex education with all its flaws to an idealized notion of coeducation. Given the high level of skepticism and virulent opposition these programs have generated, there is the danger of slipping into a game of “gotcha,” holding these programs to an unreasonable and unreachable standard to justify their continued existence. With legal presumptions and political pressure working against them, there is also the danger of demanding too much too soon from research findings. Single-sex schooling in its contemporary form is still a work-in-progress.

Meanwhile, policymakers and educators must exercise caution in interpreting results. The task of evaluating and assessing the success of single-sex programming will not yield quick and certain answers. This is a long-term and complex project with more aspects to be explored than we probably now can envision. As such, it demands ongoing fine-tuning as research and practice continuously inform each other. And finally, as with other innovative approaches, the federal government should allocate funds over a sustained period of time to support program planning, staff development, research, and dissemination. A recently initiated two-year study of public single-sex schools in the

United States, funded by the Department of Education, is an important step in that direction.[\[61\]](#)

Most importantly, we must understand from the beginning that even a well-financed and carefully designed research effort, and especially one that raises so many complex and interlocking questions, will never yield definitive results in favor of single-sex schooling or coeducation. That simply is not the way educational research works. The still unresolved debates over bilingual education, Head Start, and class size, despite decades of publicly and privately supported research, are clear examples.[\[62\]](#) Yet we must remain mindful that inconclusivity is not negativity.

CONCLUSION

Despite a seeming research conundrum, the various pronouncements emanating from Washington that bear on single-sex schooling are conceivably reconcilable given certain adjustments in methodological expectations to accommodate this dramatic change in federal education policy. The key factor is to understand fully the potential for research, broadly defined, and the critical role it can play in providing initial justifications and ongoing direction as the approach emerges from the shadows of legal ambiguity and gains increasing appeal especially in urban areas. It is important at the outset that educators thoughtfully consider their decision to separate girls and boys and that they articulate clear rationales and defined goals based in what we now know and continue to learn about gender, child development, and the distinct problems of underprivileged students. At the same time, researchers should look to a wide range of cognitive and social indicators to measure the success of various program models. Gradually, findings will start stacking up and provide useful feedback to educators in addressing the needs of different populations of girls and boys at different stages in their schooling, whether in single-sex or coeducational settings.

It remains to be seen whether, at some point, these insights will become sufficiently pointed, consistent, and compelling to resolve the current debate or to push public sentiment decidedly in either direction. Meanwhile, those engaged in exploring the approach, from planning through implementation and evaluation must keep their eye on the total picture and understand how research is the common thread that ties together all the necessary elements.

Notes

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May 8, 2002), 31102-03.

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[13] *Bray v. Lee*, 337 F. Supp. 934 (D.

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[17] 20 U.S.C. § 1681 (2004); 34 C.F.R. § 106.34 (2004).

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March 9, 2004), 11276-85 (to be codified at 34 C.F.R. Part 106), at 11285.

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[21] *Federal Register*, 69, 46 (

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[60] *Equal Educational Opportunities Act of 1974*, 20 U.S.C. §§ 1703(c), 1705, 1720 (c) (2004).

[61] Michelle R. Davis, "Federal Study Examining Single-Sex Public Schools," *Education Week*, March 24, 2004 , 24.

[62] See Timothy A. Hacsí, *Children as Pawns: The Politics of Educational Reform* (Cambridge : Harvard University Press, 2002).

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