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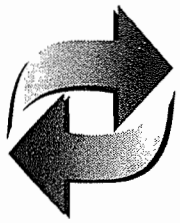

Is There a Crisis in the Education of Boys?

YES: Michael Gurian and Kathy Stevens, from "With Boys and Girls in Mind," *Educational Leadership* (November 2004)

NO: Sara Mead, from "The Truth About Boys and Girls," An Education Sector Report (June 2006)

ISSUE SUMMARY

YES: Michael Gurian and Kathy Stevens, researchers in gender differences and brain-based learning at the Gurian Institute, contend that our schools, structurally and functionally, do not fulfill gender-specific needs and that this is particularly harmful to boys.

NO: Sara Mead, a senior policy analyst at Education Sector in Washington, D.C., assembles long-term data from the federally sponsored National Assessment of Educational Progress to show that the "crisis" emphasis is unwarranted and detracts from broader social justice issues.

The importance of gender in the process of education has permeated professional discourse for quite a few years. Stereotyping, which often begins in the home and is heavily reinforced in the commercial realm (pink for girls, blue for boys; dolls for girls, guns for boys), typically continues during the years of schooling. Boys and girls have been steered toward certain areas of the curriculum and have been prompted to follow certain career paths. Individual teachers are often guilty of gender bias and often fail to see beyond the stereotypes and biases to recognize their effects on the aspirations and achievements of the learner.

In the early 1990s, the spotlight was clearly on the female gender. The 1992 report issued by the American Association of University Women (AAUW), *How Schools Shortchange Girls,* called for reforms and legislative action to reverse prevailing patterns of discrimination and to bolster the self-esteem of girls and increase the breadth and depth of their vocational and professional aspirations. Many of the findings of the AAUW report were given support in research-based books such as Myra and David Sadkers' *Failing at*

Fairness: How America's Schools Cheat Girls and Judy Mann's *The Difference: Growing up Female in America.* The Sadkers' research revealed vastly different gender expectations on the part of teachers, leading to great differences in the way they interact with male and female students, with most of the negative effects being felt by girls.

There was a backlash against this campaign by those who saw it as part of the wider feminist movement and who questioned the need for more gender equity legislation. Diane Ravitch, then U.S. assistant secretary of education, contended that great strides had already been made in the previous quarter-century to redress historical patterns of discrimination that squelched female opportunity. A further turn was taken in 2000 by Christina Hoff Sommers in her book *The War against Boys: How Misguided Feminism Is Harming Our Young Men.* In that work, she declared that the research supporting claims of male privilege is riddled with errors, that in actuality boys are on the weak side of the education gender gap. The typical boy, Sommers claimed, is behind the typical girl in reading and writing, is less committed to school, and is less likely to go to college.

Greater specificity in the concern about boys was brought to public and professional attention by Michael Gurian and fellow brain researchers at the Gurian Institute who published their findings in *The Wonder of Boys, Boys and Girls Learn Differently,* and *The Minds of Boys.* In his article "Learning and Gender," *American School Board Journal* (October 2006), Gurian claims that boys make up about 90 percent of discipline referrals, 70 percent of learning disabled children, and at least 66 percent of children on behavioral medication. They receive two-thirds of the Ds and Fs, and on average are a year-and-a-half behind girls in literacy skills. Earlier in 2006, *Newsweek* featured a cover story on "The Boy Crisis," claiming that at every level of schooling, they are falling behind. The Gurian Institute has enrolled some 15,000 educators in its seminars on brain-based strategies, and a representative of the Gates Foundation has declared that "helping underperforming boys has become part of our core mission." Not everyone has jumped on the bandwagon, however. In "The Myth of 'The Boy Crisis'" in *The Washington Post* (April 9, 2006), Caryl Rivers and Rosalind Chait Barnett take the position that "obsessing about a boy crisis or thinking that American teachers are waging a war on boys" is not helpful.

In the following articles, Michael Gurian and Kathy Stevens present their case for "boy-friendly" classrooms, while Sara Mead counters with evidence that gender is not the crucial factor.

YES

Michael Gurian and Kathy Stevens

With Boys and Girls in Mind

Something is awry in the way our culture handles the education needs of boys and girls. A smart 11-year-old boy gets low grades in school, fidgets and drifts off in class, and doesn't do his homework. A girl in middle school only uses the computer to instant-message her friends; when it comes to mastering more essential computer skills, she defers to the boys in the class.

Is contemporary education maliciously set against either males or females? We don't think so. But structurally and functionally, our schools fail to recognize and fulfill gender-specific needs. As one teacher wrote,

> For years I sensed that the girls and boys in my classrooms learn in gender-specific ways, but I didn't know enough to help each student reach full potential. I was trained in the idea that each student is an individual. But when I saw the PET scans of boys' and girls' brains, I saw how differently those brains are set up to learn. This gave me the missing component. I trained in male/female brain differences and was able to teach each individual child. Now, looking back, I'm amazed that teachers were never taught the differences between how girls and boys learn.

New positron emission tomography (PET) and MRI technologies enable us to look inside the brains of boys and girls, where we find structural and functional differences that profoundly affect human learning. These gender differences in the brain are corroborated in males and females throughout the world and do not differ significantly across cultures.

It's true that culture affects gender role, gender costume, and gender nuances—in Italy, for example, men cry more than they do in England—but role, costume, and nuance only affect some aspects of the learning brain of a child. New brain imaging technologies confirm that genetically templated brain patterning by gender plays a far larger role than we realized. Research into gender and education reveals a mismatch between many of our boys' and girls' learning brains and the institutions empowered to teach our children.

We will briefly explore some of the differences, because recognizing these differences can help us find solutions to many of the challenges that we experience in the classroom. Of course, generalized gender differences may not apply in every case.

From *Educational Leadership*, November 2004, pp. 21–26.

The Minds of Girls

The following are some of the characteristics of girls' brains:

- A girl's corpus callosum (the connecting bundle of tissues between hemispheres) is, on average, larger than a boy's—up to 25 percent larger by adolescence. This enables more "cross talk" between hemispheres in the female brain.
- Girls have, in general, stronger neural connectors in their temporal lobes than boys have. These connectors lead to more sensually detailed memory storage, better listening skills, and better discrimination among the various tones of voice. This leads, among other things, to greater use of detail in writing assignments.
- The hippocampus (another memory storage area in the brain) is larger in girls than in boys, increasing girls' learning advantage, especially in the language arts.
- Girls' prefrontal cortex is generally more active than boys' and develops at earlier ages. For this reason, girls tend to make fewer impulsive decisions than boys do. Further, girls have more serotonin in the bloodstream and the brain, which makes them biochemically less impulsive.
- Girls generally use more cortical areas of their brains for verbal and emotive functioning. Boys tend to use more cortical areas of the brain for spatial and mechanical functioning (Moir & Jessel, 1989; Rich, 2000).

These "girl" brain qualities are the tip of the iceberg, yet they can immediately help teachers and parents understand why girls generally outperform boys in reading and writing from early childhood throughout life (Conlin, 2003). With more cortical areas devoted to verbal functioning, sensual memory, sitting still, listening, tonality, and mental cross talk, the complexities of reading and writing come easier, on the whole, to the female brain. In addition, the female brain experiences approximately 15 percent more blood flow, with this flow located in more centers of the brain at any given time (Marano, 2003). The female brain tends to drive itself toward stimulants—like reading and writing—that involve complex texture, tonality, and mental activity.

On the other hand, because so many cortical areas are used for verbal-emotive functioning, the female brain does not activate as many cortical areas as the male's does for abstract and physical-spatial functions, such as watching and manipulating objects that move through physical space and understanding abstract mechanical concepts (Moir & Jessel, 1989; Rich, 2000). This is one reason for many girls' discomfort with deep computer design language. Although some girls excel in these areas, more males than females gravitate toward physics, industrial engineering, and architecture. Children naturally gravitate toward activities that their brains experience as pleasurable—"pleasure" meaning in neural terms the richest personal stimulation. Girls and boys, within each neural web, tend to experience the richest personal stimulation somewhat differently.

The biological tendency toward female verbal-emotive functioning does not mean that girls or women should be left out of classes or careers that use spatial-mechanical skills. On the contrary: We raise these issues to call on our

civilization to realize the differing natures of girls and boys and to teach each subject according to how the child's brain needs to learn it. On average, educators will need to provide girls with extra encouragement and gender-specific strategies to successfully engage them in spatial abstracts, including computer design.

The Minds of Boys

What, then, are some of the qualities that are generally more characteristic of boys' brains?

- Because boys' brains have more cortical areas dedicated to spatial-mechanical functioning, males use, on average, half the brain space that females use for verbal-emotive functioning. The cortical trend toward spatial-mechanical functioning makes many boys want to move objects through space, like balls, model airplanes, or just their arms and legs. Most boys, although not all of them, will experience words and feelings differently than girls do (Blum, 1997; Moir & Jessel, 1989).
- Boys not only have less serotonin than girls have, but they also have less oxytocin, the primary human bonding chemical. This makes it more likely that they will be physically impulsive and less likely that they will neurally combat their natural impulsiveness to sit still and empathically chat with a friend (Moir & Jessel, 1989; Taylor, 2002).
- Boys lateralize brain activity. Their brains not only operate with less blood flow than girls' brains, but they are also structured to compartmentalize learning. Thus, girls tend to multitask better than boys do, with fewer attention span problems and greater ability to make quick transitions between lessons (Havers, 1995).
- The male brain is set to renew, recharge, and reorient itself by entering what neurologists call a *rest state*. The boy in the back of the classroom whose eyes are drifting toward sleep has entered a neural rest state. It is predominantly boys who drift off without completing assignments, who stop taking notes and fall asleep during a lecture, or who tap pencils or otherwise fidget in hopes of keeping themselves awake and learning. Females tend to recharge and reorient neural focus without rest states. Thus, a girl can be bored with a lesson, but she will nonetheless keep her eyes open, take notes, and perform relatively well. This is especially true when the teacher uses more words to teach a lesson instead of being spatial and diagrammatic. The more words a teacher uses, the more likely boys are to "zone out," or go into rest state. The male brain is better suited for symbols, abstractions, diagrams, pictures, and objects moving through space than for the monotony of words (Gurian, 2001).

These typical "boy" qualities in the brain help illustrate why boys generally learn higher math and physics more easily than most girls do when those subjects are taught abstractly on the chalkboard; why more boys than girls play video games that involve physical movement and even physical destruction; and why more boys than girls tend to get in trouble for impulsiveness,

shows of boredom, and fidgeting as well as for their more generalized inability to listen, fulfill assignments, and learn in the verbal-emotive world of the contemporary classroom.

Who's Failing?

For a number of decades, most of our cultural sensitivity to issues of gender and learning came from advocacy groups that pointed out ways in which girls struggled in school. When David and Myra Sadker teamed with the American Association of University Women in the early 1990s, they found that girls were not called on as much as boys were, especially in middle school; that girls generally lagged in math/science testing; that boys dominated athletics; and that girls suffered drops in self-esteem as they entered middle and high school (AAUW, 1992). In large part because of this advocacy, our culture is attending to the issues that girls face in education.

At the same time, most teachers, parents, and other professionals involved in education know that it is mainly our boys who underperform in school. Since 1981, when the U.S. Department of Education began keeping complete statistics, we have seen that boys lag behind girls in most categories. The 2000 National Assessment of Educational Progress finds boys one and one-half years behind girls in reading/writing (National Center for Education Statistics, 2000). Girls are now only negligibly behind boys in math and science, areas in which boys have historically outperformed girls (Conlin, 2003).

Our boys are now losing frightening ground in school, and we must come to terms with it—not in a way that robs girls, but in a way that sustains our civilization and is as powerful as the lobby we have created to help girls. The following statistics for the United States illustrate these concerns:

- Boys earn 70 percent of *D*s and *F*s and fewer than half of the *A*s.
- Boys account for two-thirds of learning disability diagnoses.
- Boys represent 90 percent of discipline referrals.
- Boys dominate such brain-related learning disorders as ADD/ADHD, with millions now medicated in schools.
- 80 percent of high school dropouts are male.
- Males make up fewer than 40 percent of college students (Gurian, 2001).

These statistics hold true around the world. The Organisation for Economic Co-operation and Development (OECD) recently released its three-year study of knowledge and skills of males and females in 35 industrialized countries (including the United States, Canada, the European countries, Australia, and Japan). Girls outperformed boys in every country. The statistics that brought the male scores down most significantly were their reading/writing scores.

We have nearly closed the math/science gender gap in education for girls by using more verbal functioning—reading and written analysis—to teach such spatial-mechanical subjects as math, science, and computer science (Rubin, 2004; Sommers, 2000). We now need a new movement to alter classrooms to

better suit boys' learning patterns if we are to deal with the gaps in grades, discipline, and reading/writing that threaten to close many boys out of college and out of success in life.

The Nature-Based Approach

In 1996, the Gurian Institute, an organization that administers training in child development, education, and male/female brain differences, coined the phrase *nature-based approach* to call attention to the importance of basing human attachment and education strategies on research-driven biological understanding of human learning. We argued that to broadly base education and other social processes on anything other than human nature was to set up both girls and boys for unnecessary failure. The institute became especially interested in nature-based approaches to education when PET scans and MRIs of boys and girls revealed brains that were trying to learn similar lessons but in widely different ways and with varying success depending on the teaching method used. It became apparent that if teachers were trained in the differences in learning styles between boys and girls, they could profoundly improve education for all students.

Between 1998 and 2000, a pilot program at the University of Missouri–Kansas City involving gender training in six school districts elicited significant results. One school involved in the training, Edison Elementary, had previously tested at the bottom of 18 district elementary schools. Following gender training, it tested in the top five slots, sometimes coming in first or second. Statewide, Edison outscored schools in every subject area, sometimes doubling and tripling the number of students in top achievement levels. Instead of the usual large number of students at the bottom end of achievement testing, Edison now had only two students requiring state-mandated retesting. The school also experienced a drastic reduction in discipline problems.

Statewide training in Alabama has resulted in improved performance for boys in both academic and behavioral areas. Beaumont Middle School in Lexington, Kentucky, trains its teachers in male/female brain differences and teaches reading/writing, math, and science in separate-sex classrooms. After one year of this gender-specific experiment, girls' math and science scores and boys' Scholastic Reading Inventory (SRI) scores rose significantly.

The Nature-Based Classroom

Ultimately, teacher training in how the brain learns and how boys and girls tend to learn differently creates the will and intuition in teachers and schools to create nature-based classrooms (see "Teaching Boys, Teaching Girls" for specific strategies). In an elementary classroom designed to help boys learn, tables and chairs are arranged to provide ample space for each child to spread out and claim learning space. Boys tend to need more physical learning space than girls do. At a table, a boy's materials will be less organized and more widely dispersed. Best practice would suggest having a variety of seating

options—some desks, some tables, an easy chair, and a rug area for sitting or lying on the floor. Such a classroom would allow for more movement and noise than a traditional classroom would. Even small amounts of movement can help some boys stay focused.

The teacher can use the blocks area to help boys expand their verbal skills. As the boys are building, a teacher might ask them to describe their buildings. Because of greater blood flow in the cerebellum—the "doing" center of the human brain—boys more easily verbalize what they are doing than what they are feeling. Their language will be richer in vocabulary and more expansive when they are engaged in a task.

An elementary classroom designed to help girls learn will provide lots of opportunities for girls to manipulate objects, build, design, and calculate, thus preparing them for the more rigorous spatial challenges that they will face in higher-level math and science courses. These classrooms will set up spatial lessons in groups that encourage discussion among learners.

Boys and Feelings

An assistant principal at a Tampa, Florida, elementary school shared a story of a boy she called "the bolter." The little boy would regularly blow up in class, then bolt out of the room and out of the school. The assistant principal would chase him and get him back into the building. The boy lacked the verbal-emotive abilities to help him cope with his feelings.

After attending male/female brain difference training, the assistant principal decided to try a new tactic. The next time the boy bolted, she took a ball with her when she went after him. When she found the boy outside, she asked him to bounce the ball back and forth with her. Reluctant at first, the boy started bouncing the ball. Before long, he was talking, then sharing the anger and frustration that he was experiencing at school and at home. He calmed down and went back to class. Within a week, the boy was able to self-regulate his behavior enough to tell his teacher that he needed to go to the office, where he and the assistant principal would do their "ball routine" and talk. Because he was doing something spatial-mechanical, the boy was more able to access hidden feelings.

Girls and Computers

The InterCept program in Colorado Springs, Colorado, is a female-specific teen mentor-training program that works with girls in grades 8–12 who have been identified as at risk for school failure, juvenile delinquency, and teen pregnancy. InterCept staff members use their knowledge of female brain functioning to implement program curriculum. Brittany, 17, came to the InterCept program with a multitude of issues, many of them involving at-risk behavior and school failure.

One of the key components of InterCept is showing teenage girls the importance of becoming "tech-savvy." Girls use a computer-based program to

consider future occupations: They can choose a career, determine a salary, decide how much education or training their chosen career will require, and even use income projections to design their future lifestyles. Brittany quite literally found a future: She is entering a career in computer technology.

Teaching Boys, Teaching Girls

For Elementary Boys

- Use beadwork and other manipulatives to promote fine motor development. Boys are behind girls in this area when they start school.
- Place books on shelves all around the room so boys get used to their omnipresence.
- Make lessons experiential and kinesthetic.
- Keep verbal instructions to no more than one minute.
- Personalize the student's desk, coat rack, and cubby to increase his sense of attachment.
- Use male mentors and role models, such as fathers, grandfathers, or other male volunteers.
- Let boys nurture one another through healthy aggression and direct empathy.

For Elementary Girls

- Play physical games to promote gross motor skills. Girls are behind boys in this area when they start school.
- Have portable/digital cameras around and take pictures of girls being successful at tasks.
- Use water and sand tables to promote science in a spatial venue.
- Use lots of puzzles to foster perceptual learning.
- Form working groups and teams to promote leadership roles and negotiation skills.
- Use manipulatives to teach math.
- Verbally encourage the hidden high energy of the quieter girls.

The Task Ahead

As educators, we've been somewhat intimidated in recent years by the complex nature of gender. Fortunately, we now have the PET and MRI technologies to view the brains of boys and girls. We now have the science to prove our intuition that tells us that boys and girls do indeed learn differently. And, even more powerful, we have a number of years of successful data that can help us effectively teach both boys and girls.

The task before us is to more deeply understand the gendered brains of our children. Then comes the practical application, with its sense of purpose and productivity, as we help each child learn from within his or her own mind.

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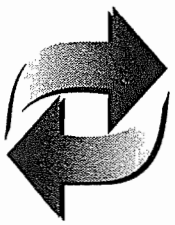

Sara Mead

NO

The Truth about Boys and Girls

If you've been paying attention to the education news lately, you know that American boys are in crisis. After decades spent worrying about how schools "shortchange girls," the eyes of the nation's education commentariat are now fixed on how they shortchange boys. In 2006 alone, a *Newsweek* cover story, a major *New Republic* article, a long article in *Esquire*, a "Today" show segment, and numerous op-eds have informed the public that boys are falling behind girls in elementary and secondary school and are increasingly outnumbered on college campuses. A young man in Massachusetts filed a civil rights complaint with the U.S. Department of Education, arguing that his high school's homework and community service requirements discriminate against boys. A growth industry of experts is advising educators and policymakers how to make schools more "boy friendly" in an effort to reverse this slide.

It's a compelling story that seizes public attention with its "man bites dog" characteristics. It touches on Americans' deepest insecurities, ambivalences, and fears about changing gender roles and the "battle of the sexes." It troubles not only parents of boys, who fear their sons are falling behind, but also parents of girls, who fear boys' academic deficits will undermine their daughters' chances of finding suitable mates.

But the truth is far different from what these accounts suggest. The real story is not bad news about boys doing worse; it's good news about girls doing better.

In fact, with a few exceptions, American boys are scoring higher and achieving more than they ever have before. But girls have just improved their performance on some measures even faster. As a result, girls have narrowed or even closed some academic gaps that previously favored boys, while other long-standing gaps that favored girls have widened, leading to the belief that boys are falling behind.

There's no doubt that some groups of boys—particularly Hispanic and black boys and boys from low-income homes—are in real trouble. But the predominant issues for them are race and class, not gender. Closing racial and economic gaps would help poor and minority boys more than closing gender gaps, and focusing on gender gaps may distract attention from the bigger problems facing these youngsters.

The hysteria about boys is partly a matter of perspective. While most of society has finally embraced the idea of equality for women, the idea that women might actually surpass men in some areas (even as they remain behind

in others) seems hard for many people to swallow. Thus, boys are routinely characterized as "falling behind" even as they improve in absolute terms.

In addition, a dizzying array of so-called experts have seized on the boy crisis as a way to draw attention to their pet educational, cultural, or ideological issues. Some say that contemporary classrooms are too structured, suppressing boys' energetic natures and tendency to physical expression; others contend that boys need more structure and discipline in school. Some blame "misguided feminism" for boys' difficulties, while others argue that "myths" of masculinity have a crippling impact on boys. Many of these theories have superficially plausible rationales that make them appealing to some parents, educators, and policymakers. But the evidence suggests that many of these ideas come up short.

Unfortunately, the current boy crisis hype and the debate around it are based more on hopes and fears than on evidence. This debate benefits neither boys nor girls, while distracting attention from more serious educational problems—such as large racial and economic achievement gaps—and practical ways to help both boys and girls succeed in school.

A New Crisis?

"The Boy Crisis. At every level of education, they're falling behind. What to do?"

—*Newsweek* cover headline, Jan. 30, 2006

Newsweek is not the only media outlet publishing stories that suggest boys' academic accomplishments and life opportunities are declining. But it's not true. Neither the facts reported in these articles nor data from other sources support the notion that boys' academic performance is falling. In fact, overall academic achievement and attainment for boys is higher than it has ever been.

Long-Term Trends

Looking at student achievement and how it has changed over time can be complicated. Most test scores have little meaning themselves; what matters is what scores tell us about how a group of students is doing relative to something else: an established definition of what students need to know, how this group of students performed in the past, or how other groups of students are performing. Further, most of the tests used to assess student achievement are relatively new, and others have changed over time, leaving relatively few constant measures.

The National Assessment of Educational Progress (NAEP), commonly known as "The Nation's Report Card," is a widely respected test conducted by the U.S. Department of Education using a large, representative national sample of American students. NAEP is the only way to measure national trends in boys' and girls' academic achievements over long periods of time. There are two NAEP tests. The "main NAEP" has tracked U.S. students' performance in reading, math, and other academic subjects since the early 1990s. It tests students in

grades four, eight, and 12. The "long-term trend NAEP" has tracked student performance since the early 1970s. It tests students at ages 9, 13, and 17.

Reading

The most recent main NAEP assessment in reading, administered in 2005, does not support the notion that boys' academic achievement is falling. In fact, fourth-grade boys did better than they had done in both the previous NAEP reading assessment, administered in 2003, and the earliest comparable assessment, administered in 1992. Scores for both fourth- and eighth-grade boys have gone up and down over the past decade, but results suggest that the reading skills of fourth- and eighth-grade boys have improved since 1992.

The picture is less clear for older boys. The 2003 and 2005 NAEP assessments included only fourth- and eighth-graders, so the most recent main NAEP data for 12th-graders dates back to 2002. On that assessment, 12th-grade boys did worse than they had in both the previous assessment, administered in 1998, and the first comparable assessment, administered in 1992. At the 12th-grade level, boys' achievement in reading does appear to have fallen during the 1990s and early 2000s.

Even if younger boys have improved their achievement over the past decade, however, this could represent a decline if boys' achievement had risen rapidly in previous decades. Some commentators have asserted that the boy crisis has its roots in the mid- or early-1980s. But long-term NAEP data simply does not support these claims. In fact, 9-year-old boys did better on the most recent long-term reading NAEP, in 2004, than they have at any time since the test was first administered in 1971. Nine-year-old boys' performance rose in the 1970s, declined in the 1980s, and has been rising since the early 1990s.

Like the main NAEP, the results for older boys on the long-term NAEP are more mixed. Thirteen-year-old boys have improved their performance slightly compared with 1971, but for the most part their performance over the past 30 years has been flat. Seventeen-year-old boys are doing about the same as they did in the early 1970s, but their performance has been declining since the late 1980s.

The main NAEP also shows that white boys score significantly better than black and Hispanic boys in reading at all grade levels. These differences far outweigh all changes in the overall performance of boys over time. For example, the difference between white and black boys on the fourth-grade NAEP in reading in 2005 was 10 times as great as the improvement for all boys on the same test since 1992.

And while academic performance for minority boys is often shockingly low, it's not getting worse. The average fourth-grade NAEP reading scores of black boys improved more from 1995 to 2005 than those of white and Hispanic boys or girls of any race.

Math

The picture for boys in math is less complicated. Boys of all ages and races are scoring as high—or higher—in math than ever before. From 1990 through 2005, boys in grades four and eight improved their performance steadily on

the main NAEP, and they scored significantly better on the 2005 NAEP than in any previous year. Twelfth-graders have not taken the main NAEP in math since 2000. That year, 12th-grade boys did better than they had in 1990 and 1992, but worse than they had in 1996.

Both 9- and 13-year-old boys improved gradually on the long-term NAEP since the 1980s (9-year-old boys' math performance did not improve in the 1970s). Seventeen-year-old boys' performance declined through the 1970s, rose in the 1980s, and remained relatively steady during the late 1990s and early 2000s. As in reading, white boys score much better on the main NAEP in math than do black and Hispanic boys, but all three groups of boys are improving their math performance in the elementary and middle school grades.

Other Subjects

In addition to the main and long-term NAEP assessments in reading and math, the NAEP also administers assessments in civics, geography, science, U.S. history, and writing. The civics assessment has not been administered since 1998, but the geography and U.S. history assessments were both administered in 1994 and 2001; the writing assessment in 1998 and 2002; and the science assessment in 1996, 2000, and 2005.

In geography, there was no significant change in boys' achievement at any grade level from 1994 to 2001. In U.S. history, fourth- and eighth-grade boys improved their achievement, but there was no significant change for 12th-grade boys. In writing, both fourth- and eighth-grade boys improved their achievement from 1998 to 2002, but 12th-grade boys' achievement declined. In science, fourth-grade boys' achievement in 2005 improved over their performance in both 1996 and 2000, eighth-grade boys showed no significant change in achievement, and 12th-grade boys' achievement declined since 1996.

Overall Long-Term Trends

A consistent trend emerges across these subjects: There have been no dramatic changes in the performance of boys in recent years, no evidence to indicate a boy crisis. Elementary-school-age boys are improving their performance; middle school boys are either improving their performance or showing little change, depending on the subject; and high school boys' achievement is declining in most subjects (although it may be improving in math). These trends seem to be consistent across all racial subgroups of boys, despite the fact that white boys perform much better on these tests than do black and Hispanic boys. Evidence of a decline in the performance of older boys is undoubtedly troubling. But the question to address is whether this is a problem for older boys or for older students generally. That can be best answered by looking at the flip side of the gender equation: achievement for girls.

The Difference Between Boys and Girls

To the extent that tales of declining boy performance are grounded in real data, they're usually framed as a decline relative to girls. That's because, as

described above, boy performance is generally staying the same or increasing in absolute terms.

But even relative to girls, the NAEP data for boys paints a complex picture. On the one hand, girls outperform boys in reading at all three grade levels assessed on the main NAEP. Gaps between girls and boys are smaller in fourth grade and get larger in eighth and 12th grades. Girls also outperform boys in writing at all grade levels.

In math, boys outperform girls at all grade levels, but only by a very small amount. Boys also outperform girls—again, very slightly—in science and by a slightly larger margin in geography. There are no significant gaps between male and female achievement on the NAEP in U.S. history. In general, girls outperform boys in reading and writing by greater margins than boys outperform girls in math, science, and geography.

But this is nothing new. Girls have scored better than boys in reading for as long as the long-term NAEP has been administered. And younger boys are actually catching up: The gap between boys and girls at age 9 has narrowed significantly since 1971—from 13 points to five points—even as both genders have significantly improved. Boy-girl gaps at age 13 haven't changed much since 1971—and neither has boys' or girls' achievement.

At age 17, gaps between boys and girls in reading are also not that much different from what they were in 1971, but they are significantly bigger than they were in the late 1980s, before achievement for both genders—and particularly boys—began to decline.

The picture in math is even murkier. On the first long-term NAEP assessment in 1973, 9- and 13-year-old girls actually scored better than boys in math, and they continued to do so throughout the 1970s. But as 9- and 13-year-olds of both genders improved their achievement in math during the 1980s and 1990s, boys *pulled ahead* of girls, opening up a small gender gap in math achievement that now favors boys. It's telling that even though younger boys are now doing better than girls on the long-term NAEP in math, when they once lagged behind, no one is talking about the emergence of a new "girl crisis" in elementary- and middle-school math.

Seventeen-year-old boys have always scored better than girls on the long-term NAEP in math, but boys' scores declined slightly more than girls' scores in the 1970s, and girls' scores have risen slightly more than those of boys since. As a result, older boys' advantage over girls in math has narrowed.

Overall, there has been no radical or recent decline in boys' performance relative to girls. Nor is there a clear overall trend—boys score higher in some areas, girls in others.

The fact that achievement for older students is stagnant or declining for both boys and girls, to about the same degree, points to another important element of the boy crisis. The problem is most likely not that high schools need to be fixed to meet the needs of boys, but rather that they need to be fixed to meet the needs of *all* students, male and female. The need to accurately parse the influence of gender and other student categories is also acutely apparent when we examine the issues of race and income.

We Should Be Worried About Some Subgroups of Boys

There are groups of boys for whom "crisis" is not too strong a term. When racial and economic gaps combine with gender achievement gaps in reading, the result is disturbingly low achievement for poor, black, and Hispanic boys.

But the gaps between students of different races and classes are much larger than those for students of different genders—anywhere from two to five times as big, depending on the grade. The only exception is among 12th-grade boys, where the achievement gap between white girls and white boys in reading is the same size as the gap between white and black boys in reading and is larger than the gap between white and Hispanic boys. Overall, though, poor, black, and Hispanic boys would benefit far more from closing racial and economic achievement gaps than they would from closing gender gaps. While the gender gap picture is mixed, the racial gap picture is, unfortunately, clear across a wide range of academic subjects.

In addition to disadvantaged and minority boys, there are also reasons to be concerned about the substantial percentage of boys who have been diagnosed with disabilities. Boys make up two-thirds of students in special education—including 80 percent of those diagnosed with emotional disturbances or autism—and boys are two and a half times as likely as girls to be diagnosed with attention deficit hyperactivity disorder (ADHD). The number of boys diagnosed with disabilities or ADHD has exploded in the past 30 years, presenting a challenge for schools and causing concern for parents. But the reasons for this growth are complicated, a mix of educational, social, and biological factors. Evidence suggests that school and family factors—such as poor reading instruction, increased awareness of and testing for disabilities, or over-diagnosis—may play a role in the increased rates of boys diagnosed with learning disabilities or emotional disturbance. But boys also have a higher incidence of organic disabilities, such as autism and orthopedic impairments, for which scientists don't currently have a completely satisfactory explanation. Further, while girls are less likely than boys to be diagnosed with most disabilities, the number of girls with disabilities has also grown rapidly in recent decades, meaning that this is not just a boy issue. . . .

The Source of the Boy Crisis: A Knowledge Deficit and a Surplus of Opportunism

It's clear that some gender differences in education are real, and there are some groups of disadvantaged boys in desperate need of help. But it's also clear that boys' overall educational achievement and attainment are not in decline—in fact, they have never been better. What accounts for the recent hysteria?

It's partly an issue of simple novelty. The contours of disadvantage in education and society at large have been clear for a long time—low-income, minority, and female people consistently fall short of their affluent, white, and male peers. The idea that historically privileged boys could be at risk, that boys could be shortchanged, has simply proved too deliciously counterintuitive and "newsworthy" for newspaper and magazine editors to resist.

The so-called boy crisis also feeds on a lack of solid information. Although there are a host of statistics about how boys and girls perform in school, we actually know very little about why these differences exist or how important they are. There are many things—including biological, developmental, cultural, and educational factors—that affect how boys and girls do in school. But untangling these different influences is incredibly difficult. Research on the causes of gender differences is hobbled by the twin demons of educational research: lack of data and the difficulty of drawing causal connections among multiple, complex influences. Nor do we know what these differences mean for boys' and girls' future economic and other opportunities.

Yet this hasn't stopped a plethora of so-called experts—from pediatricians and philosophers to researchers and op-ed columnists—from weighing in with their views on the causes and likely effects of educational gender gaps. In fact, the lack of solid research evidence confirming or debunking any particular hypothesis has created fertile ground for all sorts of people to seize on the boy crisis to draw attention to their pet educational, cultural or ideological issues.

The problem, we are told, is that the structured traditional classroom doesn't accommodate boys' energetic nature and need for free motion—or it's that today's schools don't provide enough structure or discipline. It's that feminists have demonized typical boy behavior and focused educational resources on girls—or it's the "box" boys are placed in by our patriarchal society. It's that our schools' focus on collaborative learning fails to stimulate boys' natural competitiveness—or it's that the competitive pressures of standardized testing are pushing out the kind of relevant, hands-on work on which boys thrive.

The boy crisis offers a perfect opportunity for those seeking an excuse to advance ideological and educational agendas. Americans' continued ambivalence about evolving gender roles guarantees that stories of "boys in crisis" will capture public attention. The research base is internally contradictory, making it easy to find superficial support for a wide variety of explanations but difficult for the media and the public to evaluate the quality of evidence cited. Yet there is not sufficient evidence—or the right kind of evidence—available to draw firm conclusions. As a result, there is a sort of free market for theories about why boys are underperforming girls in school, with parents, educators, media, and the public choosing to give credence to the explanations that are the best marketed and that most appeal to their pre-existing preferences.

Unfortunately, this dynamic is not conducive to a thoughtful public debate about how boys and girls are doing in school or how to improve their performance.

Hard-Wired Inequality?

One branch of the debate over gender and education has focused on various theories of divergence between male and female brains. Men and women are "wired differently," people say, leading to all kinds of alleged problems and

disparities that must be addressed. There's undoubtedly some truth here. The difficulty is separating fact from supposition.

The quest to identify and explain differences between men's and women's mental abilities is as old as psychology itself. Although the earliest work in this genre began with the assumption that women were intellectually inferior to men, and sought both to prove and explain why this was the case, more recent and scientifically valid research also finds differences in men's and women's cognitive abilities, as well as in the physiology of their brains.

It's important to note that research does not find that one gender is smarter than the other—on average, men and women score the same on tests of general intelligence. But there are differences between men's and women's performance in different types of abilities measured by intelligence tests. In general, women have higher scores than men on most tests of verbal abilities (verbal analogies being an exception), while men have higher scores on tests of what psychologists call "visual-spatial" abilities—the ability to think in terms of nonverbal, symbolic information, measured through such tasks as the ability to place a horizontal line in a tilted frame or to identify what the image of an irregular object would look like if the object were rotated. Quantitative or mathematical abilities are more even, with men performing better on some types of problems—including probability, statistics, measurement and geometry—while women perform better on others, such as computation, and both genders perform equally well on still others.

Much of this research is based on studies with adults—particularly college students—but we know that gender differences in cognitive abilities vary with development. Differences in verbal abilities are among the first to appear; vocabulary differences, for example, are seen before children are even 2 years old, and by the time they enter kindergarten, girls are more likely than boys to know their letters and be able to associate letters with sounds. Male advantages in visual-spatial abilities emerge later in childhood and adolescence.

The research identifying these differences in male and female cognitive abilities does not explain their cause, however. There may be innate, biologically based differences in men and women. But gender differences may also be the result of culture and socialization that emphasize different skills for men and women and provide both genders different opportunities to develop their abilities.

Researchers have investigated a variety of potential biological causes for these differences. There is evidence that sex hormones in the womb, which drive the development of the fetus's sex organs, also have an impact on the brain. Children who were exposed to abnormal levels of these hormones, for example, may develop cognitive abilities more like those of the opposite sex. Increased hormone levels at puberty may again affect cognitive development. And performance on some types of cognitive tests tends to vary with male and female hormonal cycles.

In addition, new technologies that allow researchers to look more closely into the brain and observe its activities have shown that there are differences between the sexes in the size of various brain structures and in the parts of the brain men and women use when performing different tasks.

But while this information is intriguing, it must be interpreted with a great deal of caution. Although our knowledge of the brain and its development has expanded dramatically in recent years, it remains rudimentary. In the future, much of our current thinking about the brain will most likely seem as unsophisticated as the work of the late 19th and early 20th century researchers who sought to prove female intellectual inferiority by comparing the size of men's and women's skulls.

In particular, it is notoriously difficult to draw causal links between observations about brain structure or activity and human behavior, a point that scientists reporting the findings of brain research often take great pains to emphasize. Just as correlation does not always signify causation in social science research, correlations between differences in brain structure and observed differences in male and female behavior do not necessarily mean that the former leads to the latter.

But these caveats have not prevented many individuals from confidently citing brain research to advance their preferred explanation of gender gaps in academic achievement.

Proponents of different educational philosophies and approaches cherry-pick findings that seem to support their visions of public education. And a growing boys industry purports to help teachers use brain research on gender differences to improve boys' academic achievement. But many of these individuals and organizations are just seizing on the newest crisis—boys' achievement—to make money and promote old agendas. Scientific-sounding brain research has lent an aura of authority to people who see anxiety about boys as an opportunity for personal gain. Many have also added refashioned elements of sociology to their boys-in-crisis rhetoric.

Dubious Theories and Old Agendas

"Girl behavior becomes the gold standard. Boys are treated like defective girls."

—Psychologist Michael Thompson, as quoted in *Newsweek*

Thompson is just one of many commentators who argue that today's schools disadvantage boys by expecting behavior—doing homework, sitting still, working collaboratively, expressing thoughts and feelings verbally and in writing—that comes more naturally to girls. These commentators argue that schools are designed around instructional models that work well with girls' innate abilities and learning styles but do not provide enough support to boys or engage their interests and strengths. While female skills like organization, empathy, cooperativeness, and verbal agility are highly valued in schools, male strengths like physical vigor and competitiveness are overlooked and may even be treated as problems rather than assets, the argument goes.

Building from this analysis, a wealth of books, articles, and training programs endeavor to teach educators how to make schools more "boy friendly." Many of these suggestions—such as allowing boys to choose reading selections that appeal to their interests—are reasonable enough.

But many other recommendations are based on an inappropriate application of brain research on sex differences. Many of these authors draw causal connections between brain research findings and stereotypical male or female personality traits without any evidence that such causality exists, as the sidebar demonstrates. These analyses also tend to ignore the wide variation among individuals of the same sex. Many girls have trouble completing their homework and sitting still, too, and some boys do not.

Members of the growing "boys industry" of researchers, advocates, and pop psychologists include family therapist Michael Gurian, author of *The Minds of Boys, Boys and Girls Learn Differently!*, and numerous other books about education and gender; Harvard psychologist William Pollack, director of the Center for Research on Boys at McLean Hospital and author of *Real Boys*; and Michael Thompson, clinical psychologist and the author of *Raising Cain*. All of these authors are frequently cited in media coverage of the boy crisis. A quick search on Amazon.com also turns up Jeffrey Wilhelm's *Reading Don't Fix No Chevys*, Thomas Newkirk's *Misreading Masculinity: Boys, Literacy and Popular Culture*, Christina Hoff Sommers' *The War On Boys*, Leonard Sax's *Why Gender Matters*, and *Hear Our Cry: Boys in Crisis*, by Paul D. Slocumb. A review of these books shows that the boys industry is hardly monolithic. Its practitioners seem to hold a plethora of perspectives and philosophies about both gender and education, and their recommendations often contradict one another.

Some focus on boys' emotions and sense of self-worth, while others are more concerned with implementing pedagogical practices—ranging from direct instruction to project-based learning—that they believe will better suit boys' learning style. Still others focus on structural solutions, such as smaller class sizes or single-sex learning environments. But all are finding an audience among parents, educators, and policymakers concerned about boys.

It would be unfair to imply that these authors write about boys for purely self-serving motives—most of these men and women seem to be sincerely concerned about the welfare of our nation's boys. But the work in this field leaves one skeptical of the quality of research, information, and analysis that are shaping educators' and parents' beliefs and practices as they educate boys and girls. Perhaps most tellingly, ideas about how to make schools more "boy friendly" align suspiciously well with educational and ideological beliefs the individuals promoting them had long before boys were making national headlines. And some of these prescriptions are diametrically opposed to one another.

A number of conservative authors, think tanks, and journals have published articles arguing that progressive educational pedagogy and misguided feminism are hurting boys. According to these critics, misguided feminists have lavished resources on female students at the expense of males and demonized typical boy behaviors such as rowdy play. At the same time, progressive educational pedagogy is harming boys by replacing strict discipline with permissiveness, teacher-led direct instruction with student-led collaborative learning, and academic content with a focus on developing students' self-esteem. The boy crisis offers an attractive way for conservative

pundits to get in some knocks against feminism and progressive education and also provides another argument for educational policies—such as stricter discipline, more traditional curriculum, increased testing and competition, and single-sex schooling—that conservatives have long supported.

Progressive education thinkers, on the other hand, tend to see boys' achievement problems as evidence that schools have not gone far *enough* in adopting progressive tenets and are still forcing all children into a teacher-led pedagogical box that is particularly ill-suited to boys' interests and learning styles. Similarly, the responses progressive education writers recommend—more project-based and hands-on learning, incorporating kinetic and other learning styles into lessons, making learning "relevant," and allowing children more self-direction and free movement—simply sound like traditional progressive pedagogy.

More recently, critics of the standards movement and its flagship federal legislation, the No Child Left Behind Act (NCLB), have argued that the movement and NCLB are to blame for boys' problems. According to *Newsweek*, "In the last two decades, the education system has become obsessed with a quantifiable and narrowly defined kind of academic success, and that myopic view, these experts say, is harming boys." This is unlikely, because high-school-age boys, who seem to be having the most problems, are affected far less by NCLB than elementary-school-age boys, who seem to be improving the most.

Further, many of the arguments NCLB critics make about how it hurts boys—by causing schools to narrow their curriculum or eliminate recess—are not borne out by the evidence. A recent report from the Washington, D.C. based Center for Educational Policy showed that most schools are not eliminating social studies, science, and arts in response to NCLB. And, a report from the U.S. Department of Education found that over 87 percent of elementary schools offer recess and most do so daily. More important, such critics offer no compelling case for why standards and testing, if harmful, would have more of a negative impact on boys than on girls.

In other words, few of these commentators have anything new to say—the boy crisis has just given them a new opportunity to promote their old messages. . . .

POSTSCRIPT

Is There a Crisis in the Education of Boys?

In an article in *Principal* (March/April 2005), David Sadker and Karen Zittleman address the issue at hand in "Closing the Gender Gap—Again!". The authors observe that gender bias, once considered to affect only girls, continues to impact both girls and boys in ways often difficult to detect. They conclude that "the gender gap is the one demographic that challenges [all] schools, urban and rural, wealthy and poor."

This brings up some companion issues. First, the education of black boys. A provocative book by Jawanza Kunjufu, *Countering the Conspiracy to Destroy Black Boys*, written in 1982, perhaps was a springboard to the serious treatment of this problem. Jonathan Kozol and others have clearly and forcefully documented the sad state of many urban schools. Rosa A. Smith, in "Saving Black Boys," *The School Administrator* (January 2005), addresses the situation specific to black boys—expulsions, dropouts, low graduation rates, juvenile incarceration, and unemployment. Smith says "school success for black male students . . . depends on leaders willing to distance themselves from business as usual. . . . For these students, it is a matter of life and death."

Two other good sources on this subissue are Carla R. Monroe's "African American Boys and the Discipline Gap: Balancing Educators' Uneven Hand," *Educational Horizons* (Winter 2006) and Rosa A. Smith's "Building a Positive Future for Black Boys," *American School Board Journal* (September 2005).

Another subissue is single-sex education. Dr. Leonard Sax, founder of the National Association for the Advancement of Single-Sex Public Education, contends that the learning styles of boys and girls differ in ways that are now fairly well understood. Because of this, he states in "Single-Sex Education: Ready for Prime Time?" in *The World & I* (August 2002), that "for the first time in thirty years teachers and administrators are at liberty to offer single-sex education to students in public schools." Other perspectives on this subissue include Karen Stabiner's book *All Girls: Single-Sex Education and Why It Matters* (2002) and Michael Ruhlman's *Boys Themselves: A Return to Single-Sex Education* (1996). Also see Kathleen Vail's "Same-Sex Schools," *American School Board Journal* (November 2002) and Mary Ellen Flannery's "No Girls Allowed," *NEA Today* (April 2006).

Finally, another interesting subissue is the effect of teacher gender on interactions with students. For this, see "The Why Chromosome: How a Teacher's Gender Affects Boys and Girls" by Thomas S. Dees in *Education Next* (Fall 2006).