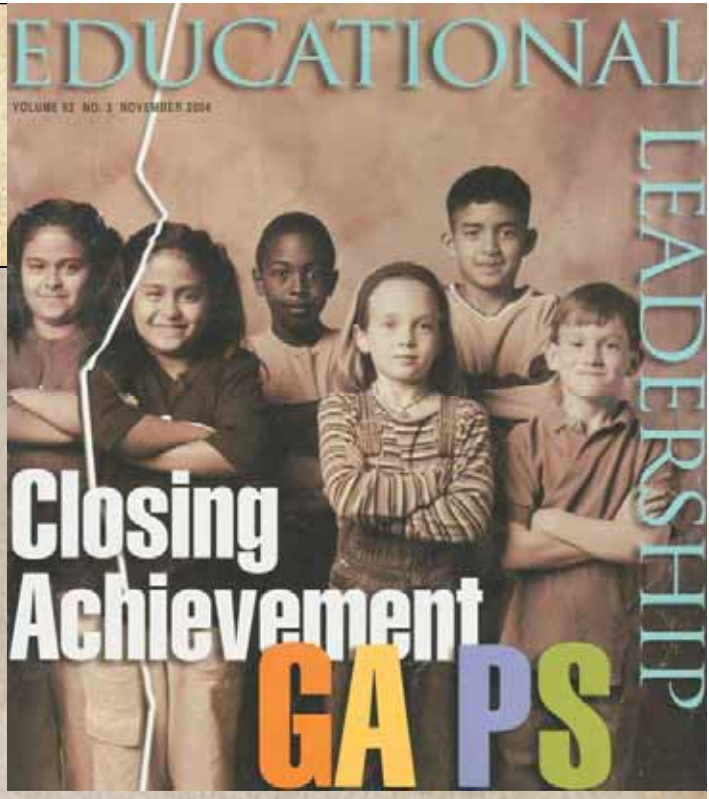
Closing

Achievement Gaps



Not Just About Facts

"Reality is not about facts, but about the relationship of facts to one another," writes Ronald Steel, biographer of the syndicated columnist Walter Lippmann (1986, p. 158). Steel was talking about how difficult it was to sift through facts in order to write his biography of a complex personality. He was also explaining a tenet of Lippmann's book, *Public Opinion*—that there are many sides to a "fact."

One fact about our most important challenge in education—closing achievement gaps—seems to be clear: In the United States, blacks and Hispanics significantly trail whites and Asians on standardized achievement tests. Moreover, achievement gaps abound in other countries as well. As Richard Rothstein notes, class backgrounds influence relative student achievement everywhere (2004).

Meanwhile, public opinion about "the facts" varies widely. Depending on your point of view, you may believe that achievement gaps are inevitable, narrowing, widening, or are being correctly or incorrectly addressed and measured. You may believe that the principal cause for disparities in achievement scores is poverty, or you may believe that the effects of poverty can be overcome by higher expectations and academic standards. You may place responsibility on students and their families for their attitudes toward achievement at school, or you may think blaming students and their families reflects underlying racism. You may believe that policymakers and society as a whole need to address the achievement gaps, or you may think that schools must take the lead in raising achievement for all students. And, according to the authors in this issue of *Educational Leadership*, your reasoning would be right, but incomplete.

If any challenge ever demanded looking at the relationships among facts for a solution, closing achievement gaps does. Four of our authors in particular make the case for thinking complexly about this problem.

Paul E. Barton (p. 8) lists 14 factors that research identifies as correlating with student achievement. From birth weight to television watching, from student mobility to parent availability, eight of the factors identified are outside-school conditions. Six of the factors—curriculum rigor, teacher preparation, school safety, class size, teacher experience, and access to technology—are school variables. "Closing the gap must be more than a one-front operation," Barton tells us.

Richard Rothstein (p. 40) also insists that fixing failing schools is not sufficient; we must also furnish children with better health care and increase low-income families' access to stable housing. Among the school-based solutions he advocates are investing in early childhood programs and expanding after-school and summer programs that provide enriched learning experiences. He writes:

> To date there have been few experiments to test the relative benefits of these alternative strategies, particularly because people are so wedded to the notion that school reform alone is sufficient. But we could easily design experiments of this sort, and we should make them a priority.

W. James Popham (p. 46) suggests another priority—that educators attain a better grasp on the appropriateness of tests being given to students. Using a suitable achievement test—an instructionally supportive one—is essential. He writes:

> If we referred to the gaps we're trying to reduce as test score gaps rather than achievement gaps, people might become more aware of the inappropriateness of using test scores as the sole benchmark for student achievement.

Joshua Aronson (p. 14) offers psychological insight about the factors that relate to intellectual performance. His fascinating studies about tests and anxiety reveal that we are all vulnerable to stereotype threat. Providing students with the encouragement and the security to believe in their own ability to learn are the powerful (but not magic) gap closers within every educator's grasp.

All issues of *Educational Leadership* look at a challenge through multiple lenses. This challenge—closing achievement gaps—demands action on multiple fronts. ASCD's statement on closing achievement gaps (p. 94) is one step in that direction. Another most important step is your effort to see beyond the simplistic facts of the achievement gaps to the complex task of reaching all your students.

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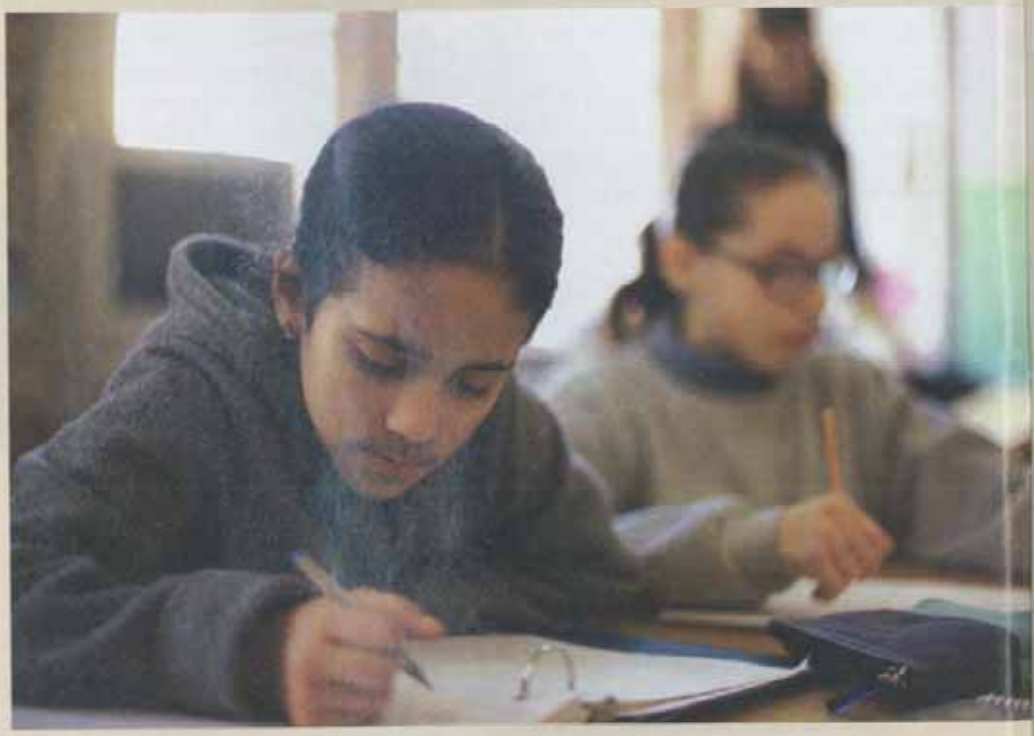
—Marge Scherer

The Threat of

To close the achievement gap, we must address negative stereotypes that suppress student achievement.

Joshua Aronson



Not long ago, I was asked to explain why Jews were so rich. I had just accepted an offer to be assistant professor at a large university, and my wife and I, hunting for our new home, were in a restaurant having lunch with the realtor. "I mean it," the realtor said. "Do you people have some *genetic* thing that makes you good at making money?" She explained that in her experience, her Jewish clients had the biggest houses and the nicest cars. I bristled. "What do you mean? That's a worn-out stereotype. My wife and I are not rich, and *we're* Jewish . . ." I proceeded to give her a brief anti-stereotyping primer to which she responded with interest. I was reassured.

A few moments later, however, I faced a predicament. The bill for lunch arrived and, unfamiliar with realtor-client etiquette, I considered picking up the tab. Then it hit me: If I do, it will support the stereotype that I just tried to debunk. But then, almost immediately, I had another thought: If I *don't* offer to pick up the tab, maybe she'll consider that other, more negative stereotype about Jews—that we're all stingy. I was stuck.

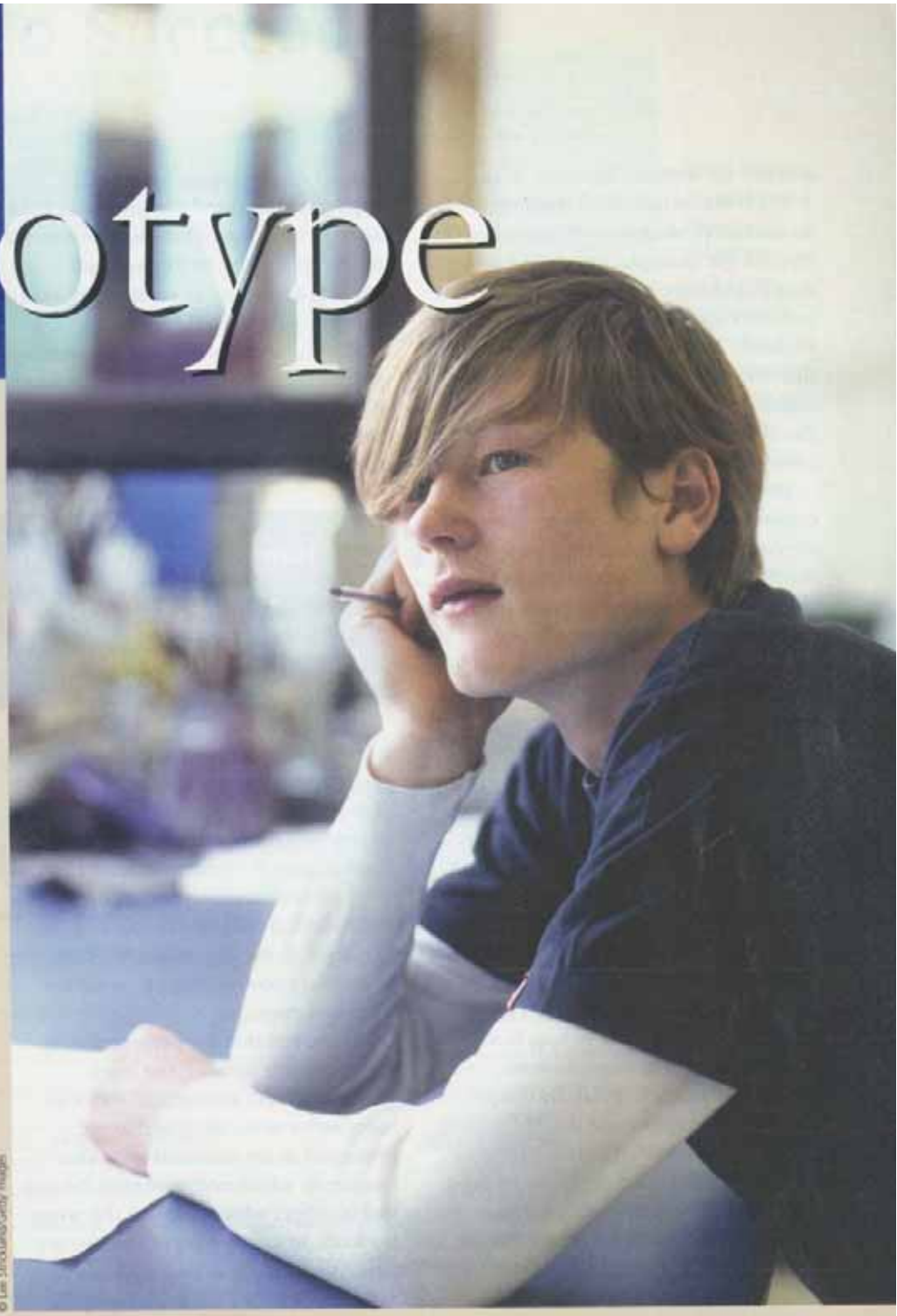
In the months following the September 11 attacks, it was common for Muslim cabdrivers in New York City to display U.S. flags in their cabs; some even posted signs declaring, *I am not a terrorist!* or *Proud to be an American!* I asked my driver one day why he had put up his sign. "Since the World Trade Center," he said, "vibrations are awful; tips are very bad. Things are better with the sign."

The cabdriver's uneasiness following September 11 and my predicament with the realtor are common phenomena that arise when humans interact across cultural or racial divides. Few people enjoy being reduced to a stereotype, especially when the stereotype has negative associations, so we often change our behavior to avoid being viewed and treated as though the stereotype were true. In many cases, the stakes of confirming a stereotype are low, as with my realtor. But for the cabdriver, both his psychological well-being and his livelihood were threatened by people looking at him and thinking *Arab terrorist*.

During the last decade, I have studied how people cope with unflattering stereotypes about their groups, focusing on those stereotypes that allege intellectual inferiority and on the students who have to deal with those stereotypes. Fellow researcher Claude Steele and I named this predicament *stereotype threat*. We have found that stereotype threat and the responses it elicits can play a powerful role in the relatively poor achievement of certain students—African Americans, Latinos, and girls in math-oriented domains. We have found that understanding stereotype threat has the potential to help educators narrow persistent achievement gaps.

Data on college performance initially

Stereotype



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drew us to the topic. The data were clear and consistent from study to study—and they frustrated nearly all the arguments about genetics or early-developed skills being the sole determinants of differences in performance between black and white students. The data showed that even when students arrived at college with similar skills and preparation (as measured by grades and SAT scores), black students fared worse than white students did. As many studies have since shown, even when students start out matched—in terms of parental income and education and the quality of schools the students attended—a significant achievement gap remains between black and white students (Jencks & Phillips, 1998; Massey, Charles, Lundy, & Fischer, 2003). Something else was suppressing the achievement of these college students—something not related to their intelligence and skills. Our hunch was that this "something else" was rooted in the cultural stereotypes of intellectual inferiority that these students so frequently complained about.

Unnerving Expectations

By the age of 6, virtually everyone in our culture is aware of a variety of cultural stereotypes. Mere familiarity with their content is enough to bias people's perceptions and treatment of individuals from stereotyped groups (Devine, 1989). Moreover, opinion polls suggest that the stereotypes are widely believed. About half of white Americans endorse common stereotypes about blacks and Latinos, which, among other images, portray them as unintelligent (Smith, 1990). It has long been known that stereotypes—the pictures in the head that simplify our thinking about other people—produce expectations about what people are like and how they will behave. We also know that such expectations on the part of a teacher can influence the performance of his or her students (Rosenthal, 2002; Weinstein, 2002) and that the black-white achievement gap may in part result from the differential treatment that black students receive in school (Ferguson, 1998).

Our focus, however, was to look at the situation through the eyes of the students on the receiving end of these negative expectations. Research indicates that African Americans are well aware of their group's negative reputation. Indeed, some research suggests a tendency for African Americans to be hyperaware of the negative expectations about their group and to considerably overestimate the extent to which the mainstream sees them as less intelligent and more likely to commit crimes

and live off welfare (Sigelman & Tuch, 1997). Thus, when black students are in an evaluative situation—being called on in class, for example, or taking a test—they experience an additional degree of risk not experienced by nonstereotyped students. The very real possibility looms that they will confirm the stereotype's unflattering allegations of inferiority, in the eyes of others and perhaps in their own eyes as well.

From hundreds of interviews that I've conducted with black college students, it's clear that many believe that the stereotype places them in situations freighted with unnerving expectations. Some report feeling a sense of unfairness, that there will be less patience for their mistakes than for white students' mistakes, and that their failure will be seen as evidence of an unalterable limitation rather than as the result of a bad day. Others report worrying that the stereotype might be true or that their poor performance will reflect badly on other members of their group. Such feelings can make black students more apprehensive than white students about being evaluated and about the prospect of failure. They will often begin to question whether they truly belong in an arena that prizes academic talent.

This is bad news, given the ubiquity of social stereotypes and the fact that they are notoriously resistant to change. But there is also good news: Stereotype threat is partly situational; it varies in intensity as a function of social climate and of students' perceptions about their own goals and abilities.

Test Stress

Our research began with the simple hypothesis that stereotype threat makes students anxious, which in turn can depress their performance on such challenging tasks as tests. We decided that if we could reduce students' apprehension about confirming the stereotype, then we could reduce their anxiety and boost their performance.

We tested this reasoning with a number of simple experiments (Steele & Aronson, 1995). In our first experiment, we had African American and white college students take a challenging standardized verbal test. In the control condition of the experiment, we presented the test in the standard way—as a measure of intellectual ability and preparation. In the experimental condition, we sought to reduce stereotype threat by removing the relevance of the stereotype. We told our test takers that we were not interested in using the test to measure their ability; we only wanted to use it to examine the psychology of verbal problem solving. This was the only difference between the two conditions of the experiment. The test was the same, the students were equally talented, and students were allotted the same amount of time to complete the test. When we looked at student performance, the results surprised even us.

Human intellectual performance is far more fragile than we customarily think; it can rise and fall depending on the social context.

On the test that we presented in a nonevaluative manner, the black students solved, on average, twice as many items as on the test that we presented in the standard way. The manner in which we presented the test had no effect whatsoever on the white students. In another set of studies, we found that merely asking students to indicate their race on a demographic questionnaire prior to starting the test had a similarly debilitating effect on black students. When they thought we were interested in their race, their test scores plunged.

I've come to believe that human intellectual performance is far more fragile than we customarily think; it can rise and fall depending on the social context. As research is showing, conditions that threaten basic motives—such as our sense of competence, our feelings of belonging, and our trust in people around us—can dramatically influence our intellectual capacities and motivation. And stereotype threat appears to threaten all these things at once (Aronson & Steele, 2005).

Since the publication of our initial report a decade ago, nearly 100 studies on stereotype threat have been conducted, both by us and by researchers around the world, showing that stereotype threat is a significant factor in the achievement gap (Massey et al., 2003). These studies shed considerable light on how stereotypes suppress the performance, motivation, and learning of students who have to contend with them, and they suggest what educators can do to help (Aronson & Steele, 2005).

Everyone Is Vulnerable

One thing is clear from the studies on test performance: Stereotype threat does not prompt test takers to give up or try less. If anything, stereotype threat makes people try harder on tests. This increased level of effort and anxiety reflects an "I'll show you" response aimed at invalidating the stereotype. Such a reflex can be advantageous in situations requiring brute effort. Indeed, stereotype threat can actually boost performance on easy or well-learned tasks in which additional effort pays off (O'Brien & Crandall, 2003).

But on difficult standardized tests—as with brain surgery or chess—relaxed concentration is optimal; anything that compounds performance pressure is likely to be a handicap. The data from our studies strongly suggest that this extra motivation on the part of test takers reflects the desire to disprove the negative stereotype or, at least, to deflect it from being self-characteristic, as in the cabdriver's *I am not a terrorist* sign. Thus, poor test performance does not necessarily reflect a

lack of effort, but rather the fragility of intellectual performance. Indeed, the research shows that students who are most vulnerable to stereotype threat are those who care the most and who are most deeply invested in high performance (Aronson et al., 1999), a fact that contributes to the poor predictive value of standardized tests. In theory, these tests should add points for dedication, not subtract them.

Everyone is vulnerable to stereotype threat. Studies show similar effects for women on math tests, Latinos on verbal tests, and elderly individuals (who face the stereotype about poor memory) on tests of short-term memory. But even groups who carry no historical stigma of inferiority can be impaired if one arranges the situation to their disadvantage. My colleagues and I found that white male engineering students (with astronomical SAT math scores) performed significantly worse on a difficult math test when we told them that their performance would help us understand Asians' mathematical superiority (Aronson et al., 1999). The rather unusual situation that we imposed on these students—a direct comparison with a supposedly superior group—is not unusual for blacks and Latinos. They contend daily with this sort of implied comparison in most integrated academic settings. The fact that such undeniably smart and accomplished students as those in our experiment underperformed on a test when faced with a stereotype should make us think twice about casually assuming that the low performance of blacks and Latinos reflects a lack of ability. Instead, we need to appreciate the power of the circumstances that these students face.

Students are vulnerable to stereotypes as early as 6th grade, an age when children become concerned with others' evaluations, comprehend that the world at large has negative expectations for certain groups, and form their notions about intellectual ability. Children who are exposed to more prejudice or who are more advanced in their thinking about stereotypes and intellectual abilities will become vulnerable earlier.

Early adolescence is a crucial period for students, partly because students are deciding who they are, what they are good at, and what they want to be. For the first time, they get to make choices that will determine their long-range education trajectories. To the extent that students avoid challenge when given the opportunity—by selecting easier courses, for example—they rob themselves of opportunities to expand their skills and intelligence. The studies reveal a significant tendency among minority students to avoid challenge when they are being evaluated. When given a choice of problems ranging in difficulty, they generally select easy, success-ensuring tasks (Aronson & Good, 2002). One of the most pernicious effects of stereotype threat is that it creates an atmosphere in which *looking* smart is more important than *getting* smart.

How Educators Can Help

Educators can minimize stereotype threat. When we do this, we see student scores, motivation, and enjoyment of the education process soar. For example, cooperative classroom structures in which students work interdependently typically produce immediate and dramatic gains in minority students' grades, test scores, and engagement because such environments reduce competition, distrust, and stereotyping among students (Aronson & Patnoe, 1997).

Studies also indicate the benefits of teaching students to conceptualize their intellectual abilities as expandable rather than fixed. Stereotypes impose on students the notion that their difficulties reflect an unalterable limitation, a bell curve view of abilities that says that some people are born smart and others dumb. When we teach students to reconsider the nature of intelligence, to think of their minds as muscles that get strengthened and expanded—*smarter*—with hard work, we find that their negative responses to stereotype threat diminish.

In one laboratory study with college students, teaching a malleable view of intelligence dramatically boosted the students' test scores on a difficult standardized test (Aronson, 2004). In another study, it significantly boosted

students' enjoyment of school and their resulting year-end grade point averages (Aronson, Fried, & Good, 2002). In a third study that tested this approach, poor minority students in a middle school showed dramatic improvement on their statewide standardized test scores (Good, Aronson, & Inzlicht, 2003). Stereotype threat can be overcome with the proper mind-set about the nature of ability, and this mind-set can be taught (Dweck, 1999).

Studies also show the value of simply teaching students about stereotype threat. Learning that their test anxiety results from a common response to stereotyping helps students interpret their struggles in a less pejorative and anxiety-producing way and results in higher test scores (Aronson & Williams, 2004; Johns & Schmader, 2004). Similarly, exposing minority students to role models who have triumphed over similar academic struggles with hard work and persistence markedly improve the students' study habits, grades, and test scores.

No Child Left Behind, as currently implemented in many schools, maximizes some elements of stereotype threat. The single-minded emphasis on *the big test*, the end-of-year evaluation used to judge the quality of students, teachers, schools, and districts—all of whom will be duly rewarded or punished for the outcome—adds pressure for students already disadvantaged by tests. Worse, it threatens an already tenuous sense of belonging by creating a belief that the school views certain students as weak links in the chain and might prefer it if they weren't around to lower the school's test score average. Such stigmatization and threats to belonging can have devastating effects on achievement (Aronson & Steele, 2005; Wong, Eccles, & Sameroff, 2003). Thus, for many minority students, No Child Left Behind is programmed to backfire. Not surprisingly, many states have witnessed a rise in dropout rates among disadvantaged minorities since the law went into effect. Research makes it clear that if we are serious about narrowing the minority-white achievement gap, we'll need to pay much greater attention to the social and psychological implications of our policies.

Students who are most vulnerable to stereotype threat are those who care the most and who are most deeply invested in high performance.

The Big Picture

A caveat: H. L. Mencken wisely pointed out that "for every problem, there is a solution that is simple, neat—and wrong." Attending only to stereotype threat—or to any single factor—will never close the achievement gap. Much public discourse surrounding the achievement gap tends toward the variety identified by Mencken: too simple to be right or broadly helpful.

For example, various researchers and commentators have looked at the four-year reading gap between African American high school students and their white counterparts (National Center for Education Statistics, 2000). They see poor, troubled, uneducated black families as the sole culprits in black students' lagging test scores and grades (Farkas, 2004; Wax, 2004). According to them, the problem begins and ends in the home where, owing to their lack of education, parents fail to provide the kind of intellectual stimulation needed to put their children on an equal footing with their white, better-off peers. Black parents don't talk enough to their kids, don't use enough complex vocabulary, or don't read enough books, these commentators' logic goes, and this intellectually impoverished environment creates a skill deficit that starts black children behind and keeps them behind throughout their school years.

This analysis isn't flat-out wrong; it's just incomplete. Early skill differences *do* contribute greatly to the achievement gap, but they do not account for all of it (Jencks & Phillips, 1998). Focusing solely on the preschool years ignores the transformative power of schools, teachers, and peers in either magnifying or remedying these early deficits. Such an emphasis disregards the fact that given ample funding, expertise, and freedom, schools *can* eliminate the gap. And by blaming parents, we absolve policymakers of their responsibility to give schools the support they need to provide students with the schooling they deserve.

If we are serious about closing achievement gaps, we will have to move beyond the simplistic rhetoric of "It's the family," or "It's the schools," or "It's poverty"—or "It's stereotyping," for that matter. Serious analyses make it clear that all of these factors matter. Unless we learn to think complexly about the problem, then surely we will continue to fail *our* big test, which is to find a way for all children to thrive in school.

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With Boys and Girls in Mind

Research on gender and education reveals a disconnect between teaching practice and the needs of male and female brains.

Michael Gurian and Kathy Stevens

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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 func-

tional 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.

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.

Girls tend to multitask better than boys, with fewer attention span problems.

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.

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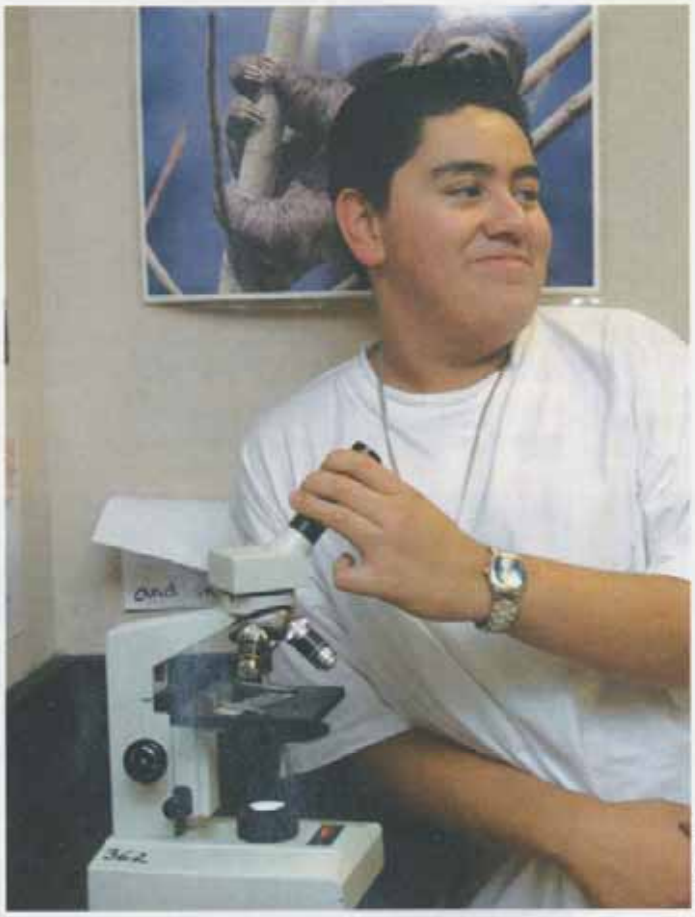
At the same time, most teachers, parents, and other professionals involved in education know that it is mainly our boys who underperform in school. Since 1981, when the U.S. Department of Education began keeping complete statistics, we have seen that boys lag behind girls in most categories. The 2000 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).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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.

Boys' language will be richer in vocabulary and more expansive when they are engaged in a task.

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.

The Task Ahead

As educators, we've been somewhat intimidated in

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.

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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Confronting the Racism of Low Expectations

Racism in educators' attitudes—and in how students are placed in advanced classes—still robs minority students of chances for success.

Julie Landsman

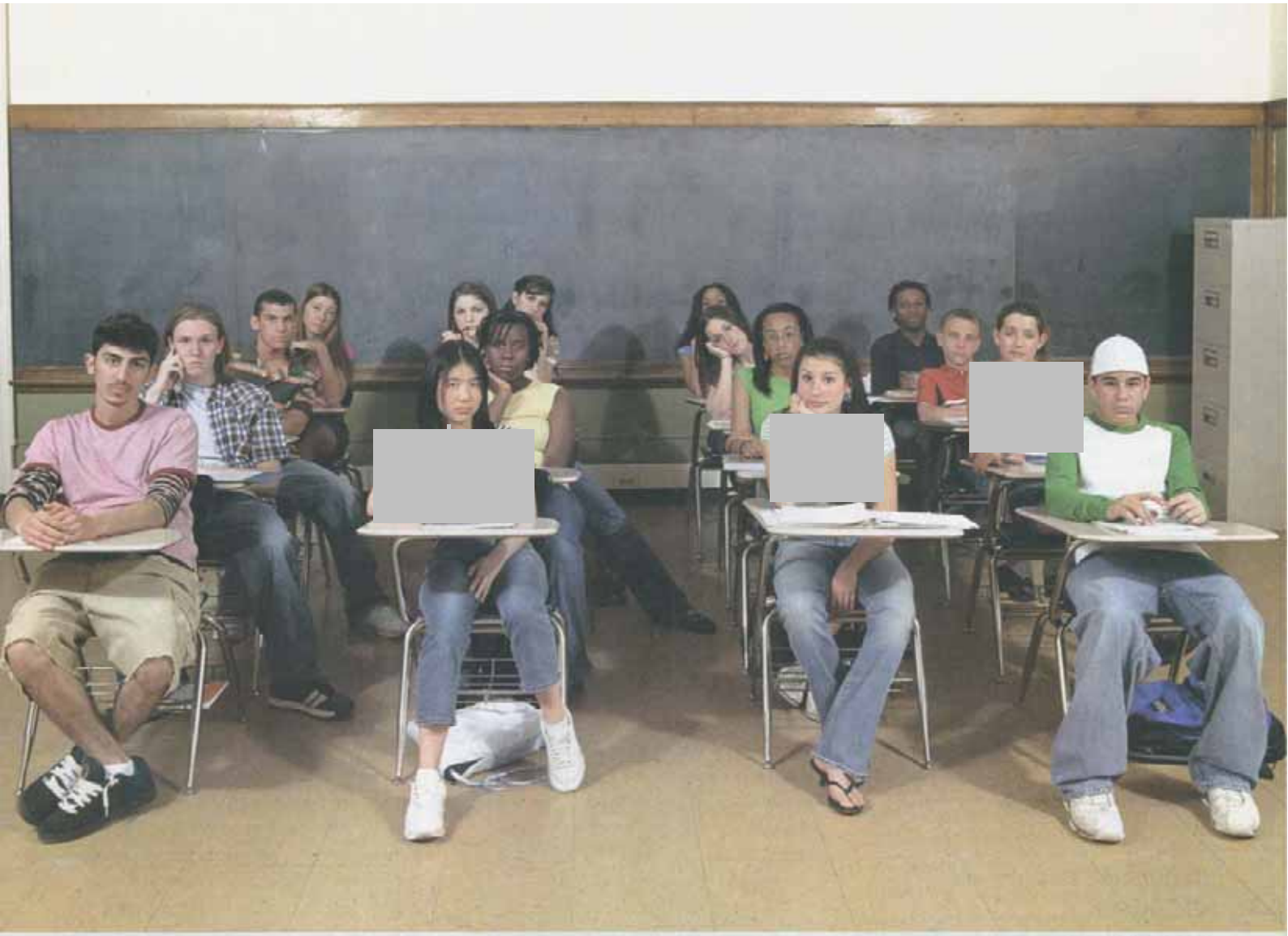
In an affluent suburb of New York City, in the midst of large backyards and roses along stone walls and the kind of broken beauty I have always loved from my own childhood there, a black man sits at the breakfast table with his two sons, ages 7 and 9. He looks from one to the other and, with great seriousness and hope, tells them they are spectacular boys. As he does every morning, he tells them they can do anything in this world, dream any dream. Then the boys finish breakfast and go off to the nearby elementary school.

The father has created this daily ritual because he believes that his sons will spend the next six to seven hours being given the opposite message. He is a rich man and has worked in corporate America most of his life. He loves this part of New York and its excellent, well-appointed schools. But he and his family are taking a gamble living here. The cost is great, not just in terms of property taxes, but in terms of potential damage to his sons' psyches. As one of only two or three students of color in each of their classes, these boys have a good chance of being objects of curiosity and condescension, or victims of low expectations. Daily encouragement is this father's way of countering assumptions that his sons are likely to face in school: that they cannot do the work assigned, that they do not come from a functional family, and even—tucked back in a teacher's subconscious—that they are innately less intelligent than their white peers.

Racist Attitudes: Subtle and Overt

I have run into many parents like this man during the two years since the publication of my book, *A White Teacher Talks About Race*. All over the United States, from small towns to gated suburbs to "inner-ring" districts to inner-city schools, I have listened to parents, teachers, administrators, and students verify the truth of this father's observations. Principals have told me about teachers who say openly that black boys are impossible to work with because they are hyperactive and uncontrollable. These same teachers ignore the behavior of white boys who act out. Teachers have told me that they avoid their faculty lounge because the talk behind closed doors is offensive to them, full of negative assumptions based on race. One teacher told me it is like "witnessing the chances for kids diminish right before your eyes."

Students in one St. Paul, Minnesota, high school talked about a teacher who asked the white kids in an advanced placement class the tough questions but turned to the few black or Latino students when she had an easy question that "anyone could answer." When confronted with this situation, the teacher was stunned. She realized it was true and admitted, "I just assumed you didn't know the answers, and I didn't want to embarrass you." This assumption—that black or Latino students could not possibly know the answers to deep or complex questions—is at the crux of the racism still embedded in many teachers' belief systems. This



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racism is so subtly expressed that students often cannot put into words what they clearly sense is wrong.

I saw racist attitudes come out in the open when I taught a class in multicultural education at a college in Northfield, Minnesota. A white student, doing well in her junior year at this academically tough school, wrote in a final paper,

> It is good I took this class from you, because before I took it, I thought all black people were stupid because they let themselves be slaves.

This intelligent young woman was heading into the final year toward attaining her teaching licensure. Yet somehow she had nearly completed her school career believing in the innate inferiority of a whole people.

Unless educators face the facts that these examples reveal, we will not be able to change this broken system. I believe that a true test of any country's morality is whether it gives all children a fair and equal chance to achieve their potential as human beings. The extent to which a society is meeting this challenge is reflected in the way its schools track students—in the way giftedness and intelligence are defined. How are students chosen for advanced placement classes? Once they enroll in a class for high-achieving students, are they made to feel welcome or unwelcome? Are they seen as potential leaders or potential dropouts?

I have visited school districts that claim to have dealt successfully with a culturally diverse student body. But when I visited their advanced placement classes, or gifted services, or the International Baccalaureate program, I found mostly white students with a sprinkling of black, Latino, or Asian American students. Whole corridors house these classes; thus whole corridors in the building are filled with white kids going from AP History to AP English to IB Math. The white youth go through their day in a white ghetto in the middle of an "integrated" school.

Recently, I spoke at a ceremony inducting students into the National Honor Society of an urban high school in Minneapolis, Minnesota. Of 80 youth being admitted to this privileged leadership group, I counted five of color. Yet approximately 60 percent of the students at the school were not white. One teacher told me that the distribution was better than in past years, when no students of color had been inducted.

Yet we know there are smart, talented students of all races. I have worked with gifted high school students in programs for kids in trouble, and with brilliant gang members in alternative schools. Let me tell you about a teacher and his former student who now go around the Twin Cities

speaking to education classes. This student, whom I will call Jamal, was defiant, obstreperous, and difficult in class. He came from a black family that many teachers openly dubbed a "problem family." One day Jamal threatened his teacher, whom I will call Tony. Jamal swore and stomped out of class. Tony, a white man, called the office, reported the incident, and arranged to meet with Jamal and the principal later that day.

At the meeting, Jamal was sullen, rarely looking Tony in the eye. The principal asked Tony what he needed from Jamal to allow him to return to class. At this point the teacher looked directly into his student's eyes and said, "I need Jamal to be in my class for gifted students. He is too smart for the class he has been assigned to now." This response changed Jamal's life. He came to the more advanced class and—with the support of his teacher, his parents, and the community—began to take school seriously.

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Rethinking Definitions of "Gifted"

It is time to rethink how we define and, accordingly, place students. I'm disturbed by how teachers, even in their own minds, classify students at young ages on meaningless grounds. Students in my education classes, most of them white, told me that they could tell by 2nd grade which students in their schools were headed for college and which were not. The kids they branded as heading to college were almost all white. All were wealthy or middle-class.

Entrance into many top-track programs in schools is subtly based on acquaintance with certain authors, certain ways of reasoning, and certain ways of behaving. To be eligible for the best education in this country, you often have to have money, books in the home, the desire and training to sit in one place all day, and an acquaintance with white middle-class and upper-class cultural icons. The result is that whole schools are full of smart African American boys, for instance, who have not made it into these programs. Teachers, counselors, social workers, and principals have determined that they are not bright enough, or they have the wrong attitude, or they are from a dysfunctional family and won't be able to get the support they need at home.

We must address the racism involved in the process of selecting students for gifted education and for tracked programs. Yet when confronted with the lack of students of color in advanced programs, many educators struggle to find any rationale they can other than the truth: The system that sets up the hierarchy of intelligence and excellence is racist.

Steps for Change

Where do educators go from here? We go to work for radical change. We need to rethink our entrance requirements, the way we teach, our expectations, and our relationship to the communities that many of our students come from. We are sure to meet resistance. Some teachers in training tell me, "I won't need to worry about all this stuff because I will be teaching in white schools." They are missing the entire point of anti-racism work, yet theirs is not an unusual attitude. I have faced audience resistance to my message during many presentations. But I believe that countering such resistance and bringing about change is possible.

Joseph White and James H. Cones, authors of *Black Man Emerging* (1999), suggest that to confront and combat racism, people need to change their lives in three ways: by exploring racism intellectually, by engaging in dialogue, and by immersing themselves in an unfamiliar culture. I believe we also need to work for change by creating safe classroom environments and committing ourselves to activism.

Exploring the Issues Intellectually

Educators need to study, go to conferences, and voraciously read books about racism and minority cultures. I recommend meeting once a month in small groups with a trained leader to discuss selected books or listen to speakers. A group called SEED (Seeding Educational Equity and Diversity) has developed a method for exploring these issues through literature and self-examination (Nelson & Wilson, 1998).

Reading and reflecting in small groups helps us—particularly white educators—open our minds and examine assumptions and behaviors that can do much harm. Do we ask the black kids the easy questions without realizing it? Do we refrain from calling home when we are concerned about a

Latino student because we assume she does not have a functional, literate family who can respond? How can we change our assumptions and practices?

Engaging in Dialogue

Teachers need to meet with parents, members of the community, students, and colleagues to discuss racism in our schools, our cities, and our states. Through dialogue with our students and their communities, we may find ourselves looking at learning, cooperation, and achievement in a more complex, interesting way. And when the going gets tough—when words are exchanged that hurt or are hard to hear—we need to take a break and then begin again. Students of all races talk together like this all the time, and they can model persistent and fearless dialogue for us. Friendships, reconciliation, and enlightenment come from their interactions.

Students of all races can model persistent and fearless dialogue for us. Friendships, reconciliation, and enlightenment come from their interactions.

When teachers meet and really talk with the families of their students—in their homes, on their front porches, in community meeting places—school can also become a place where real exchanges happen, where students feel welcome in their classes, and where visitors from diverse neighborhoods feel needed and wanted. One principal in St. Paul has her teachers go out in pairs every fall to visit her students' homes. At first teachers were hesitant, but after the first day of this work, they agreed that it was the best way they could spend their time. Parents told the principal that these visits made them feel they were being listened to and made them feel more inclined to come into the school.

It is doubly important that teachers of AP classes reach out to the communities of those students who rarely make it into their programs. I guarantee they will find students who do not feel welcome, who do not envision themselves as "gifted kids" because they believe that intelligence and giftedness are always defined in white terms.

There is no end to the creative ways we can break down barriers between minority cultures and white educators—or break through white educators' assumptions about minorities. For example, parents of Asian American immigrant students and African American students in St. Paul complained that the gifted program in their city schools used definitions of giftedness that favored students from middle-class, white backgrounds. Instead of dismissing their complaints, the district administration studied the issue. They found that although approximately 60 percent of students in the district were students of color, only 15 percent of the students in gifted programs were students of color; the rest were white. The school adopted a new test for giftedness that did not rely on verbal or English language ability, but tested for creative problem solving, divergent thinking, and artistic talent. After this change, the racial composition of this program came closer to district demographics.

Immersing Ourselves in Other Cultures

So many of us stick together, stay in our neighborhoods, and rarely venture into a synagogue if we are Christian or a Kwanzaa celebration if we are white. The area around Minneapolis-St.Paul has the largest population of Hmong students in the United States, and every year a huge celebration for Hmong New Year takes place in the Twin Cities. Rarely do you see anyone but Hmong families at this celebration. Yet it is essential for those of us who are in the racial majority to go out of our comfort zones and get a sense of what many of our students go through every day.

By immersing ourselves in another culture, teachers also begin to perceive the world in a new way, to understand the intricacy of culture and the complexity of worldviews. As a result, we may no longer define giftedness in a simplistic, monocultural way.

Creating a Safe Environment

As teachers and administrators, we need to make sure that all students feel protected in every class they attend. They need to know that someone is keeping the emotional, intellectual, and physical climate of their classroom safe, and that if anyone engages in racist comments, hurtful assumptions, or name calling, the teacher will step in.

In some ways, keeping our own personal actions welcoming and nonracist is the toughest part of this task because it has to do with how we think and react instinctively when we are working with students—how we turn our shoulder or change our tone of voice. As a coteacher and a poet in the schools, I have watched teachers demand the best from all their students while at the same time filling the room with laughter and relaxation. Teachers can only do this when they operate on a basic assumption that all the students in front of them have their own gifts and the potential to make changes in the world.

The best teachers are those who have explored how their own background and experience of the world is different from that of others, and have reflected on how that difference affects their beliefs, their personal reactions, and their teaching. Once white teachers, in particular, accept that their experience is just one of many experiences of being an American, they become more open, more able to deal with cultural issues that come up in the classroom.

When teachers create classrooms that are safe and yet leave room for creative classroom projects, giftedness emerges

from places we did not anticipate. After reading black poetry to students, we may find that an angry young man in our 10th grade English class suddenly shines at writing. We may consider him for classes that we thought beyond his reach before he was exposed to authors from his culture.

Committing Ourselves to Activism

For too long I have heard educators say that to keep white students in a particular school district, we must provide more gifted programs. The racism behind this assumption is astounding: It implies that only white kids are gifted, or that we should tailor our definition of giftedness to white culture. Unless teachers refuse to accept this kind of assumption and are willing to speak out loud and clear against such thinking, we will not change anything. Unless we are willing to form alliances with parent groups representing low-income or minority kids—like those in St. Paul who challenged the district's definition of giftedness—we are part of the problem, not part of the solution. Friends of mine who are not white tell me that whites seem to want to talk about change, but when it comes to working for it, speaking up or organizing the community, white faces are often absent. Teachers cannot sit back and wait for such necessary changes as smaller classes and more even distribution of resources to happen. It is up to all of us to make changes in our environments and to advocate systemwide and nationwide progress toward a more equitable system.

Teachers often want to change things quietly, politely, behind closed doors. I understand that feeling, having a certain amount of the introvert in me, yet we can no longer give in to this desire for an orderly solution. Real change can be loud, messy, and time-consuming. If we see racism—in the way our district defines and tests for giftedness, in the way advanced classes are filled, or in the school curriculum—we must raise our voices.

One way to start is to look into our schools and identify evidence of exclusiveness and racism. I have developed a questionnaire that teachers and administrators can use to measure how well their school communicates respect for all cultures and high expectations for all students (see "Does Your School Have High Expectations for All Students?").

I have great hope for our system of education. If educators read and reflect, engage in ongoing dialogue, immerse ourselves in other cultures, create safe classrooms, and challenge racist definitions of intelligence, then schools will stop using racist assumptions to determine a child's potential.

Then, perhaps, the man in the New York suburb will not feel so alone in his dreams for his sons.

Does Your School Have High Expectations for All Students?

- Are examples of the achievements and ideas of diverse authors, thinkers, and historical figures woven into—not separated from—the curriculum?
- Are texts, lessons, and discussion topics chosen with thought about how to provide a safe environment for discussion of controversial issues?
- Do all students feel safe in the classrooms, hallways, and lunchroom?
- Does the school challenge anyone making generalizations about racial and ethnic groups?
- Is evidence of diverse cultures displayed in hallways, in the library, in classroom examples, and in the racial and cultural backgrounds of adults working in the building?
- Does the school take students' and parents' discomfort, frustration, or anger seriously? Are issues worked out through mediation and discussion?
- Do teachers expect *all* students to complete and turn in work, know the answers to different levels of questions, work in class, follow class guidelines, and respond to structure?
- Do parents of color feel welcome at conferences, parent advisory group meetings, and school events?
- Do students of all ethnicities represented in the school participate in all academic courses and programs?
- Are students of color counseled to consider high-level academic programs and college?
- Are administrators and teachers willing to counter racist comments?
- Do teachers value inclusive curriculum even when the school is primarily populated by white students?
- Do teachers and staff members feel they can openly discuss issues of race, class, and gender without feeling defensive or ashamed?

—Julie Landsman

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time structuring education success with ease for their own children. They need to understand that the education of both low-income and middle-class African American children affects the health of society as a whole. The education advantages enjoyed by upper-middle-class children must be extended to all.

If we are serious about closing achievement gaps, we need to form a coalition that includes educators, concerned citizens, civil rights organizations, the business community, fraternal and service organizations, and middle-class black professionals to create support structures—not just to close the gap in school outcomes, but to prepare all African American children for leadership roles in the 21st century.

Let that be our mission.

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A Call for Universal Preschool

To close achievement gaps in the United States, we must pay attention to our youngest citizens.

Rosa A. Smith

If we truly want *all* children to succeed in school, then we must ensure that *all* children come to school ready to learn. Achieving the goals of No Child Left Behind requires a radical education reform: the provision of high-quality early education programs for all children, especially children of color and children in poverty.

An Effective Reform

Early childhood education has demonstrated remarkable results. For example, one study found that the initiation of high-quality early care and education programs for urban children of color led to a 41 percent reduction in special education enrollments (Reynolds, Temple, Robertson, & Mann, 2002). The National Research Council (2000) concluded that at-risk children who have attended high-quality early childhood programs are less likely to repeat a grade. And Barnett's review of 36 studies on the long-term impact of early childhood education programs in the United States (1995) confirmed these programs' benefits in terms of reduced special education enrollments and retention rates. The review also found that children from low-income families who participated in preschool programs were more likely to graduate from high school.

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A Wise Investment

High school graduation, of course, translates into better work opportunities. According to the U.S. Census Bureau (2004), people whose highest education attainment is a high school diploma earn approximately 25 percent more than their nongraduate counterparts

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earn. Reducing retention rates could also contribute to a stronger economy by saving significant tax dollars, given that the U.S. public spends, on average, more than $9,300 per student per year (National Center for Education Statistics, 2002).

In 2002, the Committee for Economic Development (CED) came out with a strong endorsement for high-quality universal early education programs. CED assessed private and public annual expenditures on early care and education at $50–55 billion for children from birth to age 5, with parents paying 50–55 percent of those costs and federal and state governments paying 25–30 percent and 15–20 percent, respectively. CED's report called on the federal and state governments to undertake a new national compact to make early education available to all children ages 3 and up. To ensure that all children have the opportunity to enter school ready to learn, the United States needs to reform its current haphazard, piecemeal, and underfunded approach to early learning by linking programs and providers into coherent state-based systems (2002, p. 9).

In fall 2003, the Federal Reserve Bank of Minneapolis also weighed in. A group of leading economists, brain scientists, and child development experts reviewed recent research on early education programs for low-performing students and decided that early childhood education is probably one of the best public investments a state can make. The group estimated that approximately $1.50 per household per week could improve the performance of Minnesota public schools and increase the number of students who earn diplomas, thus cutting the crime rate and jail population (Cobb, 2003).

The United States needs to reform its current haphazard, piecemeal, and underfunded approach to early learning.

Some policymakers are beginning to see the wisdom in this thinking. In December 2003, Governors Dirk Kempthorne of Idaho, Judy Martz of Montana, Jeb Bush of Florida, and Jennifer Granholm of Michigan met to exchange ideas with early childhood experts and representatives from 24 states and territories to discuss how states with tight budgets can offer universal preschool programs.

The preponderance of research endorsed by economists, early childhood development experts, think tanks, and politicians makes a resounding case for high-quality universal early education programs. The No Child Left Behind Act will not achieve its stated purpose until public policy leaders have the courage and determination to provide all children, especially those at risk, with better education opportunities at the time in their lives when it matters most.

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The Achievement Gap:

Closing the achievement gap requires more than just improving schools.

Richard Rothstein

The large achievement gap between white and minority students is generally viewed as a failure of the U.S. education system. Policymakers almost universally conclude that this gap must result from ineffective school policy and practice: low expectations, unqualified teachers, badly designed curriculum, large classes, undisciplined school climates, unfocused leadership, or a combination of these.

Many well-intentioned people blame the achievement gap on "failing schools" because common sense tells them that it could not be otherwise. The amount of money a family has—or the color of a child's skin—should not determine how well that child learns to read. If teachers know how to teach and schools permit no distractions, all students should be able to learn.

This commonsense perspective, however, is misleading. For although income and skin pigment don't directly cause low achievement, the characteristics that in general define social-class differences inevitably influence learning. Here are some examples.

Child Rearing Practices

Parents from different social classes often have different child rearing habits, disciplinary philosophies, ways of communicating expectations, and even styles of reading to children. These differences do not hold true in every family, but they influence the average tendencies of families from different classes.

Social-class patterns in child rearing make sense when you think about them. If upper-middle-class parents have jobs in which they collaborate with fellow employees and resolve problems, they are more likely to show their young children how to figure out answers for themselves. Parents whose jobs require them to follow routines are less likely to encourage creative problem solving in their children. Therefore, youngsters raised by parents who are professionals will generally have a more inquisitive, active approach to learning than will youngsters raised by working-class parents.

Thirty-five years ago, Kohn (1969) found that parents whose occupations required creativity and decision making were less likely to punish their children for actions in which the children's intentions were desirable, even if matters did not work out as intended. Parents who were closely supervised at work were more likely to base punishment on their children's actions, regardless of the children's intentions.

More recently, two researchers visited homes of families from different social classes to record conversations between parents and toddlers (Hart &

A Broader Picture

Risley, 1995). On average, professional parents spoke more than 2,000 words per hour to their children, working-class parents spoke about 1,300, and welfare mothers spoke about 600. At 4 years old, children of professionals had vocabularies that were nearly 50 percent larger than those of working-class children and twice as large as those of welfare children.

The researchers also tracked how often parents verbally encouraged or reprimanded their children. Toddlers of professionals received an average of six encouragements per reprimand. Working-class children got two. For welfare children, the ratio was reversed: They received an average of one encouragement for every two scoldings. It seems reasonable to expect that when these children eventually go to school, their teachers will not be able to fully offset such differences in early interactions. Students whose parents have encouraged initiative from an early age are more likely to take responsibility for their own learning.

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Health Needs

Many social and economic manifestations of social class also have implications for learning. Among these are differences in health.

For example, vision problems have an obvious effect on school success. Poor children have twice the average rate of severe vision impairment (Starfield, 1997). One reason for this higher rate of vision problems may be inadequate prenatal development resulting from mothers' poor medical care and nutrition. Visual deficits may also arise because low-income children are more likely to watch too much television, an activity that does not develop hand-eye coordination and depth perception. Forty-two percent of black 4th graders watch six hours or more of television a day, compared with 13 percent of white 4th graders (National Center for Education Statistics, 2003, Table 117).

Typical vision screening in school only asks students to read charts for nearsightedness. Most students are never tested for farsightedness or for difficulty with tracking, problems that are most likely to affect academic performance. Even when testing leads to optometric referrals, low-income children are less likely to follow up. When they get prescriptions for lenses, they less frequently obtain them or wear them to school (Gould & Gould, 2003).

Vision problems make it difficult to read from a book or see the chalkboard. The disproportionate assignment of low-income black students to special education may partly reflect a failure to correct their vision. When students have puzzling difficulties learning to read, the explanation is often no more complex than their inability to see well.

Differences in dental care have a similar impact: Untreated cavities are nearly three times as prevalent among poor children as among middle-class children (U.S. General Accounting Office [U.S. GAO], 2000, Figure 1). Students with toothaches, even minor ones, will tend to pay less attention in class and to be more distracted during tests than will students with healthy teeth.

Low-income children have dangerously high blood lead levels—at five times the rate of middle-class children's—diminishing their cognitive ability (U.S. GAO, 1999). Although lead-based paint was banned from residential construction in 1978, low-income children more often live in buildings constructed prior to that date and in buildings that are not repainted often enough to prevent old layers of paint from flaking.

Low-income children, particularly those who live in densely populated city neighborhoods, are also more likely to contract asthma. The asthma rate is substantially higher for urban than for rural children, for those on welfare than

for nonwelfare families, for children from single-parent families than for those from two-parent families, and for poor than for nonpoor families (Forrest, Starfield, Riley, & Kang, 1997). The disease is provoked in part by breathing fumes from the low-grade heating oil often used in low-income housing and from diesel trucks and buses. Excessive dust and allergic reactions to mold, cockroaches, and secondhand smoke also provoke it.

Asthma keeps children up at night; even if they make it to school the next day, they are likely to be tired and inattentive. Many children with asthma refrain from exercise and so are less physically fit. Drowsy and more irritable, they also have more behavioral problems. Middle-class children typically get treatment for asthma symptoms; low-income children often do not. Lower-class children with asthma are about 80 percent more likely than middle-class children with asthma to miss more than seven days of school a year because of the disease (Halfon & Newacheck, 1993).

Children without regular medical care are also more likely to contract other illnesses—some serious, others minor—that keep them out of school. Despite federal programs that make medical care available to low-income children, gaps between access and use remain. Many families do not enroll in such programs because they don't know of the programs' availability, are intimidated by the process, or are unaware of the importance of medical care. Even when enrolled, they are less likely to use the services to which they are entitled.

Mobility Rates

The growing shortage of affordable, adequate housing for low-income families also affects achievement. Urban rents have risen faster than working-class incomes have, forcing many families to move frequently because they fall behind in rent payments. Family breakups and bouts of unemployment also contribute to low-income children's high mobility rates. In some schools in minority neighborhoods, mobility rates are above 100 percent: For every seat in the school, two children were enrolled at some time during the year (Bruno & Isken, 1996; Kerbow, 1996).

A 1994 report found that 30 percent of the poorest students had attended at least three different schools by 3rd grade, whereas only 10 percent of middle-class students had done so. Black students were more than twice as likely as white students to change schools this often (U.S. GAO). High mobility depresses achievement not only for the students who move—each move means readjusting to teachers, classmates, and curriculum—but also for other students in high-mobility schools. Teachers with ever-changing classrooms are more likely to review old material than introduce new material, and they are less able to adjust instruction to the individual needs of students they barely know.

We need to make a more expansive commitment and provide a full array of health services to all students.

Financial Assets

Differences in long-term economic security are also important predictors of student achievement. Most analysts overlook these differences and use only annual income to indicate economic status. But when we recognize that black families who earned a low income in one specific year are likely to have been poor for longer than white families who earned a similar income that year, it helps explain why black students, on average, score lower than white students with the same family incomes.

White families are also likely to own more assets that support children's achievement than are black families at the same current income level. Median black family income is now about 64 percent of median white family income, but black family net worth is only 12 percent of white family net worth (Mishel, Bernstein, & Boushey, 2003, Tables 1.4 and 4.6). So white middle-class families are more likely than black middle-class families to have adequate and spacious housing, even when their annual incomes are similar, not only because whites suffer no discrimination in real estate markets but also because white middle-class parents are more likely to have received capital contributions from their own parents—for a down payment on a first home, for example. Black middle-class parents are more likely to be the first generation in their families to have middle-class status, and their own parents are less likely to have been able to help financially. As with all these examples, not all middle-class whites get first-time down payments from their parents, and not all middle-class blacks fail to get them. But on average, more whites than blacks with similar incomes benefit from this practice, and this contributes to average differences in neighborhood resources and in housing quality that add to the test score gap.

Asset differences also influence how much families save for college educations. A student's awareness that his or her family has resources for college can influence whether or not that student believes that college attendance is within reach. Comparing black and white middle-class students whose families have similar current incomes, it would be reasonable to expect the white students to be more confident about affording college and thus more dedicated to working hard in school.

Making Progress

To make significant progress in narrowing the achievement gap, we must pursue three tracks simultaneously.

Certainly, schools need to raise the quality of instruction. Better schools are

important, and better school practices can probably narrow the gap. School reform, however, is not enough.

We must also invest resources to expand the definition of schooling to include crucial out-of-school hours in which families and communities are now the sole—and disparate—influences. Because the gap is already huge among 3-year-olds, this investment should probably concentrate initially on early childhood programs for infants and toddlers that provide the kind of intellectual environment that middle-class children typically experience. This goal probably requires professional caregivers and low child-adult ratios.

Another essential out-of-school focus is giving low-income students after-school and summer experiences similar to those that most middle-class students take for granted. These experiences should not consist only of remedial programs that provide added drill in math and reading. The advantage that middle-class children gain after school and in the summer comes mostly from the self-confidence they acquire and the awareness they develop of the world outside their homes and immediate communities as they participate in organized athletics, dance, drama, museum visits, recreational reading, and other activities that develop their inquisitiveness, creativity, self-discipline, and organizational skills. After-school and summer programs will narrow the achievement gap only if they duplicate such enriched experiences.

Finally, the federal and state governments need to develop social and economic policies that enable children to attend school more equally ready to learn. These policies include offering health services for low-income children and families, providing stable housing for working families with children, taking aggressive action against discrimination, and boosting the incomes of working parents employed in low-wage occupations.

Although many characteristics of social class are impervious to short-term change, many others would respond to achievable policy reforms. For example, establishing optometric clinics in schools to improve the vision of low-income students may raise their test scores more than spending the same money on instructional improvement. Likewise, schools could provide dental clinics at a cost that is comparable to what schools typically spend on less effective reforms. If the United States truly intends to raise the achievement of low-income students, however, we need to make a more expansive commitment and provide a full array of health services. We should also evaluate whether increasing low-income families' access to stable housing raises student achievement.

The characteristics that define social class differences inevitably influence learning.

To date, there have been few experiments to test the relative benefits of these alternative strategies, partly because people are so wedded to the notion that school reform alone is sufficient. But we could easily design experiments of this sort, and we should make them a priority.

For nearly half a century, economists, sociologists, and educators have been aware of the association of social and economic disadvantage with student achievement gaps. Most, however, have avoided the obvious implication of this understanding: Raising the achievement of low-income children requires ameliorating the social and economic conditions of their lives, not just reforming schools.

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A Game Without Winners

Striving to reduce the achievement gap without reforming testing is an impossible dream.

W. James Popham

Suppose the new products division of a game company created a board game named *Blind Alley*. For some perverse reason, the new game's rules never allowed any player to win. Thus, every person who takes part in this new game inevitably ends up a loser. We could confidently predict that the annual sales of *Blind Alley* would not seriously challenge the annual sales of *Monopoly*.

A game without winners has limited appeal—perhaps attracting only those who have masochistic leanings. Games without winners are patently pointless. Yet, for the last few decades, many U.S. educators have enthusiastically taken part in an instructional game they simply cannot win. I call it the *gap-reduction game*, although as it is currently being played, it could just as easily be labeled *Blind Alley*. Although most participants in the gap-reduction game are well-intentioned, they don't understand that as matters currently stand, there's not a chance in Hades that they'll succeed in their efforts to reduce achievement gaps.

Test Performance Does Not Equal Learning

When U.S. educators speak of "achievement gaps," they mean the performance differentials among various racial/ethnic groups, and between children from poor families and those from middle-class or well-off families. When statewide achievement tests are administered in, say, language arts or mathematics, the average test scores of black and Latino students are rarely as high as those of white students. Similarly, when children from lower-socioeconomic status (SES) families take those sorts of tests, they frequently score lower than their higher-SES counterparts. Educators would like to diminish these gaps or eliminate them altogether.

The makers of standardized achievement tests have no serious interest in selecting test items that will reflect effective instruction.

It is wonderful that so many educators are committed to reducing test score gaps among the different student groups. Our nation's long-standing commitment to equality for all its citizens demands no less. However, most educators' understanding of gap-reduction ground rules is inadequate.

Much of the problem stems from the fact that many educators (and most laypeople) employ the term *achievement* interchangeably with *learning*. When people think about school-related achievement, they typically think about what students have learned in school. Indeed, my dictionary even describes an *achievement test* as "a test to measure a person's knowledge or proficiency in something that can be learned or taught." Thus, achievement tests have historically been regarded by almost everyone as satisfactory measurements of what kids have learned in school, and when most people think about achievement gaps, they are referring to differences stemming from what students have learned. When educators and the public set out to determine whether various student groups have been taught equally well, we almost always look at the achievement test scores earned by those students.

But the assumption that students' in-school learnings and their scores on standardized achievement tests are essentially the same thing is mistaken. This faulty assumption leads to a doomed approach to gap reduction.

All educators, I believe, want students from lower-SES families to master the same cognitive skills and knowledge that students from upper-SES families master. We want every child to have a chance to achieve her or his potential. But we have been relying

exclusively on students' test scores to tell us whether this goal has been attained—and that's where our well-intentioned gap-reduction strategies have foundered.

As long as we unthinkingly accept the premise that high standardized test scores equal gobs of achievement, whereas low standardized test scores equal the opposite, our gap-reduction gambits are certain to be ineffectual. Actually, if we referred to the gaps we're trying to reduce as *test score gaps* rather than *achievement gaps*, people might become more aware of the inappropriateness of using test scores as the sole benchmark for student achievement. The reality is that educators are using the wrong measures to tell whether gap reductions have occurred.

The Worship of "Score Spread"

To see why standardized achievement tests are flawed measurement instruments, let's look at how most such tests are constructed. Traditional achievement tests are "norm-referenced," meaning they have been built to yield scores capable of being interpreted *comparatively*. Thus, when Johnny scores at the 84th percentile in mathematics and Evan scores in the 79th percentile (those percentiles being based on the scores of previous test takers who constitute the test's norm group), the comparison of their scores gives parents and teachers one way to interpret the information. But to provide the fine-grained contrasts that are crucial to a norm-referenced measurement strategy, these tests must produce a high degree of *score spread*—that is, a range of student test scores, with satisfactory numbers of high, middle, and low scores.

Because traditional standardized achievement tests need this range of scores, the creators of such tests take pains to include test items that will produce ample score spread. Score spread, in fact, becomes almost a deity in test construction.

Surprisingly, most of the state-specific, custom-built tests that are intended to better assess a particular state's official curricular aims have also been influenced by this adulation of score spread. Because the major test-development companies usually build these state-customized tests, many state tests function in almost exactly the same score-spreading manner that national norm-referenced tests do.

Test developers and teachers have different priorities. Teachers complain about the amount of time external tests take away from their teaching. But from the perspective of achievement test developers, far too little time is available to assess students. That's because scads of score spread must be produced in only an hour or two of testing.

Statistically, items that very large proportions of students answer either correctly or incorrectly do not produce score spread. Thus, test developers dare not put many "too easy" or "too hard" items in their tests. If too many students actually begin to answer too many items correctly, then a test's score spread evaporates. In practical terms, this means that the majority of the items on a standardized achievement test will turn out to be answered correctly by between 40 and 60 percent of the test takers.

The makers of standardized achievement tests have no serious interest in selecting test items that will reflect effective instruction. They are interested in using items that not all test takers can answer, even if having many

such items causes a test to be *instructionally insensitive*—that is, incapable of detecting the presence and impact of effective instruction.

Here's where this zany assessment puzzle gets even more perplexing. Some of the best items for yielding sufficient score spread are those that are apt to be answered correctly by students from upper-SES families and incorrectly by students from lower-SES families. We call such test items *SES-linked*. From the test developers' perspective, SES is a delightfully spread-out variable—meaning that students represent a wide range of family income levels and that lower-SES students and upper-SES students show many differences. So, SES-linked items will almost always yield the score spread that is so crucial for comparative interpretations.

Now, let's return to the core issue with which we're dealing, namely, how to promote "achievement catch-up" for minority and low-SES students. Because of the United States' social and economic history, minority students are more likely to be low-SES than nonminority students are. It should be apparent, therefore, that if many items on standardized achievement tests are more directly linked to students' SES than to what students have been taught in school, then the use of such tests will never reduce the difference in test scores between minority and white students. We are relying on tests containing SES-linked items to demonstrate that students can overcome SES-linked education deficits. This is really stupid.

As long as educators and testing companies continue to assess what students have learned in school using assessment devices that rely heavily on SES-linked items, we will be measuring what students bring to school, not what they learn in school. SES-linked assessment will never allow educators to show that they've reduced the kinds of gaps among students that we all want diminished.

If we referred to the gaps as *test score gaps* rather than *achievement gaps*, people might become more aware of the inappropriateness of using test scores as the sole benchmark for student achievement.

What Is an SES-Linked Item?

All right, you may be asking, what does an SES-linked item look like? Here's a multiple-choice item that I think is SES-linked, drawn from a standardized science achievement test used nationally to measure the knowledge of 6th graders:

> If you wanted to find out if a distant planet had mountains or rivers on it, which of the following tools should you use?
>
> (a) binoculars, (b) microscope, (c) telescope, or (d) camera

If you think about this item carefully, you'll see how students from lower-SES families might have less of a chance to come up with the correct answer. Consider two families, each of which includes a 6th grader. Family X has three children and two parents. Both parents earn decent salaries and the family's oldest child possesses an expensive telescope. This family often watches science programs on TV; sometimes they discuss science-related topics at dinner. Family Y, on the other hand, consists of three children and one parent—a mother whose skill level only qualifies her for jobs that pay minimum wage. In this second family there is no cable television, no telescope, and no dinner-time discussions of articles in news magazines that the family cannot afford.

I hope you will have little difficulty answering this question:

> On average, which student will be more likely to answer the test item about seeing distant planets correctly?
>
> (a) the 6th grader in Family X, or (b) the 6th grader in Family Y

Norm-referenced standardized achievement tests contain far too many items like the telescope question. I recently went through one complete grade level's worth of items on two nationally standardized achievement tests, item by item. I concluded that in reading, language arts, science, and social studies, between 40 and 80 percent of the items were SES-linked. One could almost say that the tests are little more than measures of students' SES. In mathematics, only 15 to 20 percent of the items were SES-linked, but this is still unacceptable. If students' scores on achievement tests are dependent on their SES levels, how will such tests ever show a reduction in student achievement gaps that follow racial and socioeconomic lines?

So does the presence of all these SES-linked items on standardized achievement tests indicate that the folks who develop such tests are determined to oppress the masses? Are test developers part of a plot to keep the nation's blue-collar proletariat in its proper place? Definitely not. The test developers, with no malice at all, are simply hot to create items that produce score spread. And because SES is such a wonderfully spread-out variable, many items that have a good track record of yielding a range of scores turn out to be SES-linked.

As educators, we should not blame

the test-development companies for creating SES-biased tests. Rather, we should blame ourselves for allowing such tests to be used as measures of our effectiveness as teachers.

What About Standards-Based Tests?

So far, I have been sniping exclusively at norm-referenced standardized achievement tests. But what about achievement tests that have been custom-built for particular states in such a way that any student's score is based on individual mastery of specific criteria rather than on student-to-student comparisons? Such tests are called *criterion-referenced* or *standards-based*. About half of the state-level achievement tests used throughout the United States are supposed to measure students' mastery of a state's official curricular aims—also known as *content standards, benchmarks,* or *expectancies*.

If you've been thinking that criterion-referenced tests will save the day, get ready for a disappointment. These standards-based achievement tests are just as tied to SES as are norm-referenced tests. The crux of the problem with states' standards-based tests is that such tests are intended to measure too many curricular aims. Typically, a state's curricular aims are crafted by well-intentioned content specialists who dream up a "wish list" rather than a set of essential competencies and knowledge that can be realistically taught and measured in the time available within public schools. I was recently in a state that expected its teachers to promote more than 6,000 curricular aims!

Any given year's standards-based test can't possibly measure a whole galaxy of content standards in a meaningful way. So state standards-based tests typically contain items that *sample* the plethora of curricular aims. Some curricular aims don't get measured at all, whereas others get measured only superficially. The state's teachers can only guess which curricular aims a given year's test is going to assess, and in many instances they guess wrong.

Moreover, because there are so many competencies to measure, there aren't enough items on most tests for test results to give teachers an accurate fix on students' mastery of any one curricular aim. Teachers receive information that's so general as to be nearly meaningless in terms of analyzing and improving their instruction.

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Imagine that you're a teacher who for years has guessed wrong about what's likely to be assessed on your state's standards-based tests. For years you've aimed your instruction at the wrong curricular aims. In addition, the score reports from the state's standards-based tests don't help you figure out what parts of your instructional program are working. Wouldn't you be apt to give up on the whole instruction-aligned-with-assessment approach and just return to teaching in the best way you know how?

As currently set up, most standards-based assessments don't really align with classroom instruction, and instruction doesn't significantly influence test scores. Instead, students' scores on most states' standards-based tests turn out to be tied most directly to—you guessed it—students' socioeconomic status. If criterion-referenced tests cover curricular content that, more often than not, wasn't stressed sufficiently in class, then students must draw on knowledge and experience outside their classroom learning to have a shot at a correct answer. Once again, simply because of life experiences, youth from economically advantaged families will outperform less advantaged youngsters. With few exceptions, today's standards-based tests—even those proudly cavorting in criterion-referenced costumes—are no better at evaluating the merits of gap-reduction efforts than norm-referenced achievement tests are.

Thus, when any gap-reduction guru touts the virtues of a special instructional strategy without first requiring the installation of appropriate assessments, that person is making a serious mistake. Don't misunderstand me. I've listened to many first-rate folks argue for instructional procedures that seem to be sensible ways of reducing the achievement gap between lower-SES and higher-SES kids. But because of most existing achievement tests' SES links, those instructional procedures cannot reduce the *test score gap* between lower-SES and higher-SES children. Gap-reduction experts are sending their best instructional strategies marching onto a battlefield where those strategies are certain to stumble.

A Two-Step Strategy

A straightforward two-step strategy might free educators and students from this untenable situation.

As step one, anyone who is working to reduce achievement gaps must become assessment literate—at least with respect to the qualities of achievement tests that will or won't reveal genuine differences between what upper- and lower-income students learn. Educators have historically given far too much deference to assessment special-

ists. Most educators don't know squat about measurement, and they wrongly assume that anyone who can actually compute an internal consistency reliability coefficient must be sufficiently intelligent to avoid making measurement mistakes. Such a deferential demeanor needs to disappear—and in a hurry. The fundamentals of educational testing, at least those concepts necessary to be able to spot a suitable achievement test, really aren't too complex to grasp.

As step two, educators ought to be working toward the adoption of instructionally supportive accountability tests that are designed, from the very get-go, to detect the kind of instructional impact that must be present if achievement gaps will ever be *demonstrably* reduced.

In 2001, the Commission on Instructionally Supportive Assessment described three essential attributes of an instructionally supportive achievement test. Such a test should

- Measure only a modest number of curricular aims of extraordinary significance so teachers are not overwhelmed by too many curricular targets;
- Describe curricular aims in clear, teacher-palatable language so teachers can aim their instruction directly at the curricular goals rather than at a particular test's items; and
- Supply score reports that show whether or not each curricular aim was mastered by each student, thus helping teachers determine which aspects of their instruction were or were not effective.[1]

Educators who wish to reduce achievement gaps must initiate an immediate and dramatic turnaround with respect to the assessments they use to evaluate their efforts. Otherwise they will be destined to continue playing their own special version of *Blind Alley*. In this game, unfortunately, low-SES and minority students turn out to be the biggest losers.

[1]Commission on Instructionally Supportive Assessment. (2001). *Building tests that support instruction and accountability: A guide for policymakers*. Washington, DC: Author. Available: www.ioxassessment.com/catalog/pdfdownloads/BuildingTestsToSupport.pdf

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The High School/ College Disconnect

Students, parents, and K–12 educators are not receiving clear messages about the skills that high school students need to enter and succeed in college.

Michael W. Kirst

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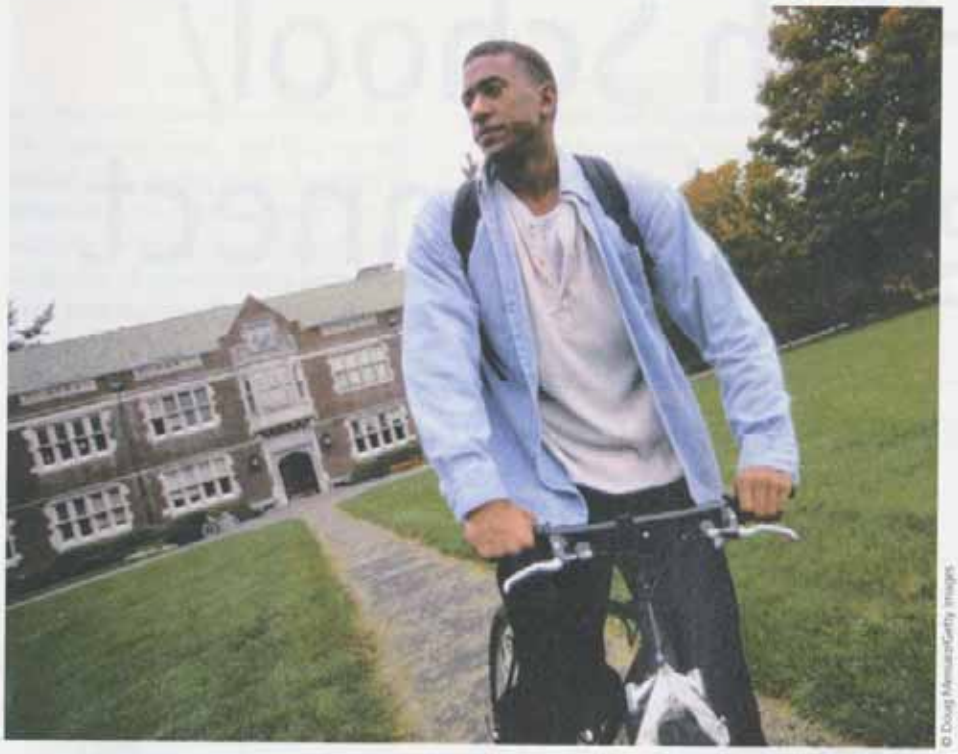
U.S. high school students now have higher aspirations for college than ever before. During the last few decades, parents, educators, policymakers, and business leaders have pointed out that to succeed in our society, students need to go to college. Eighty-eight percent of 8th graders expect to participate in some form of postsecondary education, and approximately 70 percent of high school graduates actually do go to college within two years of graduating (Education Trust, 1999).

Unfortunately, disconnected education systems are undermining students' college aspirations. State high school assessments often stress knowledge and skills that differ from college entrance and placement requirements. Students graduate from high school under one set of coursework standards only to discover that three months later, they must meet a whole new set of standards in college. Students are simply not getting the information they need about what it takes to succeed in higher education.

Starting at a Disadvantage

These mixed signals have disproportionately affected low-income students and students of color. As the economic benefits of holding a college degree have increased, low-income students have continued to experience much lower college enrollment and graduation rates than students in higher economic brackets. Low-income students primarily attend nonselective four-year schools or open-enrollment community colleges. For example, nearly 66 percent of Latinos—compared with fewer than 45 percent of white students with similar academic backgrounds—initially enroll at open-door institutions (Fry, 2004). Two of every three high school graduates from the wealthiest quartile enroll in a four-year institution, compared with one in five from the lowest socioeconomic quartile. At the nation's 146 most selective



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The best predictor of whether a student will complete a bachelor's degree is the intensity and quality of that student's secondary school curriculum.

colleges, 74 percent of students come from the top socioeconomic quartile and only 3 percent come from the poorest quartile (Kahlenberg, 2004).

As for students of color, not only are African American and Latino students obtaining postsecondary education degrees at a lower rate than their white, non-Latino counterparts (see fig. 1), but they are also graduating from high school with a lower level of academic skills. African American and Latino 12th graders across the United States read and do math at the same levels as white 8th graders, on average (Kahlenberg, 2004). Consequently, many low-income and minority students take remedial courses in college, a factor that lowers their chances for completing either a two-year or four-year degree or a vocational certificate. Between 1980 and 1993, for example, only 34 percent of students who took even one remedial reading course completed a two-year or four-year degree; 56 percent of students who took no remedial courses at all completed such degrees (National Center for Education Statistics, 2001).

The statistics regarding student attrition in college are equally startling. About one-half of first-year students at community colleges do not continue for a second year. About one-fourth of first-year students at four-year colleges do not stay for their second year. More than 40 percent of college students who earn more than 10 credits never complete a two-year or four-year degree. At two-year colleges, more than 70 percent of students who enroll say that they expect to eventually obtain a bachelor's degree, but only 23 percent actually receive one (Adelman, 1994).

Although student finances are an important concern, the best predictor of whether a student will go on to complete a bachelor's degree is the intensity and quality of that student's secondary school curriculum (Adelman, 1999). Broad-access institutions—community colleges or four-year institutions that admit just about every student who applies—represent about 85 percent of all postsecondary schools and educate approximately 80 percent of the nation's first-year college students. Instead of focusing on the 20 percent of students who attend the most selective four-year institutions with the wealthiest and best-prepared student bodies (Adelman, 2001), media and public attention should focus on program completion rates for students from low socioeconomic brackets attending broad-access institutions.

The Major Disconnects

The Stanford University Bridge Project,[1] a six-year national study, analyzed high school exit-level policies and college entrance policies to see whether a discrepancy exists between the skills that each education system requires. Bridge Project researchers analyzed state and institutional policies in six states—California, Georgia, Illinois, Maryland, Oregon, and Texas (Kirst & Venezia, 2004). They gathered information on state-level high school graduation and college entrance policies; specifically, they studied placement policies, admissions requirements, and outreach and communication strategies at 18 selective and less selective colleges and universities.

Researchers also interviewed high school administrators, counselors, and teachers in each of the six states about high school coursework and college counseling. The schools involved were comprehensive public high schools with a broad spectrum of student achievement. Researchers wanted to learn what students, parents, and secondary school educators knew about college admissions and course placement policies, and whether these groups had the necessary resources to make informed decisions about students attending college. The findings revealed a number of disconnects.

FIGURE 1 Who Goes to College?

	Graduate from High School	Complete at Least Some College	Obtain at Least a Bachelor's Degree
Asian and Asian American	94%	80%	49%
White (Non-Latino)	93%	62%	29%
African American	86%	48%	15%
Latino	61%	31%	10%

Education Attainment for Young People, Ages 25–29, in 1998.

Source: Education Trust (2001), p. 9. Adapted with permission.

Who's getting groomed for college? The Bridge Project data show that high school students in accelerated curricular tracks receive clearer signals about college preparation than do their peers in other tracks (Kirst & Venezia, 2004). Postsecondary education outreach efforts by high school and college counseling staff often fail to reach students in middle- and lower-level high school courses (Venezia, Kirst, & Antonio, 2003). In California, for example, 70 percent of honors students knew at least three course requirements for the California State University system, but fewer than half of the non-honors students possessed this knowledge (Kirst, Antonio, & Bueschel, 2004). Also, such resources as college counseling centers on high school campuses, opportunities to visit colleges, and visits from college recruiters are unequally distributed among high schools.

Who's getting the right information? Fewer than 12 percent of the students surveyed knew *all* the high school course requirements needed to enter the postsecondary institutions studied (Kirst & Venezia, 2004). This ranged from 1 percent in California to 11 percent in Maryland. Students do appear to have considerable partial knowledge of curricular requirements. Slightly more than half of the students knew three or more course requirements, but students in high tracks had more information than those in lower tracks. Although failing college placement exams causes incoming students to take remedial noncredit college courses, fewer than half of the sampled students across the studied states knew the specific placement-testing policies for the institutions in the study. Said one Oregon community school student,

> So I did my orientation, and they told me something about [placement] testing. I was like, What? You have to do a test? Nobody told me about that when I graduated from high school.

Who's helping students prepare? Teachers in both upper and lower high school tracks often took a greater role in helping students prepare for college than counselors did, although teachers lack connections to broad-access postsecondary institutions and up-to-date admission and placement information (Kirst & Venezia, 2004). Because most low-income and first-time college students attend postsecondary institutions near their homes, teachers should learn about the key admission and placement standards for local colleges.

Are parents in the loop? Many economically disadvantaged parents lack experience and information concerning college preparation. Forty-two percent, 44 percent, and 47 percent of economically disadvantaged parents in Illinois, Maryland, and Oregon, respectively, stated that they had received college information, compared with 74 percent, 71 percent, and 66 percent of their more economically well-off counterparts in the same states (Kirst & Venezia, 2004).

An Eye on Change

Our research found three promising areas for immediate reform. First, all students, parents, and educators should receive accurate, high-quality information about secondary school courses that will help prepare students for college-level standards, and all students should have access to these classes. Schools should also make it clear that a minimum competency state high school graduation test is *not* intended to measure college readiness.

Second, media, policy, and research attention should focus on the broad-access colleges and universities that serve the majority of students. These colleges need the financial and policy attention of federal, state, and other leaders. Increasing the rates of student success at these colleges is a sound public investment because it would likely increase college completion rates for economically disadvantaged students and students of color.

Last, students need to understand that getting into college is not the hardest part. Local, state, and federal programs should broaden their focus beyond *access* to college to include *success* in college. True college opportunity includes having a good chance to succeed once the student is admitted. High school course content, academic counseling, college outreach, and other programming should clarify for students what it takes to succeed in both selective and nonselective colleges.

Strategies That Make Sense

How can we achieve these ends? For a start, college stakeholders must be brought to the table when K–12 standards and assessments are developed

and revised. Likewise, K–12 educators should participate when postsecondary education admission and placement policies are under review. Reforms across the two education systems will be difficult to implement without meaningful communication and coordinated policymaking between the levels.

K–12 schools and districts, postsecondary institutions and systems, and states and the federal government can take the following steps to improve the transition from high school to college for all students.

■ Ensure that colleges and universities publicize their academic standards so that students, parents, and educators have accurate college preparation information. This effort must go beyond targeted outreach to universal programs for all students. For example, the California State University system uses the statewide 11th grade achievement test as its placement test. High school juniors who plan to attend state schools and who have low scores on their 11th grade state test receive specific recommendations for senior year courses. In addition, states should disseminate materials not only in English but also in other languages prevalent in their states.

■ Examine the relationship between the content of postsecondary education placement exams and K–12 exit-level standards and assessments to determine the possibility for greater compatibility. High-quality K–12 standards and assessments aligned with high-quality postsecondary education standards and assessments can provide students with clear signals and incentives.

Student Misconceptions About Attending College

Misconception: I can't afford college.
Reality: Students and parents regularly overestimate the cost of college.

Misconception: I have to be a stellar athlete or student to get financial aid.
Reality: Most students receive some form of financial aid.

Misconception: Meeting high school graduation requirements will prepare me for college.
Reality: Adequate preparation for college usually requires a more demanding course of studies than the minimum curriculum required for high school graduation, even when that curriculum is termed "college prep."

Misconception: Getting into college is the hardest part.
Reality: For the majority of students, the hardest part is completing college.

Misconception: Community colleges don't have academic standards.
Reality: Students usually must take placement tests at community colleges to qualify for college-level work.

Misconception: It's better to take easier classes in high school and get better grades.
Reality: One of the best predictors of college success is taking rigorous high school classes. Getting good grades in lower-level classes will not prepare students for college-level work.

Misconception: My senior year in high school doesn't matter.
Reality: The classes students take in their senior year will often determine the classes that they are able to take in college and how well prepared they are for those classes.

Misconception: I don't have to worry about my grades or about the kind of classes I take until after my sophomore year in high school.
Reality: Many colleges look at sophomore grades. To enroll in college-level courses, students need to prepare for college, and this means taking a well-thought-out series of courses starting no later than 9th or 10th grade.

Misconception: I can't start thinking about financial aid until I know where I'm going to college.
Reality: Students need to file a federal aid form before most colleges send out their acceptance letters. This applies to students who attend community colleges as well, even though they can apply and enroll in the fall of the year they wish to attend.

Misconception: I can take whatever classes I want when I get to college.
Reality: Many colleges and universities require entering students to take placement exams in core subject areas. Those tests determine the classes that students can take.

Excerpted from the final policy report of the Bridge Project authored by Andrea Venezia, Michael W. Kirst, and Anthony L. Antonio. Published with permission.

Students need to understand that getting into college is not the hardest part.

■ Allow students to take college placement exams in high school so they can understand college-level expectations and prepare academically for college. These assessments should be diagnostic so that students, parents, and teachers are clear on how to improve students' college preparation skills.

■ Use the senior year in high school to correct college readiness deficiencies and link appropriate senior-year courses to postsecondary general education courses (Kirst, 2001). For example, students often do not take mathematics in their senior year because, technically, three years of mathematics is the minimum required to graduate from high school and get into college. Consequently, students often fail math placement exams when they enter college because they have not taken enough demanding content or have forgotten what they learned.

■ Provide teachers with information about college academic standards

(including placement) and application procedures. Resources should target teachers who work with students in middle- and lower-level tracks. Schools also need to provide high school teachers with more information about college placement standards so they can align their courses with postsecondary expectations.

■ Expand successful dual or concurrent enrollment programs between high schools and colleges so they include all students, not just traditionally college-bound students.

■ Collect and connect data from all education sectors. States and regions should create common identifier numbers for students and track students' academic progress after they leave high school. Data should include student performance on placement exams and progress made toward a degree or certificate and should tie into the state K–16 accountability system. Postsecondary institutions and K–12 schools need assistance in learning to use data to inform curricular and instructional policies and practices. For example, a recent study found that the high school textbook reading level is much lower than the college textbook reading level (Williamson, 2004). Moreover, the education assessment and research organization ACT found a major discrepancy between what high school teachers and college instructors value in student writing. College instructors ranked grammar and usage as most important, whereas high school teachers considered these the least important skills (Rooney, 2003).

■ Expand federal grants to stimulate more state-level K–16 policymaking. This could include funding collaborative discussions between K–12 and postsecondary educators, with requirements for examining and improving such issues as collecting and using data across the systems. Funding could also target joint development activities that enable students to transition successfully from one education system to the next.

■ Tie student aid policies to college retention and graduation rates. Colleges would receive more federal and state aid as more students *complete* degrees or vocational certificates.

These recommendations will be easier to accomplish and more effective if each state creates an overall organizational base for K–16 policymaking and oversight.

Media and public attention should focus on program completion rates for students from low socioeconomic brackets attending broad-access institutions.

For example, Georgia created a state P–16 (preschool through postsecondary) council chaired by the governor, which includes state officials from K–12 and public postsecondary education. Regional P–16 councils across the state adapt statewide initiatives to local contexts. Having a K–16 entity within the state, however, does not ensure that innovative K–16 reforms will follow. Only a concerted effort by policymakers, educators, parents, and students will do the job.

Implementing these recommendations will not magically eliminate the dozens of reasons for poor student preparation for college.[2] But these are important steps toward developing a more equitable education experience for all students and providing all students with the preparation they need to succeed in college. ■

[1]The full report for the Stanford University Bridge Project is available at www.bridgeproject.stanford.edu.

[2]This research focuses solely on the role of policies and programs related to high school graduation, college admission, and college placement. The project did not address issues related to financial aid, affordability, or teacher preparation and professional development.

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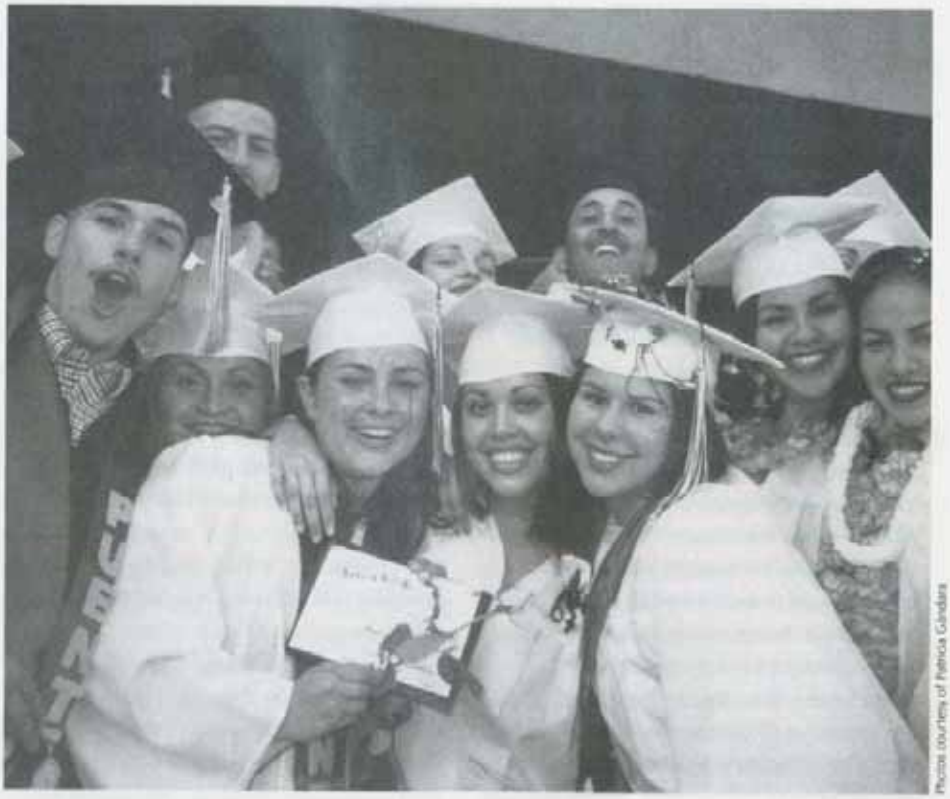
Building Bridges to College

A high school program for Latinos sets high expectations, offers challenging content, and puts college on the map.

Patricia Gándara

Latinos are the largest ethnic minority in the United States, yet Latino students are the least likely of all the major ethnic groups to graduate from high school, go on to college, and earn a degree. In 2000, only 10 percent of Latinos nationwide had earned a college degree, compared with 18 percent of African Americans and 34 percent of European Americans (National Center for Education Statistics [NCES], 2001). This undereducation of Latino students constitutes a social and economic liability for the United States.

The education gap begins, of course, long before students start to think about going to college. According to the National Assessment of Educational Progress, 41 percent of white students are proficient in reading by 4th grade, compared with only 15 percent of Latino students. By 12th grade—a point by which a significant number of lower-performing students have already dropped out of school—only about one-fourth (26 percent) of Latinos have achieved proficiency in reading, compared with almost one-half (47 percent) of white students (NCES, 1999, 2003). Ultimately, between one-third and one-half of all Latino students who begin school in the United States drop out of high school and fail to receive a diploma (Orfield, Losen, Wald, & Swanson, 2004; Rumberger & Rodriguez, 2002).



Photos courtesy of Patricia Gándara

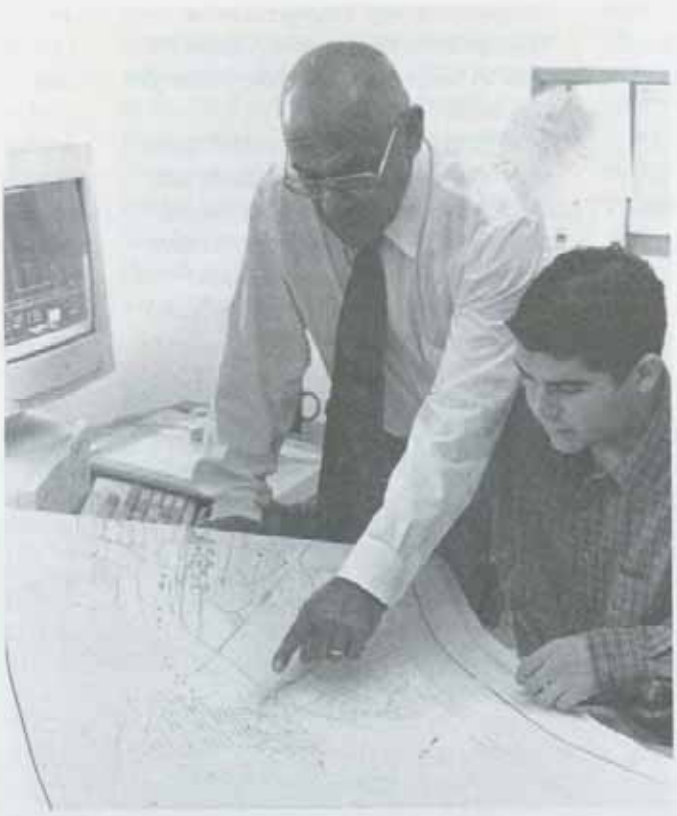
Why do Latino students fare so poorly in school and continue on to college in such small numbers? What can be done to counteract this trend? Research during the last several years provides some answers.

Out of Reach

Latino families often lack the *social capital* that is so essential for students to gain a foothold in society. In her book *Home Advantage*, Lareau (1989) described the way middle-class parents—predominantly whites—advocate on behalf of their children and locate the resources in public schools to support their children's success. They know how bureaucracies work, and they have easy access to people in key decision-making posts. Lareau showed how this social capital is out of reach for low-income

parents and their children.

Parents' earnings and education, two factors closely related to social capital, predict students' school performance and education attainment (Puma et al., 1997). As far as parent earnings are concerned, recent census data show that Latino workers, on average, earn less than either blacks or whites at almost all levels of education (U.S. Census Bureau, 2001). Information about parent education is reflected in data that the College Board collects on the education backgrounds of parents of students who are taking the SAT and planning to go on to college. The differences in parent income and education by ethnicity are startling, with Latinos lagging considerably behind other groups. Looking at the education backgrounds of the parents of SAT takers, only 1 percent of the white parents and 5 percent of the black parents do not have a high school diploma, compared with 27 percent of the Mexican American parents.



The undereducation of Latino students constitutes a social and economic liability for the United States.

In addition to family background factors, Latinos are likely to attend overcrowded, underfunded urban or rural schools in which disproportionate percentages of teachers are not well qualified to teach (Rhoads, 2003). The curriculum in these schools tends to be weaker than that in middle-class suburban schools, and Latino students generally have less access to rigorous coursework and advanced placement classes (Betts, Rueben, & Dannenberg, 2000). In California—the state with the largest number of Latino students in the United States—schools average more than 850 students for each counselor. As a result, few students receive personal attention geared toward helping them prepare for college (California Department of Education, 2003). Further, approximately half of Latinos in the Southwest are primarily Spanish speakers who have varying degrees of English proficiency. Schools in these areas have been notoriously weak in meeting the needs of English language learners. Recent data show that teachers with one or more English learners in their classrooms have had, on average, only four hours of professional development during the last five years that targets the needs of these students (Zehler et al., 2003).

Finally, considerable research has demonstrated the importance of expectations—both teachers' and other adults' expectations for students and students' expectations for themselves. Teachers are more likely to have lower expectations for their Latino students than for their white students (Romo & Falbo, 1996; Rosenholtz & Simpson, 1984), and Latinos are more likely to have lower expectations for themselves (Kao & Tienda, 1995). Clustered together in impoverished schools with weak curriculums, inexperienced teachers, and low expectations, students generally find schoolwork a waste of time. Unlike middle-class students in suburban schools, low-income Latino students rarely, if ever, discuss academic topics or postsecondary plans with their friends (Gándara, O'Hara, & Gutiérrez, 2004). When they do go on to a postsecondary education, they generally attend a two-year college and are unlikely to transfer to a four-year college or gain a four-year degree (Gándara & Chávez, 2003).

Bridging the Gap

The High School Puente project—the word *puente* means *bridge* in Spanish—came about in 1994 in response to these crushing statistics. With help from such groups as the Carnegie Foundation and the DeWitt Wallace-Reader's Digest Fund, the project developed as an offshoot of a program serving 45 community colleges in California. The new model serves 36 California high schools. Whereas the community college program has enjoyed enormous success in facilitating the transfer of Latino students from two-year colleges to four-year colleges, the high school program is geared toward moving students directly from high school to four-year colleges, where overall chances for students to earn a college degree are greater.

The High School Puente project emphasizes three practices: rigorous instruction in writing and literature; mentoring that provides missing social capital and, in some cases, a peer partner who acts as a guide through the early transition into high school; and intensive college preparatory counseling to address student and parent information deficits. The project overtly

acknowledges that Latino culture can be an instructional asset in motivating and preparing these students for college. Successful professionals from the students' Latino community interact with students and share the ways in which their roots in their community and culture have supported their professional achievements.

Instruction

Students involved in the program take two years of college preparatory English in academically heterogeneous classes in 9th and 10th grade. A highly trained Puente teacher instructs students in the writing process and in developing writing portfolios. Students learn to critique their writing, assess their progress, and set high performance standards for themselves.

Puente English classes model the kind of instruction normally reserved for gifted or advanced writers. Students must write daily, and they receive instruction in a number of writing formats: literary analyses, personal narratives, community-based reports, critical essays, and research papers. Students maintain writing folders and select their best work at the end of the year to create their portfolios. All students are required to read between four and 12 books independently, above and beyond the books assigned in class. They hone their writing skills by working in small groups and responding to one another's writing, an experience that helps them become better, more critical readers.

The teacher also weaves acclaimed Latino literature into the regular 9th and 10th grade literature curriculum, including such authors as Sandra Cisneros (*The House on Mango Street*), Gary Soto (*Living Up the Street*), Victor Villaseñor (*Rain of Gold*), and Luis Valdez (*Zoot Suit*). In one lesson we observed, a teacher had students compare marriage arrangements in Shakespeare's *Romeo and Juliet* with those in Laura Esquivel's *Like Water for Chocolate*.

In interviews and open-ended questions on annual surveys, students talk about their surprise and pride when they encounter famous Latino writers for the first time. The connections students draw between their own and the authors' experiences leave an indelible impression. One student was nearly brought to tears when she read *The House on Mango Street*, which deals with a young girl's experience in the Latino section of Chicago. "I didn't know that Latinos wrote books," she said, "and that they had experiences like mine."

The curriculum also includes community-based folklore and assignments that incorporate parents and other family members and mentors as sources for research activity. One activity focuses on *dichos*, meaning *proverbs* in Spanish. *Dichos* are important in Latino culture because they serve as guidelines for appropriate behavior and demonstrate life lessons. A teacher might ask a student to bring a favorite *dicho* to class and discuss its meaning. This is a wonderful opportunity for critically analyzing both language and culture.

Puente teachers receive several weeks of training each year in Latino literature, cultural awareness, the writing process, teaching in heterogeneous classrooms, and portfolio assessment. Although some of this training is provided during a summer institute, teachers receive continual instruction throughout the school year at regularly scheduled one- and two-day workshops.

Mentoring

A community mentor liaison seeks out appropriate mentors from the community, trains them, and matches them to students in the program. Mentors represent successful individuals in various occupations, such as teachers, lawyers, doctors, engineers, scientists, and businesspeople. The mentor liaison also works with the counselor to plan and arrange appropriate activities for mentors and students, such as attending a concert or community cultural event as a group.

Mentors are encouraged to maintain relationships with students for a minimum of two years, during which time they should meet monthly with students, either individually or in groups. Mentors are also urged to meet with the students' families, preferably in the student's homes. Most students believe that it is important for mentors to communicate with parents, so mentors generally need to be able to speak Spanish. As one young man noted, "It's important to me that my mentor explain to my parents the things I need to do to go to college."

The mentoring component of Puente now includes a peer partners program, which pairs 9th graders—and eventually 10th graders—with 11th or 12th graders who serve as high school guides. The peer partners program also provides an opportunity for younger students to

meet with older Puente students in a closely monitored and structured environment. One 9th grader would often meet his peer partner in the morning before school started. Being seen with an older student gave him status at school and provided him with a sense of belonging that was crucial as he adjusted to high school.

Counseling

The counseling component is, in many ways, the heart of the Puente program. Counselors each have approximately 240 students across two high school sites, less than one-third the normal load for a counselor in a California high school. The counselor ensures that students are placed in college preparatory classes, that any academic deficiencies are quickly addressed, and that students have the information necessary to prepare for postsecondary education. Counselors also participate in some Puente classroom activities, such as a planned writing experience or a session on university admission requirements. Counselors arrange for college visits, field trips, and parent/mentor meetings and events. Most oversee the Puente Club—an extramural organization in which students get together for social events that support their college preparatory activities, such as car washes and bake sales to help finance field trips.

An important objective of High School Puente is strengthening the identity of the students so they feel empowered—not disadvantaged—by their Latino heritage. The program emphasizes the importance of pairing students with Latino counselors. Drawing from their own experiences, these counselors can explain to students how they successfully navigated the road from high school to college to career.

Key Findings

To test the effectiveness of Puente in preparing students for postsecondary education, we collected survey data during a four-year period on 2,000 students—approximately 1,000 Puente students across California and 1,000 non-Puente students (half of whom were Latino) who were enrolled in the same classes as the Puente students. We asked these students about their aspirations, their attitudes toward school, and their preparation for postsecondary education. (Findings for this large data set are reported in Gándara, 2002.) We also followed a matched group of 75 Puente students and 75 non-Puente Latino students through the four years of high school. These students were matched on age, gender, socioeconomic status, and 8th grade reading scores and grade point averages. At the end of 12th grade, 144 students remained in the sample. Examining the college-going patterns for these students who looked almost exactly alike at the point of entry into high school, we found that the Puente students from the class of 1998 attended four-year colleges in much larger numbers—43 percent—than did students from the non-Puente group, whose attendance rate was only 24 percent. A final data collection in 2000 located 62 students (31 Puente, 31 non-Puente) from the original sample who had enrolled in college: Seventy-five percent of the Puente students were continuing in college, compared with 55 percent of the non-Puente students.

Puente students applied to and attended four-year colleges at nearly double the rate of the non-Puente students who began high school with comparable grades and test scores.

Puente and non-Puente student responses to a number of issues in the matched sample were highly consistent with the findings for the larger statewide group of 2,000 students. Students were asked to agree or disagree with the following statements. Their responses revealed the Puente program's effect on student attitudes and on student preparation for college.

- *The counselor influenced how hard they worked in school.* Puente: 49 percent agreed; non-Puente: 16 percent agreed.
- *The counselor influenced their decision to go to college.* Puente: 58 percent agreed; non-Puente: 22 percent agreed.
- *The teacher influenced their decision to go to college.* Puente: 37 percent agreed; non-Puente: 23 percent agreed.
- *The counselor influenced their goals.* Puente: 34 percent agreed; non-Puente: 18 percent agreed.
- *By 12th grade, they had all the information they needed to apply to college.* Puente: 82 percent agreed; non-Puente: 59 percent agreed.

These data suggest that Puente teachers and counselors—and the consistency of their impact over time—are invaluable components of the program.

There is also evidence that some of the Puente program's results may be due to students maintaining primary friendships at school. School friendships are an important indicator of student engagement, and they reduce the likelihood that students will drop out. One of the objectives of the program is to build a cohort of students who support one another and who have high expectations both for themselves and for others in the program. The program appears to have met that objective: Forty-two percent of Puente students—compared with 32 percent of non-Puente students—reported having the same close friends throughout high school. A significant portion of the Puente students—two-thirds—also indicated that they "hung out" with other Puente students at school.

Going Forward

Students' academic trajectories are set early in the school years (Barr & Dreeben, 1983). For the great majority

of students, year-to-year performance is highly predictable—in part because students are relatively consistent in their performance and in part because institutions respond to specific students in consistent ways. The statewide sample of 2,000 students highlighted the differences in Latino and non-Latino students' experiences with schooling. Nonetheless, Puente students had significantly better outcomes than their non-Puente peers did: They applied to and attended four-year colleges at nearly double the rate of the non-Puente students who began high school with comparable grades and test scores.

Judging from the discussions we have observed in Puente classrooms, the program has opened Latino students up to new possibilities and insights. Perhaps these students will find more enjoyment in reading. Perhaps they will become more skilled at analyzing complex issues. And perhaps this instruction will bear fruit in Puente students' college performance. ■

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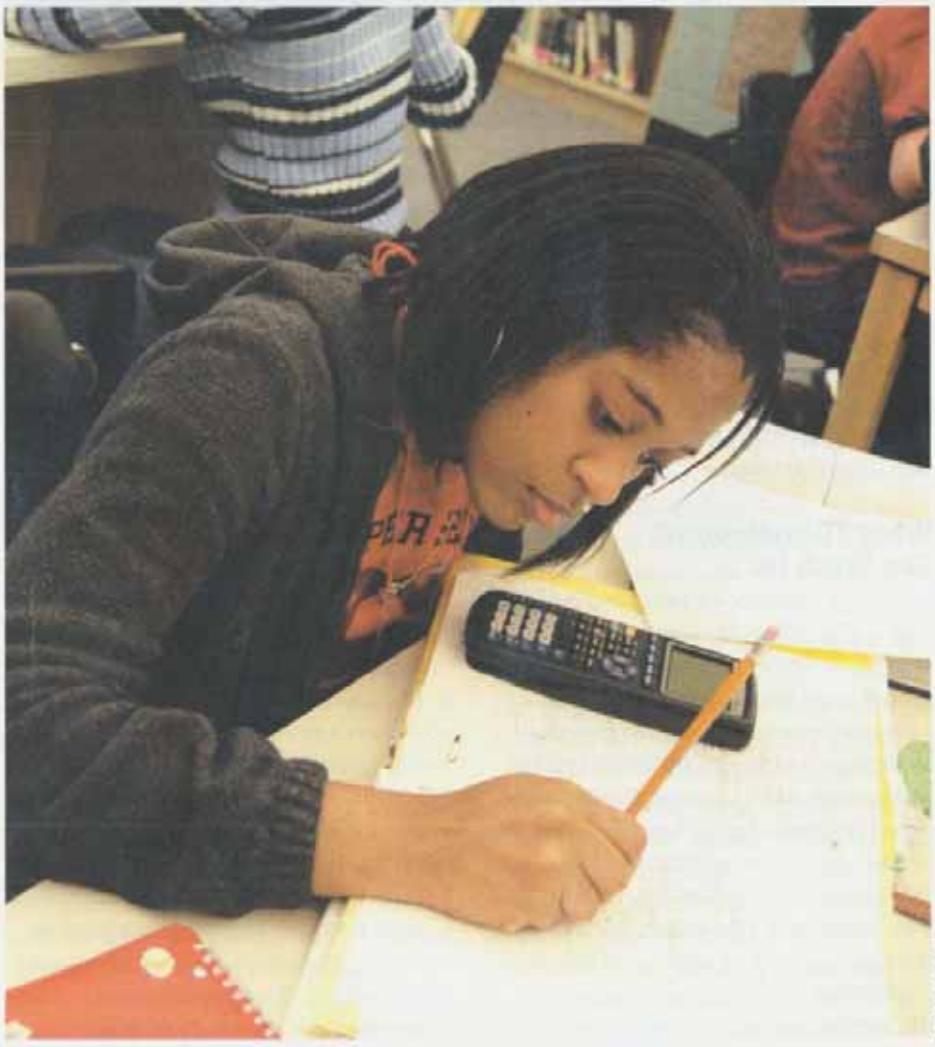
Why Do Students Drop Advanced Mathematics?

A look at two high schoolers shows that high expectations and teacher collaboration encourage students to persist through a challenging curriculum.

Ilana Horn

Concerns about the achievement gap have led to cries for change in high school mathematics. In an effort to increase the number of students who take advanced math classes, policymakers have urged raising graduation requirements, eliminating remedial courses, and implementing high-stakes assessments. As a result, schools feel pressured to support *all* students' success in the college preparatory math curriculum. Yet historically high attrition from mathematics—especially among black, Latino, and Native American youth and students of low socioeconomic status—exacerbates this challenge. How can schools stem the flow of math dropouts and encourage students to persevere through a challenging math curriculum?

High attrition from mathematics is frequently attributed to either the individual characteristics of students or the low expectations of teachers. Many teachers believe that such personal characteristics as innate math ability or drive to succeed determine who persists in advanced math classes and who drops out (Horn, in press; Ruthven, 1987). Although this explanation has some validity, it places the onus



of achievement solely on the student, leaving no role for adult intervention.

The "teacher expectation effect" has been well documented in education research (Weinstein, 2002). In the United States, we place a lot of faith in the power of teachers' expectations, from President Bush's indictment of "the soft bigotry of low expectations" to Hollywood's teacher heroes who buck the system by expecting more of students whom others have written off. It is part of our folklore of teaching.

Yet high expectations without the teaching tools to back them up only lead to disappointment.

Expectations do not simply reside in math teachers' heads and hearts; they come to life in the experiences students have in mathematics classrooms—and in their cumulative math-related experiences in school. Imagine, for example, a math-hating student who feels motivated and successful working with a caring, "high expectations" teacher. What happens to that student's motivation once the student moves on to a new teacher? Can "math turnarounds" stay turned around?

How can schools stem the flow of math dropouts? And can "math turnarounds" stay turned around?

What "Turnarounds" Can Teach Us

As part of a Stanford University research study, I have been looking at "turnaround" students in two California high school math departments (Boaler, n.d.). I am currently following two groups of students who entered their first college preparatory math class seemingly unprepared because of prior low achievement or low test scores in math, yet who managed to succeed in these classes. I have found that high expectations, strong classroom practice, and intensive collaboration among math teachers in the high school play a key role in supporting these students' long-term success.

The students I am tracking attend either Greendale High School,[1] a suburban school with mostly white, middle-class students, or Railside High School, which is urban and has an ethnically diverse student body. During the last four years, I have used classroom observation, student and teacher interviews, assessments, and other kinds of measurements to follow approximately 400 students as they progress through their school's math curriculum. The two students I describe here are representative of the math turnarounds at each school. Closely examining the experiences of these girls—one of whom persisted in college preparatory mathematics despite obstacles and one of whom returned to remedial math—sheds light on conditions that help students persist in advanced math.

A Tale of Two Turnarounds

Gabrielle, a white, middle-class student, attended Greendale High and took Integrated Mathematics—her first college preparatory math class—in her sophomore year, taught by Ms. Nelson. As a freshman, Gabrielle had taken a remedial math course in which, she claimed, "we didn't do any real math."

Railside High freshman Tamika came to Ms. Larimer's algebra class with low scores on a prior test of math achievement. Tamika, a middle-class African American, remembers that "in 7th grade, I was, like 'Aw, I hate math! I'm never taking this class!'"

Both Gabrielle and Tamika succeeded in their first year of college preparatory math, turning around their achievement in the subject. That success was connected to their teachers' high expectations and demanding classroom practices.

Ms. Nelson, a National Board–certified teacher who had won a national teaching award, taught her students through complex problems that combined algebra and geometry. She emphasized student thinking. Students had to explain their answers, were praised for asking questions, and were gently but firmly admonished when they did not push themselves. Ms. Nelson adjusted her teaching to support student understanding, yet pressed for rigor.

Ms. Larimer at Railside had similar high expectations. An answer was not an end point in her class: Students had to justify their reasoning by explaining *why* their answers made sense. As in Ms. Nelson's class, students debated and deliberated mathematical ideas and made presentations to their peers.

Both teachers used instructional methods advocated by the National Council of Teachers of Mathematics (2000), emphasizing mathematical thinking and problem solving. Both sustained a mathematically demanding environment while reaching students with weak mathematical preparation.

Gabrielle earned a *B* in Ms. Nelson's class and became optimistic about her ability to succeed in challenging math classes. She planned to take the next two courses in the college preparatory sequence. Tamika, who had started out "hating math," also earned a *B*. She described the satisfaction she felt as she learned to work difficult math problems with Ms. Larimer: "It makes you feel like you're smart, like you're good at it."

Year Two: A Steeper Climb

To qualify for college, a goal both girls aspired to, Gabrielle and Tamika each needed to succeed in the next college preparatory math course they took. As I followed their progress through the next school year, I witnessed the challenges both girls faced.

Gabrielle

In her second college prep math course, Gabrielle found herself uncomfortable

being a junior in a class filled with freshmen and sophomores. She reported her reluctance to ask questions in class, not wanting to look "dumb." Gabrielle's teacher for this class, Ms. Gillett, was committed to student learning and had received the same training that Ms. Nelson had in the school's innovative math curriculum. But subtle differences in Ms. Gillett's teaching practices hindered Gabrielle's progress.

In a class early on in the academic year, for example, Gabrielle tried presenting a partial solution to a problem, along with questions about the content. Instead of exploring her questions, as Ms. Nelson would have done, Ms. Gillett moved the lesson forward when another student offered the correct answer. Subsequently, Gabrielle's participation and forthrightness with questions diminished. Gabrielle and some of her classmates reported feeling that Ms. Gillett taught "to the smart kids."

Gabrielle did not have a good rapport with Ms. Gillett. It didn't help that Ms. Gillett contacted Gabrielle's mother about her daughter's "inappropriate clothing" without talking to Gabrielle first. Gabrielle eventually stopped doing her homework and ultimately earned a *D* in the course. To finish her math requirements, she retreated to the remedial track for her senior year.

Tamika

Tamika also encountered obstacles in her progress through the advanced math curriculum. As she noted,

> My freshman year, I loved algebra. It was so easy. It was one of my favorite classes. I was like, "Yes! I can't believe I'm doing this good in math!" And then I got to geometry, and I was like, "Ahhh!"

In Railside's geometry classes, as in its algebra classes, students worked in groups and were asked to explain their thinking—but two important differences caught Tamika off guard. First, the curriculum moved at a faster pace. Ms. Larimer's algebra classes met 90 minutes daily for two semesters, but Tamika's geometry class met 90 minutes daily for only *one* semester, requiring the teacher to cover material more quickly. Second, students were expected to be more responsible for their learning in the geometry class. In the algebra classes, teachers kept students inside during lunch or after school to complete any unfinished homework, whereas Railside's geometry teachers did not take such strong measures. Tamika explained,

> Geometry was one of those classes that was like, if you don't get it, come get help. That was when I was lazy. I didn't want to come get help.

After receiving a *B*– for the first half of geometry, Tamika ended the course with a *D*, earning credit but not a promotion to the next math class. She retook the second half of the class and had varying test scores and homework grades. During Tamika's struggle through geometry, her teachers (Ms. Watson and Ms. Murphy) regularly discussed the best way to support her, frequently planning together and observing in each other's classrooms. Her geometry teachers also communicated with Tamika's parents and Ms. Larimer about her. Ms. Watson and Ms. Murphy both held high expectations of their students and were committed to helping each student achieve excellence.

Despite a more concerted effort on her part, however, Tamika did poorly on a major test at the end, again earning a *D*. After Tamika's two inconsistent performances, her geometry teachers evaluated her work and decided to allow her to attempt advanced algebra, the next class in the curriculum. She earned a *B* in the first semester and a *C* in the second semester of advanced algebra. In her senior year, Tamika earned a *B*+ in precalculus, a course that exceeds college entry requirements.

Expectations do not simply reside in math teachers' heads; they come to life in the experiences students have in mathematics classrooms—and in their cumulative math-related experiences in school.

What Helped Tamika Persist?

Why did Tamika stay turned around as a math student whereas Gabrielle eventually gave up? The girls started with similar aptitudes and attitudes toward math, and both worked with teachers who had high expectations. I believe that four factors—three of which point beyond classroom practice to aspects of the way each school's math department was organized—supported Tamika's success.

High expectations built into the curriculum. Greendale separates its students into a college preparatory and a non-college preparatory track, whereas Railside places all students into a college preparatory track. In a sense, high expectations are built into Railside's mathematics curriculum: *All* students must succeed in advanced classes. Unlike Gabrielle, Tamika had no remedial track to fall back on when she encountered challenges.

Scheduling that facilitates a second chance. Greendale's block scheduling meant that classes met for double periods every other day, year-round. In contrast, Railside uses a block schedule that requires most classes to meet for 90 minutes a day for half of the academic year. This schedule enables Railside students to take more courses per year. If they encounter failure, as Tamika did, they can quickly retake a course without getting off their grade level. Gabrielle did not have this option.

Teacher collaboration. Greendale's Ms. Nelson described herself as a "lone wolf," teaching with inconsistent

support from her departmental colleagues. If Ms. Gillett and Ms. Nelson had had opportunities to discuss in depth their observations of students and their teaching methods, perhaps Gabrielle would not have felt so unwelcome in Ms. Gillett's class. In contrast, math teachers at Railside prided themselves on working collectively to teach rigorous mathematics. The teachers observed one another's classes and met weekly to plan lessons, design assessments, and consult about classroom challenges. They remained aware of one another's expectations for students, which minimized jolting variations as students moved from teacher to teacher.

Awareness of status issues. Gabrielle felt stigmatized in Ms. Gillett's college preparatory math class as an off-grade-level student who was not seen as one of "the smart kids." Ms. Gillett did not address Gabrielle's insecurity. Railside math teachers, on the other hand, worked consciously to change students' sense of mathematical incompetence to one of competence. Teachers often contacted parents to tell them of students' positive performances; Ms. Larimer did so with Tamika in the year she taught her. These teachers adopted the use of *Complex Instruction* (Cohen & Lotan, 1997), an approach that deliberately addresses differences in academic status. They often "assigned competence," or publicly acknowledged the intellectual contributions of low-status students, as demonstrated in this exchange:

> *Mr. R.:* I heard several people say that it equals negative *y*.
>
> *Donna:* No, because *y*'s not a number.
>
> *Mr. R.:* Very good. Did you all hear what Donna said?

This strategy helps students reimagine not only their own but also their peers' potential.

I consider the teachers' improvement-oriented collaboration at Railside to be the most important factor leading to Tamika's success—and one that all math teachers should strive to emulate in their own schools. Some teachers relish the independence they feel once classroom doors are closed. But if we are to stop struggling students from dropping out of advanced math classes when the path becomes steep, teachers must coordinate their expectations, their knowledge of students, and—to some extent—their teaching practices. Just as it takes a whole village to raise a child, it takes a whole mathematics department to raise the achievement of students like Gabrielle and Tamika.

[1]All names of schools and individuals are pseudonyms.

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