

# The Achievement Gap: Past, Present & Future

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Ten years ago, Congress passed the No Child Left Behind Act, which legislated that race and class gaps in academic achievement be eliminated by 2014. I am unsure whether the act was passed with the cynical knowledge that no such massive change could be accomplished so quickly or in the naive belief that sheer will and a little money could suffice to achieve it. In any case, it is clear that we will not make the deadline. Will we ever?

The class and ethnic gaps are revealed by all types of testing, including for both academic skills and IQ, and the barriers in the way of reducing the gaps are large. Moreover, it is doubtful that the social-class gap can ever be brought to zero, if for no other reason than that people with more money will always see to it that their children get more and better education than people with less money. There is however plenty of evidence (which I review below) indicating that much can be done to reduce the social-class gap.

How about race and ethnic gaps? There is not much evidence about the possibility of closing the gap between Hispanics and whites, but there is plenty of evidence relevant to the possibility of closing the gap between blacks and whites. That is the gap I focus on in this essay.

Is there at least a partially genetic basis to the intellectual gap between blacks and whites? Many, if not most, Americans harbor a suspicion that this may be the case, including many highly edu-

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cated Americans. In their book *The Bell Curve* (1994), psychologist Richard Herrnstein and political scientist Charles Murray reviewed the literature on intelligence, argued that most of the variation in intelligence is due to genetics, and presented evidence – quite one-sided as we will see – that the difference between groups such as white Americans and black Americans is also partially genetic in origin.

By at least the early nineteenth century, most white Americans believed in the congenital intellectual inferiority of blacks. (Lincoln was confident of it, though Jefferson thought it was “an hypothesis only” that blacks were intrinsically inferior.) The IQ test, developed early in the twentieth century, reinforced the genetic view. Because whites scored higher than blacks, many psychologists, basing their hypothesis on the fact that IQ is heritable to a degree, assumed that the black/white group differences were genetically based.

For decades, whites scored about fifteen points higher than blacks on IQ tests. Whites averaged a score of about one hundred, blacks about eighty-five – a difference of a full standard deviation. If such a difference were wholly or substantially genetic in origin, the implications for American society would be dire. It would mean that even if the environmental playing field were leveled, a much higher proportion of blacks than whites would have trouble supporting themselves, and a much lower proportion of blacks than whites would be capable of success in business or the professions.

Some laypeople I know – and some scientists as well – reject the possibility of genetic difference in intelligence between the races. But such a conviction is entirely unfounded; there are countless ways that a genetic difference in intelligence could have arisen, either in favor

of whites or in favor of blacks. The question is an empirical one, not answerable by a priori convictions about the essential equality of groups. In fact, there is a great deal of empirical evidence on the question, albeit most of it is indirect. (Readers who would like to see a refutation of such evidence will find it in the appendix to my book *Intelligence and How to Get It: Why Schools and Cultures Count*.<sup>1</sup>) Here, I present what I believe is the most important direct evidence about the contribution of genes to the black/white gap.

The gap between the races is not due to some obvious artifact, such as blacks not being familiar with formal English, being less motivated to perform on IQ tests, or having teachers or IQ testers with low expectations for their performance.<sup>2</sup> Moreover, it is not the case that blacks perform better at either school or work than their IQ scores (or SAT scores) might indicate. At least as late as 1980, when educational psychologist Arthur Jensen reviewed the question, academic performance and occupational outcomes for blacks were actually lower than would be predicted by their IQ scores.<sup>3</sup> At a given IQ level, whites perform better than blacks.

Blacks have lower socioeconomic status (SES) on average, and people with low SES have lower IQ test scores. But that fact by itself does not speak clearly to the heritability issue, because it is not clear to what extent low SES drives IQ lower versus to what extent low IQ drives SES lower. Blacks have lower IQs than whites at every level of SES, so SES cannot fully explain the black/white IQ difference.

The direct evidence about a possible genetic contribution to the difference in IQ between blacks and whites comes from studies that examine “blacks” of mixed African and European heritage. If European genes confer an advantage,

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then we could expect the offspring from one black parent and one white parent to have IQ scores lower than those with white-only parentage but higher than those with purely black ancestry.

Skin color of blacks is one guide (a quite imperfect one) to genetic heritage. As it happens, there is almost no correlation between skin color of blacks and IQ,<sup>4</sup> even though we would expect lighter-skinned blacks to have social advantages over darker-skinned blacks that might manifest in higher intellectual attainment and higher IQ.

Another test of the genetic hypothesis arose from the fact that, at the end of World War II, both black and white American soldiers fathered children with German women. Thus some of these children had 100 percent European heritage and some had substantial African heritage. Tested in later childhood, the German children of the white fathers were found to have an average IQ of 97, and those of the black fathers had an average of 96.5, a trivial difference.<sup>5</sup>

If European genes confer an advantage, we would expect that the smartest blacks would be particularly likely to have substantial European heritage. But when a group of investigators sought out the very brightest black children (IQ 130+) in the Chicago school system and asked them about the race of their parents and grandparents, these children were found to have no greater degree of European ancestry than blacks in the population at large.<sup>6</sup>

Most tellingly, blood-typing tests have been used to assess the degree to which black individuals have European genes. The blood group assays show no association between degree of European heritage and IQ.<sup>7</sup> Similarly, the blood groups most closely associated with high intellectual performance among blacks are no more European in origin than other

blood groups.<sup>8</sup> (This evidence is not quite knockdown, however, because European blood genes are only very weakly, if at all, associated with one another in the black population. If not associated with one another, they might also not be associated with the white genes that are determinative of IQ.)

One way of testing the heredity versus environment question is to look at black children raised in white environments. If the black deficit in IQ is due entirely to the environment, then blacks raised in white environments ought to have higher IQs than those raised in black environments. The hereditarians cite a study from the 1970s showing that black children who had been adopted by white parents had lower IQs than whites adopted by white parents.<sup>9</sup> Mixed-race adoptees had IQ scores between those of the black and white children. But, as the researchers acknowledged, the study had many flaws; for instance, the black children had been adopted at a substantially later age than the mixed-race children, and later age at adoption is associated with lower IQ. (This study, incidentally, is the only direct-evidence study that Herrnstein and Murray deal with at any length in their book.)

A superior adoption study was carried out by developmental psychologist Elsie Moore, who looked at black and mixed-race children adopted by middle-class families, either black or white, and found no difference in IQ between the black and mixed-race children.<sup>10</sup> However, she found a very large difference – thirteen points – between the IQs of blacks and mixed-race children raised by whites and those raised by blacks. Clearly, something about family environment or the neighborhood and school environments associated with race has a marked impact on IQ – enough, in fact, to account for virtually all the IQ difference between

blacks and whites that existed at the time of the study.

Important recent research helps pinpoint just what factors shape differences in IQ scores. Psychologists Joseph Fagan and Cynthia Holland tested black and white community college students on their knowledge of, and their ability to learn and reason with, words and concepts.<sup>11</sup> The whites had substantially more knowledge of the various words and concepts, but when participants were tested on their ability to learn new words, either from dictionary definitions or by learning their meanings in context, the blacks did just as well as the whites. Whites showed better comprehension of sayings, better ability to recognize similarities, and better facility with analogies – when solutions required knowledge of words and concepts that were more likely to be known to whites than to blacks. But when these kinds of reasoning were tested with words and concepts known equally well to blacks and whites, there were no differences. *Within* each race, prior knowledge predicted learning and reasoning, but *between* the races, only prior knowledge differed, not reasoning ability.

It seems unlikely that differences in knowledge would have a genetic basis if there are not differences between the races in learning and reasoning ability. It seems much more likely that the knowledge differences are entirely due to environmental effects. (However, I would never argue that knowledge differences do not count as intelligence differences. Your intelligence depends to a substantial degree on the words and concepts that you know.) Some of the most convincing evidence about whether the IQ gap has environmental causes concerns political scientist James Flynn's discovery about IQ changes over recent gener-

ations.<sup>12</sup> He established that, in the developed world as a whole, IQ increased markedly from 1947 to 2002; in the United States, it went up by eighteen points.

Our genes could not have changed enough over such a brief period to account for the shift. The only plausible explanation is that it was the result of powerful environmental factors. And if such factors could produce changes over time for the population as a whole, they could also produce big differences between subpopulations at any given time. Indeed, black IQ now is superior to white IQ circa 1960. If black genes for IQ are inferior to those of whites, that gain could not have happened – unless you argue that the environment for blacks today is far more conducive to high IQ than the environment for whites in 1960. I doubt that many people would attempt to make such an argument.

Finally, because there is good reason to believe that the environment of blacks has been improving at a more rapid rate than that of whites, we would expect the black/white gap to be less today than in the past. In fact, the IQ difference between black and white twelve year olds has dropped, to 9.5 points from 15 points, in the last thirty years, a period that in many ways was more favorable for blacks than the preceding era.<sup>13</sup> Black performance on the National Assessment of Educational Progress (NAEP) Long-Term Trend Test shows equivalent gains. Improvement in reading and math has been modest for whites but substantial for blacks. The shrinkage of the gap on the NAEP test is roughly equal to the change in standard deviation terms that was found by Dickens and Flynn for IQ tests.

What can be done to hasten the complete closing of the black/white gap in IQ and academic achievement? Schools (and preschools) are the arenas in which

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we have the most control, so I will focus on the evidence about gap reduction that we might expect from improvements in education.

I am a social psychologist, and two of the most important general principles in my field are that 1) some big-seeming interventions can have little or no effect on some process or phenomenon and 2) some trivially small-seeming interventions can have a significant effect. Both principles are confirmed over and over again in the field of education. Head Start, for example, seems like a pretty big intervention; it is certainly costly. Poor children and minority children, and especially poor minority children, are placed in small settings where at least some of the activities are supposed to be intellectually stimulating. But Head Start's effects are slight: reduction of the gap by a few IQ points at the beginning of elementary school before fading into nothing after a few years of school. The effect on grades is similarly transient. The United States will spend \$11 billion on Head Start this year and that money is largely wasted, in my opinion.

Fortunately, there are bigger interventions that have a marked effect on ability and subsequent success in life. These include the Perry Preschool Project, carried out with poor black children in Ypsilanti, Michigan.<sup>14</sup> This program provided a full day of preschool, with most activities deliberately chosen to increase intelligence and academic skills. Another example, the Abecedarian program, did the same on a half-day basis.<sup>15</sup> Both programs employed educators with considerable skill and experience – criteria that are often not met in Head Start. These intellectually enriched programs result in big IQ gains on entry into elementary school and massive academic gains that persist for the long haul.

The programs were able to cut in half the percent of children put into special education, to cut by almost two-thirds the percentage in the bottom 10 percent on standardized tests, to reduce by almost half the percent forced to repeat a grade, to increase by a third the percentage who graduated from high school, to more than double the percent who went on to a four-year college, and to cut in half the percentage who claimed welfare benefits as adults. The programs are expensive, but the payoff to the public has been estimated at between \$4 and \$9 per dollar spent on these programs. If you pull out all the stops in preschool education you can have an enormous effect. Smaller but still big-seeming measures may fail.

What are some of the big-seeming interventions in K-12 education that have disappointing results? Vouchers sound like a big intervention to many people. Families receive money to pay for education at any school in the community; the freedom of choice supposedly tailors the school to the child and results in steady attrition of the least effective schools, which parents begin to shun. But there is no evidence that vouchers result in better scholastic outcomes for kids.<sup>16</sup> How about charter schools, institutions that are “off the grid” of public education and that can design their own programs and hire and fire teachers as they please without necessarily having to deal with unions? The best evidence indicates that (most) charters are little better than regular public schools, and perhaps a little worse during their start-up periods.<sup>17</sup> I might send my child to an established charter school – without much conviction that it would be better than regular public schools – but I would not enroll him in a new charter.

“Whole school” interventions are very ambitious-sounding. Corporations go into a school with a new curriculum,

special teacher training, suggested lesson plans, reorganization of the administration, and so on. But there is not much evidence that they improve things substantially. Schools undergoing such makeovers are only a very little bit improved by the experience – and they are very expensive, so the bang for the buck is poor.

But again, there are *really* big interventions that do make a huge difference for poor and minority kids. Uncommon Schools, Achievement First, Harlem Children’s Zone, and KIPP (the Knowledge is Power Program) keep kids in school for as much as 60 percent more time than regular public schools. The best-researched of these programs is KIPP. KIPP students start the school day as early as 7:30 and finish as late as 5; the schools are open some Saturdays and continue into the summer for a few weeks. Instruction is not just of the “drill and kill” variety. Students enjoy experiences and programs typical of what upper-middle-class children receive: museums, sports, dance, art, theater, photography, and music performance. KIPP principals have the power to hire and fire teachers, and they insist on cooperation among teachers. Teachers visit parents and children in their homes, require kindness and good behavior of their students, and hand out rewards and penalties on the spot for behavior and academic achievement. One KIPP teacher described the atmosphere at the schools thus:

We’ve never had a kid talk back to a teacher, and we’ve never had kids fight. I don’t attribute this to the discipline system. It’s from setting expectations from the start. The smallest detail was called out. . . . It’s because kids believe that this is an extraordinary place, and we’ve taught them that. I don’t think they don’t tease because they

are afraid of the bench [for bad behavior]. It’s just something that they would not do at KIPP. This is the one school they’ve been to where there’s no teasing. They feel safe, and they are learning more.

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KIPP gets remarkable results. A Stanford Research Institute study of San Francisco Bay area students who entered a KIPP school in the fifth grade showed marked improvement over the course of a year.<sup>18</sup> Twenty-five percent of the students scored at or above average on a nationally standardized language arts test at the beginning of the school year; in the spring, 44 percent did this well. In the fall, 37 percent of KIPP fifth graders scored at or above national averages in math; in the spring, 65 percent did this well. Progress continued at a good clip in the subsequent middle school years. A more recent study by Mathematica, the Cambridge, Massachusetts, research corporation, found comparable effects in a larger study with a somewhat different design: the “intention to treat” design,<sup>19</sup> meaning that not all children assigned to the intervention group actually get that treatment (because they drop out of the KIPP school, for instance). The design yields a conservative estimate of the effects of three years of KIPP education, which in this case indicated that KIPP student performance in math exceeded that of controls by at least 0.5 standard deviations and in reading by 0.3. Those three years obliterated half of the black/white difference in math and a third of the black/white difference in reading! Again, big-seeming interventions sometimes fail to have big effects; *really* big-seeming interventions can have huge effects.

How about high school? There are no KIPP-type programs for high school yet, but we have a pretty good idea of what can be achieved with poor minority stu-

dents in math. You may have seen *Stand and Deliver*, the 1988 movie about math teacher Jaime Escalante's achievement in getting his East Los Angeles barrio students – who typically did not even graduate from high school – to pass AP calculus at higher rates than students from the rich Beverly Hills High (and for that matter, from most elite high schools in the country). But is the story told by the movie true?

There is good news and bad news about Escalante's feat. Most important, it is perfectly true that it happened. But unfortunately it did not happen in the way the movie implies: Escalante did not announce to unsuspecting seniors that he was going to make them into math whizzes that year. He started by building up math programs at junior high schools that then fed highly prepared students into his three-year high school.<sup>20</sup> And he made sure his students had excellent courses in high school math before he ever taught them as seniors. Once again, massively ambitious programs can make a massive difference.

Finally, the biggest intervention of all: college. Black students start college a full fifteen points lower in IQ than white students. But blacks in college gain in intellectual ability much more than whites, so that by the end of college the IQ difference is reduced to six points.<sup>21</sup> Black students are on track to erase even that difference in the years ahead.

I started out by saying that big interventions do not always have a big effect but that small interventions *can* have a big effect. That is decidedly true for interventions with minority students.

Many Americans believe that abilities are essentially fixed at birth: you either have math ability or you don't. Others believe abilities are highly susceptible to manipulation: if you work hard you'll be

better at a given skill than if you don't. Social psychologist Carol Dweck and her colleagues<sup>22</sup> have measured attitudes about ability in a group of mostly minority junior high students, asking for beliefs about such statements as "You have a certain amount of intelligence, and you really can't do much to change it" and "You can always greatly change how intelligent you are." Their results showed, not surprisingly, that students who believe that ability is a matter of hard work get higher grades than students who believe that ability is rooted in genes.

Dweck and her colleagues then tried to convince a group of poor minority junior high students that intelligence is highly malleable and can be developed by hard work.<sup>23</sup> The thrust of the intervention was that learning changes the brain by forming new connections and that students are in charge of this change process. Dweck reports that some of her tough junior high school boys were reduced to tears by the news that their intelligence was something substantially under their control. Students exposed to the intervention worked harder, according to their teachers, and got higher grades than students in a control condition. The intervention was more effective for children who initially believed that intelligence is a matter of genes than it was for children who were already inclined to believe that it is a matter of hard work.

NYU professor Joshua Aronson and his colleagues from the School of Education at the University of Texas performed similar experiments, with dramatic results.<sup>24</sup> They conducted one study with poor minority students in Texas who were just beginning junior high school.<sup>25</sup> Their intervention was short and easy to pull off. Each student in the Texas study was assigned a college student mentor for his or her first year in junior

high. The mentors discussed a variety of issues related to school adjustment. Mentors for the control group participants gave information about drugs and encouraged their students to avoid taking them. Experimental group participants were told about the expandable nature of intelligence and were taught how the brain can make new connections throughout life. Students were exposed to a Web page that reinforced the mentor's message. For students in the experimental group, the page showed animated pictures of the brain, including images of neurons and dendrites, and featured narratives explaining how the brain forms new connections when new problems are solved. The mentors also helped the students design their own Web pages, where they could re-imagine, through words and pictures of their own making, the message the mentor had been presenting.

The effects of the intervention were very powerful. On the Texas Assessment of Academic Skills (TAAS) test for math, performance of male students exposed to the intervention was much higher than for males not exposed to the intervention: 0.64 standard deviations. For females, who tend to worry whether their gender makes them less talented in math, the difference was truly massive: 1.13 standard deviations. In reading, students exposed to the intervention did much better than students in the control group: 0.52 standard deviations on average.

Daphna Oyserman, from the University of Michigan School of Social Work, set up an elaborate, but still easily carried out, intervention with poor minority junior high students.<sup>26</sup> She gave them several sessions designed to make them think about what kind of future they hoped for, what difficulties they would likely have along the way, how they could deal with those difficulties, and which of their

friends would be most helpful in dealing with the difficulties. These were supplemented with sessions in which students worked in small groups on how to deal with everyday problems, social difficulties, academic problems, and the process of getting to high school graduation. The intervention had a modest effect on GPA (0.25 standard deviations), a bigger effect on standardized tests (0.36 standard deviations), and a very big effect on likelihood of retention in grade (lowering those chances by half).

One small intervention with students at an integrated high school in the East had effects that were breathtakingly large. The study, by Geoffrey Cohen and his colleagues at Yale University, involved asking students, as they began their high school years, simply to write about their most important values: sports, school achievement, family, and so on.<sup>27</sup> This intervention had no effect on whites or on high-performing black students. But it had a huge effect on low-performing black students, reducing the need for remediation from 18 percent to 5 percent and very substantially improving GPAs. Cohen reasons that the exercise was self-affirming, building confidence in a situation where stereotypes about low black ability were sapping the energy and efforts of black students. The intervention made them feel more a part of things and more comfortable in their surroundings. Interestingly, the same intervention had no effect on black students in a segregated school situation. It seems that the stereotype threat inherent in integrated settings is not so active in segregated settings, and therefore the intervention cannot lessen its deleterious effects on performance.

Small interventions can also make a difference in college. Most students worry about social acceptance and fitting in on campus, but for minority

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students this fear can be particularly worrisome. If they fail to make friends, because there typically are not that many minority students on campus and because they may feel ill at ease with majority students, they may begin to wonder if they belong on campus. It is common for minority students' motivation to flag and for their GPAs to suffer as they progress through college.

Cohen and his student Greg Walton reasoned that lagging performance could be mitigated if minority students knew that worries about social acceptance are common for all students, regardless of ethnicity, and that things would likely improve in the future.<sup>28</sup> The researchers performed a modest intervention with black students at a prestigious private university. They invited black and white freshmen to participate in a psychological study at the end of their freshman year and exposed them to older students who assured them that worries about social acceptance are common for everyone but that over time most students find friends and a comfortable social niche. The intervention had no effect on whites but a large positive effect on blacks. In the period after the intervention, blacks reported studying more, making more contacts with professors, and attending more review sessions and study group meetings. In the subsequent term, grades of the blacks in the intervention group reflected these behaviors: their grades were much higher than those of blacks in the control group – 1.10 standard deviations higher, to be exact.

Much can be done, from infancy through college, to reduce the achievement gap. Some expensive and big-seeming interventions have no effect, while much more expensive interventions can have huge effects. How expensive are these very big interventions?

If we put the poorest sixth of children into the most effective preschool programs, the cost would be about \$50 billion a year. If we put the poorest sixth of children in KIPP-type elementary school programs that would cost about \$18 billion. (Current KIPP-type programs cost very little more than regular public schools, but that is only because their teachers work about 60 percent more than regular public school teachers. That would not be possible to duplicate on a large scale.) Can we afford this kind of outlay for education for the poor? By way of orienting the question, Congress felt in 2001 that we could afford \$70 billion per year in tax cuts for the richest 2 percent of Americans, and Congress reapproved those cuts in December 2010. The bill for bailing out AIG in 2009 was \$145 billion.

Bear in mind that some very big-seeming interventions do not cost much more than school as usual: Escalante's enriched math classes are but one example. And of course all the small-seeming interventions with notable effects cost next to nothing to carry out: recall the huge gains achieved simply from convincing minority students that their intelligence and academic achievement are within their power to affect.

Perhaps the single most important fact to remember when thinking about the future of the achievement gap is that we can reduce the black-white gap in reading by more than a third, and the black-white gap in math by a half, in a matter of three years with a program whose expense is clearly within our reach. Are we likely to attempt it? It is not impossible.

Continued reduction of the achievement gap is highly probable even if we do little to change the status quo. If we were to do the most that is within our power now, the gap would be drastically

reduced in a very short period of time.  
We can only hope that society comes to

believe in the value of these investments  
and moves to implement them.

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#### ENDNOTES

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