

BOOK REVIEW ARTICLE

**Race, Socioeconomic Variables, and Intelligence:
A Review and Extension of *The Bell Curve***

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The Bell Curve

Intelligence and Class Structure in American Life

Richard J. Herrnstein and Charles Murray

New York: The Free Press, 1944

The Bell Curve's major findings regarding the importance of intelligence for economic success and social success are summarized, as is its demonstration that racial differences in intelligence help explain the racial disparities in economic success and social pathologies. Its treatment of eugenics, the genetic basis for racial differences, and the evolution of racial differences is extended.

The Bell Curve has made waves – and it should. Yet most of its controversial findings were no surprise to the specialists in intelligence (for instance see Gottfredson 1986a, Gottfredson & Sharf, 1988, Hartigan & Wigdor, 1989, Jensen, 1981), even if they were to the media. However, most of the book is new research using the National Longitudinal Survey of Youth (abbreviated NLSY), a large scale study starting in 1979 of 12,486 youths. These have been followed from high school, through college, and into early adulthood. Fortunately, intelligence data in the form of the Armed Forces Qualification Test was obtained for almost 94% these youths.

Although from the commentary in the media one might think *The Bell Curve* was a book about racial differences, most of it is actually a discussion of the importance of intelligence in non-Hispanic whites.

The book proceeds by first examining how variables such as income, poverty, crime, illegitimacy are affected by intelligence and

socioeconomic status. The major finding is that intelligence is much more important than socioeconomic class for many of these variables. For instance, whites in the bottom 5% of intellectual ability are 15 times more likely to be in poverty than those in the top 5%. Intelligence was more important than the socioeconomic class of their families (a combination of parent's education, occupation, and income). With both intelligence and socioeconomic class in the equation, intelligence was more important.

A major surprise was how often socioeconomic class seemed to be serving as a surrogate for intelligence. It had been known from previous studies that those born into poverty did worse as adults than those born into good families. Most of these studies lacked a measure of intelligence, preventing most economists and sociologists from realizing the extent to which class of birth was acting as a surrogate for intelligence.

Similar findings were found for schooling. Intelligence was much more important in determining who dropped out of high school, or who completed college, than being born into a high status family.

Racial Differences in Intelligence;

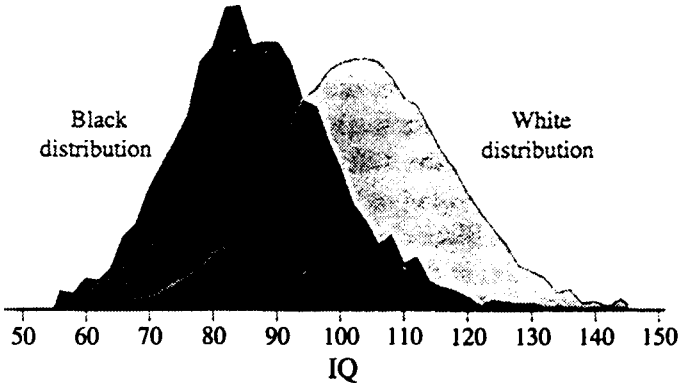
The really explosive part of the book is the discussion of race. This book openly discusses the intellectual differences between the races. After pointing out that East Asians (Chinese, Japanese) appear to be slightly more intelligent than whites, it moves on to the black-white differences. The blacks test about one standard deviation below the Whites, which for the non-statistically trained implies that the average White is superior to 84% of the Blacks, although about 16% of the blacks do better than the average white.

Some very striking graphs (p. 279) show the data from the National Longitudinal Survey of Youth. One graph shows the distribution of intelligence in the white and black parts of the U.S. population with the vertical axes equal. Another makes the vertical axes proportion to the number of individuals in each group. What is striking is how the number of blacks on the graph with IQ's over 120 is scarcely visible, while there are actually more black Americans with IQ's below 80 than there are whites.

This tendency for the racial disparities to become more

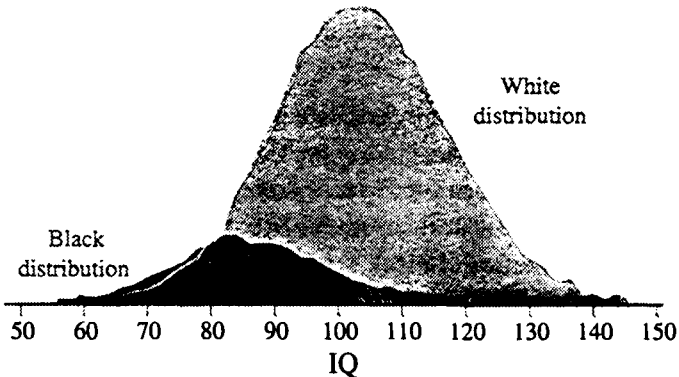
The black and white IQ distributions in the NLSY, Version I

Frequency distributions for populations of equal size



The black and white IQ distributions in the NLSY, Version II

Frequency distributions proportional to the ethnic composition of the U.S. population



Graphs from page 279 of *The Bell Curve* (Courtesy of The Free Press), based on data from the National Longitudinal Survey of Youth (1980).

pronounced at a distribution's extremes is well known to the specialists, but has seldom been discussed in the media presentations to the public. It is a mathematical result of the distribution of abilities in both groups being described by bell (normal) curves whose means differ. This property of normal curves is extremely important in understanding why so few blacks will be in the professions or in graduate schools without aggressive affirmative action, and why blacks are over represented in classes for the retarded. The category of what the book calls the very dull (those with IQ's below 75) account for 25% of the blacks, but only 5% of the whites. Many of the country's social problems in both races are concentrated in this group.

Are the tests biased against blacks? In spite of the impression left in popular discussions, the experts have concluded that they are not. One reason is that the racial differences on the parts of tests that seem most culturally based (general knowledge, for instance) are actually smaller than on the more abstract problem solving parts. The tests predict school and job performance equally well for both races, although the media appears to believe otherwise. The Herrnstein & Murray discussion draws heavily on Jensen (1980).

Intelligence and Other Social Problems;

Is part of the difference in intelligence related to socioeconomic status? Yes. *The Bell Curve* concludes that 37% of the difference between the races is statistically related to socioeconomic differences. Of course, this does not mean that these socioeconomic differences are causing the intelligence disparities. Instead, those of low intelligence end up with low socioeconomic status. The genes for low intelligence, along with environmental disadvantages, are then passed on to their children. A major reason many blacks are poor is that their low intelligence which makes it hard for them to finish high school or college, or to obtain and hold high paying jobs.

Is there discrimination against blacks? It is well known that blacks earn less than whites and get less schooling. However, most studies showing this fail to control for IQ differences. The data in *The Bell Curve* shows the importance of controlling for intelligence. A white of the study's average age (29 years) would earn \$27,372. A black of that age would earn only \$20,994. However, a white person

of average age and average IQ (100) would earn \$25,546, while a black of the same age and intelligence would earn \$25,001. However, more working blacks than whites are females. Thus, gender should be controlled for. Once this is done the average black is found to earn 101% of what a white would earn. The vast bulk of the black/white wage difference appears to be due to the intelligence difference, not to discrimination. There appears to be very little scientific basis for blaming discrimination for most of the lower wages blacks receive.

What about poverty? For those 29 years old, the equations show that only 7% of the whites in the study versus 26% blacks would be in poverty. For those of average age and intelligence, the figures shrink to 6% for whites and 11% for blacks. The black poverty problem seems primarily, but not completely, related to lower intelligence.

We hear a lot about black difficulties in getting into and finishing college. Supposedly discrimination is preventing blacks from getting through college as easily as white do. The Bell Curve shows that 27% of whites of average age (29) have finished college, while only 11% of the blacks have done so. However, for a person of the same age and the average IQ for college graduate (114), 50% of the whites have finished college, but 68% of the blacks have. Of two people with same IQ in high school, the black is more likely to finish college than the white. If there is any discrimination, it appears to be against whites, not blacks. Incidentally, an implication of this is that the typical black college graduate will be of lower intelligence, and know less, than the typical white graduate. This observation may be of use to those responsible for hiring, or for setting policy related to hiring.

The Bell Curve (p. 493) provides data on pass rates for teacher competency exams (which blacks consistently fail at greater rates than whites) that suggest that the black college graduates do indeed know less than white ones. For other fields, data from their sample (p. 488) shows that there are indeed black-white differences in intelligence and that these range from 1.1 standard deviations (managerial jobs, clerical, craft, and low-skill labor) up to 1.5 standard deviations (technical occupations) in all of the categories listed.

What about entering the high IQ occupations (such as lawyers, doctors, scientists, college professors, etc.)? There is constant

publicity about black under-representation in such jobs. Blacks are indeed under-represented. Only 3% of them at age 29 had made it into these professions, while 5% of the whites had. However, for those of the average IQ for these professions (117), 10% of the whites had made it versus 26% of the blacks. For two individuals with the same ability, the black appeared 2 1/2 times as likely as the white to make it into these professions. The black under-representation appears to be more than explained by their lower IQ's. Affirmative action is the obvious explanation for the large advantage of blacks over whites with the same IQ in getting into these occupations.

Affirmative Action

The later chapter on higher education makes clear the advantage affirmative action gives blacks. The data assembled shows that at the elite campus, the average black is in the bottom 10th to 15th percentile in abilities (a result of a 180 point difference in the SAT test scores).

The difference appears to be even greater in graduate schools. For all law schools, the average black first year student would be better than only 7% of the white first year students. For ten highly selective law schools, the average black would be at the ability level of the bottom 1% of the whites. The problem is the very few blacks with extremely high ability. In 1993, there were 1100 whites with scores on the Law School Aptitude Test of better than 170, but only 3 blacks. The only way to get large numbers of blacks into the elite law schools was to greatly lower admission standards.

The situation is similar for other graduate schools and for medical schools. The average entering black in medical school is at the level of the bottom 8 to 10% of the whites on the Medical College Admission Test (p. 457). "In none of the three subtests did more than 19 blacks score in the 12 to 15 range (on a scale that goes from 1 to 15), compared to 1,146, 1469, and 853 whites (for the biological sciences, physical sciences, and verbal reasoning tests, respectively)." While this very strong black preference clearly benefits the few high ability blacks who receive well paying medical jobs, it is clearly not in the interest of whites, and probably harms most blacks. Blacks are disproportionately treated by black doctors (Jaynes &

Williams, 1989), and the lower intellectual ability of the blacks entering medical school by affirmative action probably results in poorer medical care for the typical black.

The book does not devote a lot of space to the policy implications. Contrary to the impression left by the press, most of the policy discussion is not directed at race related policy. The authors express concern about the increasing division of the country into a cognitive elite and others. A striking chart (p. 516) shows that about 1970 the growth of median family income for Americans slowed, while the percentage of families with incomes over \$100,000 continued. Economic growth is benefiting less those whose intellectual abilities limit them to unskilled occupations. While the book doesn't go into great detail on reasons for this, it has become easier to mechanize the most mechanical tasks (which creates a demand for those smart enough to maintain the machines, while reducing the number of operators and laborers the economy requires). Also, as the world economy becomes increasingly integrated, many unskilled jobs can be easily moved to third world countries where wages for low skilled labor are low.

It is argued that there is an increasing division of America (and presumably other countries) into the mass of ordinary citizens and a cognitive elite, which is typically now university educated and often descended from those who are university educated. The policy makers, may not realize how limited in cognitive ability (and knowledge) the masses are. Policy makers are virtually always from the cognitive elite, even if they claim to be representing the working classes. A casual inspection of tax forms or government regulations shows they are hard to understand even for those in the cognitive elite, and almost impossible to understand for most others.

One chapter (Chapter 16) discusses the prevalence of low cognitive ability in Americans suffering from different problems, showing how frequently they are of disproportionately low cognitive ability. This fact needs to be taken into account in designing programs.

As the authors put it (p. 387):

Do we wish to persuade poor single teenagers not to have babies? The knowledge that 95% of poor teenage women who have

babies are also below average in intelligence should prompt skepticism about strategies that rely on abstract and far-sighted calculations of self-interest. Do we favor job training programs for chronically unemployed men? Any program is going to fail unless it is designed for a target population half of which has IQs below 80.

The concluding chapter discusses in a philosophical manner the problem of building a society where those of average and below average ability can find a useful role. Even for those whose cognitive limitations prevent them from achieving high socioeconomic status, supporting and rearing a family, and being law abiding and productive citizens in the local community appear possible routes to self esteem.

The Dysgenic Trend

The book contains a chapter on the dysgenic trend by which those of low IQ are having more offspring than those of high IQ. After summarizing the literature as (p. 341), "The professional consensus is that the United States has experienced dysgenic pressures throughout either most of the century (the optimists) or all of the century (the pessimists)," the discussion turns to data for the 90's. Current Population Survey data is used to show that the average number of children ever born to US women ages 35-44 in 1992 was 71% greater for high school dropouts than for college graduates. The new research reported using the NLSY shows that the average IQ of the mothers in the sample was less than 96. However, because many of the higher IQ women have not yet completed their childbearing, it is estimated that the overall IQ of American mothers was a little less than 98. This implies that a slow generation to generation decline in US IQ is to be expected.

A point not made in *The Bell Curve* is that the tendency for the high IQ to have fewer children appears more pronounced among women than among men. This is primarily because childbearing interferes more with schooling and careers among women than among men. Also, the higher status of high IQ men probably helps them get younger more fertile wives if they remarry, and helps them get more extramarital mating opportunities. Since children inherit genes from both parents, the dysgenic effect is a little weaker when

both parents are considered.

There is an additional factor that is often neglected. The high IQ have their children later than the low IQ (partially because most women defer childbearing until their education is completed, and high IQ women seek higher level of education). The data from the NLSY shows that women in the top 5% for IQ have their first child at an average age of 27.2 years, while those in the bottom 5% have their first child at an average age of 19.8 years (p. 352). The difference is less for the average over all births, but it appears that those in the bottom 5% will complete 5 generations for every four generations completed by those in the top 5%.

The discussion of differences in birthrates by ethnicity shows that the ethnic differences are much reduced when women of the same levels of education are compared (p. 353), with fertility declining in all three ethnic groups with education. A surprising finding is that after "assigning IQ equivalents based on the relationship of educational attainment and cognitive ability in the NLSY, it appears that after equating for IQ, black women at a given IQ level may have lower fertility rates than either white or Latino women" (p. 353). A footnote suggests that the fertility depressing effect of high IQ is due to the educational and career effects that accompany it, and suggests the lower black fertility may be because at any IQ level blacks are more likely to be in school.

A fascinating table (p. 354) shows the percentage of births to mothers of different ethnic groups among those in the NLSY (whose members have yet to complete their childbearing). Among whites 19% of the birth were to mothers with IQ's below 90, and 22% with IQ's above 110. However, for blacks 69% of the births were to mothers with IQ's below 90, and only 2% to mothers with IQ's above 110. This suggests that the racial differences will increase over time. Incidentally, for Latinos the figures were 64% and 2%.

The NLSY also includes test results for the offspring of the original sample. This makes it possible to compare the IQ gap between the racial groups in parents with the gap in children. Between white and black mothers the gap was 13.2 IQ points. However, among children of these parents, the IQ gap was 17.5 points, with a major cause plausibly being that the low IQ mothers among the blacks were having relatively more children. It appears

likely that the racial IQ difference is increasing rather than decreasing in America.

Eugenics

A few very controversial topics that the book might have discussed are not discussed. An obvious policy proposal is eugenics. If a child's intelligence and life chances are heavily influenced by intelligence, and intelligence is partially dependent on the genes, it would seem desirable to have a high percentage of children borne with genes for high intelligence. How this might be accomplished is another question.

If the benefits to children of good genes were publicized, some people might consider a potential spouses genes before marriage. While in American culture, the problem of choosing a spouse appears to be most often conceptualized as choosing a companion for life (with the choice presumably based on the spouse's entertainment value, or on the ability to provide financial and emotional support), in some other places (and to some extent in America) it is conceptualized as "choosing a mother or father for my children". With the latter conceptualization, those aware of the importance of genetic heritage may give it weight in selecting mates.

In general, if males and females are looking for high IQ mates (which they appear to do even if they aren't aware of the inheritance of intelligence), the major effect is to increase the probability that high IQ males and females mate with others of similar IQ, and those of low IQ mate with each other. Because most genes that affect intelligence appear to act additively, such an increase in associative mating for IQ should not raise the average IQ of the population. However, it should increase the variance of IQ, leaving the population with more high IQ individuals and more low IQ ones. This may be desirable. Most the inventions, discoveries, and cultural creations come from the cognitive elite. Likewise, they occupy most of the leadership positions (even when they act in the name of the working class or union members). Raising the ability of the cognitive elite could easily bring benefits that exceed the offsetting decline in the ability of the working classes and the underclass.

However, there is one mechanism by which increased emphasis

on intelligence in selecting mates might raise the intelligence of a society. A young women might trade off acceptance of an older mate and the greater risk of a longer period of widowhood for better genes for her children. Such behavior should actually raise the IQ of the populations. Decisions of this type might result from publicizing the data in *The Bell Curve*. However, intelligence is a trait that is highly valued in a mate in most cultures (see the surveys discussed in Buss, 1994) so an awareness of its importance and partially genetic transmission, may not greatly change behavior.

Other eugenic measures are more controversial. A simple measure would be to use only sperm from highly intelligent males in artificial insemination programs. Currently they appear to be typically screened for most genetic diseases (as well as for AIDS), but typically not for intelligence (Seligson, 1995). Supposedly, there is a current bias towards intelligence in donors because many of the donors are medical or other students, but the typical procedure does not guarantee this.

Yet the cost of giving intelligence tests would be relatively low. If some donors were to be rejected because of low intelligence, it might be desirable to enlarge the pool of potential donors, but that could be done by increasing the fees paid, or possibly by a public campaign to persuade high quality donors to provide sperm as a public service. The genetic quality of the sperm used could be raised by relaxing other less desirable constraints such as restrictions on the number of children that can be fathered from a single donor, or by relaxing efforts to choose donors with particular hair, eye, or skin color. Certainly, if parents are willing to pay many tens of thousands to get their children into and through Ivy League colleges, potential parents should be willing to pay a few dollars more for quality sperm. If well-heeled parents seek the best designer jeans for their offspring, why shouldn't they seek the best genes?

In spite of the apparently very high benefit-cost of ratio from selecting sperm on the basis of the donor's intelligence, an Italian doctors group has decided "There should be no selection of sperm based on the social, economic or professional standing of the donor" (Montalbano, 1995), all cheaply ascertained surrogates for intelligence, and other genetic traits that contribute to obtaining these types of status.

A lot of proposed public policies appear to have eugenic implications, which are typically not even discussed. Should conjugal visits be permitted in prisons? In the Bell Curve study (p. 376), 62% of the men ever interviewed in jail or prison came from the bottom 20% in intelligence. The offspring resulting from conjugal visits to these men are likely to be of below normal intelligence (as well as having inherited what ever other genes contribute to a criminal career).

The textbook reasons for imprisonment are deterrence, and keeping the criminal off the streets so he can't commit another crime. An undiscussed benefit is preventing the criminal from reproducing for several years. Feminists occasionally propose castration as a punishment (usually for rape). This measure would appear to have positive eugenic effects on intelligence, and on any other genes that contribute to rape.

Should Lesbians or single women become mothers by artificial insemination? If the sperm used is of high quality, it is very likely that the offspring will be of high intelligence, and unlikely that they will become public burdens. Should post-menopausal women have babies using advanced technology and their husbands sperm, as a 62 year old woman recently did in Italy (Montalbano, 1995)? Given the high cost of such technologies, it is very likely that their husbands had genes for high intelligence. Yet this measure was to be banned by the new Italian doctor's code, as was artificial insemination after the death of a partner.

How should population growth be slowed? Typical proposals involve each family having fewer children, but with all being subject to the same limits. The possibility of disproportionately discouraging reproduction by the less intelligent appears to have been seldom discussed by those concerned with over population.

The Bell Curve does contain some data (p. 379) that points to an eugenic effect for any program that successfully reduces illegitimacy. Of the illegitimate children in the NLSY sample a third were born to children in the bottom 10% of the IQ sample, and 85% were born to women in the bottom half of the cognitive distribution. Of the children born to poor, single, teenage girls, 64% were born to women in the bottom 20% of the cognitive ability distribution, and

95% to women in the bottom half.

Anything that successfully reduced the number of children born to single, poor, unmarried women would serve to increase the nation's IQ level, and to reduce the incidence of the social problems that are most common among the children of such mothers. While the data in the Bell Curve implies it would be desirable to reduce births of such children, it does not specifically propose measures to do so. The closest it comes is to suggest that the welfare system enables poor, low IQ women to have children who would not otherwise do so.

Perhaps the most practical eugenic measure that is even close to politically feasible would be to offer welfare to unwed mothers only if they agree to having a Norplant contraceptive device (which would prevent pregnancy for several years) inserted, or to use of the new three month contraceptive injections. This would somewhat reduce the birth rate among the low IQ, and appears more humane than simply refusing assistance to unmarried teenagers, as has been proposed by the Republicans in the US Congress. Incidentally, sex education classes do not appear to reduce illegitimacy rates.

Implications for Anthropology

The Bell Curve is basically a book about America, drawing on data to show how differences in intelligence affect its citizens. There is only a brief discussing of the IQ's of various races when tested outside of the United States. However, its conclusions should readily extend to other industrialized countries where most citizens are offered the opportunity for schooling, and the brighter one can be educated at taxpayer expense through the university level. Indeed, in some countries the economic obstacles to education are even smaller than in the US, and one would expect access to the universities and professions to depend even more on intellectual ability (and the genes that determine it) than in the US.

However, in many third world countries the sorting by cognitive ability is less effective. *The Bell Curve* suggests that low intelligence is the most likely reason to "Why Johnny can't read" in the US (where virtually all children have been given the opportunity to learn how). However, in many countries the most likely reason is still that he did not go to school. Genetic heritage will be less important in

such countries, and the environment factor of access to schooling more important.

The material showing that a large part of racial differences in income and in various social variables is explained by the lower IQ of blacks may be relevant to other countries that have a black minority.

Intelligence, the genetics of intelligence, and racial differences in intelligence are not well covered in anthropology textbooks. In many circles they are not considered suitable topics for discussion. Textbooks either ignore them or present what in America is called the "politically correct" view, without mentioning that any other views are widely held by respectable scholars, or even providing references to the scientific literature. The Bell Curve does provide a short discussion of these topics along with references to the primary scientific literature. The discussion is far superior to what can be found in any anthropology textbook I am aware of. However, as discussed below, the literature review is already dated.

Genes and Racial Differences

The Bell Curve presents the evidence that a large proportion of the variability in intelligence in America is genetic (pp. 105-108). Is part of the racial difference genetic? The book summarizes well the evidence (pp. 295-311) that was available to the authors when it was being written. The authors conclude (p. 311), "It seems highly likely to us that both genes and the environment have something to do with racial differences. What might the mix be? We are resolutely agnostic on that issue; as far as we can determine, the evidence does not yet justify an estimate." This mild statement was upsetting to many in the US media, although an earlier survey sent to 1020 experts (Snyderman and Rothman, 1988) showed that there were three times as many who thought it was both genetic and environmental, as thought it was solely environmental.

There has been considerable press discussion of racial differences in intelligence following the publication of *The Bell Curve* (for a review of this discussion see Murphy, 1995). What the press was not aware of is that *The Bell Curve* is not the latest scientific work on racial differences. Since it went to press, several new papers have been published which greatly strengthen the case for racial IQ

differences being at least partially genetic.

Another recent development is new adoption data. As background, the theoretically best way to discover if black/white differences are due to something they were born with (presumably genetic) is to rear them in the same families (or at least families randomly chosen) and see how they turn out.

Scarr & Weinberg (1976) had earlier reported the results of a study at age 7 of black children adopted into middle class white families, which they interpreted as not supporting genetic differences. In particular, their finding that black children raised in white families had childhood IQ's of 106 was widely interpreted (correctly) as evidence that childhood intelligence could be affected by the environment (for instance, Tucker, 1994, p. 230). However, since a purely environmental theory would suggest that racial origin (between those with two black biological parents and those with one black and one white biological parent) would make no difference for children raised in the same families, and there was a difference, the study also provided evidence for a genetic difference between the races.

Recently, the results of a follow-up of the children when they were about seventeen appeared. The published report (Weinberg, Scarr, Waldman, 1992) primarily discussed the IQ change between the first and second testing (even though the use of different tests complicated comparison), rather than the absolute values of the IQs (although these were given in the paper). The authors interpreted their results in terms of demonstrating the power of the environment.

Two recently published comments point out how her results provide evidence for genetic differences between the races. One is by Levin (1994). With good reason, he points out how their results are just as would be expected if most racial differences in IQ were genetic.

Lynn (1994), a member of this journal's editorial board, points out that when black and white children are reared in matched social environments (educated white families) they have an IQ difference of 17 points. This slightly exceeds the 15 points observed when each are in their own environments. This is very close to a controlled experiment, and suggests that altering environments after infancy does nothing to reduce the racial IQ differences. The IQ of the mixed race children is 98, halfway between that of the study's whites and

blacks. As he points out, this is as predicted by genetic theory, but is hard to explain environmentally, since both mixed race and black adopted children are socially classified as black. He gives other powerful arguments I find convincing.

In their reply (Waldman, Weinberg & Scarr, 1994), the authors of the study appear to disagree, claiming "results from the Minnesota Transracial Adoption Study provide little or no conclusive evidence for genetic influences underlying racial differences in intelligence and achievement." They give their reasons, of which the strongest is that the children were not perfectly matched on early childhood experience, since the whites were adopted at an earlier age (probably because they had been easier to place), and also pointing out that an inherited characteristic, skin color, might have led to different treatment of the children even in liberal Minnesota.

However, there is support for the genetic explanation in their article. Notice they are denying "conclusive evidence" from their study. They do not deny it is strong evidence. They readily concede there are IQ differences between white and black adoptees (and make no argument about biased tests). They later say "We think it is inherently implausible that these differences are either entirely genetically based or entirely environmental based." (p. 31). The reader, not being familiar with the role Sandra Scarr has played in the controversy about racial differences in IQ may not realize the significance of this sentence. She has been a leading opponent of the idea of genetic differences. She is now saying that it is highly implausible that the differences are entirely environmental. This is news.

It contrasts strongly with the impression most of the media has that no respectable scientist believes there are genetic differences, and that all the experts believe the differences are entirely due to environmental causes. The leading opponent among professional behavior geneticists now believe "We think it is inherently implausible that these differences are . . . entirely environmental based."

There have been some interesting findings reported regarding head size and intelligence recently. Rushton & Osborne (1995) have reported on a study of black and white twins showing smaller head size in black twins than in white twins in a sample where the blacks

have lower IQs. His analysis shows a high heritability for head size (and presumably brain size) in whites, although for an unknown reason the heritability is lower (but still appreciable) in blacks.

Jensen (1994) shows that the tests that measure intelligence best are those most sensitive to head size differences, and that the tests that are most sensitive to head size show the largest black/white differences.

Jensen and Johnson (1994) of the University of California at Berkeley studied head size and intelligence in black and white children, males and females, using the very large data base from the National Collaborative Perinatal Study. Its importance is not merely in showing that brain size and intelligence co-vary. (This has been shown in several recent studies using MRI measurements of brain size), or that there are racial differences in head and brain size (this has been shown by autopsy data). Comparing siblings, Jensen showed that the large-headed tended to be the more intelligent in black males, black females, white males, and white females. This result indicates that there is something biological (almost certainly genetic) that affects both brain size and intelligence. (Miller, 1994a, argued that this biological factor affecting both intelligence and brain size could be the thickness of layers of myelin). By showing that much of the racial difference in IQ disappears when children of the same head size are compared, Jensen and Johnson provide strong evidence that whatever is causing the racial head size differences is also causing at least part of the racial differences in intelligence. In turn, it is known that the racial differences in intelligence are closely related to the racial differences in school performance, which are known to be related to the differences in poverty (see *The Bell Curve*). This is a very exciting lead for those concerned with the causes of poor school performance and poverty in blacks.

The Jensen and Johnson's finding that one gene or set of genes seems to affect both head size and intelligence could help explain an intriguing finding reported in *The Bell Curve*. This is that 45% of low-birth weight babies had mothers in the bottom 20% of intelligence (p. 381). One possible explanation is that low intelligence mothers adopted behavior patterns that led to low birth weight babies. However, there is another possibility that *The Bell Curve* does not discuss. It now appears that brain size and IQ are correlated from

MRI studies (Andreasson, et al. 1993; Schultz, 1991; Wickett, Vernon, & Lee, 1994; Willerman, Schultz, Rutledge, and Bigler, 1991), and that head size at birth correlates with childhood intelligence (Broman, Nichols, Shaughnessy, Kennedy, 1987). The latter effect is probably because small-headed babies are small brained. The brain at birth uses a large percentage of the body's metabolic energy. This would imply that a larger brain would have to be supported by larger lungs, heart, and digestive system. It is plausible that the genes for high adult IQ produce at least part of their effect by affecting brain size at birth (or something correlated with brain size). Since half of a baby's genes come from the mother, the existence of genes that affect both intelligence and birth weight would produce a concentration of low-birth-weight babies among the offspring of low IQ mothers, as *The Bell Curve* reports. It would be interesting to do a sibling analysis similar to that done by Jensen and Johnson of the birth weights and later intelligence to see if the higher birth weight siblings typically were smarter.

The Evolutionary Origins of Racial Differences in Intelligence

Not surprisingly, in a book that does not take a position on the extent to which racial differences are genetic, there is no discussion of how such differences could have arisen. That there could be differences in behaviorally relevant gene frequencies should be no surprise. Recently, a massive compilation of data on the world wide distribution of gene frequencies has become available (Cavalli-Sforza, Menozzi, & Piazza, 1994). As a review in this journal pointed out (Miller, 1994c) there is no polymorphic gene known in humans whose frequency does not vary among populations. This observation makes it very likely that when and if specific genes are identified that affect intelligence, that the frequency of the alleles that contribute to high intelligence will be found to differ between populations.

Recently, the APOE*4 allele has been shown to be a significant risk factor for Alzheimer's disease, which adversely affects intelligence. In one study the risk increased from 20% with no copy of the APOE*4 allele to 47% and 91% with one and two copies of the APOE*4 allele respectively (Corder, Saunders, Strittmatter, Schmechel, Gaskell, Small, Roses, Haines, Pericak-Vance, 1993).

"Although only 14% of Asians and 25% of whites carry the APOE*4 allele, almost 50% of Africans, Polynesians, Melanesians, and Australian Aborigines do." (Kamboh, 1995, p. 203). This provides a documented case of racial differences in the frequency of a gene relevant to intelligence, although admittedly the effect occurs through susceptibility to a disease.

Recently progress has been made towards identifying other genes that affect intelligence (Plomin et al, 1994), with there being evidence for two intelligence related genetic markers in published work, and there being evidence for others in unpublished work. Most likely the alleles of these genes will be found to differ in frequency in racial groups.

The question of how evolution could produce genetic differences in intelligence between races could arise has recently been the subject of discussion. Rushton (1995) has proposed a theory to explain racial differences in a large number of traits. He argues that Negroids are more r selected than Caucasoids, who in turn are more r selected than Mongoloids. In turn, he argues a less predictable environment selects for r traits, and that such an environment existed in sub-Saharan Africa during the period in which racial differences evolved. In biology, r selected organisms have more offspring and invest less in them than K selected ones. He argues intelligence is a K trait. His argument and data has been summarized in a book review article in this journal (Taylor, 1994). Miller (1993, 1995) has presented arguments against this view to which Rushton and Ankney (1993) have replied.

Miller (1994b) has provided an alternative theory to explain most of the facts explained by Rushton's differential K theory. Miller points out that in the tropics during hunter-gatherer times, females were able to support themselves and their offspring year round. The males who left the most descendants would have been those that adopted a "love them and leave them" strategy with relatively weak pair bonds and males devoted more of their efforts to obtaining mating opportunities. Obtaining sexual access would often require fighting other males.

In contrast, in colder climates, the problem is to get through the winter, which is normally done by some combination of food storage and hunting. Large game hunting could not be efficiently done by

females carrying babies, or by pregnant females. Thus females were dependent on male provisioning. The males who left the most descendants were those who formed strong pair bonds and provisioned their mates loyally. Provisioning selected for a somewhat different set of traits than a high mating effort environment did.

Intelligence and the Differing Importance of Paternal Investment

Recently, Miller (in press) has extended his differential paternal investment theory to explain differences in intelligence in different parts of the world. Sociobiologists (Symons, 1979; Hrdy, 1981) have argued that resources provided by men are important to female reproductive success, and that women select mates partially on the basis of the male's ability and willingness to provide such resources. This induces men to try to persuade women that they have such resources and will provide them to the woman and her children.

Buss (1994) emphasizes how often in human mating deception is used. For instance, men try to convince women that they have, or will have resources, and will devote them to the well-being of the woman and her children (and not squander their resources on other women and their children), while women try to convince men of their sexual loyalty (while possibly seeking better genes from other men).

Buss states (p. 155) "Because the deceived can suffer tremendous losses, there must have been great selection pressures for the evolution of a form of psychological vigilance to detect cues to deception and to prevent its occurrence. The modern generation is merely one more cycle in the endless spiral of an evolutionary arms race between deception perpetuated by one sex and detection accomplished by the other. As the deceptive tactics get more subtle, the ability to penetrate deception become more refined." With northern women more dependent on male provisioning than tropical women, selection would have been stronger in the cold areas for the intelligence needed to recognize deception.

Men can also be deceived. They can waste many resources if they raise another man's child. Women try to deceive men as to their loyalty. The more dependent a man's reproductive success is on accurately directing his provisioning to his own biological offspring

and to those females who have or will bear their children, the stronger the selection for male intelligence. In the northern climates, where provisioning directly impacts their children's survival, selection for intelligence will be greatest.

Differences in the importance of paternal investment may even explain the pattern of racial abilities. Detecting deception in a mate calls for reasoning, which would show up in high intelligence. Merely impressing potential sex partners with conversation and song would call for high verbal skills, memory, and verbal fluency. This does resemble the observed pattern of racial differences (Jensen & Reynolds, 1982; Jensen, 1985).

The only alternative to hunting for surviving the winter is food storage, which can be shown to be more common in cold climates. Successfully storing food calls for the ability to defer gratification, the ability to imagine winter conditions when times are warm, and simple quantitative skills to manage the accumulation and consumption of stores. Thus, the need for storage should select for intelligence (Miller 1991). Storage also leads to a settled lifestyle which leads to the use of more artifacts

Lynn (1991b) has tried to explain the racial differences intelligence, which he had earlier described (Lynn 1991a), by the greater need for hunting in cold climates, and the greater intellectual demands of hunting.

Further research will be needed to pin down the exact role of the different selective forces that could have produced racial differences in intelligence. There is now strong evidence that such differences exist, and there is no shortage of mechanisms that could explain their existence.

Conclusions

The Bell Curve shows that intelligence is an important determinant of many socioeconomic variables. Many effects that sociologists have attributed to social class appear to be really due to intelligence.

Races differ in intelligence. Many racial disparities shrink or disappear when intelligence is controlled for. In particular, discrimination is not needed to explain low black income or occupational status.

Since *The Bell Curve* was written additional evidence has appeared that the racial difference in intelligence is primarily genetic. These come from adoption studies and from studies of the relationship between head size and IQ. Plausible hypotheses exist for how such a difference emerged. One possibility is that selection for intelligence was strongest where paternal provisioning was most important.

The Bell Curve is an important book that should be read by those interested in the role of intelligence in modern societies, or in the causes of racial inequality.

References

- Andreasson, N. C., Flaum, M., Swayze, V., O. Leary, D. S., Alliger, R., Cohen, G., Ehrhardt, and J., Yuh, W. T. C.,
 (1993) Intelligence and brain structure in normal individuals. *American Journal of Psychiatry*, 150, 130-134.
- Broman, S., Nichols, P. L., Shaughnessy, P., Kennedy, W.
 (1987) *Retardation in Young Children*, Hillsdale: Lawrence Erlbaum.
 (1994) *The Evolution of Desire*. New York: Basic Books.
- Cavalli-Sforza, L. L., Menozzi, P., & Piazza, A.
 (1994) *The History and Geography of Human Genes*. Princeton: Princeton University Press.
- Corder, E. H., Saunders, A. M., Strittmatter, W. J., Schmechel, D. E., Gaskell, P. C., Small, G. W., Roses, A. D., Haines, J. L., Pericak-Vance, M. A.
 (1993) Gene does of apolipoprotein E type 4 allele and the risk of Alzheimer's disease in late onset families. *Science*, 261, 921-923.
- Gottfredson, L. S.
 (1986a) *The g Factor in employment: A Special Issue of the Journal of Vocational Behavior*, 29 (3).
- Gottfredson, L. S. & Sharf, J. C.
 (1988) *Fairness in Employment Testing: A Special Issue of the Journal of Vocational Behavior*, 33 (3).
- Hartigan, J. A. & Wigdor, A. K.
 (1989) *Fairness in Employment Testing*. Washington, National Academy Press.
- Herrnstein, R. J. & Murray, C.
 (1994) *The Bell Curve: Intelligence and Class Structure in American Life*. New York: The Free Press.

- Hrdy, S. B.
(1981) *The women that never evolved*. Cambridge: Harvard University Press.
- Jaynes, G. D. & Williams, R. M. Jr.
(1989) *A Common Destiny: Blacks and American Society*, Washington: National Academy Press.
- Jensen, A. R.
(1980) *Bias in Mental Testing*, New York: The Free Press.
- Jensen, A. R.
(1981) *Straight Talk About Mental Tests*, New York: The Free Press.
- Jensen, A. R.
(1985) The nature of the black-white differences on various psychometric tests: Spearman's hypothesis. *Behavioral and Brain Sciences*, 8, 193-219.
- Jensen, A. R.
(1994) Psychometric g related to differences in head size. *Personality and Individual Differences*, 17, 597-606.
- Jensen, A. R. & Johnson, F. W.
(1994) Race and sex differences in head size and IQ. *Intelligence*, 18, 309-333.
- Jensen, A. R. & Reynolds, C. R.
(1982) Race, social class, and ability patterns on the WISC-R. *Personality and Individual Differences*, 3, 423-438.
- Jensen, A. R., & Sinha, S. N.
(1993) Physical correlates of intelligence. In Vernon, P. A. (Ed.). *The biological basis of intelligence*. Norwood: Ablex, 139-142.
- Kamboh, M. I.
(1995) Apolipoprotein E polymorphism and susceptibility to Alzheimer's disease. *Human Biology*, 67, 195-217.
- Levin, M.
(1994) Comment on the Minnesota transracial adoption study. *Intelligence*, 19, 13-20.
- Lynn, R.
(1991a) Race differences in intelligence: a global perspective, *The Mankind Quarterly*, 31, 254-296.
- Lynn, R.
(1991b) The evolution of racial differences in intelligence, *The Mankind Quarterly*, 32, 99-121.
- Lynn, R.
(1994) Some reinterpretation of the Minnesota transracial adoption study. *Intelligence*, 19, 21-28.
- Miller, Edward M,
(1993,) Could r Selection Account for the African Personality and Life

- Cycle. *Personality and Individual Differences*, 15, 665-676.
- Miller, Edward M,
 (1994a) Intelligence and Brain Myelination: A Hypothesis, *Personality and Individual Differences*, 17, 803-833.
- Miller, Edward M,
 (1994b) The Relevance of Group Membership for Personnel Selection: A Demonstration Using Bayes Theorem, *Journal of Social, Political and Economic Studies*, 19, 323-359.
- Miller, Edward M,
 (1994c) Tracing the Genetic History of Modern Man, *The Mankind Quarterly*, Vol. 35, No. 1-2, 71-108.
- Miller, Edward M,
 (in press) Environmental Variability Selects for Large Families only in Special Circumstances: Another Objection to Differential K Theory, *Personality and Individual Differences*,
- Montalbano, W. D.
 (1995) Code of ethics given to fertility doctors. *Times-Picayune*, April 17, 2.
- Murphy, D.
 (1995) Rethinking the American dream: Reactions of the media to the Bell Curve, *Journal of Social, Political and Economic Studies*, 20, 93-128.
- Plomin R., McClearn, G., Smith, D., Vignetti, S., Chorney, M., Venditti, C., Kasarda, S., Thompson, L., Detterman, D., Daniels, J., Owen, M., & McGuffin P.
 (1994) DNA Markers Associated with High Versus Low IQ: The IQ Quantitative Trait Loci (QTL) Project. *Behavior Genetics*, 24, 107-118.
- Rushton, J. P.
 (1995) *Race, Evolution and behavior: A life history perspective*. New Brunswick: Transaction Publishers.
- Rushton, J. P. & Ankney, C. D.
 (1993) The evolutionary selection of human races: a response to Miller, *Personality and Individual Differences*, 15, 677-680.
- Rushton, J. P. & Osborne, R. T.
 (1995) Genetic and environmental contributions to cranial capacity in black and white adolescents. *Intelligence* 20, 1-13.
- Scarr, S., & Weinberg,
 (1976) IQ performance of black children adopted by white families. *American Psychologist*, 31, 726-739.
- Schultz, R.
 (1991) *The relationship between intelligence and gray-white matter image contrast: A MRI study of healthy college students*, Unpublished

- doctoral dissertation, Department of Psychology, University of Texas.
- Seligman, D.
(1992) *A Question of Intelligence*. New York: Birch Lane Press.
- Seligson, S.
(1995) Seeds of doubt. *The Atlantic Monthly*, 275 (3), 28-39.
- Symons, D.
(1979) *The evolution of human sexuality*. New York: Oxford University Press.
- Snyderman, M. and Rothman, S.
(1988) *The IQ Controversy, the Media and Public Policy*. New Brunswick, Transaction Books.
- Taylor, J.
(1994) Evolution and differences in human behavioral patterns. *The Mankind Quarterly* XXXV, 109-121.
- Tucker, W. H.
(1994) *The Science and Politics of Racial Research*. Urbana: University of Illinois Press.
- Waldman, I. D., Weinberg, R. A., & Scarr, S.,
(1994) Racial group differences in IQ in the Minnesota transracial adoption study: A reply to Levin and Lynn. *Intelligence* 16, 29-44.
- Weinberg, R. A., Scarr, S., & Waldman, I. D.
(1992) The Minnesota transracial adoption study: A follow-up of IQ test performance at adolescence. *Intelligence* 16, 117-135.
- Wickett, J. C., Vernon, P. A. & Lee, D. H.
(1994) *In vivo* brain size, head perimeter, and intelligence in a sample of healthy adult females. *Personality and Individual Differences*, 16, 831-838.
- Willerman, L., Schultz, R., Rutledge, J. N. & Bigler, E. D.
(1991) *In vivo* brain size and intelligence. *Intelligence*, 15, 223-228.

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