



The Bell Curve

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Symposium

The Bell Curve

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The Bell Curve is a massive, ideologically driven, and frequently careless or incompetent assemblage of good science, bad science, and pseudo-science that is likely to do great damage both in the realm of public policy and in the conduct of social research. In the policy realm, *The Bell Curve* will be used to argue against affirmative action in education and the labor market, to discredit public schooling, and, worst of all, to argue the futility of investing in education and training, especially of racial and ethnic minorities and immigrants. As one example of its effect on scientific discourse, I would say that public responses to *The Bell Curve* have in part fulfilled the claims and expectations of Herrnstein and Murray that the role of ability in the stratification process is a forbidden topic that cannot be discussed rationally in public. But there are ample scientific grounds to dismiss *The Bell Curve*. Unfortunately, many of its critics have lacked either the time or the expertise to identify more than a few of the factual or scientific errors and distortions in the text.

Late in September 1994, I was to attend an NIH conference near Washington, D.C., and I received a phone call from Charles Murray, inviting me to attend a symposium about *The Bell Curve* on October 1 and 2 at the American Enterprise Institute (AEI), the right-wing think tank in Washington. Murray sent me a copy of the book and said that AEI would pay my travel and lodging expenses. Since I knew of the Herrnstein-Murray project and had previously disagreed in public with Herrnstein about black-white differences in academic achievement, I agreed to attend as AEI's guest.

The main purpose of the AEI symposium was to make *The Bell Curve* a controversial best-seller, and it obviously succeeded in that respect. The meeting was also, in part, a memorial to Richard J. Herrnstein, who had died

The Bell Curve, by **Richard J. Herrnstein** and **Charles Murray**. New York: The Free Press, 1994. 845 pp. \$30.00 cloth. ISBN: 0-02-914673-9.

weeks earlier. The AEI symposium included well-known newspaper and newsmagazine reporters or commentators of the left and right as well as an equally heterogeneous group of social scientists. The guests included many whose commentaries about *The Bell Curve* appeared almost instantaneously after its publication; unlike me, they had several weeks to read the book in galley proof. The discussions were serious, uninhibited, and stimulating. At AEI I was overly impressed with the respect shown the book, and it took another eight weeks for me to slog through enough of the text to develop a thorough disrespect for Herrnstein and Murray's work.

Stephen Jay Gould (1994) has nicely summarized the arguments of *The Bell Curve* as "a rehash of the tenets of social Darwinism" combined with a rehash of scientific racism, the proposal that racial differences in IQ are substantially genetic in origin and cannot be altered by known environmental interventions. Much of the worst pseudo-scientific nonsense in *The Bell Curve* lies in its treatment of the genetic argument, especially as applied to racial and ethnic differences, but I prefer to focus here on the overall place of intelligence in the class structure and on the issue of change in cognitive performance.

Whether we like it or not and whether or not we believe that there are many kinds of talent, the economic and social hierarchies of contemporary societies reflect a single dimension that is much like cognitive ability. For example, Duncan, Featherman, and Duncan (1972: 75-77) showed many years ago that as early as the 1920s, psychological conceptions of the intellectual demands of occupa-

tions were very much like occupational prestige ratings by the general public. At the same time, it is not obvious that the argument of *The Bell Curve* would fail if its authors accepted a multi-factorial view of intelligence. That is, what would change, beyond much more extensive demands for data, if one were to accept a multi-factor model of intelligence? Neither Herrnstein and Murray nor the critics who favor multi-factor models appear to have considered such possibilities. Rather, they prefer to support one extreme position or the other, as if the two were exhaustive of the possibilities and as if each had distinctive and unambiguous implications for the stratification process.

There is something schizophrenic in American opinion about cognitive ability and academic achievement. We think that we value academic achievement and that it represents, to some degree, the kind of merit that we would like to see rewarded. We spend a great deal of money to create and improve it through the schools, and we blame the schools because we do not think that they have produced enough of it. We think that if achievement were higher, we would do better economically and socially, as individuals and local communities and in the world economy. Yet we balk when terms like ability, intelligence, or—worse yet—IQ, rather than academic achievement, are applied to what are usually rather similar and highly correlated measures. We fret about the fairness of standardized tests, though such fairness is long established (Wigdor and Garner 1982: 3), and we often disapprove—both personally and legally—of the mechanical use of achievement or ability test scores to make decisions about entry to jobs or to schools.

Herrnstein and Murray play with the tensions and contradictions between our images of ability and achievement throughout their text, and they often shift the line between the two to suit their purposes. For example, the SAT is at some times a measure of “achievement,” whose downward trend shows our neglect of education among the cognitively gifted, while at other times it is a measure of “intelligence,” whose use in college entry demonstrates both the establishment of a national cognitive elite and the defects of affirmative action.

Herrnstein and Murray argue that, over the

course of this century, ability has increased in its importance with respect to occupational and economic success. That in turn has tended to segregate people in the higher reaches of the occupational distribution. Along with assortative mating, this social isolation leads through mutual sociation to elitism, and, finally, by dint of genetic inheritance, to persistence of membership across generations in the cognitive elite. I suspect that, to the extent cognitive elitism and isolation have grown, it has far more to do with the growth of complex, high-status occupations and the organizations in which they are located than with selection on ability per se. Indeed, the evidence that Herrnstein and Murray present about occupations and the cognitive elite combines real data about the growth of key, knowledge-based occupations with unfettered numeric speculation about the intelligence of their incumbents (p. 56). Their evidence of “increasing cognitive isolation” is no more than a speculative extrapolation from the growth of knowledge-based occupations.

To test the original proposition, Wendy Carter and I looked at data for 13,000 persons in the General Social Survey in the eleven years from 1974 and 1993 in which a 10-item verbal ability test had been administered. In brief, we found no evidence of increase in the relationship between high cognitive performance and incumbency in the elite knowledge-based occupations identified by Herrnstein and Murray.

The Herrnstein-Murray thesis would predict increasing intergenerational status correlations in the United States, yet a great deal of evidence—extending throughout this century and into the last—shows consistent declines in intergenerational correlations of educational attainment and occupational status. None of these trend data is even mentioned in *The Bell Curve*.

Much of the book uses two wonderful sets of data, the National Longitudinal Survey of Youth (NLSY) and the Children of the NLSY. The former is a large sample of American youth aged 14 to 22 in 1979, who have been followed annually since then, and the latter matches women (in the NLSY) with their children. Both sets of data contain good measurements of cognitive ability, but the sample of children old enough to provide useful data were born when their mothers

were quite young and were thus negatively selected. Both sets of data are used poorly by Herrnstein and Murray.

Most of the original analysis in the book consists of graphical displays of one reduced-form logistic or linear regression equation after another, in which some measure of educational or socioeconomic attainment, contact with the criminal justice system, or child-rearing success has been regressed on two variables, AFQT score in the IQ metric (adjusted for age at administration) and a composite measure of socioeconomic status of the family of orientation. The latter is limited in content to father's and mother's educational attainments, father's occupational status, and family income in the first year of the NLSY. While this is a minimally adequate specification—and no one should expect the addition of a few more background variables to boost explanatory power substantially—the scheme nonetheless tends to understate the effects of social background. For example, a full specification of social background would add such variables as number of siblings, intact family, rural or metropolitan origin, and regional origin. While there is nothing wrong with such reduced form equations, in the hands of Herrnstein and Murray they become a rhetorical device, and the social background variable is largely used as a straw man to impress readers with the effects of ability. For example, they herald the larger effects of ability than of socioeconomic background on the attainment of education, which are well known to any serious student of the subject. From the study of stratification, we know that the explanatory power of measured social background is modest, but we also know that the effects are important and are worth understanding. No measures of the explanatory power of the equations are ever reported in text, so the inexpert reader never learns that most of the variation remains unexplained. Effects appear to support their theses by repetition, rather than by strength.

Herrnstein and Murray's regression analyses are structured to sidestep any serious effort to explain how the effects of ability come about, yet such analyses would be essential in any serious attempt to understand the consequences of variation in cognitive ability for social policy. For example, Herrnstein and Murray explain their

effort to avoid presenting the main effects of educational attainment with a limp set of excuses: that education is in part an effect of ability and SES, that education may have nonlinear effects, that education may be too highly correlated with ability to yield reliable estimates of its effects, and that education must interact with ability in some ranges of the latter, thus creating "problems that we hope others will take up but would push us far beyond the purposes of this book" (pp. 124–25). Would it not behoove researchers who declare the ineducability of a large fraction of the population to consider the observable effects of schooling among such persons? Herrnstein and Murray often show the effects of the AFQT score and of socioeconomic status separately among persons who completed exactly four years of high school or among persons who completed exactly a four-year college degree, but the main effects of schooling, and their relationship with ability, are suppressed. I have been able to find only two places in the entire volume in which educational attainment appears explicitly in an equation, along with ability, and both are in appendices. Schools are the major instrument of public policy affecting the functional competence of adults in this country, yet their effects are deliberately excluded from Herrnstein and Murray's analyses.

Herrnstein and Murray make much of the fact that African-Americans obtain more schooling than whites and—in some cases—have better jobs, once ability is controlled. They imply that such effects are unfair and improper consequences of affirmative action policies. They never report black-white differentials in schooling when socioeconomic background alone is controlled, yet such controls have for many years accounted for black-white differences in schooling—before the era of affirmative action and in situations—like high school completion—to which affirmative action is irrelevant.

Finally, let's consider Herrnstein and Murray's treatment of the mutability of IQ. *The Bell Curve* presents a great deal of data on trends and differentials in a variety of measures of academic achievement, and no firm line appears between the treatment of such measures as IQ relative to achievement. Their rule of thumb appears to be that, when a measure changes, it reflects achievement,

but when it does not, it reflects IQ. One egregious contradiction is change in SAT scores: Early in the text, the increasing role of SAT scores in selection into elite colleges is a signal of IQ stratification, but later on, the SAT decline becomes a failure in the schooling of the cognitive elite. Indeed, in its effort to avoid evidence that we can and have changed levels of cognitive functioning in the general population, the text declares that we know how to lower the performance of bright students, but we cannot raise that of dull students.

Herrnstein and Murray's treatment of the mutability of black-white differences in IQ is most significant, for substantial change in the relative performance of blacks and whites would undermine many of Herrnstein and Murray's reactionary claims and recommendations. Most of *The Bell's Curve's* treatment of change in black-white ability or achievement differentials consists of a review of the short- and long-term cognitive effects of social and educational programs of greater or lesser intensity. I am not a student of such programs, and I find little reason to take exception to their review, beyond its use as a straw man of the long-abandoned notion that Head Start is supposed to raise IQ. Their review focuses the attention of readers mainly on experimental programs, in which large or long-term changes are hard to find.

But *The Bell Curve* also provides evidence of aggregate change in test score differentials between blacks and whites in the general population. These changes apparently were convincing enough to Herrnstein and Murray for them to warn against errors of extrapolation (p. 293), but not strong enough to lead them to modify their overall views about the environmental mutability of racial differences. Almost all of the evidence of aggregate test score change is presented in an appendix (pp. 637-42), not in the main text. In the national studies of high school students, in the SAT, in the ACT, and in the GRE, black-white differences in achievement all declined modestly over the past two decades, but Herrnstein and Murray are careful to note that this was sometimes a result of white decline, as well as black gain, and they invoke questionable data from the Children of the NLSY to suggest that a new divergence may be at hand.

In the main text, at page 291, Herrnstein

and Murray present one table of "Reductions in the Black-White Difference on the National Assessment of Educational Progress" (NAEP), which is based upon summary data from the National Center for Education Statistics (Mullis, et al. 1991). Across math, science, and reading examinations, and at ages 9, 13, and 17, Herrnstein and Murray report that the black-white difference declined by an average 0.28 standard deviations between 1969-73 and 1990. They describe these changes as presenting "an encouraging picture." After adding a summary of changes in the SAT, "from 1.16 to 0.88 standard deviations in the verbal portion and from 1.27 to 0.92 standard deviations in the mathematics portion of the test," they conclude that there has been a "narrowing of approximately 0.15 to 0.25 standard deviation units, or the equivalent of two to three IQ points overall." Apparently, Herrnstein and Murray temper their arithmetic with cautionary data from the appendix when they decide that changes of 0.28, 0.28, and 0.35 standard deviations suggest a range of 0.15 to 0.25 standard deviation units. Then, they discount this range by a factor of 0.6 or 0.8—to account for the imperfect relationship between SAT or NAEP tests and IQ—in order to come up with the estimated change of 2 to 3 IQ points. And, in the end, Herrnstein and Murray fail to acknowledge even this modest convergence when they start drawing conclusions and making recommendations.

Herrnstein and Murray's treatment of the NAEP data seemed curious, for it is the only set of test scores that consistently cover almost all of the general population. If one applied their range of discount factors to their estimate of the test score convergence in the NAEP data, the estimated closure would lie between 2.5 and 3.4 points, which is not bad for aggregate change in an immutable quantity over a 20-year period. But there is more to the story than this, for Herrnstein and Murray's footnote says that they "assume a standard deviation of 50." I recalled some variation in the standard deviations of the NAEP test scores, so I went back to the source.

This proved a cautionary lesson in what the book jacket of *The Bell Curve* describes as the "relentless and unassailable thoroughness" of Herrnstein and Murray's analysis.

Many of the numbers in their table are simply wrong, but the effect of these errors is small; the overall average change is 0.29, rather than 0.28. But this is the least of the problems. Herrnstein and Murray evidently confined their reading to a footnote on page 1 of the source (Mullis, et al. 1991), stating that "each scale was set to span the range of student performance across all three ages in that subject-area assessment and to have a mean of 250.5 [*sic*] and a standard deviation of 50," along with a one-page summary of change in the test score differences (p. 11). Appendix tables provide details of the test score distributions for each population, including the standard deviations, which are typically much less than the value of 50 adopted by Herrnstein and Murray. The difference is mainly due to the incorporation of variation by age in the larger overall value. The black-white comparisons should have been conditioned on age, just as Herrnstein and Murray did (correctly) in adjusting the AFQT for age at administration. The effect of choosing too large a standard deviation was to understate both the initial black-white differences and the changes in test scores across time in standard deviation units. When I recalculate the changes in test scores using the standard deviations of the population of each age in 1990 as the unit of measure, using Herrnstein and Murray's assumptions, the implied convergence in IQ between blacks and whites ranges between 3.5 and 4.7 IQ points. I wonder whether they would have waxed so eloquent about immutability

and ineducability if they had acknowledged aggregate changes in test score differentials of this magnitude in the general population over the past two decades.

I do not know, nor am I sure that it is important, whether or not the large and well-documented changes in aggregate test score differentials between blacks and whites reflect changes in IQ. I think it is enough to know that we are quite capable of changing the academic achievement of American students on a large scale. I hope that such flawed and destructive works as *The Bell Curve* do not prevent continuing efforts to extend and accelerate those encouraging trends.

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The authors make five general points regarding the relationships in society among social class, race-ethnicity, and measured cognitive ability. First, that past as well as presently used IQ tests, and also the ability portions of the well-known SAT (Scholastic Ability Test) and the American College Testing (ACT) Program's ability tests, accurately measure, with little measurement error or measurement bias, cognitive abilities, or intelligence. They argue that intelligence is unidimensional, having one general factor, called *g* (for "general intelligence"), based on the early

and controversial thinking of Charles Spearman at the turn of this century. Recent multidimensional formulations of intelligence, which argue that there are several "types" or dimensions of intelligence, such as the work of Gardner (1983) and Sternberg (1988), are largely rejected.

Second, that general intelligence (a construct) and its presumed indicator, one's obtained IQ score, is heavily determined by one's genes, and that the genetic heritability (called b^2) of intelligence is quite high, at around .60 or even .70, and very probably