Most recently in a very important social document on equality of educational opportunity, Coleman (1966) again showed that the *quality* of education (here in secondary school) seemed to have very little effect on the academic achievement test scores of children. In other words the children who went to poor schools with poorly trained teachers, dilapidated buildings, and crowded classrooms did no worse on the tests than children who went to excellent, well-equipped schools with low teacher-pupil ratios, once one had corrected for the initial differences in intelligence and social background of the pupils attending the two types of schools. In other words what the test results seem to have shown over and over again is that quality of education makes no difference in improving competence.

What does make a difference are the attributes of the people getting the education—their intelligence, their social characteristics and so forth. Why then should citizens spend so much money trying to improve education? Why should educational psychologists be trying to find better ways of educating pupils? Why is money wasted on conferences to try to find ways of improving education—if in fact the data clearly show that educational variations have very little effect on academic achievement, which in turn is considered the main measure of competence for life's tasks?

One reason is that we keep suspecting that the educators may be right in continuing to think that the quality of education does make a difference. It may be the psychological testers who are wrong: their tests may simply not be adequate measures of the competence which better education produces. In fact there may even be a built-in theoretical reason why most existing tests are inadequate measures of variations in the quality of education. Most testers have worked hard to create tests which are reliable—that is, which will give the same score when the same individual is tested again. An instrument which is designed to be very reliable may not be very sensitive to changes that have actually taken place in the person through education.

But this theoretical problem has never shaken the self-confidence of the testing movement. It has continued to roll on like a juggernaut overwhelming all such doubts.

When many psychologists began to examine really seriously for the first time the assumptions on which the intelligence testing movement had been built, it took them no time at all to discover that many intelligence tests had a built-in middle-class bias. The vocabulary used in the tests was so-called "standard English," not the dialect spoken in many ghetto communities. So the children from these communities often did not even understand the instructions for the tests, let alone the words they were supposed to identify which were not part of the vocabulary in common use in their community. Correct answers to questions also often assume a standard middle-class way of life. For example a child is asked on an intelligence test, "What would you do if you were sent to the store by your mother to buy something and you found the store didn't have it?" The "intelligent" or correct answer is supposed to be that you would go to another store to see if they had it. However this is certainly not an intelligent answer for a ghetto child who is under strict orders from his mother to come straight home from the store because she is afraid he might be robbed or beaten if he strayed

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Comments on Individual and Group Differences in I.Q.
SANDRA SCARR-SALAPATEK

Thanks to Jensen's provocative article, many academic psychologists who thought I.Q. tests belonged in the closet with the Rorschach inkblots have now explored the psychometric literature and found it to be a trove of scientific treasure. One of these is Richard Herrnstein, who from a Skinnerian background [B.F. Skinner, Professor of Psychology, Harvard University] has become an admirer of intelligence tests—a considerable leap from shaping the behavior of pigeons and rats. Herrnstein's popular account in the *Atlantic* of I.Q. testing and its values is generally responsible, if overly enthusiastic in parts.

Herrnstein unabashedly espouses I.Q. testing as "psychology's most telling accomplishment to date," despite the current controversy over the fairness of testing poor and minority-group children with I.Q. items devised by middle-class whites. His historical review of I.Q. test development, including tests of general intelligence and multiple abilities, is interesting and accurate. His

account of the validity and usefulness of the tests centers on the fairly accurate prediction that can be made from I.Q. scores about academic and occupational achievement and income level. He clarifies the pattern of relationship between I.Q. and these criterion variables: High I.Q. is a necessary but not sufficient condition for high achievement, while low I.Q. virtually assures failure at high academic and occupational levels. One must assume that Herrnstein's enthusiasm for intelligence tests rests on population statistics, not on predictions for a particular child, because many children studied longitudinally have been shown to change I.Q. scores by twenty points or more from childhood to adulthood. It is likely that extremes of giftedness and retardation can be sorted out relatively early by I.Q. tests, but what about the 95 percent of the population in between? Their I.Q. scores may vary from dull to bright normal for many years. Important variations in I.Q. can occur up to late adolescence. On a population basis Herrnstein is correct; the best early predictors of later achievement are ability measures taken from age five on. Predictions are based on correlations, however, which are not sensitive to absolute changes in value, only to rank orders. This is an important point to be discussed later.

After reviewing the evidence for average I.Q. differences by social class and race, Herrnstein poses the nature-nurture problem of "which is primary?" in determining phenotypic differences in I.Q. For racial groups, he explains, the origins of mean I.Q. differences are indeterminate at the present time because we have no information from heritability studies in the black population or from other, unspecified, lines of research which could favor primarily genetic or primarily environmental hypotheses. He is thoroughly convinced, however, that individual differences and social-class differences in I.Q. are highly heritable at the present time and are destined, by environmental improvements, to become even more so.

For Herrnstein, society is, and will be even more strongly, a meritocracy based largely on inherited differences in I.Q.

Five "corollaries" for the future predict that the heritability of I.Q. will rise; that social mobility will become more strongly related to inherited I.Q. differences; that most bright people will be gathered in the top of the social structure, with the I.Q. dregs at the bottom; that many at the bottom will not have the intelligence needed for new jobs; and that the meritocracy will be built not just on inherited intelligence but on all inherited traits affecting success, which will presumably become correlated characters. Thus, from the successful realization of our most precious egalitarian political and social goals, there will arise a much more rigidly stratified society, a "virtual caste system" based on inborn ability.

To ameliorate this effect, society may have to move toward the socialist dictum, "From each according to his abilities, to each according to his needs," but Herrnstein sees complete equality of earnings and prestige as impossible because high-grade intelligence is scarce and must be recruited into those critical jobs that require it, by the promise of high earnings and high prestige. Although garbage collecting is critical to the health of the society, almost anyone can do it; to waste high-I.Q. persons on such jobs is to misallocate scarce resources at society's peril.

Sandra Scarr-Salapatek is an Associate Professor in the Institute of Child Development, University of Minnesota. Her research on genetic and environmental factors in personality and intellectual development has been published in many scientific journals. She is a Harvard Ph. D. in child development and behavioral genetics. Dr. Scarr-Salapatek has an unusual name because she is married to Dr. Philip Salapatek, also at the Institute of Child Development. Thanks to an excellent housekeeper, the household, which includes three children and numerous pets, runs pretty smoothly. The children all show individual differences.

Herrnstein points to an ironic contrast between the effects of caste and class systems. Castes, which established artificial hereditary limits on social mobility, guarantee the inequality of opportunity that preserves I.Q. heterogeneity at all levels of the system. Many bright people are arbitrarily kept down and many unintelligent people are artificially maintained at the top. When arbitrary bounds on mobility are removed, as in our class system, most of the bright rise to the top and most of the dull fall to the bottom of the social system, and I.Q. differences between top and bottom become increasingly hereditary. The greater the environmental equality, the greater the hereditary differences between levels in the social structure. The thesis of egalitarianism surely leads to its antithesis in a way that Karl Marx never anticipated.

Herrnstein proposes that our best strategy, in the face of increasing biological stratification, is to publicly recognize genetic human differences but to reallocate wealth to a considerable extent. The I.Q. have-nots need not be poor. Herrnstein does not delve into the psychological consequences of being publicly marked as genetically inferior.

Does the evidence support Herrnstein's view of hereditary social classes, now or in some future Utopia? Given his assumptions about the high heritability of I.Q., the importance of I.Q. to social mobility, and the increasing environmental equality of rearing and opportunity, hereditary social classes are to some extent inevitable. But one can question the limits of genetic homogeneity in social-class groups and the evidence for his syllogism at present.

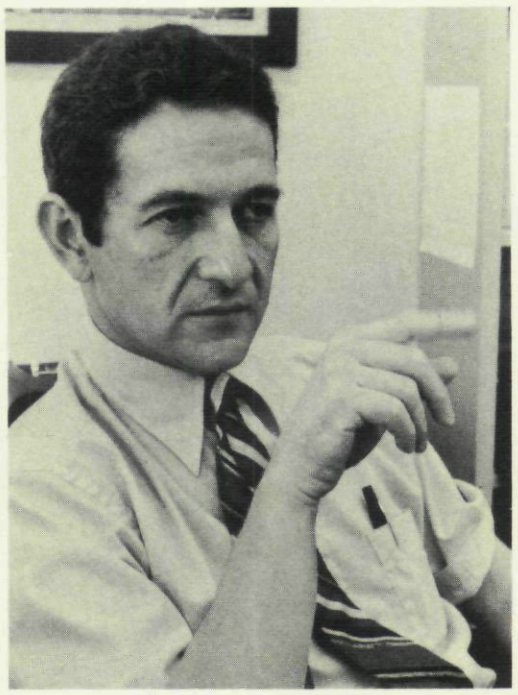
Is I.Q. as highly heritable throughout the social structure as Herrnstein assumes? Probably not. In a recent study of I.Q. heritability in various racial and social-class groups, I found much lower proportions of genetic variance that would account for aptitude differences among lower-class than among middle-class children, in both black and white groups. Social disadvantage in prenatal and postnatal development can substantially lower phenotypic I.Q. and reduce the genotype-phenotype correlation. Thus, average phenotypic I.Q. differences between the social classes may be considerably larger than the genotypic differences.

Are social classes largely based on hereditary I.Q. differences now? Probably not as much as Herrnstein believes. Since opportunities for social mobility act at the phenotypic level, there still may be considerable genetic diversity for I.Q. at the bottom of the social structure. In earlier days arbitrary social barriers maintained genetic variability throughout the social structure. At present, individuals with high phenotypic I.Q.'s are often upwardly mobile; but inherited wealth acts to maintain genetic diversity at the top, and nongenetic biological and social barriers to phenotypic development act to maintain a considerable genetic diversity of intelligence in the lower classes.

As P. E. Vernon has pointed out, we are inclined to forget that the majority of gifted children in recent generations have come from working-class, not middle-class, families. A larger percentage of middle-class children are gifted, but the working and lower classes produce gifted children in larger numbers. How many more disadvantaged children would have been bright if they had had middle-class gestation and rearing conditions?

I am inclined to think that intergenerational class mobility will always be with us, for three reasons. First, since normal I.Q. is a polygenic characteristic, various recombinations of parental genotypes will always produce more variable genotypes in the offspring than in the parents of all social-class groups, especially the extremes. Even if both parents, instead of primarily the male, achieved social-class status based on their I.Q.'s, recombinations of their genes would always produce a range of offspring who would be upwardly or downwardly mobile relative to their families of origin.

Second, since, as Herrnstein acknowledges, factors other than I.Q.—motivational, personality, and undetermined—also contribute to success or the lack of it, high I.Q.'s will always be found among lower-class adults, in combination with schizophrenia, alcoholism, drug addiction, psychopathy, and other limiting factors. When recombined in offspring, high I.Q. can readily segregate with facilitating motivational and personality characteristics, thereby leading to upward mobility for many offspring. Similarly, middle-class parents will always produce some offspring with debilitating personal characteristics which lead to downward mobility.



Robert J. Herrnstein, of the Department of Psychology at Harvard University since 1967, is now the eye of a hurricane of debate raging about the merits of heredity vs. environment as the prime determinant of human intelligence. Pictured here in his Cambridge office, he views the dispute with detached equanimity, since as a scientist he is concerned primarily with facts. He will take a leave of absence from teaching next year to write a book. Dr. Herrnstein is a member of the American Psychological Association, the Eastern Psychological Association, the American Association for the Advancement of Science, the American Association of University Professors, and Phi Beta Kappa.

Third, for all children to develop phenotypes that represent their best genotypic outcome (in current environments) would require enormous changes in the present social system. To improve and equalize all rearing environments would involve such massive intervention as to make Herrnstein's view of the future more problematic than he seems to believe.

* * *

Every parent of more than one child knows how different children can be, even though they are raised in the same family and share much of their genetic background in common. In fact, differences between brothers and sisters, and between unrelated children, arise from both genetic and environmental differences between them. Every child has a unique genetic makeup and, to some extent, a unique environment. The combination makes him what he is.

Most people know, and accept, that all children do not have the same I.Q. scores. But the fact that children from different social-class levels have different *average* I.Q. scores is more difficult to accept in our society, where equal opportunity and equality under the law are highly valued. There is no contradiction, however, between the scientific fact of individual and group differences and the moral principle of equal rights. Our civil liberties do not depend upon our being identical twins, a state that is both impossible and undesirable.

The bothersome aspects of group differences in average I.Q. scores is that social power and prestige are accorded on the basis of high achievement. The most available route to high social status is through educational achievements, and I.Q. tests are the best predictors of school success. Thus, the results of I.Q. tests are often used to guide children into school curricula that will prepare them for professions on the one hand or for unskilled jobs on the other.

Many minority-group leaders and social scientists are now campaigning for the abolition of I.Q. tests because children from poor families do not do as well on them as children from middle-class homes. Unfortunately, I.Q. scores predict school success, or failure, for children at all social-class levels. The fault lies not in the tests but in the restricted kinds of school experiences we provide for children. It is the educational system that is irrelevant for many children, not the tests.

We must ask *why* children at different social class levels have different average I.Q. scores. Some scientists prefer a primarily environmental explanation while others prefer a primarily genetic one. I feel that neither side has any conclusive proof and that most investigators have failed to use proper behavior-genetic methods to answer the question. The question is how much of the differences between people comes from their genetic difference and how much from their environment. The relationship between genetic and environmental variances is called the *heritability* estimate. Heritability is a shorthand expression for the proportion of total differences among people in a population that occur because of their genetic differences.

Many studies have shown that individual differences in I.Q. within the middle-class white population are more related to genetic differences than to environmental differences. Before my study, no one had examined the heritability of I.Q. differ-

ences in the disadvantaged segments of the population, whose environments are substantially different from the advantaged groups. The heritability of I.Q. scores in lower social-class groups can be lower if their rearing conditions do not foster the development of skills tested by I.Q. scales.

In a large study of identical and fraternal twins in Philadelphia, I found that genetic differences accounted for about half of the I.Q. differences among middle-class children, but practically none of the I.Q. differences among lower-class children. Identical twins, who have the same genetic background, were not more similar than fraternal twins in lower class groups.

Many disadvantaged children do not have the kind of home and neighborhood environments that give them the skills required for I.Q. tests. They may learn other important skills, but symbolic reasoning and school-type vocabulary are often poorly developed. If they were raised in homes where these skills were taught, they would do much better on I.Q. tests and in school. And if environmental impediments to high scores were removed, their I.Q. differences would be based far more on genetic differences than they are now.

To the extent that poor children are truly disadvantaged by their family's life style, we must provide better nutrition, preschool education, and the like. But, to the extent that children from ethnically and socially different backgrounds represent cultural diversity, we should recognize the richness in our midsts. Cultural and genetic diversity are extremely useful to a society that does not know where it will be in 1000, or even 100 years.

Suppose that we do not want every child to have the same skills—that we value diversity. Suppose that there were a wider range of good educational situations for children. And further suppose that society gave equally high rewards to a variety of talents. The traditional I.Q. test would no longer be sufficient to tap all those skills. The farther we move the social reward system and the educational system away from their reliance on sameness (high I.Q.), the more diverse talents can be rewarded, and the more just will be the development of the genetic diversity among us. We cannot, and should not try to, get rid of our differences. We can only make sure that every child has the best possible opportunity to develop what he can, and reward him for what he becomes. ☒

Some Viewpoints on Intelligence and Heredity

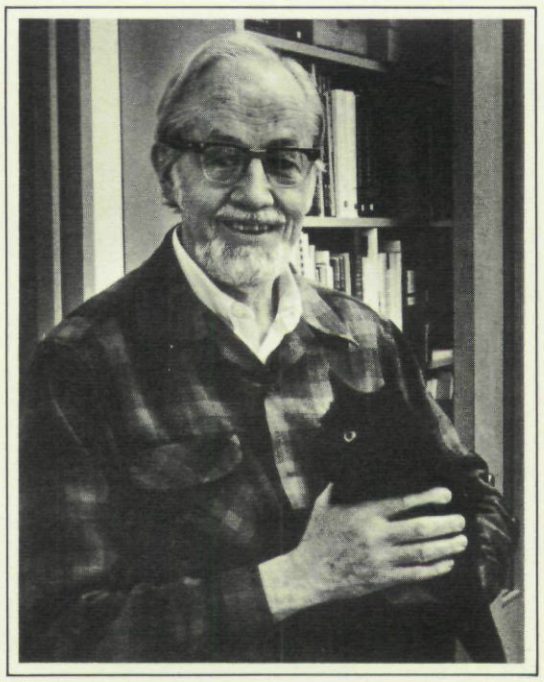
Dr. Stevens shed further light on the present discussion concerning I.Q. during an informal interview in his office at Harvard University. He has been on the Harvard faculty since 1936, a Professor of Psychology since 1946, and is presently Professor of Psychophysics and Director of the Laboratory of Psychophysics at Harvard. He is the holder of the Warren Medal awarded by the Society of Experimental Psychologists, the Presidential Certificate of Merit for research in the psychoacoustical field during World War II, and many other outstanding honors. His remarks concerning Dr. Herrnstein's work add insights to the controversial subject.

"I was at Stanford University at the time Terman was there, the man who developed the Stanford Binet tests, which are a cornerstone of all this. What Dr. Herrnstein has actually done is to draw together all of the material on what was then called the nature/nurture controversy. He has gone back and reviewed its history accurately. He has thought through some of the implications of the Stanford Binet test and actually made suggestions on how to increase opportunities for the disadvantaged. He makes the very interesting observation that if one succeeds in getting rid of the environmental factors in determining I.Q., then there will be only inherited factors remaining. This may have been said before, but it hasn't been said as well or as forcibly.

"In the nature/nurture controversy, it was mainly during World War II that the environmentalists got into the saddle. It was sort of a worldwide phenomenon and that was the curious thing about it. In Russia, it was Lysenko who succeeded in suppressing all biological work on I.Q. We didn't have anything quite as dramatic as that. As the egalitarian view became more popular and reached its climax in the sixties, it became less and less possible for us to work on what I like to call 'constitutional problems.'

"TV and the Eastern press have swung over to that side and you can get anything published that tells what wonderful things you can do by way of environmental fixing. This is true almost everywhere except in a medical concept. They haven't quite suppressed the doctor. But with that exception, it has become very difficult.

"The Lysenko type of political suppression hasn't taken place here but the result has almost been the same as if it had—the suppression here is of the type that you get when you can't be heard on the biological side of the subject. And beyond



Professor Stevens is a native of Ogden, Utah. He received his A.B. degree from Stanford University in 1931, and his Ph.D. from Harvard in 1933. During 1946-1953 he was a consultant to the Research Development Board. Dr. Stevens was a member of the Space Science Board of the National Academy, 1958-1960; and served from 1949-1952 as Chairman of the Division of Anthropology and Psychology of the National Research Council. He is photographed in his office on the Harvard campus, with a pet cat which patrols the premises.

that you occasionally run into more violent suppression attempts such as Dr. Herrnstein suffered by having people following him around to annoy him, putting up posters attacking him, and trying to get him fired.

"This suppression of nature correlates has gone along with the present ascendancy of the social sciences. The typical social scientist believes that his discipline can do everything. That is not too surprising because after all that is what he is selling; that is his bag. So that as a result we have some sociologists telling us that I.Q. testing is useless and a menace. Will it change? Probably. The pendulum can never stay at its furthest excursion very long. I don't know what else you can do but just wait for it to come back.

"You might start jailing the mental testers, I suppose. I think I read of someone starting a class-action suit to prevent the giving of intelligence tests, back in November. Now if this suit succeeds (which is very much like what happened in Russia) then there will be no more tests. They don't have them any more in Russia.

"Of course they have to judge performance by *some* standards regardless of whether you use an I.Q. test or not. The Russians are no dummies, and they have found their own methods of judging performance. When I was in junior high school, the coach of our football team just lined up the boys and made us run. He even bothered to time us. If we could run fast, he was interested. The I.Q. test is the same thing. It is a sample of performance. If you don't have an I.Q. test, then you contrive all sorts of other ways of sampling. So, in Russia, no I.Q., but just the same they have some kind of tests in order to get into a university. That amounts to the same thing. They have other samples of performance.

"What these people are complaining about is the fact that, thanks to I.Q. tests, we have a good sample of what a man's intellectual capacity is. And that in itself really constitutes the most important practical contribution that psychology has made to society so far. The reason it is important is that you can predict things from it. And of course there has been criticism—I don't know of anything much including Einstein's theory of relativity that hasn't been criticized by many people.

"Certainly no good idea has failed to be criticized by many people, and I suppose this is just another example of it. Geneticists know that it is safer to work on fruit flies than people. We are all cowards at some point." ☒

Editor's note: We regret that space does not permit us to print each author's work in its entirety as well as the work of other researchers in this field. Any readers wishing to obtain additional material by these authors and others on this subject, are invited to write to the Editorial Department of The Saturday Evening Post for sources. The SEP is interested in having your views and comments. Please write to us if you have opinions you wish to express.