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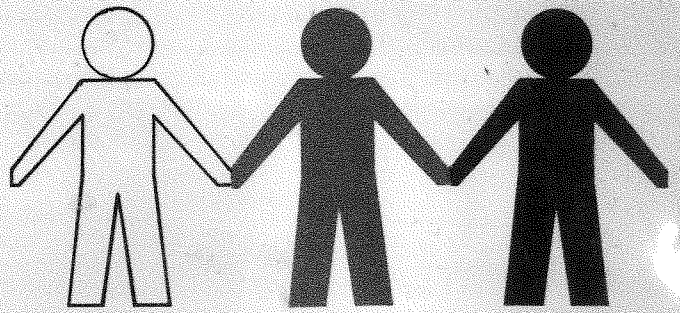
EDUCATION



INTELLIGENCE

NUT

A teacher's guide to the facts and the issues

Foreword

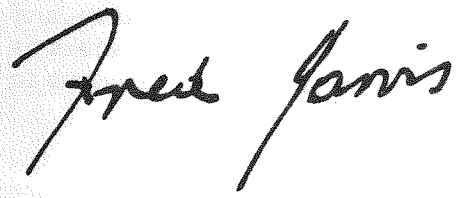
In January 1978, the National Union of Teachers published a pamphlet, entitled *All our children,* which discussed some of the consequences for educational policy of the multicultural, multiracial nature of British society and the responsibilities of teachers in educating children for this society. The purpose of this pamphlet is to try to extend the discussion beyond the views and sentiments expressed in *All our children,* and answer some of the questions in the minds of many people – adults as well as children – concerning the concept of 'race' and its relevance to teaching and learning.

Teachers in schools where there are significant numbers of children who have entered this country from abroad, or who are first generation British, are aware of the special problems that may be encountered in the education of children from different cultural backgrounds. Cultural differences, differences in home backgrounds and parental expectations, to say nothing of differences in language, all make for variations in the way in which such children respond to teaching methods which have been developed with children from an English cultural background in mind.

However, certain individuals and political groups, bent on exacerbating tensions between racial groups, allege that differences between ethnic groups go beyond cultural and economic factors. They claim that there are certain basic biological, genetic differences between individuals that determine how well children of different cultures and racial groups perform at school. A child's intelligence, according to such arguments, does not depend so much on the social and economic position of his or her parents, or the skills of teachers, as on the colour of the child's skin.

It is because there are so many deep misconceptions associated with the term 'race' that this pamphlet has been prepared by biologists and psychologists based at the Open University after discussion with practising teachers. It will provide the teaching profession with factual and analytical material concerning the biology of race and intelligence.

The Union recognises that this is a highly controversial area, but it is the belief of the Executive that the views put forward by Professor Steven Rose, Dr. Ken Richardson and their colleagues are essentially correct. I therefore warmly commend this document in the hope that it will be of assistance in making rational and informed decisions on these sensitive issues which are vital to the education and well-being of all our children.



FRED JARVIS
General Secretary
September 1978

'Race': biological or social phenomenon?

In everyday language, people use the word 'race' very loosely. They speak of white or black 'races', distinguishing people by skin colour, or of the Jewish 'race', distinguishing by culture, and even English, Irish, Scottish and Welsh 'races', distinguishing by nationality. Locked away in these uses of the word 'race' is the assumption that underlying the social label is a biological basis, that there are biologically distinguishing features which separate one 'race' from another. This belief, and this use of the word 'race', has deep roots in our own British cultural history. It dominated the thinking of much 19th and 20th century anthropology, down to its ultimate degradation in the Nazi use of the term, where 'races' were subdivided still further; for example, the Europeans into Aryan, Nordic and Mediterranean 'types', and *Untermenschen* – 'subhumans' like 'Slavs' and 'Jews'.

However, these popular uses of the word 'race' have little, if anything, to do with biology. For the biologist, 'race' is a technical term, which may apply to all species. A race is a variety of a species within which there is a free exchange of genes (the units of heredity) by interbreeding and which may be distinguished from other varieties by some common and heritable attribute. Normally such a group is formed when there is a barrier to breeding with other groups. This may be geographical if the group exists in isolation, or it may be caused, for instance, by 'deliberate' intervention – as when interbreeding and selection are used to produce different types of dog (e.g. Cocker Spaniels versus Afghans).

In the early days, a century ago, of the study of human 'races', much attention was devoted to readily observable physical differences, for instance, in skin or hair colour or bodily physique. However, geneticists today recognise that such studies may be very misleading. Instead, they attempt to measure directly the genes present in particular human groups. There are probably well over 100,000 different genes in the human genotype (the total genetic endowment of each individual). Many of these are known to exist in multiple forms, called alleles. (For instance, a person's blood group, A,B,O or whatever, is determined by which of a particular set of alleles of the genes for the blood group proteins he or she has present. Different people have different alleles, hence different blood groups.) One can then study the frequency with

which a particular allele occurs in any given group. A distinct human 'race', in the biological sense, would exist if the frequency with which a particular allele occurred in that group was very different from the frequency with which it occurred in another.

There are races in animal populations, but are there in humans? When allele frequencies are measured in human populations which are *socially* defined as races (for instance, 'English', 'Jews', 'Blacks'), it turns out that for nearly all the genes studied the differences between individuals of different 'races' are no greater than for individuals of the same 'race'. *Well over 94 per cent of all the differences are found* **within** *a given 'race' rather than* **between** *'races',* This means that, genetically, a white English individual is likely to be just as similar to or different from his white neighbour as he is to a Caribbean or Asian neighbour.

Of course, there are genetic differences between individuals – everyone, except identical twins, is genetically unique. But classifying this genetic uniqueness 'racially' only confuses the issue. Differences in the distribution of particular alleles may occur between regions (e.g. North and South Wales) or even close villages. Yet no-one would think of classifying these as 'racial' differences. Nor is 'racial purity' a meaningful concept, as can be seen by a study of allele frequency in samples of Jews and their non-Jewish neighbours. *Genetically,* for the alleles studied, Polish Jews resemble their Catholic neighbours more than they do, say, Spanish Jews.

As a final example, consider the American population. This derives from extensive interbreeding between European, Asian, African and native American Indian stocks and represents a mixture of the genes from people from all these groups. Today, within America, a person is defined as Black or White on the basis of skin colour, yet this is determined by only a very small number of genes. A 'White' person may have many more genes deriving from his or her African ancestors than a neighbouring 'Black' – but *not* have the tiny number of genes responsible for black skin colour!

It is as a result of observations like these that modern biology is coming to discard the concept of 'race' as having any relevance to the study of human populations.

'Race' differences and intelligence

Defining people as Black or White, Jewish or Christian, English or Irish, is a *social,* and not a *biological* description. It is no wonder, therefore, that a leading British sociologist of race, Professor John Rex of Warwick University, has pointed out that biology has nothing to contribute to the study of human 'race'. Human variation *is* an important topic concerning which geneticists have something to say, but they are not helped by the confusion of the social with the biological which is the stock-in-trade of racist thought. Nowhere has this confusion been more apparent and dangerous in recent years than in the dispute over supposed 'race' differences in intelligence. In particular, there is a theory promulgated by a number of prominent psychologists, and which has received much publicity, to the effect (a) that standardised intelligence tests ('IQ tests') measure an important mental ability; (b) that some non-White 'races' perform relatively less well on these tests; (c) that these differences can only be explained by the existence of genetic differences between the 'races'.

Because of its repercussions – scientific, educational and political – we must give this theory, and all the premises on which it stands, our gravest attention.

What do intelligence tests measure?

First of all, we must try to be quite clear about the meaning of 'intelligence' in this context. The problem is that there is still no generally accepted, scientific theory of intelligence – no general agreement as to what 'intelligence' is. It follows that one cannot *objectively* measure something which cannot be defined. In practice, the term 'intelligence' has been used to suit a particular purpose, the prediction of school attainment. To do this, test constructors write items whose content seems to them, subjectively, to measure intelligence. These items are then put into a pool. The test is constructed by selecting items from the pool so that the final product will have certain statistical characteristics. The most important of these is that when the test is administered to a representative national sample the resultant scores should form a normal distribution. When a test has been designed it may

later be measured against school attainment. If there were no correlation between test scores and school performance the test's validity would be suspect.

However accurately an intelligence test may predict future school attainment though, this is clearly not in itself *independent* evidence that such tests measure 'intelligence'. To argue that this is the case *assumes* that differences in school attainment are *themselves* always and necessarily the result of differences in 'intelligence', which we know is not the case. In fact, even the correlation between IQ test results and school performance is poor, and there is no correlation with subsequent 'job success'.

Thus, for many reasons, we must stress the dangers of over-reliance on the use of intelligence tests which may divert attention from the multitude of factors involved in learning, and lead to a 'blinkered' conception of child development.

'Race' differences on 'intelligence tests'

One must therefore be extremely cautious about the *meaning* of differences in test scores between groups. It is true that groups do score differently on tests – for instance, middle class children generally score higher than working class children. But, as we have seen, the direction and magnitude of differences are entirely a product of the item *composition* of the tests. It is impossible to know whether the differences reflect anything *more* than just such manipulation of the composition of tests. Here is an example: up to 1937, women scored on average about 10 points fewer than men on the Standford-Binet test (still the most widely-used test on both sides of the Atlantic). This led to numerous debates about the difference. Was it 'real'? Are women *really* less intelligent than men? Was it due to 'nature' or to 'nurture'? These debates lasted for well over a decade.

The debates were all put to a stop when the revised version of the test was constructed in 1937. In this version, several items on which women performed better than men were introduced, and some on which they

did worse than men were dropped. In this way, the 'intelligence' of women and men was judiciously equalised. Of course, it is just as possible to equalise the scores of Blacks and Whites (or the working class and middle class) in precisely the same way, a possibility which has been demonstrated many times. The fact that some people do certain items better than others indeed points to differences between them, but it does not follow that these can be graded in a linear fashion as if on a ruler measuring superiority and inferiority. And as for the *crucial* questions – whether the differences are *real* (as opposed to, say, nervousness in the test situation), whether they are important (or, like accent, trivial), what they are differences *in,* and what are their objective *magnitude* and *origins* – we are still completely in the dark.

Like the definition of 'race' itself, the definition of 'intelligence' seems to rely on criteria which are subjective and social rather than objective and scientific. In the end, test designers themselves often fall back on the well known phrase 'intelligence is what the tests test'.

We must exercise extreme caution over the notion that IQ is an index of 'innate mental ability' which some 'races' have more of than others. Furthermore, we must avoid the elusive train of reasoning which seeks to 'explain' the low school achievements of many Black children on the basis of their 'low IQ' and to label children as 'bright' or 'dull'.

The causes of low school achievement are numerous and complex and this should guard us against the kind of simple explanations and remedies that have been prevalent in the past. Certainly, we can be genuinely astonished at the ease and rapidity with which highly complex skills, such as language, are learned in all races, even in early infancy. This in itself militates against notions of biological deficiency, or of brain inadequacies or inabilities. And we should also be wary of the old false divisions between 'nature' and 'nurture'. All school learning, even in basic subjects like reading and mathematics, *can* take place smoothly and rapidly when it is rewarding in a social as opposed to a purely material sense. **It follows that if substantial proportions of the population, such as Black people in Britain, tend to be excluded from jobs in which literacy and computation are central and rewarding skills, then we should not be surprised if their children are uninterested in those skills in the schools.**

Is there a genetic basis for IQ differences?

Most teachers will be familiar with some of the attempts to obtain evidence which would show that differences in children's IQ scores really do represent differences in genetic 'potential'.

The first question to ask is whether one can say, for any individual child, that X per cent of his or her intelligence is contributed by genes and Y per cent by environment. The answer is unequivocally **no**; the question has no scientific meaning; one cannot talk about 'low-IQ genes' or 'high-IQ genes'. Genes are not the preformed attributes that such terms would imply; they have no meaning divorced from the environments in which they become expressed during an organism's development. For any individual, a *unique* genotype develops and expresses itself in a *unique* environment. What are 'low-IQ genes' in one environment are 'normal-IQ genes' in another. For example, children born with a simple genetic defect, known as phenylketonuria (PKU), and reared in a normal environment, develop irreversible mental retardation. Hence the PKU gene is a 'low-IQ gene'. But if the environment is changed, by changing the child's diet from birth to avoid a substance present in many proteins, phenylalanine, the child develops normally – the gene for PKU is still there, but in a different environment it is *no longer* a low-IQ gene. Nor can we talk about the 'topping-up' role of the environment, in which a fixed genetic potential is developed to more or less of its maximum by a poorer or richer environment. The *interactions* of gene with gene and each with the unique environment of the individual produce something which is qualitatively different from mere *addition*.

Thus for the individual child, the question of 'genes versus environment' is without any sort of meaning.

Instead, what geneticists attempt to do (for any biological character) is to estimate the contribution of genotype and environment to *differences* between individuals. It is then possible to derive an estimate, called the 'heritability' of the genetic component in the differences. To do this, the technique is to compare the character, in this case IQ, between individuals who are more or less closely related – for instance, identical and non-identical twins, parents and children, and so forth. The

'strongest' evidence is supposedly derived from measurements on the small number of identical twins who have been reared apart (and therefore have identical genes but different environments). Many studies along these lines have been made, mainly several years ago now (even as far back as the 1920s and 1930s) and it is these that are generally referred to by those who give a figure of 80 per cent for the heritability estimate.

Research of this nature is, however, fraught with difficulties. The most commonly cited studies, those of Cyril Burt, are now regarded as scientifically discredited, and similar critiques have been made of other studies in this area. The result is that Leon Kamin, when recently re-evaluating studies of identical twins and analogous studies, was led to the conclusion that there was no evidence from which to deduce that there was any heritable component to IQ differences at all.

The meaning of heritability

However, the problem of assessing the inheritance of differences in intelligence goes much deeper than this, and it is not resolvable merely by, for instance, doing more or better research. To understand why, we must ask what a heritability estimate actually means. It is *not* a measure of some general 'inheritance'. It is a technical term in genetics (derived for use in plant and animal breeding studies) which (a) can only be estimated in a controlled breeding study in which different genotypes are more or less randomly distributed through a limited range of environments; (b) gives a figure which is meaningful only for *those* genotypes in *those* environments (if the environment changes, the heritability also changes); (c) is only a within-population statistic – it tells one nothing about differences *between* populations, and there is *no* theoretical or practical technique available to genetics which could do this (a crucial but widely misunderstood point. It would theoretically be possible for the heritability of a trait like intelligence to be 100 per cent *within* the 'White' population and 100 per cent *within* the 'Black' population, and *yet* this would say nothing about differences *between* Blacks and Whites, which could still be entirely environmental).

Two things follow. The first is that the heritability measure, however sophisticated the algebra, statistical procedures and data that are fed into it, cannot give meaningful results in the human situation where condition (a) above does not apply. The second is that, even if it *could* give a meaningful figure, this would not tell one anything, except about a particular statistic, at a particular time, in a particular population. It is not a measure of 'inheritance' in the *generally* understood sense at all. And above all, in the context of supposed social and group differences in intelligence, it cannot tell us anything about the origins of differences in IQ scores between middle class and working class or Black and White children.

Because this point is so often misunderstood, it is worth emphasising as categorically as we can. It is not a question of 'ifs' or 'maybes', or 'more research is needed'. **There is no sort of research which can answer the question 'how much does environment and how much do genes contribute to differences in intelligence between middle class and working class, or Black and White children?' because it is not a scientifically meaningful question which is susceptible to answer.**

It is like asking how much does the length, how much does the breadth, contribute to the area of a square – the relationship is not one of some sort of simple addition.

We must therefore seriously question the intention of those who persist in asking this question and attempt to give it apparent scientific status.

Civilisation: social or biological?

The last 10 years or so have seen vociferous claims to explain complex social processes in terms of biological principles assumed to underlie them. Among them is the claim that all aspects of civilisation – technologies, cultures, institutions etc – are manifestations of the traits and characters 'written' in our genes. This leads to the further racial argument that only 'Whites' have developed complex civilisations, only 'Whites' have the requisite, superior, genes. To take this argument first:

what is now known of the *foundation*, the *rate of change*, and the *prime mover of change* in civilisations conclusively precludes such genetic explanations. For example, the first civilisations, accompanying the neolithic or agrarian revolution, sprang up in a number of separated localities almost simultaneously, 5-8,000 years ago. These localities included Mesopotamia, Egypt, Meso-America and Peru, West Africa and East Asia (civilisation only reached Europe 2-3,000 years later). The dispersion of these sites, together with the rapidity with which the neolithic revolution took place, precludes any genetic explanation. Moreover, the speed with which civilisations have changed in the last 2,000 years could not be explained by antecedent genetic changes, which would require hundreds, if not thousands, of generations for their establishment. To drive this point home, there are numerous cases of groups of people – for example, the Manus in East Africa, described in the famous report by Margaret Mead – who have passed from hunter-gathering, through feudal-farming to a proto-capitalism, *in the space of a single generation.* Just as the neolithic revolution was spurred by increasing population and the need for interdependence among increasingly specialised groups, so subsequent change can only be explained by social and economic pressures, together with the immense flexibility that is the most distinctive and universal property of humans. **Certainly, history offers no support for the notion of genetically graded 'races' – on the contrary, it suggests that history would have been impossible without our common humanity.**

Why the debate about 'race'?

If measurements of heritability and attempts to define 'biological' differences between 'races' have little but confusion to contribute to the proper scientific study of human variability and the biological bases of child development and learning, one may well ask, why have some people gone on trying to do the impossible?

The truth is that the 'debate' about race, class and intelligence is not a new one; its roots lie deep in the cultural and political heritage of northern Europe and America. Attempts to 'prove' the superiority of the Anglo-Saxon 'race' and of its leading aristocracy and industrialists were the stock-in-trade of the 'social Darwinism' of the late 19th century. The history of the psychological testing movement in Britain and the USA, of

Burt, Cattell, Terman and Thorndike in the 1920s and 1930s, is of men who were deeply convinced of the power of the genes and the superiority of particular races and classes.

In the US, the development of intelligence testing was closely linked to the movement for the restriction of immigration from Southern and Eastern Europe (considered 'inferior types') and to demands for the sterilisation of the morally or physically unfit on the grounds that they carried inferior genes – the so-called 'eugenics' movement. In Britain, the tradition which produced Burt and his belief in a genetic meritocracy also resulted in Lord Beveridge, the father of the Welfare State, calling for the sterilization of workers on the dole, under the belief that poverty ran in the genes. It was left largely to the good sense of educationists and teachers and the public campaigning of such leading scientists of the 1930s as JBS Haldane and Lancelot Hogben to refute these eugenic ideas.

After the 1939-1945 war, such race biology and claims for the fixed genetic basis of human differences in behaviour fell into deserved disrepute. By 1951, a massive UNESCO study was able to conclude:

> 'according to present knowledge, there is no proof that the groups of mankind differ in their innate mental characteristics, whether in respect of intelligence or temperament. The scientific evidence indicates that the range of mental capacities in all ethnic groups is much the same.'

No new scientific evidence has been adduced since 1951 to challenge this conclusion. Authors of popular books designed to 'prove' racial differences and the propagandists of extremist racist groups, such as the National Front, are forced to dig back into the long-discredited 'research' of the 1920s and 1930s to support their claims. What has happened is that, over the last decade of economic stagnation, inflation and rising unemployment, racist groups have attempted to play on the cultural differences between ethnic groups in Britain to foster racist thinking and attitudes, to 'blame' immigrants and the children of immigrants from the Caribbean and from the Indian subcontinent for the problems of British society. Racism dressed up in pseudo-scientific clothes, even when it attempts to look respectable by quoting apparent 'scientific authority', remains racism, and should be combatted today in our schools.

Teachers, especially those in schools with significant numbers of ethnic minority children but also those in largely 'White' schools, have a particular role and responsibility in this context. There are, of course, special issues to be faced by teachers in the education of children from different cultural backgrounds, and it does no good to pretend that such cultural differences can be ignored, or blurred within a generation. Cultural diversity is surely a strength to be encouraged in education. In addition, children are likely to be curious about the origin and theory of observable human differences even in the most 'colour-blind' society, just as they need to be conscious of the attributes which, as members of the same species, all humans have in common. Where, because of the political climate and media publicity, this curiosity becomes heightened, teachers may wish to discuss, in appropriate classes, the meaning of the term 'race'. This difficult and sensitive educational task is one which the exponents of race hatred in our society may do much to wreck. The purpose of this short pamphlet is to help in this task by exposing the fallacies and dangers of 'scientific racism'.

Summary of main points

1. In *biological* terms the concept of 'race' is meaningless for human populations.
2. More than 94 per cent of all genetic differences between individuals that have been studied occur between individuals of the *same* 'race', not *between* 'races'.
3. Intelligence tests may help predict children's school performance but they say nothing about any fixed 'biological potential' of the individual.
4. It is not meaningful or possible to divide a child's performance into 'genetic' or 'environmental' components.
5. The determinants of 'civilisation' and the development of different human societies should be sought in social, economic and historical factors, not in biology.