THE REALITY OF RACIAL DIFFERENCES: A REJOINDER WITH NEW EVIDENCE

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Summary—The criticisms of my race differences paper are considered within the following questions: (1) Do the racial differences exist as described or are they due entirely to faulty measurement or reporting? (2) Are the racial differences due partly to genetic factors as suggested or are they due entirely to environmental influences? (3) Does the r/K framework provide a good fit to the data or is some other framework more useful? Special attention is given to the issue of whether the racial differences are due to the genes or to social class and several lines of evidence are brought to bear to support the hypothesis that some of the differences are genetic. For example, inbreeding depression scores calculated from Japanese cousin marriages on the WISC are shown to predict black-white difference scores on the WISC-R.

INTRODUCTION

Zuckerman and Brody (1988; hereafter Z & B) fault my review on several counts. This reply is differentiated by the questions mentioned in the abstract. Z & B's opening remarks, however, should not go unchallenged. Any sociobiological approach to human behaviour must include genetic variance to be complete. The first premise of evolutionary biology is the existence of genetic variance within and between populations. The second is that some of this variance is more successful at getting itself replicated. Coming to terms with the evolutionary expectation that human groups will differ, genetically, in the mechanisms underlying their behaviour, has been a long process.

DO THE RACIAL DIFFERENCES EXIST AS DESCRIBED?

About 20 articles were cited for racial differences in each of the sections on brain weight and intelligence, speed of maturation, personality and temperament, sexual restraint, and social organization. A dozen more could have been added to each category and it was concluded: "While many studies finding an *absence* of differences have necessarily been omitted, I am unaware of any major study demonstrating results *opposite* to those reported here" (1988a, p. 1017).

Here then is the place for refutation. If the opposite to predicted patterns could be observed in crime, rough and tumble play, marital stability, longevity or other relevant variables, Z & B's critique would gain credence. Since there is an explicit 1, 2, 3, ordering on each variable, there is ample opportunity for disconfirmation. Such a refutation is not provided. Instead of contradictory evidence, Z & B cite 4 or 5 studies which effectively show "no difference". With craniometry, for example, they report a 1930 study from which uncertain measures of brain size are derived and which, in any case, found no difference. With respect to personality and temperament, Z & B carry out several analyses of the P scale (a dimension I had judged to be of uncertain status to the r/K dimension, Rushton, 1985b), finding "The differences are not significant". Similarly with psychopathology they cite a National Institute of Mental Health survey and a study of the MMPI apparently showing no differences between blacks and whites. If racial differences are random they will be distributed around a mean of zero (no difference) with an equal number of negative results for r/K theory as positive. Instead most predictions are confirmed, with only a few being null and hardly any going in the opposite direction.

Instead of contradictory evidence Z & B provide discussion of, in fact, *non-sequiturs* including the reliability of crime figures, the variability within as well as between races, the overlap of population distributions, the fluctuating sample sizes, the small magnitude of the differences in

some studies, the change in frequency of intercourse over time, and the tendency for the size of both male and female genitals to increase with arousal. In the absence of other information these methodological points must be seen as sources of error for testing r/K theory. To find the consistency of results despite this error can only imply that if more accurate estimates were made, the differences would be greater. Indeed Z & B could have highlighted such secular trends as increases in IQ, height, and longevity, and decreases in DZ twinning, age of menarche, and marital stability (Flynn, 1987; James, 1982; Tobias, 1985; Staples, 1985). Why some attributes have changed in the K direction while others have moved in the r-direction is unclear but they can hardly be used to explain away the mean differences found across the swim of tendencies.

Z & B understate the case when they remark that the brain size differences of 1.5 in.^{3} to 50 cm^3 are "trivial". Using formulae based on brain/body ratios, Tobias (1970, Table 3) estimated the number of "excess neurons" available to different populations for processing information after dealing with body functioning which I averaged to find, in millions of excess neurons: Negroids = 8550, Caucasoids = 8650 and Mongoloids = 8900. Estimated racial differences of 100 to 250 million neurons seem sufficient to underlie many of the cultural differences observed. The recent brain weight data for 1261 individuals measured from consecutive autopsies over 5 years by Ho, Roessman, Straumfjord and Monroe (1980a, 1980b) confirm that the differences are real.

ARE THE RACIAL GROUP DIFFERENCES HERITABLE?

I cited several lines of argument and over a dozen studies suggesting that some of the differences between the races are genetic in origin. To rebut these arguments Z & B (1) raise the "confound problem" of social class, (2) state that there is an absence of heritability data from non-Caucasoid populations, and (3) cite a study comparing German children fathered by black and white American soldiers finding no IQ score differences. Additional data can be brought to bear on each of these critiques.

Social class vs race

Socioeconomic status (SES) will often appear to be a confound because lower SES groups are typically more r than higher SES groups (Rushton, 1985a). Dizygotic twinning (the r-strategy) is greater among lower than among upper SES women in both European and African samples (Golding, 1986; Nylander, 1981). Other SES differences have been observed on such r/K characteristics as family size, intelligence, law abidingness, health, longevity and sexuality (Rushton, 1985a, 1987a). The question then arises as to whether SES or race is most predictive of behaviour.

To examine this issue in the context of sexual behaviour, Rushton and Bogaert (1988) contrasted non-college-educated whites with college-educated blacks, finding that the non-college-educated whites were the more K on measures such as speed of occurrence of premarital, marital and extramarital experiences, number of partners, frequency of intercourse, speed and incidence of pregnancy, and rapidity of the menstrual cycle (although they were not as K as the college educated whites). The black sample, consisting of university students from 1938 to 1963 was atypical in the religiously devout and high SES direction. As such, the data distinctly implies that race is a more powerful predictor of sexual behaviour than educational level or social class.

In other domains too, race has been found to have effects independent of class. With illness, Kessler and Neighbors (1986) demonstrated an interaction between race and class such that the true effect of race was suppressed and the true effect of social class was magnified in models that failed to take the interaction into consideration. With crime, figures show that even at the time when they were lower in socio-economic status, the Chinese in the United States were more law abiding than Caucasoids. In the 1920s this led American criminologists to consider the ghetto as a place which *protected* members from the disruptive tendencies of the outside society (Wilson and Herrnstein, 1985). With the Scholastic Aptitude Test, the results from 1984 showed that the median scores of black college applicants from families earning over $50,000 were lower than those of whites from families earning less than $6,000, although the scores were monotonically related to income within both races (Gordon, 1987). Finally, while both social class and race are predictive of dizygotic twinning, race is the source of the larger portion of variance (Rushton, 1987b).

Jensen (1980) has described how data from siblings can be used to determine whether relationships between variables are caused by factors such as social class. Such factors serve to make family members similar to one another and different from people in other families. Strong social class effects can be presumed operative, therefore, if the covariance structures which emerge from between-family data disappear when using within-family data. If, however, covariance structures remain constant regardless of whether calculated from within-family or between-family data, then social class is less operative, and genetic and within-family sources of environmental variance are prevailing. Research shows that the general factor of intelligence, g, is constant across all 3 major racial groups from both within-family and between-family analyses. Thus, Jensen (1980) compared 8–12 year old siblings from 1495 white families and 901 black families on several cognitive tests, factor analyzed the scores separately for the black and white samples, extracted g factors from both between-family and within-family data, and found them to be effectively identical across all comparisons. Subsequently, Nagoshi, Phillips and Johnson (1987) analyzed the within-family and between-family cognitive factor structures for 370 Caucasoid and 116 Mongoloid families living in Hawaii, again finding substantial similarities. These results imply that differences in g found between the races are not due primarily to the between-family differences typically discussed in this context, such as cultural background, socioeconomic status, and family value systems.

Genetic influence on Black and Oriental populations

Contrary to Z & B's reading, several studies have been carried out on non-whites. Osborne (1978) studied cognitive abilities in 427 pairs of black and white adolescent twins and found that estimates of genetic influence were >50% in both samples with no difference occurring between them and thus no evidence emerging to show the suppressing effect of the environment. With Mongoloids, estimates of genetic influence on cognitive abilities have been calculated on data from the Hawaii Family Study of Cognition for Japanese, Chinese, and Korean samples, which Rushton and Nicholson (1988) showed to closely resemble data calculated on Caucasians.

Other relevant data come from studies showing that the more g loaded a subtest, the higher is the genetic penetrance, and the more clearly it differentiates the races. Thus Jensen (1983) reported a correlation of +0.81 between the degree of inbreeding depression from cousin marriages in Japan and the g loadings of 11 subtests of the Wechsler Intelligence Scale for Children (WISC). Subsequently Jensen (1987a) reported rank order correlations of +0.55 and +0.62 between estimates of genetic influence from two twin studies and the g loading of the 11 Wechsler Adult Intelligence Scale (WAIS) subtests. Vernon (1989) found a correlation of +0.60 between the heritabilities of a variety of speed of reaction time measures of intelligence and their relationship with the g loadings from a psychometric test of IQ. That a test's g loading predicts the mean black–white difference has repeatedly been shown by Jensen (1985, 1987b) in analyses of many large scale studies.

Even more direct evidence that the racial group differences on cognitive ability tests is genetic in origin was provided by Jensen (1973). An unpublished doctoral thesis was cited reporting a correlation of +0.67 between a subtest's heritability and the degree to which it differentiated whites and blacks. An "environmentality index" (the opposite of a heritability index, based on the degree to which sibling correlations departed from the pure genetic expectation of 0.5) was computed and shown to be inversely related to the magnitude of the black–white differences on various subtests. Racial differences in regression to the mean from the scores of siblings were also examined. Black and white children matched for high IQ showed sibling regressions approximately halfway to their respective population means rather than to the mean of the combined populations, with the opposite pattern observed with black and white children matched for low IQ. The regression line showed no significant departure from linearity throughout the range from IQ 50 to 150, a phenomenon predicted to occur by genetic theory.

These path breaking analyses by Jensen (1973) have recently been followed up. Rushton (1988b) took as estimates of genetic influence the Japanese inbreeding depression scores reported by Jensen (1983, Table 2) and related them to black–white differences scores on the same tests as reported by Jensen (1985, Table 5, 1987a, Table 1). The Japanese children were tested in the 1950s on 11 WISC subtests and the American children were tested in the 1970s on subtests from the WISC-R.

Also reported by Jensen (1985) were the test's reliabilities. Rushton (1988b) showed that the inbreeding depression scores from Japan predicted the magnitude of the black–white differences in the U.S. both before and after correcting for subtest reliability (e.g. Spearman $P = 0.47$, $P < 0.05$ before correction; $+0.39$, $P < 0.05$ after correction). That estimates of genetic influence calculated from inbreeding depression scores in Japanese cousin marriages on the WISC in the 1950s predicts the magnitude of black–white differences in the United States on the WISC-R in the 1970s implies that the genetic contribution to racial differences in cognitive ability may be more robust across populations, languages, time periods and measurement specifics than has been considered to date.

The post-adolescent decrease in common-family environment effects

The German adoption study cited by Z & B examines black and white children up to 13 years of age and showed no differences in IQ. This result is comparable to those from several American adoption studies of both white and interracial children showing that the common family environment has effects on development up until puberty, but after which it diminishes dramatically (Plomin and Daniels, 1987). Post-puberty, the causal influences on behaviour are increasingly of the genetic and within-family variety. This is true even of traits such as altruism and aggression which parents are expected to socialize heavily (Rushton, Fulker, Neale, Nias and Eysenck, 1986a). Theories for the change over at puberty emphasize an increasingly active organism capable of shaping its own environment in a direction canalized by its underlying genotype (Rushton, Littlefield and Lumsden, 1986b; Scarr and McCartney, 1983). Thus it would be interesting to know what happened to the black and white German children after puberty. On the basis of the preliminary results reported from the 10-year follow-up to the transracial adoption study conducted by Scarr, Weinberg and Gargiulo (1987), the black children would be expected to regress to their population mean in IQ, sexual behaviour, and social deviance.

DOES r/K THEORY ACCURATELY ORDER THE DATA?

Given that the data are as described, the question becomes whether a better formulation exists with which to account for them. Alternative theories can explain a portion of the observed constellation of correlations but typically these are *post-hoc*, unlike the *a priori* predictions derivable from r/K theory. This is not to deny the anomalies that exist (see Rushton, 1985a) nor the imperfections in the sources of data. Future research is obviously required. Fortunately a more enlightened research climate for the study of racial variation may be occurring, at least as indicated by the increasing popular interest in human racial beginnings (*Newsweek*, January, 1988), and the willingness of front rank journals to consider their differences (Gottfredson, 1986; Steen, 1987). This would be of benefit, for we simply do not know what the origins of the races are, nor the extent of their similarities and differences. A research agenda testing r/K theory may thus be of considerable value.

Genetic trait covariance

As Z & B correctly point out, a critical test of r/K theory is whether the covariance between traits is genetic or environmental in origin. Several lines of evidence suggest that when the studies are carried out the outcome will be favourable. In studies of dandelions, fish, flies, milkweed bugs, and field mice many of the covariant r/K traits do appear to be genetic in origin (Rushton, 1985a), and in humans, studies have already reported genetic linkage for some variables (e.g. between anger, impulsivity and delinquency, see Rowe, 1986), and implied them for others (e.g. between sexual behaviour and delinquency, see Rowe, Rodgers, Meseck-Bushey and St. John, 1988). Unpublished analyses of my heritability study of altruism (Rushton et al., 1986a) also indicate latent genetic correlations between the components.

The paradox of differential fertility

Contrary to Z & B's reading, Bulmer (1970) provided evidence not only for the heritability of dizygotic twinning, but also for the fact that twinning is more frequent in mothers who have had

more children. In a review by Allen (1981), the greater fecundability of mothers of twins is shown not only by their larger families (e.g. 4.3 vs 2.6 in one study, discounting one member of the twin pair), but also by the speed with which they become pregnant (e.g. following the return of husbands from war). Of relevance here is a study by Zelnick, Kimm and Kantner (1979) showing that black females are more likely to become pregnant after their first coitus than white females, results which support the racial differences in fecundity found by Rushton and Bogaert (1987, 1988). At the other extreme of the fertility distribution, numerous heritable infertility disorders have been documented (Insler and Lunenfield, 1986).

With respect to fertility and intelligence, Vining's (1986) major review showed that except for cohorts who bore their children during a unique period of rising fertility, 1935–60, the period from which Z & B drew their examples, there is a characteristically inverse relationship between "endowment" (wealth, success and measured aptitudes) and fertility. Today, most European populations have fertilities significantly below the 2.1 simply needed to maintain current levels. Internationally, Third World countries are reproducing so rapidly that in 50 years, if present trends continue, its population will be ten times that of the West (Wattenberg, 1987). Among these developing nations the birth rate is as expected from r/K theory, with Negroid (Africa) > Caucasoid (India) > Mongoloid (Asia).

The differential fertility paradox goes back centuries. Fisher (1958) suggested that the great civilizations decayed because the ruling groups failed to reproduce themselves, having lower fertilities than the ruled groups. Fisher (1958) hypothesized a trade-off between the capacity for economic success and fertility which r/K theory may help clarify. When selection pressures are relaxed, natural selection favours r-genotypes because of their capacity for speedy reproduction, and that segment of the population will expand enormously. Eventually saturation point will be reached and the population will crash (Malthus, 1798). With selection pressures back on, selection will favour K-genotypes because of their capacity to raise children under scarce resources. Such population cycles occur with rodents (Krebs, Gaines, Keller, Myers and Tamarin, 1973) and there might be a parallel with humans. A full explanation may require the addition of a cultural–ideological component, for purely genetic theories do not explain why European populations have adopted negative population growth while encouraging genetically dissimilar others to replace them. If successful, an explanatory breakthrough may herald a quantum jump in understanding the nature of gene-culture coevolution.

CONCLUSION

Students in the 21st Century may find it difficult to understand how psychologists were in the forefront of denying the importance of facts that have not only been observed in some cases for centuries, but which also spring so readily to the eyes of the layperson. Social scientists have spent enormous effort investigating how "stereotypes" are perpetuated but in recent times they have spent very little investigating the veridicality of aggregated perceptions. While one can only sympathize with honest scholars attempting to come to terms with facts they find disturbing, surely it is now time for the full implications of the Darwinian perspective to be given the close attention they deserve.

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