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SHORT COMMUNICATION

Twins' IQs: A Reply to Schwartz and Schwartz

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It is argued that the criticisms by Schwartz and Schwartz of Jensen's analysis of IQ data on monozygotic twins reared apart fall down on two central points, methodological and theoretical: (a) Valid inferences concerning the broad heritability of intelligence can be drawn from analyses of the combined data from several independent studies of MZ twins reared apart, even though the groups differ significantly in mean IQ; (b) Mean population differences within a given racial category can involve genetic as well as environmental factors.

KEY WORDS: MZ twins reared apart; IQ; heritability; twin methodology.

Schwartz and Schwartz (1976) showed that the mean IQs in the four studies of MZ twins reared apart (Burt 97.7, Shields 93.0, Newman *et al.* 95.7, and Juel-Nielsen 106.8) differ significantly. In this they are correct.

But then they argue that this fact statistically precludes combining the data from the four studies and that what I did with the combined data is therefore unwarranted. In this they are clearly wrong.

In fact, I (Jensen, 1970) made no test of the significance of the differences between the mean IQs of the twins in the four studies, because the group means are quite unimportant and irrelevant to the chief concern of my analysis, *viz.* the intrapair IQ differences for MZ twins and the correlation between twins. MZ twin intrapair differences reflect only nongenetic influences and their magnitude provides an estimate of nongenetic influences on IQ. The correlation between MZ twins reared apart provides an estimate of genetic influence on IQ.

The fact that the groups differ in mean IQ in no way precludes com-

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paring the groups in terms of the mean intrapair twin *difference* in IQ or in terms of the correlation between twins.

My analyses of the IQ data from the four studies combined (122 MZ pairs) showed the following:

1. The IQs of all the twins ($N = 244$) show an approximately normal distribution, with a mean of 96.8, SD = 14.2. They are thus not an atypical sample of IQs.
2. The mean intrapair absolute difference in IQs does not differ significantly across the four samples ($F = 0.87$, df = 3 and 118, $p < 0.46$). The overall mean twin difference is 6.60 IQ points.
3. The twin intraclass correlation for the combined data (122 pairs) is 0.82. The weighted mean of the twin intraclass correlations in the four studies separately (averaged by the method of Fisher's z transformation) is also 0.82. Thus combining the data from the four samples does not affect the twin correlation in the least.
4. In addition, it was shown that the twin absolute differences were approximately a χ distribution. Since the twin differences represent nongenetic effects, and since the χ distribution is the distribution of all possible absolute differences among all the values in a normal distribution, it was concluded that the nongenetic (or environmental) components in IQs are normally distributed. The distribution of twin differences is what one should expect if environmental influences on IQ are normally distributed in the population.
5. Finally, it was shown that the twin absolute differences are not significantly correlated with the mean IQ of the twin pairs. Since the twin difference reflects environment and the mean of the pair reflects largely genetic factors, the nonsignificant correlation (-0.15) between the pair differences and pair means indicates there is no significant genotype $\times$ environment interaction. (A further trend analysis showed no significant linear, quadratic, cubic, or quartic interaction effects.)

None of the above important findings is in the least contradicted by anything in the comments by Schwartz and Schwartz.

Finally, although it is apparent that mean differences in IQ between the samples are irrelevant to my use of the data, it needs to be pointed out that the importance of these differences even in their own right is greatly exaggerated by Schwartz and Schwartz. They emphasize especially the difference between the Juel-Nielsen Danish sample ($N = 12$, mean IQ = 106.8) and the Shields English sample ($N = 38$, mean IQ = 93.0).

But note that there is no Danish standardization of the Wechsler-Bellevue test. The Vocabulary subtest was omitted by Juel-Nielsen because

of translation problems. And subjects were tested twice (raising the IQ an average of 3 points on the second testing; I used the average of both tests in my analysis). When the Juel-Nielsen twins were tested on Raven's Standard Progressive Matrices (a nonverbal reasoning test), their average IQ (on the British norms) was 98.8, SD = 8.9, or only 3.1 IQ points above the mean of the other three studies combined. The twin correlation for Raven IQs is 0.73; it is 0.68 for Wechsler IQs.

Since in recruiting MZ twins reared apart no investigator pretends or attempts to obtain a truly random or representative sample of any broadly defined population, little if any importance can be attached to the relatively small mean differences in IQ level between these small twin samples (N = 53, 38, 19, and 12) from three different countries and on four different tests. We find considerably larger mean IQ differences between the whole White school populations of different communities just within the state of California, even on the same test given under the same conditions. Such demographic differences alone are of course not *prima facie* evidence for either a genetic or an environmental interpretation. That such community differences in IQ have a substantial genetic component, however, is strongly indicated by studies of adopted children, whose IQs show a much higher correlation with those of their biological parents than with those of their adoptive parents (Munsinger, 1975). Schwartz and Schwartz seem to believe that various groups who differ in IQ, if they are of the same race, therefore must differ only because of environmental influences. I have pointed out the fallaciousness of this belief elsewhere (Jensen, 1973, pp. 59–67).

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