

ties of the test in the two countries are interesting, but will require further research for their explication.

The title of Lynn's paper which suggests the existence of a 'great disparity' in IQ is seriously misleading. The average IQ of any population is 100 ( $1.00 \times 100$ ). The intelligence quotient is defined as the level of mental functioning expressed in terms of age divided by the child's chronological age. Intelligence tests are purposefully constructed so that the value of this quotient is unity for each chronological age within a given population from which the standardization sample was recruited.

We conclude that there are serious flaws in Lynn's attempt to compare the IQs of American and Japanese children. Several critical factors were overlooked, the most critical being the lack of representativeness of the standardization sample in Japan. We argue, therefore, that the lack of comparability of the standardization samples precludes the type of comparison Lynn attempted to undertake. The relative status of American and Japanese intellectual functioning remains unknown.

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LYNN REPLIES—Both Stevenson and Azuma and Flynn<sup>1</sup> have suggested my calculation of the mean Japanese at 111 is too high and requires revision downwards. The principal point made by Stevenson and Azuma is that the Japanese sample for the standardization of the Wechsler Intelligence Scale for Children (WISC-R) was drawn from urban schools only, that the mean intelligence quotient

(IQ) in rural schools is lower and that consequently the mean IQ of Japanese children derived from the WISC-R was biased upwards. They suggest a disparity of 7 IQ points between Japanese urban and rural children on the basis of a study by Sato and Hario, but no details of the adequacy of this study are given. They do not cite the study by Hattori *et al.*<sup>2</sup> which showed no significant differences in mean IQ between rural and urban Japanese children. Thus it is open to doubt whether the omission of rural children in the Japanese standardization of the WISC-R resulted in any serious distortion of the mean IQ in Japan. If, however, the figures suggested by Stevenson and Azuma are accepted it is quite feasible to recalculate the mean Japanese IQ making allowance for the alleged bias in the standardization. Such a recalculation is given at the end of this communication.

The second point made by Stevenson and Azuma concerns the use of the performance scale and omission of the verbal scale in the calculation of the mean Japanese IQ. It is difficult to see that the slightly lower correlation between the two scales in Japan (0.81 compared with 0.90 in the USA) and other small statistical differences between the two samples can seriously affect the comparison. In any case the inclusion of the arithmetic and digit span subtests in the calculation of the mean Japanese IQ by Flynn goes some way to correcting the omission and means that the Japanese IQ can now be calculated from all the major specific abilities except verbal. Japanese verbal ability remains an unknown quantity but a figure based on the other major specifics must give a close approximation to the true value of general intelligence.

Turning now to the arguments advanced by Flynn, the first point is that the mean American IQ should be raised by 2.26 points because of the low means obtained by racial minorities in the US. Hence a comparison of the Japanese with white Americans only reduces the Japanese advantage by 2.26 IQ points. This is indisputably correct and I made the same point myself in an earlier paper on Japanese intelligence<sup>3</sup>. Second, inclusion of the arithmetic and digit span tests reduces the mean Japanese IQ by approximately 1 IQ point. This is also correct. Third, the American standardization was carried out in 1972 and the Japanese in 1975. It is argued that the American mean IQ has been increasing at approximately 0.32 points per year, and therefore that on this account an additional 1 point must be

taken off the Japanese mean. While this point may be more contentious, taking the three arguments together the Japanese mean IQ should be reduced from 110.7 to 106.6.

If the value of 106.6 is accepted, a further correction to adjust for the urban sampling bias suggested by Stevenson and Azuma can be made as follows. Taking their figures of a mean IQ for rural children of 7 points below the national norm and the proportion of rural children in Japan at 24%, the mean IQ for all Japanese children will be

$$\frac{97.39 \times 24 + 106.6 \times 76}{100} = 104.39$$

It is therefore suggested that taking into account all the arguable qualifications proposed by Stevenson and Azuma and by Flynn, the mean IQ of the present generation of Japanese young people is approximately 104.4. This value remains significantly higher than the mean of 100 for American Caucasians.

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