

corroborating evidence) that the substituted T24 gene is transforming whereas the unsubstituted version is not. But more clearly than ever, there is much more to malignancy than that — otherwise why did the patient of Muschel *et al.* have a tumour only in his bladder?

They adopt the reasonable fall-back position that the substituted gene, an infrequent polymorphism, produces a predisposition towards cancer, the

development of which in time and location requires other factors.

They go on to argue that the other factors must already have operated on NIH 3T3 cells (which are known to be far from normal). Addition of the substituted gene is the last straw — transforming an NIH 3T3 cell into a full-blown tumour cell. □

Peter Newmark is deputy editor of Nature.

## Japanese intelligence

# Now the great augmentation of the American IQ

from James R. Flynn

ON the basis of various samples used to standardize Wechsler IQ tests in Japan, Richard Lynn has argued that the mean IQ of Japanese children has risen by about 7 points over the last generation, putting them by 1975 some 11 points above their American counterparts<sup>1</sup>. The same contentions were made a few years ago by Lester and Muriel Tarnopol citing some of Lynn's earlier work<sup>2</sup>. Lynn has also argued that the advantage Japanese enjoy in terms of mean IQ is much enhanced at high IQ levels and this may have been a factor in their economic success compared with the US and other nations. In fact, all these contentions are seen to be suspect when viewed in the light of US IQ gains over the last generation and current white US norms. Comparison with white Americans is appropriate given Lynn's use of his data to make comparisons between Japan and nations largely populated by Europeans, such as the UK, Germany and Australia.

The evidence for American IQ gains has been published in detail elsewhere<sup>3</sup> but it may be summarized as follows. In the US, great care is taken to ensure that the standardization samples of Wechsler tests are representative of the total population. Therefore, if the same group of subjects does better on an old test than a new one, the obvious explanation is that old norms are easier to exceed than more recent ones, which is to say that older standardization samples did not perform as well on IQ tests as more recent samples. Five studies in which American children took both the WISC (normed 1947–48) and the WISC-R (normed 1972) collectively revealed that they did 7.86 IQ points better on the earlier test, which suggests a rate of gain in IQ of 0.321 points per year over 24.5 years.

Seventeen studies using all combinations of Wechsler and Stanford–Binet tests during that period, 1948–1972, yielded a rate of 0.358 points per year or a total gain of 8.77 points.

The American gains are far more difficult to explain than the Japanese gains. As was pointed out by Anderson in a recent *News and Views* article, a Japanese gain of 7 points over a generation can easily be explained as almost every factor known to influence IQ can be brought into play<sup>4</sup>. Since 1930, Japan has experienced massive urbanization, a cultural revolution from feudal towards western attitudes, the decline of inbreeding and consanguineous marriages, huge advances in nutrition, life expectancy and education. But as Anderson points out, to find analogous massive changes for the US or Western Europe, one has to go back to the turn of the century. The magnitude of gain Anderson attempts to explain in the Japanese context is also present in the post-1948 American context. Whatever the explanation, the same sort of data cited to evidence Japanese gains — comparisons of WISC and WISC-R performance — shows Americans making IQ gains at a most impressive rate.

The best evidence Lynn has for his contention that the Japanese possess a mean IQ 11 points above Americans comes from the Japanese WISC-R standardization sample of 1975. All other evidence from Wechsler tests standardized in Japan either reveals no significant advantage over American whites (WAIS and WISC) or an advantage suspect because it is present only among pre-school children less than 7 years of age (WPPSI)<sup>5</sup>. Lynn scored the Japanese standardization sample against the norms set by the American WISC-R sample of 1972 and derived an overall mean for ages 6–16 of 110.7, as compared with the American mean of 100. However, as we shall see, much of this apparent advantage is open to serious challenge.

First, Lynn used performance on only five subtests of the WISC-R to compute his mean, setting aside two verbal subtests —

Digit Span and Arithmetic. One problem was altered on the Arithmetic test but that was also true of Block Design which Lynn includes. Using performance on all seven subtests that were essentially unaltered in going from the US to Japan<sup>6</sup>, the Japanese mean falls by just over one point. Second, white Americans scored 2.26 points above the norms set by all Americans in 1972, because the all-American score includes data from low-scoring racial minorities<sup>7</sup>. If Japanese are scored against only white Americans, then another two points can be deducted. Third, Americans were gaining about one IQ point every three years during this period; since the American sample was tested in 1972 and the Japanese in 1975, another point must be deducted if the latter are to be scored against current rather than obsolete norms. The table details how the mean IQ of the Japanese WISC-R standardization sample must be lowered from 110.7 to 106.6 to conform to current white American norms (columns I–IV).

Japanese WISC-R standardization sample: scored against American norms

Year of birth	I	II	III	IV	Age when tested
1959	106	108	106	105	16
1960	109	109	107	106	15
1961	111	111	109	108	14
1962	111	111	109	108	13
1963	112	112	110	109	12
1964	111	111	109	108	11
1965	111	109	107	106	10
1966	112	109	107	106	9
1967	112	109	107	106	8
1968	111	108	106	105	7
1969	112	109	107	106	6
All ages:	110.7	109.6	107.6	106.6	

The four means were scored as follows:

- I. Five subtests, norms all Americans, 1972
- II. Seven subtests, norms all Americans, 1972
- III. Seven subtests, norms white Americans, 1972
- IV. Seven subtests, norms white Americans, 1975

When Lynn argues that the Japanese advantage at the mean is enhanced at high IQ levels, he makes the mistake of overlooking the fact that, as explained in a *Matters Arising* published in this issue of *Nature*<sup>8</sup> (p.738), the Japanese standard deviation is less than the white American one, 12.81 (ref.8) as compared with 14.14 (ref.9) on the performance scale. At an IQ of 130 and above, where we find 2.3 per cent of white Americans, there would be 4.5 per cent Japanese rather than the 10 per cent claimed. Indeed, there would be the same percentage of Americans over 125 as Japanese over 130, hardly a matter of national concern. As for the notion that IQ differences of this magnitude, say 5–7 points, have influenced economic history since World War II, recall the fact that white Americans have gained 8 or 9 points during that time. It seems unlikely that this sort of IQ advantage really means that Americans today are so much brighter than their parents as to be able to overwhelm them in economic competition. □

James R. Flynn is at the Department of Political Studies, University of Otago, New Zealand.

1. Lynn, R. *Nature* 297, 222 (1982).

2. Tarnopol, L. & Tarnopol, M. *Focus Learning Pbs Math.* 2, 34 (1980).

3. Flynn, J.R. *Bull. Br. Psychol. Soc.* 35, 411 (1982).

4. Anderson, A.M. *Nature* 297, 180 (1982).

5. Flynn, J.R. *Bull. Br. Psychol. Soc.* 35, 409 (1982).

6. Tarnopol, L. & Tarnopol, M. *Focus Learning Pbs Math.* 2, 34, 43 (Table 5) (1980).

7. Kaufman, A.S. & Doppelt, J.E. *Child Dev.* 47, 167 (1976).

8. Vining, D.R. *Nature* 301, 738 (1983).

9. Jensen, A.R. *Person. Individ. Diff.* 3, 425 (1982).