



## General intelligence, visuospatial and verbal abilities in Korean children

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**Summary**—Korean and British 9-year-old children matched for intelligence to their respective populations were given the Progressive Matrices and tests of Space Relations, Perceptual Speed and Verbal Fluency. The Korean children scored significantly higher on the tests of general intelligence and visuospatial abilities but were relatively weaker on the verbal test. These results are consistent with those of other Oriental populations.

### INTRODUCTION

A number of studies have found that the East Asian or Oriental peoples of the Pacific rim have high mean levels of general intelligence and are also particularly strong on visuospatial abilities but weaker on verbal abilities, as compared with white or Caucasoid populations in the U.S. and Britain. A review of these studies is given for Japan, Hong Kong, Singapore, Taiwan and the U.S. in Lynn (1987). Additional results confirming this ability profile for Hong Kong are available in Lynn, Pagliari and Chan (1988), and Chan and Lynn (1989). A recent study by Weyl (1989) showing that in the U.S. ethnic Orientals are overrepresented among eminent scientists and technologists, but underrepresented among eminent lawyers is further evidence for the strong visuospatial–weak verbal ability profile characteristic of this ethnic group, if it is assumed that strong visuospatial abilities are required for success in science and technology, and strong verbal abilities for success in law.

A country for which no normative data for cognitive profiles has been published is South Korea. We therefore thought it would be useful to examine the cognitive profile of Korean children to ascertain whether it conforms to that of other Oriental peoples. The results form the subject of this paper.

### METHOD

The Ss were 9-year-old Korean and white British children. The numbers were 107 Koreans (54 boys and 53 girls) and 115 British (58 boys and 57 girls). The mean age of both samples was 117 months, SD = 1.4.

#### Tests

The children were given (1) Raven's Standard Progressive Matrices as a measure of general intelligence; (2) the Space Relations and Perceptual Speed tests from Primary Mental Abilities (Thurstone & Thurstone, 1962) as tests of visuospatial abilities; and (3) a Verbal Fluency test consisting of writing down the names of animals in 2 min as a measure of Thurstone's Verbal Fluency Primary (Thurstone, 1938). This is generally considered a test of long term verbal memory.

In order to ensure that the samples were representative of their respective populations, the following sampling procedures were adopted. The Korean children were taken from a large and socially mixed primary school in Pusan. Initially 299 9-year-olds were tested. In addition to the tests described above, the children took the Korean General Intelligence Test (K-GIT); a test of verbal reasoning. Their mean on this test was 108.5 (SD 5.9). The test was standardized in Korea in 1979 and the mean has probably increased in the 10 year period between the standardization and the administration of the test in our study in 1989. We do not know precisely the magnitude of the secular increase in intelligence in Korea, but in Japan the rate of increase in recent decades has been about 5.0 IQ points per decade (Lynn & Hampson, 1986) and we assume that about the same rate of increase has been present in Korea. This means that at the date of testing the mean IQ of Korean children on the GIT would have been about 105. Our sample's mean of 108.5 would therefore seem to be too high to be representative of Korean children. To obtain a more closely representative sample, children were randomly eliminated from the top half of the distribution until we obtained a sample of 107 children with a mean GIT of 104.6 (SD 5.2) which we consider a good approximation to a representative sample of Korean children for intelligence.

The representativeness of the British children was ensured in the following way. The children were obtained from several state primary schools in various geographical locations. They took the Standard Progressive Matrices and obtained a mean of 35.9. This is equivalent to the 56 percentile on the 1979 British standardization of the test (Raven, 1981), and this is equivalent to an IQ of 102. The mean of British children on the Progressive Matrices has been increasing by approx. 2 IQ points per decade in recent years (Lynn & Hampson, 1986). Hence in 1989 when the data were collected, the mean Progressive Matrices IQ should be 102, and our sample precisely representative of British children for intelligence. In both Korea and Britain the data were collected blind, i.e. the test administrators and scorers were not aware of the question under investigation.

Both samples were examined for sex differences. No statistically significant differences were found, except that among the British children girls scored significantly higher on the test of Verbal Fluency. The means were 15.3, SD 4.8 (girls) and 12.4, SD 5.6 (boys),  $t = 2.92$ .

Table 1. Means and standard deviations of British and Korean children on four cognitive tests

Test	British		Korean		D	<i>t</i>
	Mean	SD	Mean	SD		
Progressive Matrices	35.9	10.7	41.3	7.9	0.58	4.23***
Space Relations	10.2	5.9	13.8	3.8	0.73	5.30***
Perceptual Speed	19.3	9.6	22.9	7.0	0.43	3.23***
Verbal Fluency	13.8	5.4	13.1	4.9	-0.13	1.05

Three asterisks denote statistically significant differences at  $P < 0.001$ .

### RESULTS

The means and standard deviations of the British and Korean children are shown in Table 1. Column 5 gives the differences (D) in standard deviation units and column 6 the *t* values for the statistical significance of the differences. It will be seen that the Korean children obtained significantly higher means on the Progressive Matrices, Space Relations and Perceptual Speed. On Verbal Fluency the British children obtained a small but non-statistically significant advantage. The D differences show that the greatest Korean advantage was on Space Relations. The pattern of results showing that Korean children have high general intelligence as measured by the Progressive Matrices, strong visuospatial abilities as measured by the tests of Space Relations and Perceptual Speed, but relatively weak verbal abilities as measured by the test of Verbal Fluency is consistent with previous studies of Oriental populations. It should perhaps be pointed out that Verbal Fluency is only one of the verbal primary mental abilities. The other verbal primaries of verbal comprehension and reasoning are difficult to measure in cross-cultural studies of people speaking different languages because of the problem of capturing equivalent levels of difficulty in the translations.

### DISCUSSION

The advantage of the Korean children on the Progressive Matrices is equivalent to 9 IQ points. The Progressive Matrices is widely regarded as among the best measures of Spearman's *g*, and the result therefore indicates a 9 IQ point advantage for Korean children on general intelligence. This result is broadly in line with other studies of Oriental children on the Progressive Matrices. The IQ advantage of Japanese 9 year olds on this test was found to be approx. 7 IQ points, while on the Coloured Progressive Matrices Chinese Hong Kong children have a mean IQ of 116 (Shigehisa & Lynn, 1991; Chan & Lynn, 1989).

Although this is the first study to report intelligence test results for Korea, there have been two studies of the intelligence of Korean infants adopted and raised in Western countries. Winick, Meyer and Harris (1975) published results for 112 Korean babies adopted by American families. Many of these babies had been malnourished and they were divided into the severely malnourished, the moderately nourished and the adequately nourished. The respective mean IQs of the three groups at about the age of 10 years were 102, 106 and 112. A further study of Korean infants adopted by Belgian parents and tested with the WISC at the age of 10 years found that they had a mean IQ of 110 (Frydman & Lynn, 1989). The present results are therefore consistent with other studies indicating that Oriental children have a significantly higher mean IQ than Caucasian children in the U.S. and Europe.

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