

IQ and Mathematics Ability of Tibetans and Han Chinese

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The intelligence and mathematical ability of Tibetan and Han Chinese junior and senior secondary school and college students in Tibet was assessed by a modified version of the Standard Progressive Matrices and a mathematics test. Among junior secondary school students, the Tibetans obtained a lower IQ than the Chinese by 12.6 IQ points, and also scored lower on mathematics. Tibetan senior secondary school students and college students also obtained lower IQs and lower scores on mathematics tests than the Chinese.

Key Words: IQ; Mathematics; Tibetans; Chinese.

Little is known of the intelligence and cognitive abilities of Tibetans. No data are given for these in a compilation of some 600 worldwide studies of national and racial IQs summarized in Lynn (2006). This paper presents what is believed to be the first data available in English on this question. During most of its history Tibet was independent until it was invaded by China in 1951 and incorporated into China as an autonomous region. Following this event, numbers of Han Chinese have settled in Tibet. In the census of 2000 these comprised 3.1 percent of the Tibetan population (Bhalla & Qiu, 2006, p.46). The Han Chinese settlers have a much higher literacy rate than the Tibetans at 96 percent for those aged 15 years and over in the 1990 census, as compared with 27 percent of the Tibetans (Bhalla & Qiu, 2006, p.75).

Method

Lu et al. (1995), at the Chinese Northwestern Normal University, have reported a study designed to ascertain whether there is any difference in intelligence and mathematical ability between Tibetans and Han Chinese. Their results have been published in Chinese and are largely inaccessible to western readers, and hence their study and conclusions are summarized and discussed in this paper. In 1992 Lu et al. administered a

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modified version of the Standard Progressive Matrices and a test of mathematics to 40 Tibetan and 40 Han Chinese second year junior secondary school students (aged 12-13), selected to be representative of the two populations, and to the same numbers of second year senior secondary school students (aged 16-17), also selected to be representative of the two populations. These students were in similar schools in Gansu Province. They also tested 38 Tibetan and 40 Han Chinese second year university students from the general and mathematics classes of the Xibei and Qinghai National Institutes. In each age group the Tibetan and Han Chinese samples were half male and half female and were matched for age.

Results

The results are given in Table 1. In all comparisons the Han Chinese performed better than the Tibetans. The differences between the two groups are expressed as standard deviation units (d , the difference between the means of the two groups divided by the average of the two standard deviations) for intelligence and mathematics in columns 2 and 3. Column 4 shows the differences on the Progressive Matrices test, converted to IQ points by multiplying the d value by 15. All differences are statistically significant except for the intelligence difference among the university students.

Table 1:

*Differences between Tibetan and Han Chinese students on the Progressive Matrices (PM) and mathematics tests. d = standard deviation units. IQ is calculated from the d value on the Progressive Matrices. *, $p < .05$; **, $p < .01$; ***, $p < .001$.*

Group	PM: d	Math: d	IQ
Junior Secondary	.84***	.76**	12.6
Senior Secondary	.56*	1.28***	8.4
University	.35	1.40***	5.2

The study also reports the correlations between intelligence

and mathematics. These are .47 in the junior secondary school students, .40 in the senior secondary school students, and .27 in the university students. These correlations show that the intelligence tests and the mathematics tests measure overlapping cognitive abilities. The diminishing correlations in the older samples are consistent with the differentiation principle that cognitive abilities become less highly correlated or more differentiated among older children and adolescents and among high-ability groups (Jensen, 2003; te Nijenhuis & Hartmann, 2006).

Discussion

The design of the study is impressive in so far as the Tibetan and Han Chinese students attended similar schools in the same location and the same post-secondary colleges and therefore had similar educational experiences. For all comparisons of intelligence and mathematics the Tibetan students performed less well than the Chinese. From these results it can be concluded that the Tibetan students have a lower average IQ than the Chinese. The poorer mathematics performance of the Tibetans confirms the results of the IQ test, since mathematical ability and intelligence are highly correlated, and mathematical ability is often regarded as a component of intelligence. In Carroll's (1993, p. 597) hierarchical model of intelligence, mathematical ability (designated "quantitative reasoning") is a component of general intelligence (fluid intelligence: Gf). Similarly, in McGrew & Flanagan's (1998, p.14-15) hierarchical model, "quantitative reasoning" is a component of fluid intelligence (Gf) while "quantitative knowledge," consisting of "mathematical knowledge" and "mathematical achievement," appears as one of the factors of general intelligence, together with fluid intelligence and crystallized intelligence. Elsewhere, after a review of the research, they conclude that "Gf abilities are related significantly to mathematics achievement" (p.44).

The intelligence differences between the Tibetan and Han Chinese students decrease from 12.6 IQ points in the junior secondary school students to 8.4 IQ points in the senior secondary school students and 5.4 IQ points in the university students. The likely reason for this is that there is selection for senior secondary school and more stringent selection for university students. This screens out the less able students and is

likely to make the samples less representative. For this reason, the results of the junior secondary school students (a 12.6 IQ point difference) can be considered the most representative for the population at large. It is not clear why the differences in mathematics increase in the senior secondary school and college students.

The relatively low IQ of Tibetans compared with that of Han Chinese may provide some of the explanation for the poorer living standards in Tibet. In 1997, the per capita income in Tibet was 2,571 yuan, as compared with 3,586 yuan for China as a whole. This difference has sometimes been attributed by economists to distance from the coast and poor access to export markets. The economists Bhalla, Yao & Zhang (2003) attribute the poverty in Tibet to “initial disadvantages and lack of human and physical capital”. Intelligence is the ultimate human capital.

The lower IQ of Tibetans compared with the Han Chinese can be explained in anthropological terms because the Tibetans are not pure Mongoloids but a racially mixed people of Mongoloid and archaic Caucasoid origin. Sonia Cole, an anthropologist at the British Museum, has described them as a “mixture between the archaic white stock and fully evolved Mongoloids” and noted that “the Tibetan face is narrower than that of the Classic Mongoloid and is less padded with fat, while the nose is typically prominent, resembling that of the American Indians” (Cole, 1963, p.99). More recently, the population geneticists Cavalli-Sforza, Menozzi & Piazza (1994, p. 206, 231) have also concluded from genetic analyses that Tibetans are a racially mixed people and written that “the Tibetans were originally nomadic pastoralists who came from the North...” who subsequently “received contributions to their ethnic background from various neighbors to the southwest, southeast and north”.

This could be sufficient to explain their lower intelligence. Ten studies of the Chinese summarized in Lynn & Vanhanen (2006) give them an average IQ of 105, relative to a British IQ of 100. The mean of the Tibetans in this study is 12.6 IQ lower than that of the Han Chinese, giving them an IQ of 92.4. The average IQ in India based on 12 studies summarized in Lynn & Vanhanen (2006) gives them an average IQ of 82, while the IQ of Caucasoids in Kyrgyzstan to the north west of Tibet calculated by Weiss (2007) from the PISA 2006 international study of ability in math suggests an IQ in the low 80s (relative to

a British IQ of 100). Thus the IQ of Tibetans falls about midway between the higher IQ of Han Chinese Mongoloids and the lower IQ of Asian Caucasoids to the north-west. This is what would be predicted from a mixed race population.

The relatively low average IQ and math achievement of the Tibetans is associated with low living standards and a high rate of illiteracy, compared with the Han Chinese. These are best understood in terms of a reciprocal causation model, in which low IQ causes low living standards and a high rate of illiteracy, while these contribute to poorly developed intelligence. This reciprocal causation model is presented for national differences in IQs and per capita income and related variables in Lynn & Vanhanen (2006).

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