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Differences in intelligence across thirty-one regions of China and their economic and demographic correlates

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ABSTRACT

This study reports the differences in intelligence across thirty-one regions of the People's Republic of China. It was found that regional IQs were significantly associated with the percentage of Han in the population (r = .59), GDP per capita (r = .42), the percentage of those with higher education (r = .38, $p < .05$), and non-significantly with years of education (r = .32).

The results of the multiple regression showed that both the percentage of Han in the region and the GDP per capita were significant predictors of regional IQs, accounting for 39% of the total variance.

1. Introduction

Regional differences in intelligence within countries and their economic correlates have been reported in a number of studies. The first of these was found for the United States, for which Davenport and Remmers (1950) reported a correlation of .32 between state IQ and per capita income. More than half a century later, this association was confirmed with a correlation of .59 by McDaniel (2006).

In further studies, regional differences in IQs within countries and positive correlations between these and per capita incomes have been reported for 13 regions of the British Isles (r = .73) (Lynn, 1979), 90 regions of France (r = .61) (Lynn, 1980), 12 regions of Italy (r = .94) (Lynn, 2010), 19 regions of Italy (r = .98) (Templer, 2012), 18 regions of Spain (r = .42) (Lynn, 2012) and 16 regions of Germany (r = .79, .27) (Roivainen, 2012).

In the present paper we examine regional differences in intelligence and their economic and demographic correlates in the People's Republic of China. No study has yet been carried out on this question. However, a number of Chinese studies have examined the intelligence of the Han compared with that of other ethnic groups in China and this is a related issue because the percentage of Han varies across regions. Studies have examined the IQs of more than a dozen of the 56 ethnic groups in China that are officially recognized by the government of the People's Republic of China. All of these have found that the Han had higher average IQs than other ethnic groups.

Two studies have reported that Han have higher average IQs than Tibetans. The first of these was by Zhao, Tong, and Wan (1988) and reported this difference for children aged 9–15 although the mean IQs of the two groups were not provided. The second study by Lu, Fu, Kong, and Wang (1995) tested 40 Tibetan and 40 Han second year junior secondary school pupils (aged 12–13), the same numbers of second year senior secondary school pupils (aged 16–17), and the same numbers of second year university students using the Standard Progressive Matrices and tests of mathematics, all the participants being selected randomly. The results were that in all three age groups Han students had higher average IQs than Tibetan students by 12.6 IQ points ($p < .001$), 8.4 IQ points ($p < .05$) and 5.3 IQ points ($p < .05$), respectively. Han students had higher average scores than Tibetan students on mathematics by .80*d*

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(standard deviation units) ($p < .01$), 1.28*d* ($p < .001$) and 1.41*d* ($p < .001$), respectively, in the three age groups.

There have been three studies reporting that Han children have higher average IQs than Mongolian. The first of these by Na and O (1994) who reported the IQs of Han (N = 3213) and Mongolian (N = 1481) children aged 5–14. They were tested with an adaptation of Raven's Progressive Matrices designated the Connection Raven's Test (CRT) that combined items from the Standard Progressive Matrices and the Coloured Progressive Matrices. The results were that the Han children obtained a mean IQ of 5.3 IQ points higher than the Mongolian.

The second study was by Yang and Gong (1994) and compared 5–6 year old Han (N = 151) and Mongolian (N = 150) children tested with the Chinese revision of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) translated into the Mongolian language. Both groups of children lived together in Inner Mongolia. The Han children obtained a mean IQ of 99.1 and the Mongolian children obtained a mean IQ of 94.9, giving the Han children an advantage of 4.2 IQ points. In both studies these differences are statistically significant at $p < .01$. Further details of these studies are given in Lynn (2007, 2008).

In further studies, higher average IQs of the Han children were reported in comparisons between Miao and Han aged 7–11 years (Cheng et al., 1995); between Hezhen and Han (Wang, Wang, Liu, Ma, & Liu, 1995); and between Li and Han aged 13–14 years (Yang, Yuan, & Liang, 1995). In a more recent study, Yu (2008) compared the IQs of 450 teenagers of Han, Mongol, Daur and Ewenki ethnic groups aged 12, 14 and 16 year olds in Inner Mongolia using Raven's Progressive Matrices, and reported that among 12 year olds, IQs of the Han children were significantly higher than those of children in Mongol, Daur, and Ewenki ethnic groups by 8.4, 9.1 and 11.1 IQ points, respectively. Among 14 and 16 year olds, significant differences in IQs of 8.4 and 8.5 IQ points respectively ($p < .05$) were only found between Han and Ewenki ethnic groups.

There are a number of Chinese studies on the regional differences in economic development, which have shown that this is associated with foreign direct investment (FDI) (Chen & Liang, 2011; Feng, Zhao, & Du, 2008; Liu & Yin, 2010; Yao & Wang, 2011). For example, using the panel data sample of 1999–2007, Chen and Liang (2011) found that up until the end of 2009, eastern regions accumulatively attracted 82.4% of the total FDI in mainland China, whereas center regions and western regions attracted 11.9% and 6.6% of the total FDI in mainland China, respectively (Chen & Liang, 2011). Inequalities, measured by the Gini coefficients, among different regions and between rural and urban areas have been on the rise, although the Chinese government has endorsed and implemented programs that aim at alleviating inequality. For example, in 1999, the Western Development Program (WDP) was launched to boost the economic development of 12 provincial-level units in western China to reduce poverty in those regions (Fan & Sun, 2008), to counteract the regional economic disparity which was found to have a negative effect on national economic growth (Lee, Peng, Li, & He, 2012).

On the basis of previous studies in other countries, in this paper we examine four hypotheses concerning regional differences in IQs in China. These are that regional IQs in China are positively associated with GDP per capita, years of education and the percentage of Han in the population, and that GDP per capita, years of education and Han in the population are all independently associated with regional IQs.

2. Method

Data on IQs for 31 regions of China were obtained for a sample of 63,636 participants who took the test on a Chinese online IQ testing website (http://tw.iqeq.com.cn/). The data on this website are given in Chinese and hence inaccessible to most readers of this journal. The IQ test was based on the Stanford–Binet test and comprised 60 questions on verbal, quantitative and spatial reasoning. The website does not give any information on the reliability and validity but we would assume that these would be reasonable, as the test was based on the Stanford–Binet test. The time allowed to complete the test was 45 minutes. The test was administered between 2008 and 2011 and the results were published in November 2011.

The data for income were measured as GDP (Gross Domestic Product) per capita in 2011 for each region obtained from the National Bureau of Statistics of China (China NBS Database — *Quarterly Data*). We used the logarithmic transformation for the GDP per capita because of the skewed nature of the GDP. Data on average years of education for each region were obtained from the China Statistical Yearbook (2004) based on the 2000 Population Census. In addition, data for the percentage with higher education (college, university, post graduate) for each region and data for ethnic composition were obtained from the National Bureau of Statistics of China (China NBS Database — *Quarterly Data*), based on the 2010 Population Census.

The 31 regions are of three kinds. These are: (1) 22 Provinces: these are under provincial or regional government control; (2) four Municipalities: these are the highest level classification for cities and are under central government control; (3) five Autonomous Regions: these are the first-level administrative subdivision of China; like Provinces, the Autonomous Regions have their own local government, but compared with Provinces they have more legislative rights. The Autonomous Regions have a higher percentage of ethnic minorities which are given in parentheses: Tibet (93.9), Ningxia Hui (38), Guangxi Zhuang (38), Xinjiang Uyghur (59) and Inner Mongolia (21). In addition to these 31 regions, China has the two Special Administrative Regions of Hong Kong and Macau, which are not included in this analysis.

3. Results

Descriptive statistics for the 31 Chinese regions are presented in Table 1. This gives the mean IQs, number of respondents from each region, mean years of education, percentage of those with higher education, GDP (Gross Domestic Product) per capita and the percentages of the ethnic groups. The percentages of ethnic groups (per region) are representative of the populations given in the National Bureau Statistics of China (China NBS Database — *Quarterly Data*), based on the 2010 Population Census. The average of the percentages of Han in the 31 regions is 85.1, and the percentage of Han in the population of China is 92% based on 2010 census (China NBS Database — *Quarterly Data*).

Comparisons of IQs, years of education and GDP per capita by the type of regions (provinces, municipalities and autonomous regions) were examined using ANOVA. For IQs, there