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Intelligence in the People's Republic of China

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ABSTRACT

Data are reported for intelligence of children in China assessed by the Combined Raven's Test in 1988, 1996 and 2006. The IQ of the samples increased by 15.0 IQ points over 18-year period. The British IQ of China in 1988 and 2006 is estimated as 94.8 and 109.8, respectively.

1. Introduction

Many studies since the 1930s have reported that the IQs of the populations of the economically developed nations have been increasing (Lynn, 2014). Lynn's (1982) paper describing the intelligence rise in Japan was the first that brought widespread attention to this phenomenon, and later IQ increases in the United States and other countries were documented by Flynn (1984, 1987) and have become known as "the Flynn effect". There have been studies of increases in intelligence in recent decades in East Asian countries including Japan (Lynn & Hampson, 1986) and Korea (te Nijenhuis, Cho, Murphy, & Lee, 2012), and in Taiwan region (Chen, Liao, Chen, Chen, & Lynn, 2013). The present paper reports data for an increase of intelligence in the People's Republic of China.

2. Methods

The Chinese Combined Raven's Test (CRT) was constructed by Li, Hu, Chen, and Jin (1988) by combining the Coloured Progressive Matrices (CPM) and sections C, D, and E of the Standard Progressive Matrices (SPM). Three nationwide standardisations were subsequently made in China. Each one was made separately for the rural and the urban populations. From them, we can derive a national average score weighted by the proportion of urban and rural population (National Health and Family Planning Commission of the PRC, 2013).

The first standardisation (CRT-C1) was made by surveying children from two provinces in each of the six greater administrative areas between November 1987 and June 1988. The sample size was 7092. The standardisation for the rural children was reported by Wang et al. (1989). Data for urban children is from Gao, Qian, and Wang's (1998) comparison of CRT-C1 and CRT-C2.

The second standardisation (CRT-C2) was reported by Wang, Qian, and Gao (1999) and was made by surveying children in 20 provinces between May and September 1996. The sample size was 5280 and was proportional to the population size in each area. Iodine deficiency areas were avoided.

The third standardisation (CRT-C3) was reported by Wang, Di, and Qian (2007) and was made by surveying children in 17 provinces between April and July 2006. Areas with Iodine deficiency were avoided. The sample size was 4320.

We selected raw scores for urban and rural children aged between 7.5 and 14.5 for the analysis because data for this age range is available in all standardisations. The mean scores were calculated and the standard deviations were combined by the method described in Langley (1971).

Lynn and Vanhanen (2002) established the British SPM standardisation from 1979 as the "Greenwich" standardisation for international comparisons. Lynn (1991) calculated Greenwich IQ of Chinese urban children SPM standardisation in 1986 (H. Zhang & Wang, 1986). The IQ for children aged between 7.5 and 14.5 was recalculated to represent IQ of Chinese urban children in 1988.

3. Results

Raw mean scores were reported in Fig. 1.

Raw mean scores and SDs were reported in Table 1.

The IQ rise in China expressed as *ds* is reported in Table 2.

Fig. 1 shows that there is a rise in every age group of rural, urban and combined populations. In the combined population, the rise is quite uniform across the age groups despite a minor decrease of the rise in older children between the 1996 and 2006 standardizations.

The third column in Table 1 gives the differences between the rural and urban samples expressed as *ds* and shows the urban samples obtained higher scores than the rural samples. The right-hand column

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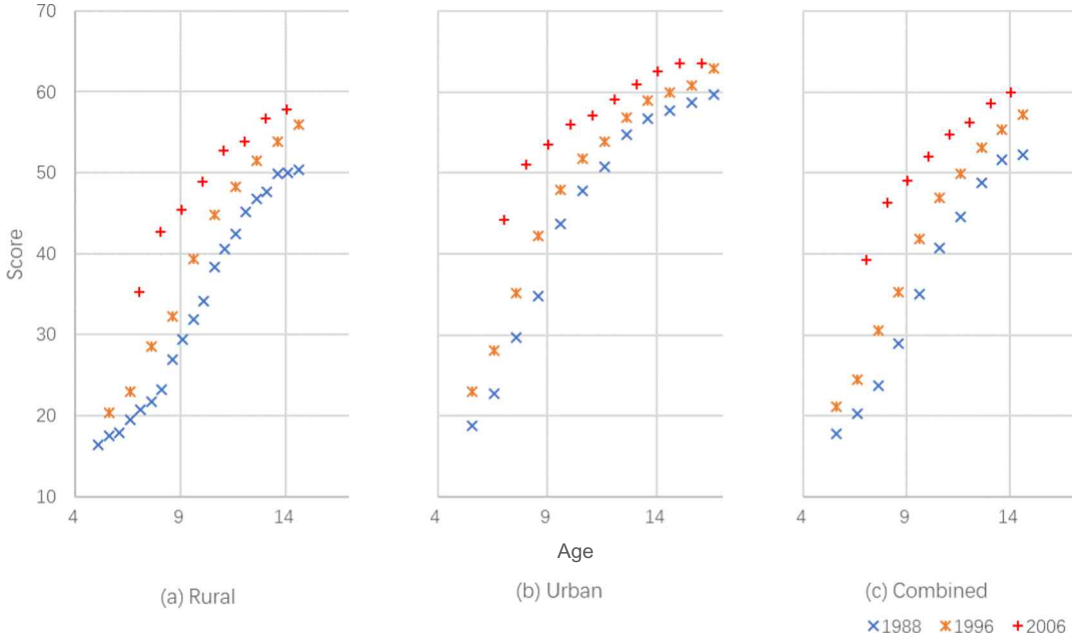

Fig. 1. Mean scores on the combined Raven's Test in China.

Table 1
Mean scores and SDs on the combined Raven's Test in China.

Year	Rural	Urban	*d*	Total
1988	38.82 (15.52)	47.25 (14.26)	0.55	41.00
1996	44.56 (14.34)	51.12 (12.55)	0.47	46.56
2006	51.32 (10.96)	57.30 (8.48)	0.60	53.97

Table 2
IQ rise expressed as *d*s.

Year	Rural	Urban
1988–1996	0.38	0.29
1996–2006	0.53	0.58
1988–2006	0.93	0.86

gives the combined score weighted by the ratio of urban and rural population at each time as the percentage of urban population increased from 25.8% in 1988 to 44.3% in 2006.

Thus, the IQ rise expressed as *d*s over the 18 years was 0.93*d* for the rural samples and 0.86*d* for the urban samples. These are equivalent to 14.0 and 12.9 IQ points, respectively. From the IQ difference between the urban and the rural samples in 1988, IQ rises in each year, and the ratios of rural and urban population, we can calculate 15.0 points rise for the combined population. Note, as the ratio of urban population increased in these years, the rise for the total population is higher than the respective rises in each population.

4. Discussion

There are four points of interest in this study. First, we can see a large rise in scores on the CRT from 1988 to 2006 amounting to 8.3 IQ points a decade over 18-year period. This increase is comparable to that in Japan (7.7 points per decade, 1953–1960) and South Korea (7.7 points per decade, 1980s and 1990s), but greater than that reported in Taiwan region (2.45 IQ points per decade, 1990s and 2000s). We can see an increase of the rise in every age groups of Chinese children, which is in contrast with the British children, where the rise between 1979 and 2008 is much more pronounced in younger children (10 for 7.5-to-8.5-year-olds) than older children (0 for 13.5-to-14.5-year-olds) (Lynn, 2009). It suggests a genuine rise of intelligence rather than children starting to reach a level at a younger age.

Second, these increases of intelligence have generally been attributed to better health and nutrition, more and better education and rising standards of living (Lynn, 1990; Rindermann, Becker, & Coyle, 2016; Wicherts, Borsboom, & Dolan, 2010). There have been considerable improvements in these in recent decades in China. GDP per capita increased from $284 in 1988 to $2099 in 2006 (World Bank, 2018), implying a rising standard of living. Food production increased in China and food deficiency has declined (Zhang et al., 2011). The prevalence of stunting declined from 8.6% and 24.15% in 1985 to 2.9% and 7.5% in 2005 for urban and rural children, respectively (Ji, 2008, 2009). Parents also have had a longer education than before (Yang, 2002) and their children have enjoyed a rearing environment with better educated parents.

Intelligence has been regarded as the cause of economic growth because it improves job performance, innovation, and management, which are determinants of economic growth (Lynn & Vanhanen, 2002; Meisenberg, 2014). The revised Chinese IQ in the 1990s is still higher than the world's average IQ (Becker, 2018), which may explain China's rapid economy development. From a 1.7% share of world's GDP in 1978 (World Bank, 2018), China has been contributing a third to the global economic growth in 2016 (Xinhua, 2017) and is expected to overtake the USA as the largest economy in the world in 2032 (O'Brien, 2017). However, other past planned economies like the Soviet Union did not have such a rapid development after transforming into market economies despite their phenotypic IQ was similar to the revised Chinese IQ in the 1990s (Lynn & Vanhanen, 2002). Because of its large size and the recent rise in both intelligence and economy, China is an important case in the study of the interplay between economic growth and intelligence and deserves further investigation.

Third, urban children obtained higher IQs than rural children in all three standardisations shown as *d*s in Table 1. The average of the 3 years is 0.54*d* and is equivalent to 8.2 IQ points. It has frequently been found that urban samples obtain higher IQs than rural samples. For example, in 79 provinces of the Russian Federation, there was a correlation of 0.43 between intelligence and urbanisation (Grigoriev, Ushakov, Valueva, Zirenko, & Lynn, 2016).

Fourth, the studies of the British IQ in China estimated at 105.5

given in Lynn and Vanhanen (2012) were mainly based on samples in Beijing (Cox, Perara, & Fan, 1999; Li, Sano, & Merwin, 1996) and Shanghai (Dan & Yu, 1990; Geary et al., 1997). The cities of Beijing and Shanghai have IQs higher than the Chinese average by nearly a standard deviation, even when rural and urban children were graded by separate standardisations (Lynn, Cheng, & Wang, 2016). These results give inflated estimates of the Chinese IQ in the 1990s. The revised estimate shows the Greenwich IQ in 1988 was 94.8 and increased to 109.8 in 2006. Meanwhile, the British IQ of 100 in 1979 increased to 106.1 in 2008 (Lynn, 2009). Note, these estimates ignored the differences in SD between the two countries because no raw data for SD in the British standardisations were obtained. If one country had a greater SD than the other, its increases should be larger.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2018.06.010.

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