A Study of Intelligence in Cambodia

Richard Lynn[1]
University of Ulster, UK

A recent study of intelligence in Cambodian and German students gives the Cambodian students an IQ of 84 in relation to a German and British IQ of 100. In both samples males obtained higher mean IQs than females.

Key Words: Intelligence; Spatial ability; Cambodia; Sex differences; Progressive Matrices

The theory that there are national differences in intelligence and that these explain approximately half the variance in national per capita income was first advanced by Lynn & Vanhanen (2002). The starting point of this theory was that it has been established that intelligence is a determinant of earnings among individuals, and hence that this association should also be present across nations. The analysis was based on 81 nations in which intelligence tests had been administered. The results of these were calculated by setting the IQ in Britain at 100 (standard deviation =15) and scaling the mean IQs of other nations to this metric, analogous to the measurement of longitude in relation to zero passing through Greenwich and hence sometimes designated "Greenwich IQ".

This theory has been extended in subsequent studies. In 2006, IQs were presented for a further 32 nations. This increased the total number of nations for which there were IQs to 113. It was shown that these were correlated with per capita income (measured as real GNI, gross national income) at 0.68, explaining 46 per cent of the variance in national per capita income (Lynn & Vanhanen, 2006, p. 102).

In the most recent studies, the theory has been extended to 156 nations (Meisenberg & Lynn, 2011; Lynn & Vanhanen,

[1] e-mail: lynnr540@aol.com

2012). These studies confirmed the association between national IQ and per capita income with a correlation of .695, explaining 48 per cent of the variance. They also extended the analysis beyond economic development and showed that national IQs explain substantial percentages of the variance in national differences a number of other phenomena including educational attainment, literacy, life expectancy, and the presence of democratic institutions.

There are approximately 200 nations and territories in the world with populations over 40,000. The 156 nations for which IQs are available comprise most of the major nations in the world, but there are a few for which IQs are not available. One of these, for which the objective of this paper is to provide an IQ, is Cambodia.

Method and Results

The study from which an IQ for Cambodia can be calculated has recently been published by Anne Janssen and Christian Geiser (2012) of the Freie University of Berlin. They collected data on the Standard Progressive Matrices (SPM) and on two tests of spatial intelligence for 310 students (55.2% males) in various academic programs from the University of Cambodia in Phnom Penh (mean age = 19.02, *SD* = 1.69) and for 278 students from secondary schools (11th and 12th grade) in the German Federal State of Brandenburg, and 68 undergraduate students from the Freie University of Berlin (38.7% males; mean age = 18.5; *SD* = 3.53). The authors propose that the samples from Cambodia and Germany were equivalent for the purpose of comparing the two populations for intelligence. They do not provide information about the kind of secondary schools attended by the German students, but most likely they are Gymnasium (academic track) students, since the non-academic track (Hauptschule) ends with 9^{th} or 10^{th} grade, when students are aged 15-16, and middle school (Realschule) ends when students are aged 16-17 years. Thus both the German and

Cambodian samples are expected to have higher IQs than their respective national averages.

The two tests of spatial intelligence used in the study were the Mental Rotations Test (MRT) and the Cube Comparison Test (CCT). Spatial intelligence is a component of general intelligence and tests of spatial intelligence are included in most intelligence tests.

On the SPM, the German students scored 52.41 (SD: 4.35), and the Cambodians scored 45.08 (SD: 9.75). The difference between the two samples is 1.05*d* (based on the averaged standard deviations of the two samples), equivalent to 15.8 IQ points, statistically significant at p<.01. When calculated based on the 1993 standardization of the SPM in the United States for the 18-22 years age group (Raven et al., 1998, p.77), the Germans scored at the 52nd percentile and the Cambodians at the 16th percentile of the US distribution, producing virtually the same difference between the two samples. It may be interesting to note that males scored higher than females in both countries. In Germany, males (n = 134) scored 53.13 (SD: 4.13), and females (n = 211) scored 51.94 (SD: 4.44). The difference between the two groups is .28*d*, equivalent to 4.2 IQ points. In Cambodia, males (n = 171) scored 45.34 (SD: 10.04), and females (n = 135) scored 44.69 (SD: 8.98). The difference between the two groups is .07*d*, equivalent to 1.05 IQ points.

The German students also scored higher than the Cambodians on both spatial tests. On the MRT the German advantage was *d* = 1.57, equivalent to 23.5 IQ points, statistically significant at p<.01. On the CCT the German advantage was *d* = 0.99, equivalent to 14.8 IQ points, statistically significant at p<.01.

On the MRT, males in Germany scored 13.2 IQ points higher than females, and in Cambodia, males scored 5.68 IQ points higher than females. On the CCT, males in Germany scored 6.4 IQ points higher than females, but in Cambodia,

females scored a negligible 0.02 IQ points higher than males.

Discussion

The SPM results give the German students an IQ advantage of 15.8 points over the Cambodian students and hence an IQ of 84.2 in relation to a German IQ of 100. In our latest compilation of national IQs given in Meisenberg & Lynn (2011) and Lynn & Vanhanen (2012) we calculate that the German IQ is the same as the British IQ, and hence the present study gives an IQ of 84.2 for Cambodia in relation to a British IQ of 100, the standard in terms of which national IQs have been calculated.

On the MRT spatial test the German advantage was d = 1.57, equivalent to 23.5 IQ points. On the CCT spatial test the German advantage was d = 0.99, equivalent to 14.8 IQ points. The two results can be averaged to give the German students an IQ advantage of 19.1 IQ over the Cambodian students and hence an IQ of 81 in relation to a German and British IQ of 100. The SPM result should be considered more valid and hence it is proposed that an IQ of 84 is the best estimate for Cambodia obtained in this study.

The authors of the study suggest that "The large differences could be explained by Cambodian participants being more prone to analytic strategies, whereas most Germans preferred a holistic strategy" and that "the huge differences between nations can partly be attributed to differences in the mathematics curriculum". It is more probable that the lower scores obtained by the Cambodian students is attributable principally to lower general intelligence and reasoning ability measured by the SPM. However, possibly the authors of the study may be right in suggesting that differences in the mathematics curriculum may have contributed to the lower IQs obtained in this study in Cambodia.

The higher scores obtained by the men by 4.2 IQ points in Germany and by 1.05 IQ points in Cambodia confirms a

number of studies reviewed in Lynn & Irwing (2004) showing that males obtain higher average scores than females on the SPM from the age of 16 years reaching an advantage of approximately 4 to 5 IQ points in adulthood. On the spatial tests, males scored significantly and substantially higher than females in Germany on the MRT and on the CCT, and in Cambodia males scored significantly and substantially higher than females on the MRT, but not on the CCT. The higher average scores obtained my males, except for the anomalous result on the CCT in Cambodia, confirms numerous studies reporting higher male spatial abilities (Voyer et al, 1995).

Another incidental observation is that the average Raven score of the German students is virtually identical to that of the general population in the United States in 1993, although the (mainly academic track) German sample is likely to score above the German average. This supports the notion that Flynn effects on Raven's Progressive Matrices have ended for adolescents and young adults in Western countries. This has been shown in Britain, where there were no gains (and even marginal losses) on the Standard Progressive Matrices for those older than 13 years over the 1980-2008 time period (Flynn, 2009; Lynn, 2009). The present results suggest that the same is true for Germany.

The IQ of 84 for Cambodia estimated here is a little lower than the IQs in neighboring Laos (89), Thailand (90) and Vietnam (94) reported in Lynn & Vanhanen (2012). Of these, the average IQ in Vietnam may have to be revised upwards to approximately 100 based on a recent study by Rindermann et al. (2013), who found that the average IQ of Vietnamese school children was virtually the same as that odf a German comparison sample. Also, in the 1012 PISA assessment of 15-year olds in mathematics, science and reading, Vietnam obtained an average of 516 compared with 492 for the United States, 502 for the United Kingdom, and 515 for Germany (OECD, 2013). It is possible that one or two IQ points may

have been lost in Cambodia as a result of the mass killing of intellectuals and the middle and professional classes that took place in the years following 1975 during the Pol Pot regime. These have been described by Kaplan (1996) who estimates that approximately 2 million were killed out of a population of approximately eight million. The professional classes and anyone who wore glasses were particularly targeted in these executions. So also were the ethnic Chinese who have higher IQs than the indigenous populations throughout Southeast Asia (Lynn, 2008), and whose numbers in Cambodia declined from approximately 425,000 before 1975 to approximately 61,400 in the 1990s.

References

Flynn, J.R.
(2009) Requiem for nutrition as the cause of IQ gains: Raven's gains in Britain 1938-2008. *Economics and Human Biology*, 7: 18-27.

Janssen, A. & Geiser, C.
(2012) Investigation of cross-cultural differences in spatial abilities and solution strategies: An investigation in Cambodia and Germany. *Journal of Cross-Cultural Psychology* 43: 558-575.

Kaplan, R.D.
(1996) *The Ends of the Earth.* New York: Vintage.

Lynn, R.
(2008) *The Global Bell Curve.* Augusta, GA: Washington Summit Publishers.

Lynn, R.
(2009) Fluid intelligence but not vocabulary has increased in Britain, *Intelligence* 37: 249-255.

Lynn, R. & Irwing, P.
(2004) Sex differences on the Progressive Matrices: A meta-analysis. *Intelligence* 32: 481-498.

Lynn, R. & Vanhanen, T.
(2002) *IQ and the Wealth of Nations.* Praeger.

Lynn, R. & Vanhanen, T.
(2006) *IQ and Global Inequality.* Augusta, GA: Washington Summit Publishers.

Lynn, R. & Vanhanen, T.
(2012) *Intelligence: A Unifying Explanatory Construct for the Social Sciences.* London: Ulster Institute for Social Research.

Meisenberg, G. & Lynn, R.
(2011) Intelligence: A measure of human capital in nations. *Journal of Social, Political & Economic Studies* 36: 421-454.

OECD
(2013) *PISA 2012 Results: What students know and can do*. Available at http://www.oecd.org/pisa/key findings/pisa-2012-results.htm.

Raven, J., Raven, J.C. & Court, J.H.
(1998) *Standard Progressive Matrices*. Oxford: Oxford Psychologists Press.

Rindermann, H., Ngoc, Q. H. S. & Baumeister, A.
(2013) Cognitive ability, parenting and instruction in Vietnam and Germany. *Intelligence* 41: 366-377.

Voyer, D., Voyer, S. & Bryden, M.P.
(1995) Magnitude of sex differences in spatial ability: A meta-analysis and consideration of critical variables. *Psychological Bulletin* 117: 250-270.