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An Increase of Intelligence in Qatar from 1986 to 2011

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Data are reported for non-verbal ability of children in Qatar in 1986, 2000 and 2011 measured by Raven's Standard Progressive Matrices. The results show a rise of the British-scaled IQ of 16.6 points over the 25 years (1986 to 2011), representing an increase of 6.6 points a decade.
Key Words: Intelligence, Progressive Matrices, Qatar, Flynn effect.

Numerous studies have reported that the mean IQ of the populations in economically developed countries has been increasing since the 1920s and 1930s. This was shown early on in the USA (Tuddenham, 1948) and Scotland (Scottish Council for Research in Education, 1949). In the period between the 1950s and 1980s many more studies reporting increases in intelligence were carried out in the USA (Flynn, 1984) and a number of other countries (Flynn, 1987), summarized in Lynn (2013).

More recently, similar gains have been reported in economically developing countries. These gains have been reported in Kenya (Daley et al., 2003), Dominica (Meisenberg et al., 2005), Brazil (Colom, Mendoza & Abad, 2007), Sudan (Khaleefa, Abdelwahid et al., 2008; Khaleefa, Al-Hussain & Abdulradi, 2008; Khaleefa, Sulman & Lynn, 2008) and Libya (Al-Shahomee, Abdalla & Lynn, 2017).

In this paper we present data showing that an increase of intelligence has also taken place in Qatar during recent decades. There have been two previous

reports of intelligence in Qatar. The first study was carried out in 1986 by Bart, Kamal and Lane (1987) on a sample of 273 10-13 year olds tested with the Standard Progressive Matrices (SPM). It produced a British-scaled IQ of 78 given in Lynn and Vanhanen (2012). The second study was carried out in 2000 on a sample of 1135 6-11 year olds tested with the SPM and produced an IQ of 88 according to British 1979 norms (Khaleefa & Lynn, 2008). The present study, also using the SPM, carries the time series forward to 2011.

Method and Results

The Standard Progressive Matrices (SPM, Raven, 1986) is a test of non-verbal reasoning. It is one of the most widely used tests of cognitive ability in cross-cultural studies because it is non-verbal and not in any obvious way dependent on learned curricular content. However, it does test the application of abstract analytical thinking, a skill that is not well developed in unschooled individuals (Luria, 1976). Therefore it measures the successful acquisition of the kind of cognitive skills that children acquire in school, and it is suitable for outcome-based quantitative studies of educational progress.

The SPM was administered in 2011 by Warrag (2011) to a representative sample of 573 primary school students aged 8:6 (8 years six months average) to 11:6 years in the Doha region of Qatar, the same region in which a representative sample of 1,135 children (517 males, 618 females) aged 6:0 through 11:6 years had been tested with the SPM in 2000 and the results reported by Khaleefa and Lynn (2008).

The means on the SPM for the 2000 and 2011 samples are given in Table 1. The column headed *d* gives the differences between the two samples in standard deviation units calculated as the difference between the two means divided by the pooled standard deviation. The mean *d* is .56 and is equivalent to 8.38 IQ points. This represents an increase of 7.62 IQ points a decade over the eleven year period. Also presented are the IQs of the two samples calculated by converting the SPM raw scores to SPM Plus scores using the conversion table SPM3 given in Raven, Raven and Court (2000), and entering the IQs according to the 2008 British standardization sample given in Raven (2008).

Discussion

There are three points of interest in the results. First, the mean increase in the SPM scores given as *ds*, averaged across the seven age groups, is .56 and is equivalent to 8.38 IQ points. This represents an increase of 7.62 IQ points a decade over the eleven year period from 2000 to 2011 and is larger than the

approximately 3 IQ points a decade increase that has typically been reported in economically developed countries during the second half of the 20th century.

Table 1. *Means on the SPM for children in Qatar in 2000 and 2011. IQs are calculated from British 2007/08 norms.*

Age	2000			2011			*d*
	N	M ± SD	IQ	N	M ± SD	IQ	
8:6	82	23.04 ± 8.78	79.5	61	28.56 ± 8.60	87	0.64
9:0	113	25.31 ± 9.54	79.5	97	33.02 ± 8.93	91	0.84
9:6	100	27.75 ± 9.35	79.5	61	37.92 ± 8.50	94	1.14
10:0	95	30.64 ± 9.80	81	80	34.53 ± 10.35	87	0.39
10:6	70	31.72 ± 9.44	80.5	55	37.25 ± 7.90	89	0.64
11:0	130	34.08 ± 8.58	84.5	129	35.34 ± 5.96	86.5	0.17
11:6	89	36.39 ± 8.22	88	90	37.09 ± 8.23	89	0.09

Second, the mean British-scaled IQ of the seven age groups of the 2011 sample is 89.1, and the average for the same age groups in the 2000 sample is 81.8. The latter value is different from the 88 given by Khaleefa and Lynn (2008). The explanation for this is that Khaleefa and Lynn (2008) calculated the IQ of the 2000 sample in relation to the British 1979 standardization sample while the IQs in Table 1 were calculated from the British 2007/08 standardization of the SPM+. The difference between the scaled IQs is due to the Flynn effect in Britain for this age group between 1979 and 2007/08.

The Bart, Kamal and Lane (1987) study reported an SPM raw score of 30.24 for a sample with an average age of 12.8 years. This corresponds to an IQ of 72.5 according to British 2007/08 norms at the time of the study in 1986. Thus in *absolute* terms, after converting the raw scores to IQs according to British 2007 norms, the average IQ in Qatar increased from approximately 72.5 in 1986 to 81.8 in 2000 and 89.1 in 2011. These are near-identical gains of 6.6 points/decade between 1986 and 2000 and between 2000 and 2011. However, the gains relative to Britain are smaller than this because average British SPM scores for children increased between the 1979 and 2007/08 standardizations. Based on the weighted average of scores according to the 1979 and 2007/08 standardizations, the average IQ in the Bart, Kamal and Lane (1987) study was approximately 77.1 relative to a British average of 100. Therefore the *relative* gain with reference to Britain was not 16.6 points but “only” 12 points.

Third, the gains between 2000 and 2011 were greater among the younger than among the older children. The two youngest age groups gained 0.64*d* and 0.84*d*, while the two oldest age groups gained 0.17*d* and 0.09*d*. A similar greater secular increase in IQs among younger than among older children has been reported in Britain where 6-year-olds gained 13 IQ points on the Coloured Progressive Matrices 1982-2007 but 10-year-olds showed no gain, and on the Standard Progressive Matrices where 7-year-olds gained 11 IQ points 1979-2008, 10-year-olds gained 9 points, but 13-15 year-olds showed no gain (Lynn, 2009).

There are two plausible explanations for this age effect. First, the initial easy items in the SPM are the main determinants of ability differences among younger children, and these are mainly measures of visual-spatial ability. The later and more difficult items that are the main determinants of ability differences among older children are measures of abstract reasoning ability (Lynn, Allik & Irwing, 2004; van der Ven & Ellis, 2000). Visual-spatial ability has shown a greater increase over time than reasoning ability (Lynn, 1990a), so the effect of this will be greater secular increases of intelligence in younger children. A second possible explanation for the age effect is that the improvements in nutrition that have been a major factor in the secular increases in intelligence (Lynn, 1990b, 1998) have accelerated the maturation of intelligence of younger children but had less effect on older children. The earlier physical and mental maturity of children during the middle decades of the twentieth century has been documented by Binning (1958).

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