



An increase of intelligence in Saudi Arabia, 1977–2010

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ABSTRACT

Normative data for 8–15 year olds for the Standard Progressive Matrices in Saudi Arabia were obtained in 1977 and 2010. The 2010 sample obtained higher average scores than the 1977 sample by .78d, equivalent to 11.7 IQ points. This represents a gain of 3.55 IQ points a decade over the 33 year period.

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1. Introduction

Numerous studies have reported that the intelligence of the populations of the economically developed nations increased during the twentieth century. There have been far fewer reports of increases of intelligence in economically developing nations. The objective of this paper is to add to the literature for economically developing nations by reporting an increase of intelligence in Saudi Arabia over the years 1977–2010.

The first major report of an increase of intelligence was published for the United States by Tuddenham (1948), who compared the IQs of men conscripted into the American army in 1917 with those conscripted in 1943. The study found that the intelligence of the 1943 sample was 11.5 IQ points higher than the 1917 sample, representing a gain of 4.4 IQ points a decade. A year later it was reported that the intelligence of 11 year old children in Scotland had increased by 2.21 IQ points over the years 1932–1947, a gain of 1.47 IQ points a decade (Thomson, 1949). Two years after this it was reported that intelligence of 9–11 year old children in England had increased by 0.77 IQ points over the years 1936–1949, a gain of 0.66 IQ

points a decade (Cattell, 1951). During the next three decades more studies were published reporting similar increases of intelligence in economically developed nations, including Britain, Japan and the United States by Lynn and Hampson (1986), and the United States and a number of other countries by Flynn (1984, 1987), after whom the increases have been designated the “Flynn effect”. More recent studies showing increases in intelligence have been summarized by Colom, Flores-Mendoza, and Abad (2007).

It is only recently that studies of increases of intelligence in economically developing nations have been published and increases in intelligence have been reported in four of these. The first of these was in Kenya, where Daley, Whaley, Sigman, Espinosa, and Neuman (2003) reported a 15 IQ point gain over 14 years on the Coloured Progressive Matrices, representing a gain of 10.7 IQ points a decade. The second was in Dominica, where Meisenberg, Lawless, Lambert, and Newton (2006) reported an 18 IQ point gain for 20–70 year olds over 35 years on the Coloured Progressive Matrices, representing a gain of 5.1 IQ points a decade. The third was in Brazil, where Colom et al. (2007) reported a 17 IQ point gain for 7–11 year olds over 72 years 1930–2012 on the Draw-a-Man Test, representing a gain of 0.24 IQ points a decade. The fourth study was in Sudan, where Khaleefa, Sulman, and Lynn (2009) reported WAIS-R

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Full Scale IQ gain of 4.05 points over the 20 year period 1987–2007, representing a gain of 2.05 IQ points a decade. The objective of this paper is to add to the literature on IQ gains in economically developing nations by reporting data for Saudi Arabia.

2. Method

In this study we present the results of standardizations of the Standard Progressive Matrices (SPM; Raven, 1981; Raven, Raven, & Court, 2000) in Saudi Arabia in 1977 and in 2010 and examine whether there has been an increase in scores over the thirty-three years.

The 1977 standardization of the SPM in Saudi Arabia was published in Arabic by Abu-Hatab et al. (1977). The study consisted of 4932 participants (males: 3158 and females: 1774), aged between 8 and 30+ years. The data were collected from Makka (Mecca) Province in Western Saudi Arabia, from the three cities of Makka, Jeddah and Al-Taif. There were six categories of participants: (a) primary school students from 8 schools, (b) intermediate school students from 7 schools, (c) secondary school students from 4 schools, (d) university students of Education and Islamic Law (Shari'a) from King Abdul-Aziz University, (e) graduates from the university and (f) postgraduate students. The SPM was administered by postgraduate students from the Faculty of Education at King Abdul-Aziz University.

The SPM was administered to groups in schools and the university by two teams, one for male students and another for female ones. The reason for this is that males and females study in a separate schools and colleges from primary schools to universities. Co-education is prohibited in Saudi Arabia. The females' team of researchers was led by Amal Ahmed Sadiq while the male team was led by Hamid Zahran and both teams were headed and supervised by Abu Hatab. The project was conducted and funded by the Center of Psychological and Education Research, Faculty of Education at King Abdul-Aziz University.

The test was administered in accordance with the instructions given in the manual. There was no time limit for the completion of the test. Time of completion of the test for each participant was recorded in the answer sheet.

The SPM was standardized again in Saudi Arabia in 2010 and the testing supervised by the first author. The sample consisted of 1553 participants (636 boys and 917 girls) aged between 8.0 and 15.5 years. The sample was drawn from school students at schools in Makka (Mecca) Province. The Province was divided into four quarters, and representative schools were selected from towns in each of the four quarters. Participants were randomly selected from both public and private schools. Public schools in Saudi Arabia only teach the curriculum assigned by the Ministry of Education while private schools are allowed to add supplementary material to the mainstream prescribed curriculum. The sample does not include elite private schools. The parents of the sample were given consent forms for the testing and for the collection of demographic information. The forms were collected prior to the day of testing and were checked for any missing information.

The SPM was administered without a time limit. Teams of female researchers were recruited to test female participants while male researchers were recruited test male participants.

Each team had four members and a coordinator. Both teams were trained on the procedure for applying the SPM. All team members had college education.

On the days scheduled for testing, each team conducted the test in the selected schools. The students were tested in groups in a classroom environment. The testing team explained and demonstrated the procedure to the students using the examples in the test manual. The testing took place between 24 April and 23 June, 2010. The data collection teams used computer software to input, correct, and tabulate the results.

3. Results

To compare the scores obtained by 1977 and 2010 samples, we consider only the eight age groups 8 through 15 years that were tested in both years. The mean scores and standard deviations of the eight age groups tested in 1977 and 2010 are given in Table 1. The column headed *d* gives the differences between the means in the two years expressed in standard deviation units calculated as the difference between the means divided by the pooled SD. The right hand column gives the *t* values for the statistical significance of the differences between the two samples. The *t* values are all statistically significant at $p < .01$.

4. Discussion

The results show that in all of the age groups aged 8 through 15 years the 2010 sample obtained higher mean scores than the 1977 sample and all of the differences are statistically significant at $p < .01$. The average of the *ds* for the eight age groups is .78 and is equivalent to 11.7 IQ points. This represents a gain of 3.54 IQ points a decade over the 33 year period 1977–2010.

This rate of gain is intermediate between those in the four economically developing countries summarized in the Introduction section. These are the high gains of 10.7 IQ points a decade in Kenya reported by Daley et al. (2003) and the 5.1 IQ points a decade in Dominica reported by Meisenberg et al. (2006), and the lower gains of 0.24 IQ points a decade in Brazil reported by Colom et al. (2007), and of 2.05 IQ points a decade in Sudan reported by Khaleefa et al. (2009). These differences in the size of the gains are likely partly attributable to the ability measured by the tests. The present study is the first to report intelligence gains on the Standard Progressive Matrices in an economically developing country. The gains on this test in Britain from 1938 to 1979 were 1.86 IQ points a decade (Lynn &

Table 1
Saudi Arabian means on the SPM in 1977 and 2010.

Age	N	1977		2010		PooledSD	<i>d</i>	<i>t</i>	
		M	SD	N	M				SD
8	287	15.5	6.8	112	18.6	6.8	6.80	0.46	4.73
9	162	16.7	8.5	142	25.3	8.2	8.35	1.03	12.23
10	233	17.9	8.6	180	29.3	7.8	8.10	1.41	19.14
11	333	19.7	10.4	215	30.5	7.2	8.80	1.23	22.12
12	426	24.8	11.5	236	32.1	7.0	9.25	0.79	15.41
13	379	26.5	12.3	234	33.4	7.4	9.85	0.70	14.91
14	391	31.1	13.4	211	36.1	6.3	9.85	0.51	11.68
15	450	35.0	12.4	235	36.0	6.4	9.40	0.11	3.40

Hampson, 1986), and from 1979 to 2008, 1.60 IQ points a decade (Lynn, 2009). The gain on the Standard Progressive Matrices of 3.54 IQ points a decade for Saudi Arabia reported here is evidently greater than the gains in Britain from 1938 to 2008 and suggests that intelligence gains have been greater in economically developing than in economically developed countries.

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