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## The increase of intelligence in Sudan 1964–2006

Omar Khaleefa<sup>a</sup>, S.B. Abdelwahid<sup>b</sup>, F. Abdulradi<sup>c</sup>, Richard Lynn<sup>d,\*</sup><sup>a</sup> University of Khartoum, Sudan<sup>b</sup> Omdurman Islamic University, Sudan<sup>c</sup> Dongola University, Sudan<sup>d</sup> University of Ulster, Coleraine, Northern Ireland, BT52 1SA, UK

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### ABSTRACT

Results are reported for mean IQs on the Draw-a-Man Test for 4–10 year olds in Sudan in 1964 and 2006. There was a gain of 12.2 IQ points over the 42 years, representing 2.9 IQ points a decade.

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### 1. Introduction

Secular increases in IQs were reported in the United States in the 1940s by Wheeler (1942), Smith (1942) and Tuddenham (1948). Shortly afterwards similar IQ increases were reported in Scotland (Scottish Council for Research in Education, 1949) and in England (Cattell, 1950). Further work documenting this phenomenon has been published for a number of other countries by Lynn and Hampson (1986) and Flynn (1984), Flynn (1987), after whom the increases have been named the “Flynn effect”. Virtually all these IQ increases have been reported in economically developed nations. There have, however, been three reports of IQ increases in the economically undeveloped nations of Kenya, Brazil and Dominica. In Kenya an IQ increase of 14 IQ points from 1984 to 1998 (10.0 IQ points a decade), based on samples of 7 year olds measured by the Colored Progressive Matrices, was reported by Daley, Whaley, Sigman, Espinosa, and Neuman (2003). In Dominica, an IQ increase of 18 IQ points (5.1 IQ points a decade), in cohorts born in 1948 and 1983, measured by the Standard Progressive Matrices, has been reported by Meisenberg, Lawless, Lambert, and Newton (2005). In Brazil an IQ increase of 17 IQ points from 1930 to 2002 (2.4 IQ points a decade), based on samples of 7–11 year olds measured by the Draw-a-Man Test, was reported by Colom, Flores-Mendoza, and Abad (2007).

In this paper we make a further contribution to the issue of IQ increases in economically undeveloped nations by presenting data for an IQ increase in Sudan.

### 2. Method

The study examines an increase of IQ in Sudan between the years 1964 and 2006 measured by the Draw-a-Man Test. This test was constructed in the United States by Goodenough (1926) and consists of drawing a man, and is scored for the presence or absence of 51 items such as eyes, eyebrows, ears, arms, legs, elbows, and so forth. The rationale of the test is that intellectual development will be reflected in the details given in drawings of the human figure. The reliability estimates (test–retest) range from 0.60 to 0.91 (Scott, 1981). Recently, the test–retest reliability was estimated at 0.63 and the inter-rater agreement reliability was estimated at a value of 0.98 (Marques et al., 2002).

There is good evidence for the validity of the Draw-a-Man Test. Harris (1963) reported correlations ranging between 0.38 and 0.77 with the WISC, and between 0.26 and 0.92 with the Stanford-Binet. Aikman, Belter, and Finch (1992) found a correlation of 0.48 between the Draw-A-Man test scores and the Wechsler IQ. Abell, Brisen, and Waitz (1996) reported a correlation of 0.50 with the WISC-R IQ and a correlation of 0.37 with the Stanford-Binet IQ.

Draw-a-Man Test was standardized in Sudan in 1964 by Badri (1965a), Badri (1965b, Badri (1966) and Badri and Dennis (1964) on a representative sample of 1345 school children aged 4–10 years, comprising boys and girls, from rural and urban areas, and in pre-schools and primary schools. The test has been

\* Corresponding author.

E-mail address: [LynnR540@aol.com](mailto:LynnR540@aol.com) (R. Lynn).

restandardized in Sudan in 2006 on a similar representative sample of the same size (Abdelwahid, 2006; Khaleefa, Abdelwahid, & Abdulradi, 2008). The results of this new standardization are only available in unpublished reports in Arabic and are summarized here.

### 3. Results

Both the 1964 and the 2006 standardizations were scored using the American norms given by Goodenough (1926). The mean IQs of the samples were 83.45 in 1964 and 95.64 in 2006. The standard deviation of the 1964 sample was not reported but of the 2006 sample is 10.09. The IQ gain is 12.19 IQ points over the 42 years, representing 2.9 IQ points a decade.

### 4. Discussion

This IQ gain in Sudan is closely similar, although slightly greater than the gain on the Draw-a-Man Test of 2.4 IQ points a decade in Brazil from 1930 to 2002 reported by Colom et al. (2007). These gains are lower than the 5 IQ point per decade on the Standard Progressive Matrices in Dominica reported by Meisenberg et al. (2005). They are also much lower than the 10 IQ points per decade increase on the Colored Progressive Matrices in Kenya reported by Daley et al. (2003). These differences are not surprising, since tests of different abilities show different rates of increase. On the basis of the present limited evidence, it can reasonably be concluded that IQ increases in economically undeveloped nations have been increasing during the last half century or so at about the same rate as the IQ increases in the economically developed nations. However, several studies have shown that the secular IQ gains in some of the economically developed nations have recently ceased or even gone into reverse, e.g. in Norway (Sundet, Barlaug, & Torjussen, 2004), Australia (Cotton et al., 2005), Denmark (Teasdale & Owen, 2008), and Britain (Shayer, 2007). It may be that the IQs in the economically developing nations will catch up with those in economically developed nations in the decades that lie ahead. Only time – and further research – will tell.

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