



Understanding the Simber Effect: Why is the age-dependent increase in children's cognitive ability smaller in Arab countries than in Britain?

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ABSTRACT

Previous research indicates that the typical increase in IQ during childhood is greater in European countries than in Arab countries. A systematic literature review of age-dependent IQ in Arab countries is conducted, yielding relevant studies for 12 countries that fulfil the inclusion criteria. In almost all of these studies, Arab children exhibit an age-dependent IQ decline relative to Caucasian children, from 5 to about 12 years of age in particular. We term this phenomenon the Simber Effect. We propose two non-exclusive explanations. (1) The Flynn Effect is less intense in Arab countries because of localised differences, including poorer education quality and greater religiosity. (2) Those from Arab countries follow a faster Life History Strategy than Europeans, for environmental and possibly genetic reasons. Either way, the Simber Effect may amount to a Wilson Effect, meaning that the impact of genetic IQ increases with age.

1. Introduction

Many studies have examined intelligence in Arab countries in comparison to that of Western countries. Lynn (2015) has compiled assorted administrations of various intelligence tests in the Arab world and compared them to British norms to achieve 'Greenwich IQs' for each country. Estimations of the average Greenwich IQ of Arab countries are mainly between 80 and 85. As with Western countries, the Flynn Effect – the secular increase in IQ scores across the twentieth century – have been found in some Arab countries, specifically in Saudi Arabia and Sudan (see Batterjee, Khaleefa, Ali, & Lynn, 2013; Flynn, 2012). 'Negative Flynn Effects' – secular declines in IQ scores – have been reported in Khartoum (Dutton, Bakhiet, Ziada, Essa, & Blahmar, 2017) as well as in Kuwait (Dutton, Bakhiet, Essa, Blahmar, & Hakami, 2017), although these authors have argued that, unlike with Western Negative Flynn Effects (see Dutton, Van der Linden, & Lynn, 2016), these appear to have mainly environmental rather than partly genetic causes.

Although the average IQ of Arab countries would – for whatever reason – appear to be around one standard deviation lower than the Greenwich norm, there is an aspect to this difference to which little

attention has been paid and which has not previously been clearly presented. Put simply, there is evidence of age variation in the extent of the difference: age-dependent cognitive decline. The IQs of child samples in Arab countries are lower than the Greenwich IQ, but this difference increases as the children age. We term this phenomenon the Simber Effect, after the Sudanese black stork whose appearance heralds the start of the rainy season and the growth of the crops. After his appearance and the arrival of the rains, the land is highly productive, but this only lasts for a brief period.

Here, we attempt to describe this phenomenon exhaustively by conducting a systematic literature review, and by contrasting the results with samples from European countries. Possible explanations for the Simber Effect are sought in cultural and environmental factors and in evolutionary theory, specifically Life History theory and gene-environment interaction.

2. Method

This study involves a secondary analysis of all known English-language studies of IQ in Arab countries, calculated against Greenwich norms. In order to find these, we conducted a systematic literature

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review. In conducting this review, we followed the PRISMA guidelines (<http://www.prisma-statement.org/>). Our inclusion criteria was the same test had been administered to two or more age cohorts and that these cohorts were comparable, meaning that they were from the same region and sampled from socioeconomically similar populations. The study also had to have calculated Greenwich IQs or percentiles for two or more cohorts.

Based on these inclusion and exclusion criteria, we used the string ‘intelligence in (country)’ AND ‘IQ,’ entered into the Google Scholar database. This method was decided upon because it would pick up any study of national intelligence while also removing studies of ‘intelligence’ in the sense of espionage, thus making our search more manageable. We chose Google Scholar as the most likely database to incorporate studies from less well-known journals or studies published as book chapters. The next step was the ‘Data Management’ of the Prisma procedure: all titles were copied into a Word Document, numbered, and marked with whether they were to be accepted or rejected and, if so, on what grounds.

Finally, we conducted the Prisma Selection Process. Based on the general criteria outlined above and on further analyses of the content of the articles (e.g. Title, abstract, text), it was decided which articles would be included. Arab countries were defined as those where the official or co-official language was Arabic, which amounts to 20 countries. The results are listed in [Table 1](#).

We then investigated the references for each of these studies and also unpublished studies of which we were aware. Through this we uncovered two additional studies, one from Somalia and another from Egypt.

3. Results

The results of our literature review are presented by country. [Table 2](#) displays the studies in which Greenwich IQs were provided. [Table 3](#) displays the studies in which percentiles were provided. In [Table 3](#), the IQs are calculated from the percentiles. In the cases where we have all of the necessary information (that is: means, Ns, and SDs), these data were subjected to independent *t*-tests. When SDs were not reported, we substituted them with 15 as a reasonable approximation. We report 21 separate administrations, of which 17 display the Simber Effect. In 13 cases, this was shown to be statistically significant. Further, [Batterjee \(2011\)](#) calculated that his own Saudi results were statistically significant within his own study.

None of the original studies actually report the British norms.

Table 1
Systematic literature review of IQ studies in Arab countries.

Country	N hits	N hits (relevant)
Egypt	8	1
Saudi Arabia	19	2
United Arab Emirates	31	1
Qatar	1	1
Algeria	0	0
Iraq	7	0
Kuwait	2	1
Morocco	3	0
Oman	4	2
Sudan	75	2
Tunisia	1	0
Libya	7	4
Lebanon	12	0
Syria	2	0
Yemen	1	1
Jordan	10	1
Bahrain	4	0
Palestine	2	2
Mauritania	0	0
Somalia	0	0

Rather, they report the Arab estimates in relation to the Greenwich IQs, which are in turn sourced from various test manuals and other publications with different specific age samples. As a reality check, we therefore contrasted the Arab IQs with the only data from Caucasian populations that – to our knowledge – cover the critical age range within each sample. [Fig. 1](#) shows all estimates from [Tables 2 and 3](#) plotted as a function of age, as well as the three comparison samples. Multiple-subtest batteries underlie the Estonian (an adaptation of the American National Intelligence Test) and Swedish data (a test developed in Sweden called DBA; [Härnqvist, 1962](#)), while the Croatian data are scores on Raven's Standard Progressive Matrices ([Raven, Raven, & Court, 2000](#)). Specifically, the Estonian data are full-scale scores ([Lynn, Allik, & Must, 2000, Table 1](#)) and the Swedish are g-factors ([Härnqvist, 1997, Table 2](#)), both averaged across sex and standardized to a mean IQ of 100 (SD = 15). The Croatian data are read off ([Fig. 3, left panel Zebec, Demetriou, & Kotrla-Topic, 2015](#)), averaged across two data collection waves and standardized. The vertical positions of the graphs are therefore not informative about the absolute levels of IQ of the comparison samples, as their mean IQ is standardized. Linear regression confirmed that IQ does indeed decrease with age in Arab countries, with a slope of -0.86 ($N = 42$, $r = -0.41$, $R^2 = 0.167$, $p = 0.007$). However, it is positive for the three comparison samples at 6.7 for Estonia, 4.23 for Croatia, and 7.3 for Sweden.

4. Discussion

The same phenomenon can be seen in almost all of the countries for which comparable results are available. The IQ of Arab countries is below that of the Greenwich mean among very young children, but it becomes even lower for older children and adolescents, reaching about one standard deviation below the Greenwich mean by the beginning of adolescence and certainly by the age of 18. Similar results were found in relation to our other European samples. Although we have focused on Arab countries in the present study, this phenomenon, when compared to Greenwich IQs, has also been found among the Xhosa of South Africa ([Bakhiet & Lynn, 2015b](#)). It is well established that IQ predicts numerous positive outcomes at the individual level, such as socioeconomic and educational status and low criminality (see [Jensen, 1998](#)). It has been argued that this extends to the level of nations ([Lynn & Vanhanen, 2012](#)). Accordingly, it is important to understand why the Simber Effect is occurring. We will consider a number of explanations but we do not claim these to be exhaustive.

One possibility may be deficiencies in the school curriculum, such that the high level of abstract thinking that has been argued to give rise to the Flynn Effect (see [Flynn, 2012](#)) is induced to a lesser extent than in European countries. In this regard, quality of education is ranked relatively poorly in most Arab countries, in terms of international educational assessments ([IMF, 1997, p. 235](#)). [Abdelrahman and Irby \(2016\)](#) aver that teachers in many Arab countries face low wages, insecure working conditions, crowded classrooms, little opportunity for professional development, and an increasingly out-dated curriculum.

Another explanation may be the influence of religion on the curriculum and values in Arab societies. [Lynn and Vanhanen \(2012\)](#) found that overall IQ is negatively associated with national levels of religiousness. It has been argued that the negative association at the individual level is underpinned by religion being an evolved instinct and intelligence being associated with being, effectively, less instinctive ([Dutton & Van der Linden, 2017](#)). However, a religious environment may also have a negative impact on intelligence. In this regard, [Stoet and Geary \(2017\)](#) analysed national differences in the international student assessment tests PISA and TIMSS. They found that religiousness does not in itself predict lower scores, but is mediated by sex, owing to the fact that females are more religious than males. They conclude that the mediating factor is the lower amount of curricular time dedicated to secular education in religious countries. In other words, highly religious countries spend less time teaching children about maths and science

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