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A Negative Flynn Effect in Kuwait: The same effect as in Europe but with seemingly different causes

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ABSTRACT

The results of two previously published Arabic language administrations of the Standard Progressive Matrices (SPM) are compared. The first is an administration of the SPM in 2006 to a probability sample of 6529 Kuwaitis aged between 8 and 15 from all regions of Kuwait. The second is an administration to a comparable sample of 6431 Kuwaitis in 2015. We find a significant Negative Flynn Effect in each age cohort and an overall Negative Flynn Effect amounting to a loss of 6.2 points in a decade. Possible reasons for this are discussed. It is proposed that the most persuasive explanation is increasing religious emphasis in the Kuwaiti school curriculum.

1. Introduction

The Negative Flynn Effect refers to the secular decline in IQ scores of roughly 2.5 points per decade in representative population samples that has been documented as having occurred in certain Western countries since the 1990s (see Dutton et al., 2016). It is the opposite of the Flynn Effect; the secular increase in average IQ scores of roughly 3 points per decade documented in Western countries across the twentieth century (see Flynn, 2012). A Negative Flynn Effect has now been reported in Denmark, Norway, Finland, the UK, Estonia, the Netherlands, and France (see Dutton et al., 2016). It has been shown that the Flynn Effect does not seem to betoken a rise in general intelligence, as it generally occurs on the least heritable and least g-loaded parts of the IQ test (te Nijenhuis & Van der Flier, 2013). By contrast, the Negative Flynn Effect has been shown to have generally occurred on the most g-loaded and on the most heritable parts of the IQ test. This is known as the Co-occurrence model (see Woodley & Meisenberg, 2013).

This raises the question of what precisely is causing the Negative Flynn Effect. A meta-analysis of the Flynn Effect itself (Pietschnig & Voracek, 2015) highlights life history speed (see Figueredo et al., 2006) becoming slower as the most persuasive explanation for the Flynn Effect. The authors observe that issues such as growing educational exposure, nutritional improvements, and decreased parasite stress could all impact the phenotype via a single developmental pathway: life history speed. This is because each of these traits is indicators of decreased extrinsic morbidity and mortality. They also observe that LH speed is not correlated with g, but predicts extent of cognitive specialization. Accordingly, slowing LH renders people more attuned to opportunities to develop specialized abilities (such as increased schooling). This more educated and wealthier society appears to push to its phenotypic limit certain weakly g-loaded abilities at the base of the intelligence pyramid, doing so to such an extent that a secular IQ increase is recorded. This has been conceptualised as the environment forcing us to 'don scientific spectacles' (see Flynn, 2012). In their systematic literature review of the Negative Flynn Effect, Dutton et al. (2016) propose that the Negative Flynn Effect, which occurs on *g* to a greater extent than the Flynn Effect, may reflect a combination of so-called dysgenic fertility – the negative association between IQ and completed fertility in industrialised countries – and 'dysgenic immigration.' This refers to the large-scale immigration of Africans and South Asians into Europe, when they typically have lower average IQs than Europeans (see Lynn, 2015) and higher fertility, at least with some groups (see Lynn, 2011, Ch. 16).

Accordingly, it would be useful to examine a country where purely native samples are employed, as well as one that is not in Europe, but where a Negative Flynn Effect has taken place. This is what we propose to do by comparing two representative samples to which were administered the Standard Progressive Matrices (SPM) in Kuwait. One administration took place in 2006 and the other in 2015. This will provide evidence of a Negative Flynn Effect and we will then explore possible reasons for it.

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2. Method

In 2006, the complete SPM was administered to a probability sample of 6529 Kuwaiti school children ranging in age from 8 to 15 years. They were drawn from all six districts of Kuwait. The sample was 51% male (Abdel-Khalek, 2006). In 2015, the complete SPM was administered to another probability sample aged between 8 and 15, comprising 6431 pupils. This was, once more 51% male. This sample was also drawn from all districts of Kuwait (Abdel-Khalek & Mourad, 2015). In both cases, these samples were composed exclusively of native Kuwaitis. One can only be a 'Kuwaiti' if one can trace descent, in the male line, from somebody who was living in Kuwait in 1920. Kuwaitis make up about a third of the country's population, with the remaining two thirds composed of expatriate workers who can never become 'Kuwaitis' (Yaphe, 2011, p. 123). Both of these studies were published in Arabic. They allow us to compare two representative samples of Kuwaitis with precisely the same age and sex composition. In 2007, 98% of Kuwaiti eight year olds were enrolled in primary school and schooling is free and compulsory up until the age of 15. That said, the literacy rate in Kuwait among 15 to 24 year olds in 2007 was 94%, so it would seem that 6% of Kuwaitis illegally do not attend school (Momani, 2016). This illiterate group may be mainly composed of Bedouin nomadic herders, as this group fiercely resisted the introduction of compulsory schooling, which was enacted in 1965, and many are categorised as Kuwaitis (Casey, 2007, p.74).

3. Results

The results can be seen in Table 1. They are presented in separate age groups and also combined.

It can be seen that there is a significant Negative Flynn Effect overall between 2006 and 2015, amounting to a loss of 6.2 SPM points in a decade. It can be observed that there is also a significant Negative Flynn Effect when comparing each age cohort. This loss is the least pronounced among 8 year olds and the most pronounced among those aged 14.

4. Discussion

There are a number of possible reasons behind this Negative Flynn Effect in Kuwait. The first possibility is 'dysgenic fertility,' a factor which has been proposed to significantly explain the Negative Flynn Effect in European countries (Dutton et al., 2016). The general decline, at least, is consistent with evidence of dysgenic fertility among the Kuwaiti population. But it should be stressed that the extent of dysgenic fertility in Kuwait is extremely weak, so it cannot possibly explain more than a small percentage of the decline.

Abdel-Khalek and Lynn (2008) examined a representative sample of 4643 children in Kuwait aged between 8 and 15 years. They found a correlation of −0.05 between family size and average score on the SPM. Clearly, this is, essentially a negligible, albeit significant, effect size. Nevertheless, this modest dysgenic fertility is consistent with evidence reported by Al-Kandari (2007) that there is a significant negative correlation in Kuwait – based on a sample of 7749 – between fertility and a number of robust proxies for intelligence. These proxies were education level, occupational status, age at first marriage, and socioeconomic status. However, there was a positive relationship between income and fertility. Fertility was also positively associated with those who were in non-consanguineous marriages, with those who were Bedouin, and with being a Sunni (rather than Shia) Muslim woman.

Al-Kandari's results contain a number of findings which may allow us to better understand the weak negative relationship between intelligence and fertility in Kuwait or which require explanation. Al-Kandari finds that Sunni Muslim women are more fertile, by implication than Shia Muslim women. Around 45% of Kuwaiti Muslims are Sunni, about 35% are Shia and roughly 10% are from other Muslim denominations (Shomali, 2003).[1] A possible explanation for higher fertility among Sunni women is that Sunni teaching permits males to take a maximum of only four wives. By contrast, Shia teaching allows men to take as many 'temporary wives' (whom Shias marry on a temporary basis with no expectation of staying married for life) as they can afford and, in some Shia sects, it is also permitted to take concubines (Minces, 1982, p. 62). On this basis, we would expect Sunni females to have more children each, because their husbands are limited in the number of wives they can take.

Moving on, we can see that Al-Kandari finds that fertility is negatively associated with education level but positively associated with income. In general, education level has been found to be a stronger correlate of intelligence than income. Based on Western samples, the correlation between education level (defined as the highest qualification obtained) and IQ score is about 0.5 whereas it is only 0.3 with regard to the relationship with income (e.g. Jensen, 1981). Assuming that this same difference exists elsewhere, Kuwaiti intelligence can be understood to be pulled in two directions, which may help to explain the very modest negative correlation. In addition, other factors may be at play, which help to explain the weakness of the negative correlation. These would include the society being religious and having strict rules condemning illegitimacy and relationships outside marriage. Premarital sex, for example, is illegal in Kuwait (US State Department, 2015, p.27). This would mean that a woman must marry to have a child and in the context of a polygamous society she is likely to sexually select for a wealthy and high status male, as these factors play an important role in female sexual selection (see Buss, 1989). This would leave low status males with relatively fewer children than in Western societies. By contrast, in the West, with relatively low levels of religiosity and little taboo on illegitimacy, there is far less pressure against those of low socioeconomic status simply impulsively having unprotected sex outside marriage (see Perkins, 2016) and, anyway, men are limited to one wife.

It can also be seen, from Al-Kandari's results, that consanguineous marriage is associated with reduced fertility. In Kuwait, cousin marriage is actually preferred among males of higher socioeconomic status (Bittles & Hamamy, 2010, p. 90), meaning that the association should be dysgenic. But, on the other hand, the practice has a weak negative effect on IQ, due to the elevated probability of double doses of mutant genes, known as 'inbreeding depression.' It also renders mental retardation more likely (see Woodley, 2009). Greater fertility, in Kuwait, is found among those practicing non-consanguineous marriage, where

Table 1
SPM Scores of Kuwaiti School Pupils comparing 2006 to 2015.

Age	2015			2006			Change	
	N	Mean	SD	N	Mean	SD		
8	674	18.75	7.6775	811	22.635	9.925	−3.88	<0.001
9	833	22.66	9.33	788	26.825	10.805	−4.2	<0.001
10	746	25.585	9.015	807	30.765	10.35	−5.2	<0.001
11	857	29.565	8.5925	833	35.745	9.475	−6.2	<0.001
12	796	32.0875	7.9575	827	37.505	9.165	−5.5	<0.001
13	887	34.38	7.2	890	40.58	8.505	−6.3	<0.001
14	833	36.3775	6.7775	815	43.575	7.515	−9.9	<0.001
15	805	37.52	6.43	758	44.275	7.875	−6.75	<0.001
Total	6431	29.616	7.873	6529	35.238	9.202	−5.6	<0.001

[1] As with Christianity, Islam has divided into assorted denominations. The fundamental schism in Islam is between Sunni and Shia. The key point of contention is over who was the rightful successor to the Prophet Mohammed as leader of the religious group. Sunnis followed the Prophet Mohammed's friend Abu Bakr and his successors, whereas the Shia believed the successor to the Prophet Mohammed should be a blood relative of the Prophet's, called Ali. This disagreement led to two separate groups, with the Sunni at first dominating the Shia. The Sunni believe the community should be led by an appointed individual and they stress following the lifestyle of the Prophet Mohammed. The Shia, however, regard their leaders, known as 'Ayatollahs,' as reflections of God on earth who can speak for God; rather like the Pope supposedly can in Catholicism. This has led to different religious traditions and beliefs in the two groups (see Hazleton, 2009).

there is less inbreeding depression. Thus, once more, Kuwaiti intelligence is pulled in two directions. However, overall, it seems likely that Kuwait's modest dysgenic fertility could explain no more than a small percentage of its Negative Flynn Effect. Research on Sudan has found that it explains <20% of the Negative Flynn Effect in Khartoum between 1999 and 2010 (Dutton et al., Under Review), for example.

A more substantial dysgenic effect is likely to have come from ongoing internal migration within Kuwait. Al-Kandari has found that the Bedouin have significantly higher fertility than the settled Kuwaitis. However, most Bedouin are counted, legally, as Kuwaitis. The Bedouin are genetically distinct from the Kuwaitis and have 17% Sub-Saharan African ancestry compared to negligible levels among Kuwaitis (Alsmadi et al., 2013). In a process known as *hadar*, the Bedouin are increasingly giving up their nomadic lifestyle, coming to live in Kuwaiti towns and sending their children to school (Suwaed, 2015, p. 242). The average IQ, based on British norms, of Kuwaitis has been found to be around 92 (Bakhiet et al., 2015). The average IQ of Bedouin, based on the Goodenough Draw-a-Man test, has been found to be much lower, at around 55 (Dennis, 1960). This is improbably low and, as Dennis (1960) points out, may partly reflect cultural factors, such as lack of experience in drawing. This view is bolstered by the fact that the frequency of IQ increasing alleles is much higher in Bedouin samples than it is in Sub-Saharan African ones (Piffer & Kirkegaard, 2014), though the Sub-Saharan African average IQ is approximately 70 (Lynn, 2015). Even so, we would expect those who had been partly raised in a nomadic environment to have reduced IQ for environmental reasons and we would expect the segment of the population which had been slowest to embrace urban dwelling to have relatively low IQ in general. This is evidenced from studies in Western countries finding lower IQ in the countryside than in the cities (see Carl, 2015). The putative lower IQ of the Bedouin, when compared to the Kuwaitis, would also be consistent with the Bedouin's relatively high level of Sub-Saharan African genetic influence (Alsmadi et al., 2013), a point discussed with reference to other ethnic groups in Lynn (2015). Accordingly, increasing movement by Bedouin to the Kuwaiti towns is likely to have played a part in the recorded Negative Flynn Effect. Indeed, this could potentially be tested, insomuch as there are known to be distinct Bedouin surnames (Alsmadi et al., 2013).

It may also be that dysgenic emigration from Kuwait is contributing to the effect, as intelligence is associated with migration (see Jensen, 1998). There is anecdotal evidence of an on-going 'brain drain' (e.g. Al Rabe, 2014, December 24th) in Kuwait, especially to the Emirate of Dubai, and it is true that emigration from Kuwait increased from 0.5% of the labour force in 1990 to just under 2% in the year 2000. By contrast, Oman, Qatar, and the United Arab Emirates witnessed miniscule levels of emigration, of approximately 0.1% in 2000 (adjudged from graph Özden, 2006, p. 7).

That said, if the Flynn Effect is caused by increases in the prevalence of and changes in the nature of education – such that it is more analytically-focused (see Flynn, 2012) – then a decrease in genetic IQ would indirectly impact society as a whole through negatively impacting its education system. Society would become, gradually, less interested in education, less able to maintain an analytically-focused education system, and less analytical in its thinking (see Jensen, 1998). This would result in the education system becoming less able to boost IQ; it would literally be a Flynn Effect in reverse. Thus, the impact of dysgenic fertility on the nature of the Kuwaiti education system would explain more of the decline.

In this regard, there has been concerned discussion in Kuwait over an apparent long-term decline in the quality of the country's schools. The Kuwaiti newspaper *Al Qabas* produced a report on the country's education system in 2014 (Ayoub, 2014, October 27th) in which it proposed a number of reasons for what it saw as Kuwait's worsening educational results, such as on international scholastic assessments. One of its proposals (based on parental consultation) was simply that younger Kuwaitis are lazier than their parents and need to be compelled, to a greater extent, to work hard at school. To the extent that this is true, it may be seen as a proxy for declining intelligence, as intelligence is associated with interest in education as well as with future orientation and thus diligence (see Jensen, 1998). However, there may be other relevant factors, such as a decreasingly harsh society meaning that there is less motivation to work hard. This point has been highlighted by Perkins (2016) with research among benefit claimants in the UK.

It has also been suggested that the Iraqi invasion of 1990 shook Kuwait's conservative religious values, leading to younger people increasingly imitating Western lifestyles and eschewing Kuwait's traditional taboos (Whitaker, 2000, August 2nd). Religion has been argued to be a group evolutionary strategy which helps to motivate in-group cooperation and impulse control (e.g. Figueredo et al., 2006), factors which would potentially be reflected in positive educational outcomes (Almlund et al., 2011), all else being equal. Thus, it is possible – though rather speculative – that the Iraq Invasion may have had some indirect impact. Another proposal, in the report, was that the quality of teachers is declining, because they have poor job security and decreasing prestige in Kuwaiti society. This increasing lack of care for educationalists would, likewise, potentially be consistent with declining intelligence (see Jensen, 1998) as well as something that would be a causal factor in decreasing IQ scores through worsening educational quality.

However, a problem with all of these explanations is that they are either only likely to explain a small element of the decline or they are question-begging or both. They do not explain why the Negative Flynn Effect is so much weaker among the younger samples. In this regard, an issue which the report highlighted which is consistent with findings elsewhere in the Islamic world (see Flynn, 2012, p.63, with regard to Sudan) was that increasing amounts of teaching time are being dedicated to Islamic education, Arabic language and 'socio-ideological courses.' This is happening 'at the expense of a range of scientific technological courses - (Science, Mathematics, Computers).' The report noted that the former groups of courses - which it termed 'heritage and social indoctrination' which 'belongs to the world of the past' - account for 60% of teaching time in Kuwaiti schools (Ayoub, 2014, October 27th). The report suggests that the growth of time spent on these courses in the Kuwaiti curriculum reflects the increasing influence of conservative Islam in Kuwait more generally. It specifically highlights the influence of the 'Salafi Islamic movement' in the Kuwaiti government, and its conflict with secularists, as partly explaining the inability of the Ministry of Education to make important reforms. The Salafists are a highly conservative branch of Sunni Islam. Extent of religiousness predicts fertility across the Middle East, just as it does in Western countries (Pew Research Center, 2011). Accordingly, we would expect Kuwait to be becoming gradually more religious, as long as the maximum ability of a low stress environment to reduce religiousness has been reached – religiousness being predicted by stress (see Dutton, 2014, Ch. 10). Evidence for this increased religiousness can indeed be found in the rise of Salafist political parties in the Kuwaiti parliament. In 2016, parties that are supportive of Salafism received 25% of the vote (AFP, 2016, November 27). The education system is one area which Salafists in Kuwait have been particularly keen to control, and by 2005, their control over it had been increasing for a long time. In 2005, in the wake of terror attacks in Kuwait, liberals in the government decided to take back some control of the education system by, for example, controlling teachers who were promoting violent Jihadist ideas and moderating how Islam was to be taught (al-Mdaires, 2010). Thus, it may be that an increasingly Salafist-influenced Ministry of Education has contributed to a reversal of the Flynn Effect in Kuwait by heavily increasing the amount of curricular time spent on religious education and related subjects. This effect is more limited among younger samples because they have been less exposed to its more extreme manifestations, due to changes since 2005.

Dutton et al. (Under Review) have suggested, based on an argument by Flynn (2012, p.63) that the imposition of the 'Muslim Curriculum' in

Sudan - which increased time allotted to religious education at the expense of scientific subjects and oriented the curriculum around conservative Islam - would appear to be a significant contributory factor to the Negative Flynn Effect in Khartoum. Our discussion of the dynamics of Kuwait's Negative Flynn Effect would imply that this may also be a significant factor in Kuwait too. It would be interesting to extend this by examining administrations of the SPM in other Muslim countries which have seen increased Salafist (or other conservative Islamic) influence on the education system to see if they are consistent with this hypothesis.

5. Conclusion

The Muslim world appears to have created a Flynn Effect, in part, by moving towards a Western system of education, produced by the West and exported to the Muslim world, which focuses on analytical thinking and subjects which strongly involve this. In moving back towards a native system of education, influenced by a highly conservative form of Islam, the Muslim world is thus seemingly reversing the Flynn Effect, at least in the case of Kuwait. Of course, there is no reason why a conservative Islamic society, let alone a Salafist one, should inherently lead to a Negative Flynn Effect. It appears to do so by dedicating insufficient levels of curricular time to the kinds of analytical subjects which encourage the analytical thinking that is associated with a positive Flynn Effect. And there is tentative evidence from Kuwait of a reversal of this Negative Flynn Effect among younger samples, coinciding with a government reaction to Salafist influence on the education system. Thus, a Salafist Islamic society could possibly avoid this problem by simply making religious instruction an extra-curricular activity or reducing the extent of it in the curriculum.

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