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A negative Flynn Effect in France, 1999 to 2008–9

Edward Dutton [a,*], Richard Lynn [b]

[a] University of Oulu, Finland
[b] University of Ulster, UK

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ABSTRACT

The results of the French WAIS III (1999) and the French WAIS IV (2008–9) are compared based on a sample of 79 subjects aged between 30 years and 63 years who took both tests in 2008–2009. It is shown that between 1999 and 2008–9 the French Full Scale IQ declined by 3.8 points.

1. Introduction

Numerous studies have shown that intelligence increased during much of the twentieth century. These IQ increases were first reported in the United States by Runquist (1936) and were confirmed by Smith (1942) and Tuddenham (1948), and were subsequently reported by Cattell (1951) in England and in many other countries summarized in Lynn (2013). The phenomenon has been designated the Flynn Effect after the work documenting it by Flynn (1984, 1987, 2012).

From the mid-1970s there has been conflicting evidence on whether these increases in IQ have been continuing or whether they have gone into reverse. Continuing increases have been reported in the United States and Britain. These can be seen in Table 1.

Contrary to these results, studies finding that IQs have declined in recent decades have been reported in Norway, Denmark, Australia, Britain, the Netherlands, Sweden and Finland. These can be seen in Table 2.

It is evident that there have been conflicting results on the trend of intelligence in recent decades in different countries and even in the same countries, in the case of Britain (we will look, later, at possible reasons for the decline). To provide further evidence on this issue we present data on the trend of the IQ in France from 1999 and 2008–9.

2. Method

The Wechsler Adult Intelligence Scale III (WAIS III) was standardized in France in 1999 (Wechsler, 2000) and the Wechsler Adult Intelligence Scale IV (WAIS IV) was standardized in France in 2008–9 (Wechsler, 2011). The two tests were administered to 79 subjects (a separate sample from the 876 subjects who composed the broader French WAIS IV) who were aged between 30 years and 63 years (mean age 45 years), approximately half of whom took the WAIS IV first and half took the WAIS III first, in order to control for practice effects (Wechsler, 2011).[1] The time between the administration of the two tests varied from between 6 and 76 days, with an average of 27 days' gap. The manual does not state whether there were significant differences in the test spacing between the two groups. However, the sample of 79 was a means of comparing the norms yielded by the two standardized samples. As such, if there were significant differences in test spacing between the two groups this would substantially undermine the purpose of administering the tests in this way. So, we can reasonably assume that there are not, as no competent administrator would allow this to happen. However, it is appreciated that this problem is a possibility, albeit an unlikely one.

3. Results

Table 3 gives the scaled score means and standard deviations for the seven verbal subtests and five performance subtests in the WAIS III and the WAIS IV (these are the subtests that are in both the tests). The scaled score means are obtained by transforming the raw score means to a scale with a mean of 10 and standard deviation of 3. The column headed

[1] The exact wording in the manual is: 'The WAIS-IV and the WAIS-III were administered in counterbalanced order to 79 subjects aged from 30 to 63 years (mean, 45 years) with a 6 to 76 days interval (mean, 27 days) between the two tests' administration' (Wechsler, 2011, p.62). All translations from French are by the corresponding author.

* Corresponding author.
E-mail address: ecdutton@hotmail.com (E. Dutton).

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Table 1
IQ gains in USA and Britain.

Country	Age	Test	Years	IQ gain per decade	Reference
USA	Children	WISC-III and WISC-IV	1989–2002	3.32	Flynn, 2012, Table AIli, p.238
USA	Adults	WISC-III and WISC-IV	1995–2006	3.06	Flynn, 2012, Table AIli, p.238
Britain	7–11	Mill Hill Vocabulary Scale	1979–2008	1.1	Lynn, 2009, Table 7
Britain	4–11	CPM	1982–2007	3.82	Flynn, 2012, Table A17, p.230
Britain	7–11	SPM	1979–2008	3.20	Flynn, 2012, Table A17, p.230

Table 2
IQ declines in 7 countries.

Country	Age	Test	Years	IQ decline per decade	Reference
Norway	18–19	General Ability	1996–2002	0.38	Sundet, Barlaug and Torjussen
Australia	6–11	CPM	1975–2003	1.07	Cotton et al. (2005)
Denmark	18–19	Borge Priene's Prove	1998–2003/4	2.70	Teasdale and Owen (2008)
Britain	11–12	Piagetian	1975–2003	4.30	Shayer and Ginsburg (2007)
Britain	13–14	Piagetian	1976–2006	2.50	Shayer and Ginsburg (2009)
Britain	14–15	SPM	1979–2008	0.64	Flynn (2012), p.232
Sweden	18–19	General Ability	1992–1993	0.26	Ronnlund, Carlstedt, Blomstedt, Nilsson, and Weinehall (2013)
Netherlands	Adults	GATB	1975–2005	1.35	Woodley and Meisenberg (2013)
Finland	18–19	Peruskoe	1998–2009	2.0	Dutton and Lynn (2013)

d gives the differences between the scores in standard deviation units. Positive *ds* designate lower scaled scores on the WAIS III than on the WAIS IV and therefore higher raw scores. These show that the WAIS III was harder and that therefore the population's IQ must have declined over the past 10 years. Table 4 gives Index score means and standard deviations and Full Scale IQs of the French WAIS III and WAIS IV. Index scores are constructed from combinations of two or three subtests. The column headed IQ decline gives the declines in the Index scores and the Full Scale IQ.

4. Discussion

The results have three points of interest. Firstly, the decline of 3.8 IQ points on the WAIS Full Scale IQ in France represents a decline of general intelligence defined as the average of a number of abilities. This decline is consistent with those reported in recent years in Norway, Denmark, Australia, Britain, the Netherlands, Sweden and Finland (see Table 2) but inconsistent with the increases in recent years in the United States and in younger children in Britain summarized in Table 1. It might behoove us to be more cautious in reaching conclusions based on these results than based on the other studies cited for two reasons: the sample (N = 79) is a relatively small and the WAIS IV manual does not tell us the degree to which it is representative of the French population in terms of variables such as education or geographic region. Clearly, it cuts out those who are under the age of 30 years or over the age of 63 years, but its average age (45 years) is approximately similar to the median age of the French population, which is 42.4 years as of 2014 (Central Intelligence Agency, 2015). In addition, the Full Scale IQ on the WAIS IV sample of 79 subjects was calculated based on a comparison with the WAIS IV sample of 876 subjects, which was representative of the French population on key variables such as education and region. The scores of this sample of 876 subjects were set at 100 and a comparison made with the sample of 79 subjects. As can be seen in Table 4, on this basis the IQ of the sample of 79 subjects was 101.1 with an SD of 14.7, where the French norm would be 100 and the SD 15. As such, the smaller sample can be regarded as representative of the French population in terms of intelligence.

Secondly, the results for France, for the subtests given in Table 3, show substantial differences in the rates of the decline of different abilities. The largest declines were in Vocabulary (.43*d*), Comprehension (.32*d*) and Information (.34*d*) and the results in Table 4 confirm these by showing the largest decline of 4 IQ points in the Verbal Comprehension Index. Table 3 also shows that Symbol Search was the only subtest that did not show a decline but registered a small increase (.05*d*). In the Symbol Search test the examinee visually scans two groups of symbols, a target group (composed of two symbols) and a search group (composed of five symbols), and indicates whether any of the target symbols matche any of the symbols in the search group. The score is the number of correct responses obtained in 2 min.

Thirdly, the results show no change in the Digit Span subtest. This confirms the conclusion of Gignac (2015) that there was no change in forward or backward digit span in the United States over the 85 years from 1923 to 2008. The present results also show that there was no change in the Working Memory Index of which digit span is a component. These are remarkable results because of the conclusion that memory span and working memory are closely associated with fluid intelligence (Chuderski, 2013; Colom, Abad, Quiroga, Shih, &

Table 3
Scaled score means and standard deviations for the subtests in the French WAIS III and WAIS IV.

Subtests	WAIS III Score (SD)	WAIS IV Score (SD)	*d*
Vocabulary	8.8 (2.7)	10.0 (2.9)	.43
Arithmetic	10.0 (2.7)	10.1 (3.0)	.02
Similarities	9.9 (2.9)	10.1 (3.0)	.07
Digit Span	10.2 (3.1)	10.2 (2.5)	.00
Comprehension	8.7 (3.0)	9.8 (2.8)	.32
Information	8.7 (3.2)	9.8 (3.0)	.34
Letter–number sequencing	10.1 (3.1)	10.2 (2.9)	.03
Matrix Reasoning	9.6 (3.4)	10.1 (3.0)	.16
Symbol Search	10.5 (4.3)	10.3 (3.7)	−.05
Digit symbol-coding	9.4 (3.4)	9.6 (3.1)	.06
Picture completion	9.9 (3.5)	10.3 (3.1)	.12
Block design	9.9 (3.2)	10.6 (3.1)	.22

Table 4
Index IQs and standard deviations and Full Scale IQs in the French WAIS III and WAIS IV.

Index IQs	WAIS III (S.D)	WAIS IV (S.D)	IQ decline
Verbal Comprehension	95.1 (13.9)	99.1 (14.9)	4.0
Perceptual reasoning index	98.9 (16.4)	102.0 (16.0)	3.1
Working Memory Index	100.7 (14.8)	100.7 (13.2)	0
Processing speed index	99.2 (18.6)	99.9 (17.1)	0.7
Perceptual organization index	96.0 (13.7)	99.9 (14.9)	3.9
Full Scale IQ	97.3 (14.9)	101.1 (14.7)	3.8

Flores-Mendoza, 2008; Kane, Hambrick, & Conway, 2005) and measures of fluid intelligence have shown Flynn Effect changes, including the increases in abstract reasoning measured by the Progressive Matrices reported in numerous studies (Flynn, 1987, 2012; Lynn, 2009) and the decline in Matrix Reasoning (.16*d*) in the present data.

Having discussed the points of interest, it would be useful to consider explanations for declining IQs reported in a number of countries and now found in France. We suggest that there are four feasible explanations. First, it was proposed by Lynn (1998) and subsequently by a number of others (Colom, Lluis-Font, & Andrés-Pueyo, 2005; Greenfield, 1998; Sigman, 2000) that improvements in the quality of nutrition during the twentieth century made a major contribution to increasing IQs. But it seems improbable that the quality of nutrition declined in recent years in France and in the other economically developed countries in which declining IQs have been reported. Second, it has been proposed by Flynn (2012, p.15) that during the twentieth century education changed to promote more scientific thinking with the result that people came to don "scientific spectacles with the attendant emphasis on classification and logical analysis" and this made a major contribution to increasing IQs, but it seems improbable that the education system changed in recent years in France and in the other economically developed countries in which declining IQs have been reported to place less emphasis on the promotion of scientific thinking. One possible explanation relating to Flynn's hypothesis is that the reading of serious literature (i.e. literary fiction) has declined in European countries in recent decades as other media have become more dominant (Flynn, 2012) and this might assist in explaining the decline in vocabulary scores. However, this would not explain declines in other forms of intelligence and, moreover, it might be argued that the desire and ability to read such literature would be underpinned by general intelligence and so a decline in the consumption of such literature would partly reflect a decline in general intelligence, as vocabulary is a measure of intelligence. It should also be said that Flynn (2012, p.37) has noted a modest rise (of 3.50 points between 1997 and 2007) in vocabulary scores in Germany, Austria, and German cantons of Switzerland. This was based on an analysis of 500 studies with a sample of 45,000 subjects and was consistent across the bell curve. It is unclear why vocabulary scores in France should have decreased while those in German-speaking countries should have increased. However, with any effect we would expect local variations. The significant issue is what the majority of studies in economically and culturally similar countries indicate.

Third, it might be that the increase in the numbers of immigrants with lower IQs in the French population may explain the decline. This increase has occurred throughout western Europe and a number of studies have shown that immigrants from North Africa and southwest Asia typically have an average IQ of around 85 to 90 (Lynn, 2006, 2008; Lynn & Vanhanen, 2012; Rindermann & Thompson, 2014; for a large meta-analysis see te Nijenhuis, de Jong, Evers, & van der Flier, 2004). This conclusion has been confirmed by Kirkegaard (2013) who has shown that in Denmark the number of non-European immigrants increased from approximately 50,000 in 1980 to 400,000 in 2012 and the IQ of non-European immigrants in 18–19 year old military conscripts was 86.3, relative to 100 for indigenous Danes. These immigrants are likely to have had some impact on reducing the average IQ of the populations, but it is doubtful whether the increase in the number of immigrants with lower IQs has been sufficiently great to have had a major effect. For instance, in Norway it was shown by Sundet, Barlaug, and Torjussen (2004) that immigrants comprised approximately 2–3% of their conscript samples and that these would have reduced the IQ by only around 0.1–0.2 IQ points (correspondence with Sundet, quoted in Dutton, 2014). In addition, Dutton and Lynn (2013) have observed a decline in IQ scores among Finnish military conscripts from 1997, despite a negligible number of non-Europeans in Finland of the appropriate age at that time. Furthermore, increasing numbers of immigrants with lower IQs than the host population has apparently had no effect in reversing the Flynn Effect in the United States (Flynn, 2012; Trahan, Stuebing, Fletcher, & Hiscock, 2014).

The fourth factor that could have contributed to the decline of intelligence is dysgenic fertility, i.e. the negative association between intelligence and numbers of children that has been present for approximately a century in a number of economically developed countries reviewed in Lynn (2011) and confirmed in Denmark (Nyborg, 2012), Finland (Dutton, 2012) and the United States (Meisenberg, 2014). This negative association entailed a decline of genotypic intelligence but for much of the twentieth century this was masked by increases in phenotypic intelligence attributable to several environmental improvements (better nutrition, more education, etc.) producing higher measured IQs. It seems that these environmental improvements reached their phenotypic ceiling towards the end of the twentieth century in a number of European countries and the decline of genotypic intelligence became manifest as a decline in phenotypic intelligence. However, there remains the problem that phenotypic intelligence has continued to increase in recent years in the United States (Flynn, 2012, Table A11i, p.238), despite evidence for dysgenic fertility reviewed in Lynn (2011) and confirmed by Meisenberg (2014). This inconsistency remains one of a number of unresolved problems.

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