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Are people with low intellectual
ability getting less intelligent?

By

Dr Simon Whitaker

My role

I have been the clinical psychologist in learning disabilities (intellectual disability) in Huddersfield since 1988.

In 1999 I was asked to become part of the Learning Disability Research Unit at Huddersfield University.

Intelligence

Difficult to define precisely but it is generally agreed that it is:

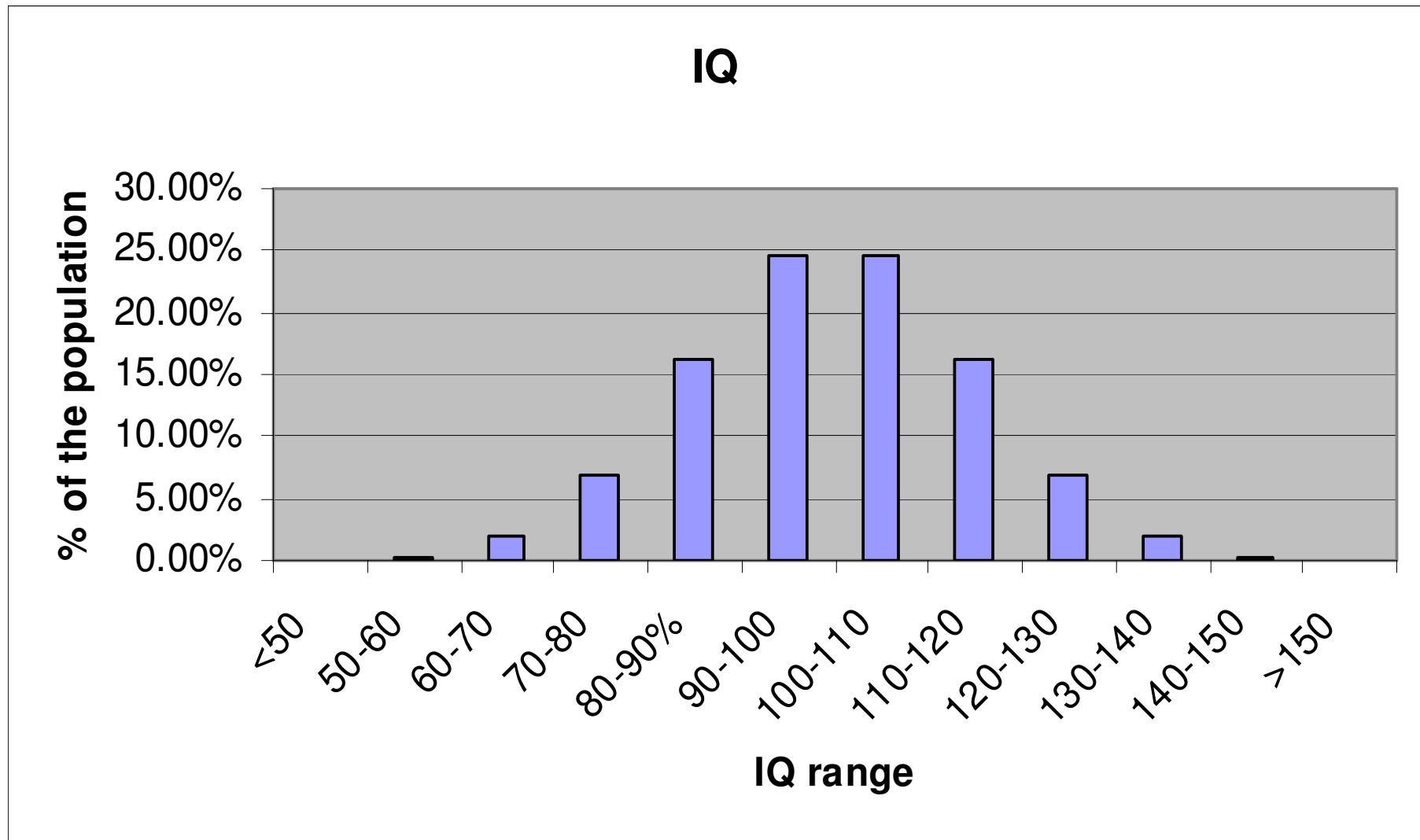
- An individual's overall cognitive ability.
- Can be predictive of his/her ability to cope in the real world.

Measurement of Intelligence

IQ Tests

Measure intelligence by giving an individual a series of cognitively demanding tasks and comparing how well they do compared with a representative sample of people of their own age.

Distribution of intelligence



Gold Standard IQ Tests

The two internationally gold standard tests are:

- The Wechsler Intelligence Scale for Children (WISC) which is now in its fourth edition.
- The Wechsler Adult Intelligence Scale (WAIS) now in its third edition.

The Flynn Effect

Flynn (1984) found that for the US the longer it was since the test was standardised the higher the IQ, the rate of increase being about 3 points a decade.

The implication is that the intellectual ability of the population is increasing by 3 points a decade or about .3 of a point per year.

Flynn (1987) extended his analysis to 14 industrialised countries and found evidence of an increase in IQ in all of them.

For some countries (e.g. Holland, Belgium and France) the data was very strong, being based on the assessment of virtually all 18-year-old men when they report for military service.

Change over the last 100 years

There is evidence that this general increase in intellectual ability has been occurring since the beginning of industrialization.

If the rate of change was .3 of a point a year for the last 100 years the average IQ in 1908 would have been 70.

IQ 70 is the point below which we now regard somebody as having an intellectual disability.

The Lynn Effect

This mean IQ score is also similar to that reported as the mean IQ in some developing countries today.

Why is IQ increasing?

There are many theories but not definitive answers.

Flynn (2006) suggests that between 1900 and 1948 a major factor in the increase in intellectual ability was increased and better education, nutrition and health care.

After 1948 he suggests that in response to a more intellectually demanding environment people started to think more abstractly and make far more use of on-the-spot problem solving.

This increase in average intellectual ability then resulted in a more intellectually demanding environment.

There was therefore a positive feedback loop with increased intellectual demands leading to increased ability which resulted in an increasingly intellectually demanding environment.

A clear example of how the environment has become more increasingly intellectually demanding in the late 20th and early 21st centuries is the use of computer technology and its constant change.

It has produced a constant stream of new products that people are motivated to adapt to:

- Computers themselves.
- Mobile phones.
- Computer games.
- The internet.

There may come a point when the less able members of the community are simply not able to adapt to the increasing demands.

A key question therefore is:

To what extent has the intellectual ability of the intellectually less able changed over time?

Change in low IQ over the years

Flynn (1985) looked at comparisons of the Wechsler Intelligence Scale for Children (WISC published 1949) and its revised version (WISC-R published 1974) standardised 25 years later. He found that the gains appeared to be higher at the low levels: .396 per year for IQs 55 to 70 as compared to .272 per year for IQs in the range 125-140.

Norwegian Conscripts

Sundet et al (2004) compared data from the intellectual assessment of military conscripts in Norway 1957 - 1959 with data from 1993 - 2002. For those scoring below the median there was an 11 point IQ point gain, which compared to a 4.4 point gain for those above the median.

Danish Conscripts

Teasdale and Owen (1989) used similar data from Denmark and found average gains in IQ over the 30 years up to the late 1980s of about 7.5 IQ points. The gains were greatest in the lower 10%.

Recent Evidence

However, Teasdale and Owen (2005) looked at the new Danish data, up to 2004, and found that there was a peak in average intellectual ability in 1998, followed by a decline until 2004.

Also after 1995 there was an increased number of people scoring at the lower end of the tests, showing a decline in the intellectual ability for people with lower IQ.

There is therefore evidence that in Scandinavia for people with low IQs the Flynn effect may have gone into reverse.

So what is happening in the UK?

Data is lacking for the UK.

There is no data from conscripts as we do not have a draft.

There are no studies comparing different standardizations of the same IQ test with the same people with low intellectual ability.

There is data on the UK standardizations of the WISC-III (1991) and the WISC-IV (2003) 12½ years later, using equivalent samples of children.

The standardisation process involves giving the test to a large representative sample of UK children.

If the tests or parts of the test are exactly the same in an early and later standardisation, then the data from the standardisations we can see if children have got more or less able on these tests in the time between the standardisations.

Common Subtests

There are two subtests, Coding and Symbol Search, that are exactly the same in each test in both the WISC-III and WISC-IV. In addition, a third one, Digit Span, has had a minor change which can be compensated for.

Symbol Search

The test requires the subject to inspect two groups of symbols and then tick a “yes” box if there are common symbols in both groups and a “no” box if there are not.

Its correlations with Full Scale IQ are .56 for the WISC-III and .62 for the WISC-IV.

Coding

The subject is given a key which pairs numbers from 1 to 9 with different symbols. The subject is then required to write down the appropriate symbols for a series of numbers.

Its correlations with Full Scale IQ are .33 for the WISC-III and .63 for the WISC-IV.

Digit Span

The subject is required to recall a series of digits. The number of digits is increased until the subject fails two trials of a particular number of digits.

Its correlations with Full Scale IQ are .43 for the WISC-III and .62 for the WISC-IV.

The Samples

WISC-III (UK)

Standardised between March and July 1991 using a sample of 814 children, 407 boys and 407 girls from 61 schools in the UK.

WISC-IV (UK)

Standardised between November 2003 and January 2004 using a sample of 780, 368 boys (47.2%) and 412 girls (52.8%) from 68 UK schools.

Both samples were stratified on race/ethnic group, and geographical region and educational level of parents.

Both claimed to be representative samples of the UK populations.

Both included children receiving special needs support in the schools were not excluded from testing.

Each sample was divided into 11 one year age groups between 6 and 16 years.

The standardisation was effectively then done separately on each age group.

Raw Scores and Scaled Scores

On each of the subtests the raw score is converted to a normalized scaled score with a:

- Mean of 10,
- Standard deviation of 3,
- Range of 1-19.

The conversion is done via tables in the manuals

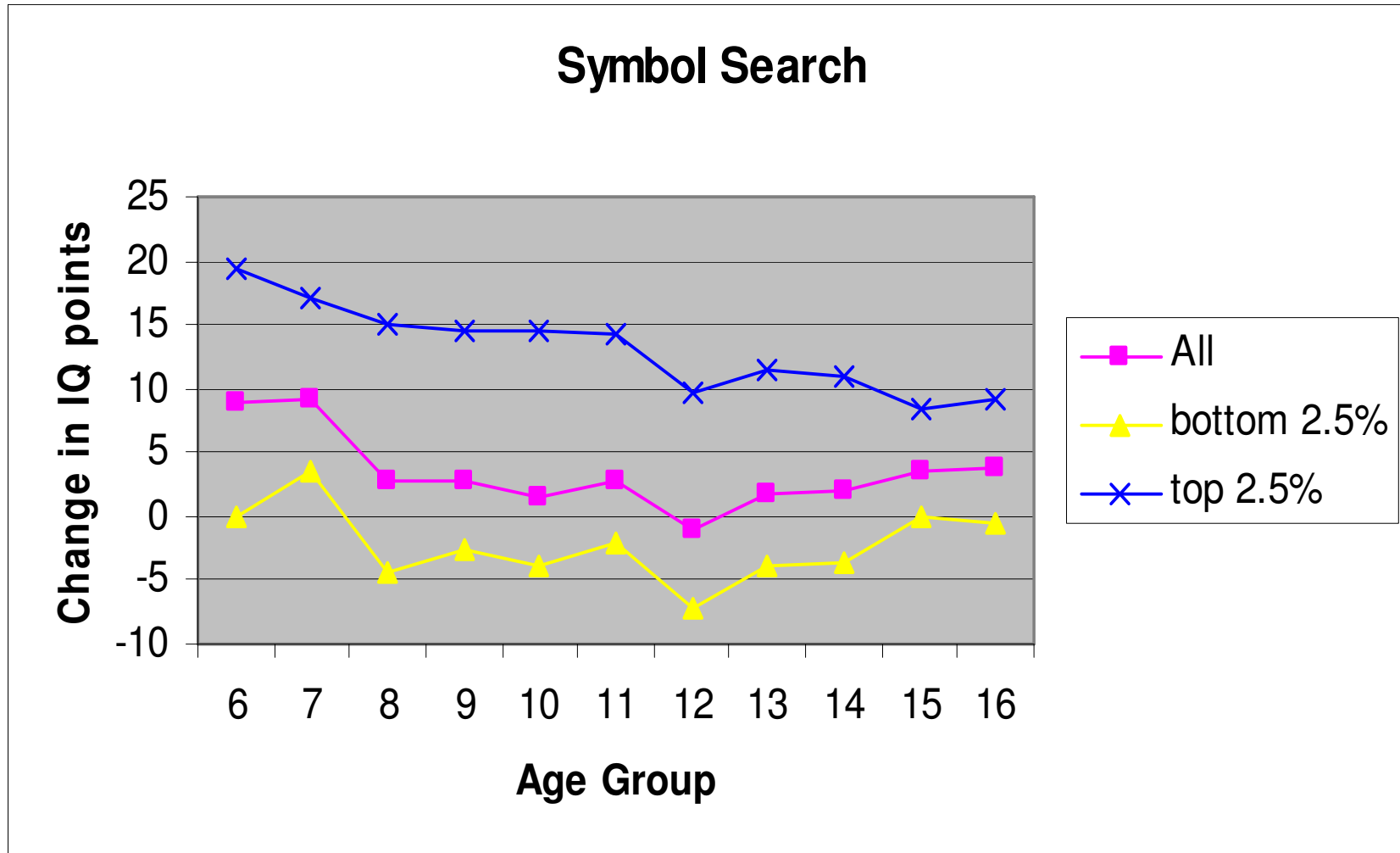
One can therefore use these tables to work backwards and find out what raw score a particular scaled score would have obtained.

If this is done for both the WISC-III and WISC-IV one can see if children were gaining higher or lower raw scores on the same test in 2004 than in 1991.

In order to assess the Flynn Effect specifically for children with low intellectual ability and for those with high intellectual ability, the above analysis was repeated using only scaled scores (on the WISC-III) of 4 or less and for scaled scores (on the WISC-III) of 16 or greater.

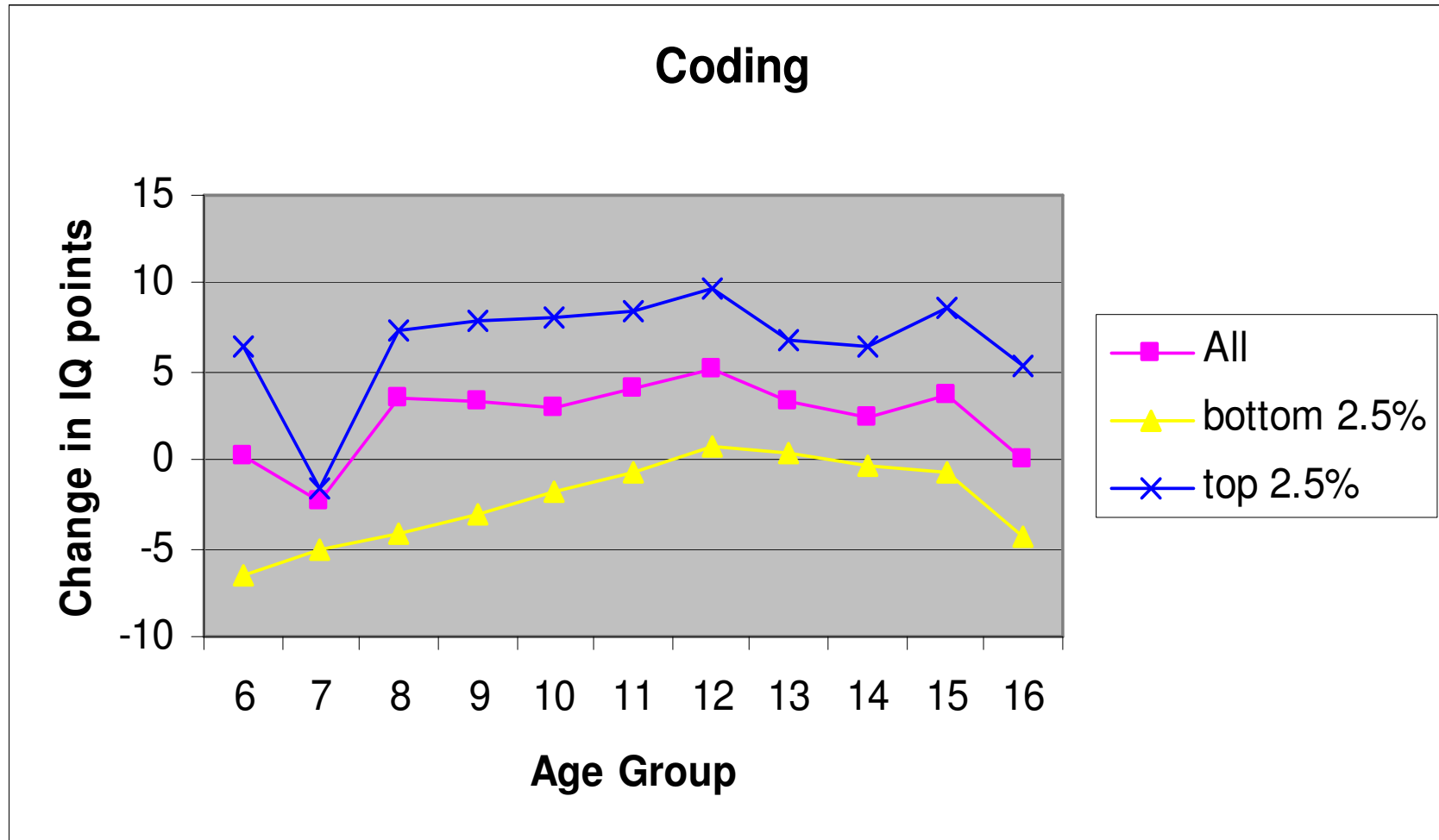
Results

Symbol Search



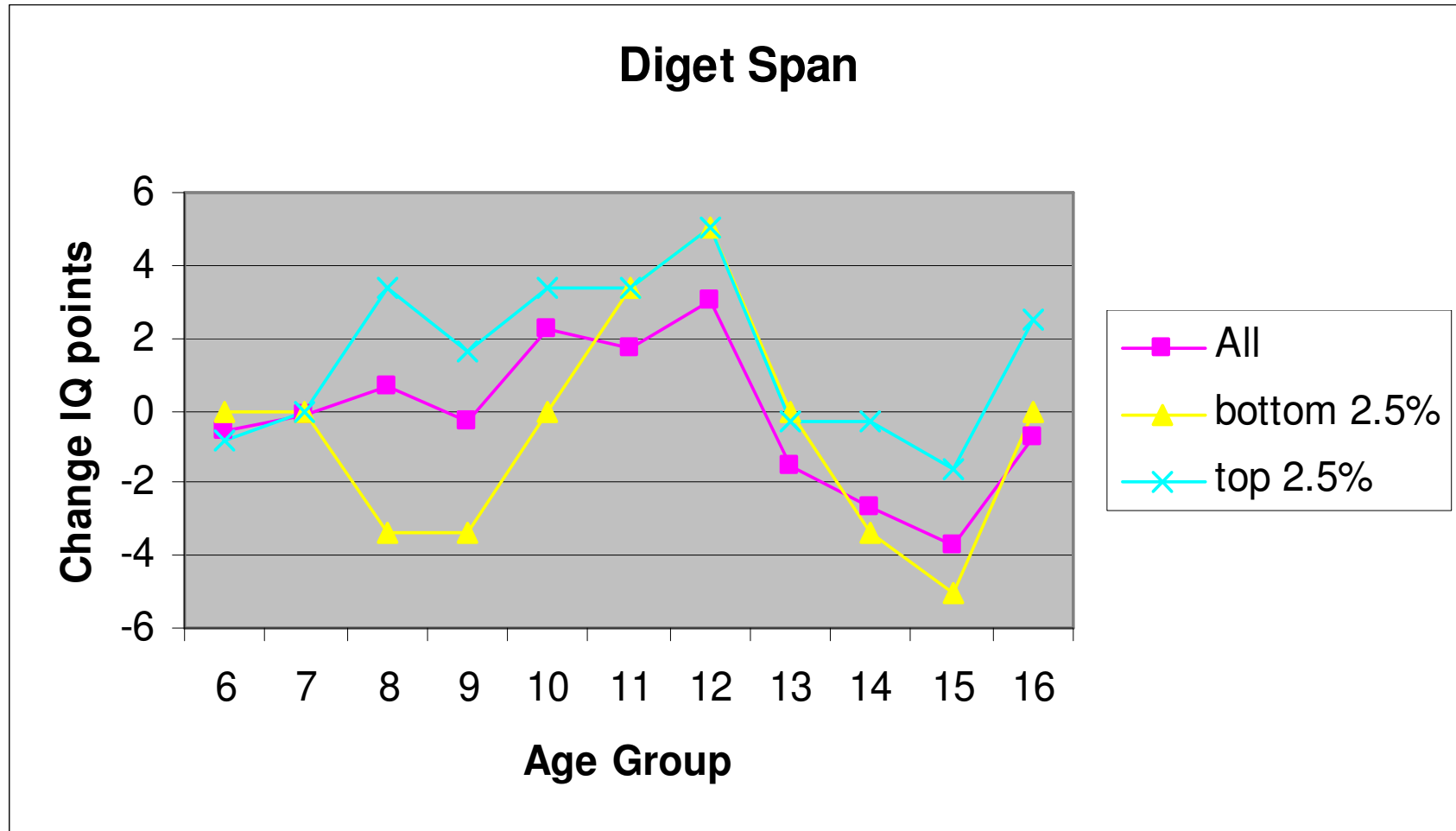
The mean difference between scaled scores overall was equivalent to a gain of 3.45 IQ points, for those with high ability equivalent to 13.45 IQ points. However, for those with low IQs there was a loss equivalent to 2.4 IQ points.

Coding



Overall there was an increase in ability equivalent to 2.4 IQ points over the 12.5 years between the standardisation of both tests. The increase was noticeably greater for those with high IQ, with an increase equivalent to 7.15 IQ points. For those with those with low IQs there was a mean loss of ability equivalent to 2.3 IQ points.

Digit Span



Overall there was very little change, equivalent to a loss of .2 of an IQ point. There is a slight increase in ability for those with high IQs with a mean equivalent to 1.45 IQ points, and a slight drop for those with low IQs with a mean equivalent to 0.65 IQ points.

The results are very tentative as is the explanation for why the Flynn effect is occurring.

However, if people with low IQs are now getting less intelligent and this is at least in part due to them being swamped by the current rate of technological change then this should have implications.

Implications

- Technology needs to take account of people with low intellectual ability and appear to change less.
- It should not to present an intellectual challenge when people first start to use it.
- Language should be simple and not technical.