



The latest thinking on intelligence

PROFESSOR James R. Flynn has played a central role in documenting massive IQ gains from one generation to another, a phenomenon now called the 'Flynn effect'. We caught up with him after he delivered a seminar 'Has intelligence been rising', sponsored by the Psychometrics Centre at Cambridge Assessment. Given that intelligence is an internationally controversial topic, we asked four young psychometricians at the Centre, from a variety of different backgrounds (see box), to set Professor Flynn an 'exam paper' on his latest thinking.

Why are IQ scores rising?

Vikas: *Do high IQ gains lead to better environment or vice versa?*

Rising IQ promotes a better cognitive environment *and* vice versa. But since IQ bears little relation to wisdom, rising IQ often means merely that we are more ingenious in inventing ways to worsen the physical environment.

Vikas: *Do the gains in IQ always follow a linear trend across generations?*

Not for individual family lines, of course. For generations in the developed world, each generation has had a higher IQ than the last (in some places like Scandinavia this may no longer be true). But I believe this is less a matter of intelligence being enhanced over time than intelligence being invested in new areas. Over the 20th century, we learned to detach logic from the concrete problems of everyday life and use it to deal with abstract and symbolic problems – and to take the hypothetical

Four young psychometricians talk to PROFESSOR JAMES FLYNN.

seriously. The latter is very important in moral reasoning: taking seriously a question like 'How would you feel if you were black?'

Paula: *The idea that improved nutrition, smaller families, better education, greater environmental complexity and heterosis improve intelligence has influenced educational policy in the UK. What's your view of these claims?*

I am sceptical about nutrition and heterosis in developed nations. As for heterosis, the classic study of Schull and Neal shows that Americans would have to have been inbred to a degree that is quite implausible (something like all being the offspring of second cousins) to explain even a fragment of IQ gains. As for nutrition, the usual thesis is that it is the common cause of IQ and height gains. Yet, in Norway, IQ gains were concentrated in the bottom half of the distribution and height gains in the top half. Better education and smaller families are much more plausible.

Paula: *In the general increase in IQ test scores, is there evidence of scores for crystallised intelligence being higher than those for fluid intelligence? Given that language and historical context were probably taught in schools, could this have been a contributing factor to an increase in overall 'g' scores?*

Despite the fact that gains have been minimal on 'crystallised' tests like WISC Arithmetic, Information, and Vocabulary, formal schooling has been very important. It is one of the major cultural forces that causes people to put on scientific spectacles – to classify the world in the language of science (thus huge gains on Similarities) and extend reasoning from the concrete to the abstract (thus huge gains on Raven's). To understand what IQ gains have been registering, you have to abandon the old mindset of they must be either some kind of 'g' or a mere artefact. They are neither. They signal something momentous – nothing less than the liberation of reason from the concrete, so it can attack all sorts of new problems such

as those posed by science, by moral argument, even by the sort of on-the-spot decision-making that faces the modern executive.

What is intelligence: The limits and utility of the concept

Lina: *Are intelligence and genius the same thing?*

By no means. Intelligence and even critical acumen are not the same, and the gap between intelligence and wisdom is huge. The 20th century has seen the dissemination of new concepts such as 'placebo', 'market' and 'sample' and these obviously could make educated people better at analysing social issues. But if university graduates are to realise that potential, they must be shown how to use them and taught to take the search for truth seriously. The fact that certain university departments disparage science and the very notion of a reality to be analysed ('reality is merely a text and all readings are equally valid') is an impediment.

Vikas: *What is the relationship between motivation and IQ/intelligence?*

Very strong – your best chance to exceed your genetic endowment is to develop a real love of ideas and do cognitive exercise. Certain groups, such as US Chinese, excel at this.

Vikas: *These days emotional intelligence seems to be very popular as a good predictor of business success. What are your views regarding this?*

Empathy, character and self-control are sometimes stronger predictors than IQ, not only of business success but also of academic achievement. Whether or not we label the measurement of such things as measuring some kind of intelligence is trivial – the point is not to ignore them.

Adverse impact

Shining: *Cross-culture psychological studies show that personality is culturally influenced, and that personality structure differs between Western and Asian countries. Do you think IQ will be*

THE QUESTIONERS

Paula Cruise is from Jamaica and is completing her PhD on cross-cultural selection approaches.

Lina Daouk is from the Lebanon and is completing her PhD on translinguistic and transcultural assessment of personality.

Vikas Dhawan is from Chandigarh in India. He completed his MSc in Psychometrics in 2005 with a research project on the validation of Raven's and the MBTI.

Xiao Li (Shining) is from Shenzhen in China and has just completed her MSc in Psychometrics with a research project on personally assessment in China.

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influenced by culture as well?

Very much so. Culturally influenced personality traits and problem-solving strategies even influence performance on elementary cognitive tasks like reaction times. For example, in a choice reaction time task, Chinese children are more adventurous in the sense that they will release the home button before they know what target button they are moving towards. British children are more conservative and have to be sure where they are going before they release the home button. The result is faster release times for the Chinese, and faster movement times for the British.

Shining: Do you think current Western developed IQ tests are valid IQ measures for Asian people?

For nations like Japan, yes. For developing nations, it depends on what you are trying to measure. You might need something rather different from the usual IQ test to measure intelligence in the sense of ability to adapt to a people's concrete environment. But the usual IQ test might tell you how far a people are along the road to absorbing (mainly through formal education) a formal or scientific perspective on the world.

Paula: Do we look enough at intra- and inter-cultural conceptualisations of intelligence. In many cultures fluid intelligence is associated with age, and crystallised intelligence with youth. How can psychometricians avoid adverse impact while accurately capturing the 'g' construct?

As I have said, I think the 'g' construct is not informative if we want to understand how cognitive abilities evolve over time or compare developed and developing nations. The construct comes into its own when we measure individual differences in cognitive ability within a culture at a given time. The cash value of the distinction between fluid and crystallised is between solving problems on the spot and demonstrating



James Flynn (seated right), at his Psychometrics Centre seminar

that you have absorbed the things (a large vocabulary) that an intelligent person would be likely to absorb. Now, in Western societies, usually there are no social impediments to young people thinking innovatively so no reason for them not to demonstrate 'fluid g' – but I assume that in more traditional societies, there would be social impediments of that kind. The 'adverse impact' you have in mind, I presume, is not taking this into account when assessing the significance of low scores on a test like Raven's by youths growing up in a traditional culture. The only way to avoid this is to stop thinking about 'g' as an operational ability that is somehow insulated from cultural context.

Lina: To what extent do you think that sex differences on various intelligence subtests may be culturally rather than biologically determined?

I will complete a paper in May showing that women equal men on Raven's as we approach the current generation in advanced nations. I suspect that there is some genetic component in the male

advantage on spatial and female advantage on verbal subtests. But the spatial difference does *not* explain why there are more male mathematicians, as shown in my book, *Asian Americans* (1991). The reason for fewer female mathematicians has to do, in my opinion, with a focus on people as distinct from a focus on 'non-people' problems. The different focus is undoubtedly to some degree cultural conditioning, although some contend that genes have a strong influence on gender character structures – testosterone makes males less socially amenable, and so forth.

Predicting the future***Lina: If it's true that intelligence has been rising for many decades and that this increase is now levelling out, how likely is it that the rest of this century will see an equivalent decline?***

Trends will undoubtedly vary with the nation. If you take the fall-off of IQ gains in Scandinavia as a sign of what will happen in the developed world in general, and if the recent take-off of massive IQ gains in Kenya and the Caribbean become typical of the developing world, clearly the latter will make huge gains on the former in the 21st century; with the proviso that no cataclysmic events occur (climate change) that nullify all predictions. Note that even the end of IQ gains in the West need not mean the end of cognitive progress: the forces of reason within the universities just might defeat unreason and we could have a century of rising critical acumen.

JAMES R. FLYNN

James R. Flynn is Professor Emeritus at the University of Otago. He was awarded the University's Gold Medal for Distinguished Career Research and has been profiled in *Scientific American*. The American Psychological Association has devoted a symposium and a book to his research. His forthcoming book, *What Is Intelligence?*, will be published by Cambridge University Press. For his recent address to Cambridge Assessment, go to www.thepsychometricscentre.co.uk and click on News.