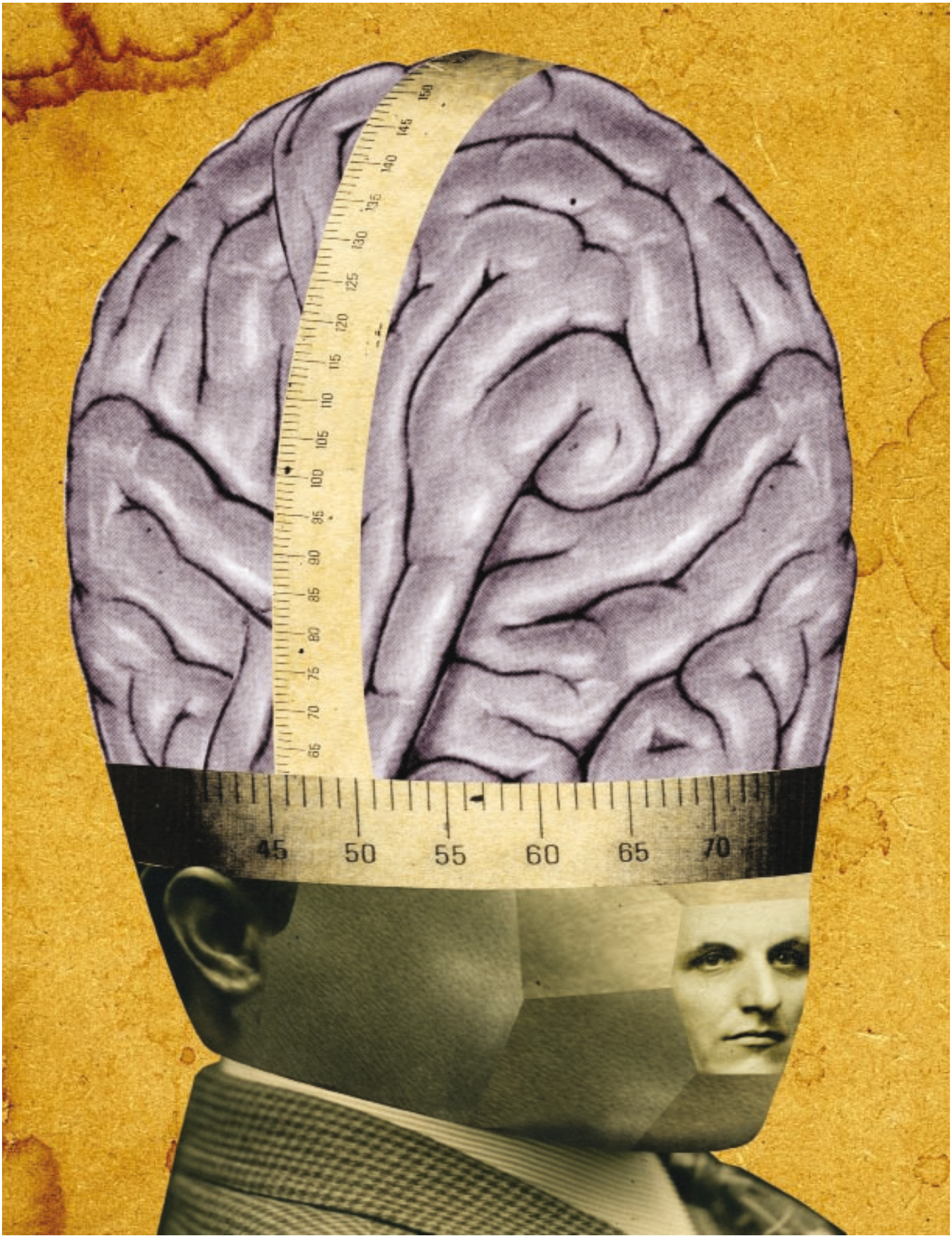


DAVE PLUNKERT

Having a high IQ doesn't necessarily mean you're smart. Far from it, says **Michael Bond**

It's how you use it that counts

IS GEORGE W. BUSH stupid? It's a question that occupied a good many minds of all political persuasions during his turbulent eight-year presidency. The strict answer is no. Bush's IQ score is estimated to be above 120, which suggests an intelligence in the top 10 per cent of the population. But this, surely, does not tell the whole story. Even those sympathetic to the former president have acknowledged that as a thinker and decision-maker he is not all there. Even his loyal speechwriter David Frum called him glib, incurious and "as a result ill-informed". The political pundit and former Republican congressman Joe Scarborough accused him of lacking intellectual depth, claiming that compared with other US presidents whose intellect had been questioned, Bush junior was "in a league by himself". Bush himself has described his thinking style as "not very analytical".

How can someone with a high IQ have these kinds of intellectual deficiencies? Put another way, how can a "smart" person act foolishly? Keith Stanovich, professor of human development and applied psychology at the University of Toronto, Canada, has grappled with this apparent incongruity for 15 years. He says it applies to more people than you might think. To Stanovich, however, there is nothing incongruous about it. IQ tests are very good at measuring certain mental faculties, he says, including logic, abstract reasoning, learning ability and working-memory capacity – how much information you can hold in mind.

But the tests fall down when it comes to measuring those abilities crucial to making good judgements in real-life situations. That's because they are unable to assess things such as a person's ability to critically weigh up information, or whether an individual can override the intuitive cognitive biases that can lead us astray.

This is the kind of rational thinking we are compelled to do every day, whether deciding which foods to eat, where to invest money, or how to deal with a difficult client at work. We need to be good at rational thinking to navigate our way around an increasingly complex world. And yet, says Stanovich, IQ tests – still the predominant measure of people's cognitive abilities – do not effectively tap into it. "IQ tests measure an important domain of cognitive functioning and they are moderately good at predicting academic and work success. But they are incomplete. They fall short of the full panoply of skills that would come under the rubric of 'good thinking'."

IQ isn't everything

"A high IQ is like height in a basketball player," says David Perkins, who studies thinking and reasoning skills at Harvard Graduate School of Education in Cambridge, Massachusetts. "It is very important, all other things being equal. But all other things aren't equal. There's a lot more to being a good basketball player than being tall, and there's a lot more to being a good thinker than having a high IQ."

IQ tests and their proxies, which are designed to measure a factor known as general intelligence, are used by many businesses and colleges to help select the "best" candidates, and also play a role in schools and universities, in the form of SAT tests in the US and CATs in the UK. "IQ tests determine, to an important degree, the academic and professional careers of millions of people in the US," Stanovich says in his book, What Intelligence Tests Miss (Yale University Press, 2008). He challenges the "lavish attention" society bestows on such tests, which he claims measure only a limited part of cognitive functioning. "IQ tests are overvalued, and I think most psychologists would agree with that," says Jonathan Evans, a cognitive psychologist at the University of Plymouth, UK.

Indeed, IQ scores have long been criticised as poor indicators of an individual's all-round intelligence, as well as for their inability to predict how good a person will be in a particular profession. The palaeontologist Stephen Jay Gould claimed in The Mismeasure of Man in 1981 that general intelligence was simply a mathematical artefact and that its use was unscientific and culturally and socially discriminatory. Howard Gardner at the Harvard Graduate School of Education has been arguing – controversially – for more than 25 years that cognitive capacity is best understood in terms of multiple intelligences, covering mathematical, verbal, visual-spatial, physiological, naturalistic, self-reflective, social and musical aptitudes.

Yet unlike many critics of IQ testing, Stanovich and other researchers into rational thinking are not trying to redefine intelligence, which they are happy to characterise as those mental abilities that can be measured by IQ tests. Rather, they are trying to focus attention on cognitive faculties that go beyond intelligence – what they describe as the essential tools of rational thinking. These, they claim, are just as important as intelligence to ›

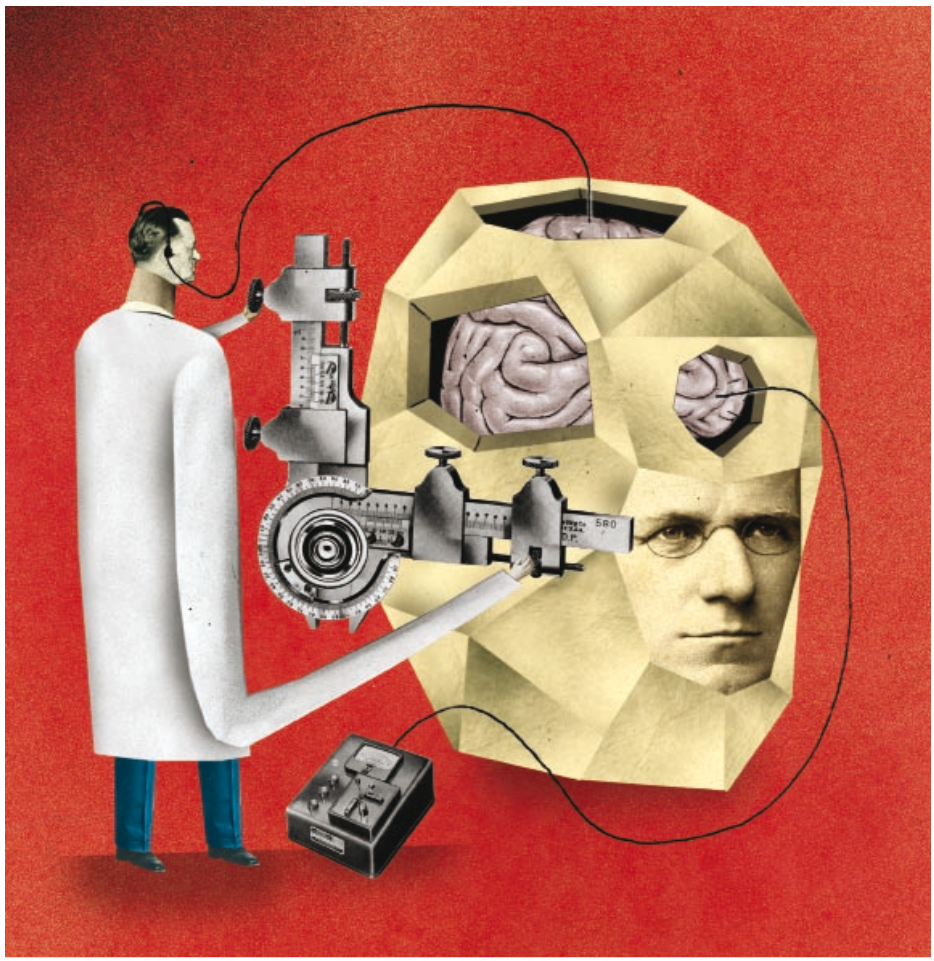
judgement and decision-making. "IQ is only part of what it means to be smart," says Evans.

As an illustration of how rational-thinking ability differs from intelligence, consider this puzzle: if it takes five machines 5 minutes to make five widgets, how long would it take 100 machines to make 100 widgets? Most people instinctively jump to the wrong answer that "feels" right – 100 – even if they later amend it. When Shane Frederick at the Yale School of Management in New Haven, Connecticut, put this and two similarly counter-intuitive questions to about 3400 students at various colleges and universities in the US – Harvard and Princeton among them – only 17 per cent got all three right (see "Test your thinking", below). A third of the students failed to give any correct answers (Journal of Economic Perspectives, vol 19, p 25).

We encounter problems like these in various guises every day. Without careful reasoning we often get them wrong, probably because our brains use two different systems to process information (see New Scientist, 30 August 2008, p 34). One is intuitive and spontaneous; the other is deliberative and reasoned. Intuitive processing can serve us well in some areas – choosing a potential partner, for example, or in situations where you've had a lot of experience. It can trip us up in others, though, such as when we overvalue our own egocentric perspective. Deliberative processing, on the other hand, is key to conscious problem-solving and can help us override our intuitive tendencies if they look like leading us astray.

The problem with IQ tests is that while they are effective at assessing our deliberative skills, which involve reason and the use of working memory, they are unable to assess our inclination to use them when the situation demands. This is a crucial distinction: as Daniel Kahneman at Princeton University puts it, intelligence is about brain power whereas rational thinking is about control. "Some people who are intellectually able do not bother to engage very much in analytical thinking and are inclined to rely on their intuitions," explains Evans. "Other people will check out their gut feeling and reason it through and make sure they have a justification for what they're doing." An IQ test cannot predict which of these paths someone will follow, hence the George W. Bush incongruity of people who are supposedly smart acting foolishly.

The idea that Bush is just one foolish smart person among many, and that intelligence is a poor predictor of "good thinking", comes from a series of recent experiments that compared the performances of people of a range of intellectual abilities on rational-thinking tasks. In a study published last year, Stanovich and Richard West of James Madison University in Harrisonburg, Virginia, found there was no correlation between intelligence and a person's ability to avoid some common traps of intuitive-thinking (Journal of Personality and Social Psychology, vol 94, p 672).



DAVE PLUNKERT

Test your thinking

When researchers put the following three problems to 3400 students in the US, only 17 per cent got all three right. Can you do any better?

1) A bat and a ball cost $1.10 in total. The bat costs $1 more than the ball. How much does the ball cost?

2) If it takes five machines 5 minutes to make five widgets, how long would it take 100 machines to make 100 widgets?

3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of it?

[For answers, see right]

Source: Shane Frederick, 2005

On certain types of thinking tasks, such as those involving number ratios, probabilities, deductive reasoning and the use of hindsight, intelligent people do perform better, Stanovich and others have found. This is particularly true when any intuitive pitfalls are obvious, especially if a correct answer depends on logic or abstract reasoning – abilities that IQ tests measure well. But most researchers agree that, overall, the correlation between intelligence and successful decision-making is weak. The exception is when people are warned that they might be vulnerable to a thinking bias, in which case those with high IQs tend to do better. This, says Evans, is because while smart people don't always reason more than others, "when they do reason, they reason better".

For example, consider the following problem. Jack is looking at Anne, and Anne is looking at George; Jack is married, George is not. Is a married person looking at an unmarried person? If asked to choose between yes, no, or cannot be determined, the vast majority of people go for the third option – incorrectly. If told to reason through all the options, though, those of high IQ are more likely to arrive at the right answer (which is "yes": we don't know Anne's marital status, but either way a married person would be looking

How to avoid making foolish decisions

It's easy for your mind to lead you up the garden path when it comes to making a good decision. Below are ways to avoid the common pitfalls.

CLEAR YOUR MIND Judgements can often be based on a piece of information you have recently had in mind, even if it is irrelevant. For example, bidding high at an auction after pondering the height of the tallest person in the room.

DON'T FALL FOUL OF SPIN We have an inclination to be strongly influenced by the way a problem is framed. For instance, people are more likely to spend a monetary award immediately if they are told it is a bonus, compared with a rebate.

DON'T LET EMOTIONS GET IN THE WAY They often interfere with our assessment of risk. One example is our natural reluctance to cut our losses on a falling investment because it might start rising again.

BE FACT BASED Don't allow your beliefs and opinions to cloud your analysis.

THINK CAREFULLY ABOUT THE LONG-TERM CONSEQUENCES When considering how a course of action will make you feel, talk to someone who has been through a similar situation rather than try to imagine your future state of mind; run mental movies about how an option might play out.

LOOK BEYOND THE OBVIOUS SOLUTION Don't accept the first thing that pops into your head.

"Think of our minds as searchlights. IQ measures the brightness of the searchlight, but where we point it also matters"

at an unmarried one). What this means, says Stanovich, is that "intelligent people perform better only when you tell them what to do".

Perkins explains this as follows: "IQ indicates a greater capacity for complex cognition for problems new to you. But what we apply that capability to is another question. Think of our minds as searchlights. IQ measures the brightness of the searchlight, but where we point it also matters. Some people don't point their searchlights at the other side of the case much, for many reasons – entrenched ideas, avoidance of what might be disturbing, simple haste. A higher wattage searchlight in itself is no protection against such follies." Indeed, it seems even the super-intelligent are not immune. A survey of members of Mensa (the High IQ Society) in Canada in the mid-1980s found that 44 per cent of them believed in astrology, 51 per cent believed in biorhythms and 56 per cent believed in aliens (Skeptical Inquirer, vol 13, p 216).

The idea that IQ is a poor measure of rationality is not without its critics, though. Christopher Ferguson, who studies the genetic and environmental factors behind human behaviour at Texas A&M International University in Laredo, says that since those with high IQ tend to live longer and earn more, we should assume that intelligent people are more rational. "They tend to have more knowledge with which to make better decisions," he says.

Yet Wändi Bruine de Bruin at Carnegie Mellon University in Pittsburgh, Pennsylvania, has shown that intelligence cannot be the only factor that dictates whether someone is a good thinker and decision-maker. In a study of 360 Pittsburgh residents aged between 18 and 88, her team found that, regardless of differences in intelligence, those who displayed better rational-thinking skills suffered significantly fewer negative events in their lives, such as being in serious credit card debt, having an unplanned pregnancy or being suspended from school (Journal of Personality and Social Psychology, vol 92, p 938). Andrew Parker, now with the Rand Corporation in Pittsburgh, and Baruch Fischhoff at Carnegie Mellon found a similar association among adolescents. Those who scored higher on a test of decision-making competence drank less, took fewer drugs and engaged in less risky behaviour overall (Journal of Behavioral Decision Making, vol 18, p 1). This suggests that rational thinking may be more important than intelligence for positive life experiences, Fischhoff says.

A potent criticism of Stanovich's theory is the lack of a proven test of rational thinking skills that could be used alongside IQ tests. "It is not enough to say what intelligence is not measuring, you have to propose alternative ways of measuring rationality," says Kahneman. Stanovich maintains that while developing a universal "rationality-quotient (RQ) test" would require a multimillion-dollar research programme, there is no technical or conceptual reason why it could not be done. There are already several contenders, such as the measure of decision-making competence used by Bruine de Bruin and Fischhoff.

Would a valid RQ test be useful? "Hypothetically, yes, because it would cover skills that are more directly related to what people will be doing in their jobs," says Bruine de Bruin. Kahneman maintains that IQ tests, as measures of brain power, work well for academic selection. "But I would very seriously consider RQ tests as a way of selecting managers or leaders, particularly if I wanted a style of leadership that is thorough and not overly impulsive," he says.

There is a drawback, however: unlike with IQ, it would be relatively easy to train people to do well on RQ tests. "They measure the extent to which people are inclined to use what capacity they have," says Evans. "You could train people to ignore intuition and engage reasoning for the sake of the test, even if this was not their normal inclination."

The flip side of this is that everyone can improve their rational thinking and decision-making skills. Richard Nisbett at the University of Michigan in Ann Arbor and others discovered that just half an hour's training in statistical reasoning can improve a person's ability to use rational thinking in everyday situations. And we don't need formal training to improve: there are many tricks we can teach ourselves, says Perkins (see "How to avoid making foolish decisions", above).

We might also be better equipped to elect leaders that did the same. Bush's successor is intellectually engaged, shows cognitive flexibility, can question beliefs, is sensitive to inconsistency and engages in counterfactual thinking, says Perkins. "They could not be more different in their rational thinking profiles." President Obama's IQ, incidentally, is well above average – but then so was Bush's. ■

Answers: 1) 5 cents, 2) 5 minutes, 3) 47 days

Michael Bond is a London-based consultant to *New Scientist*