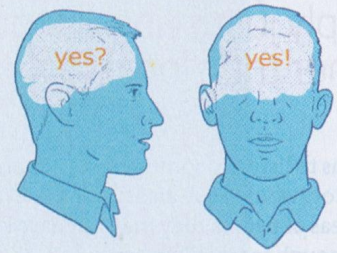


DAVID HOLLENBACH

COVER STORY



HAVE you ever, against your better judgement, nurtured a belief in the paranormal? Or do you believe that gifted rock singers are more likely to die at the age of 27? Maybe you just have the sneaking suspicion that you are smarter, funnier and more attractive than the next person.

If you buy into any of these beliefs, you are probably suffering from confirmation bias – the mind's tendency to pick and choose information to support our preconceptions, while ignoring a wealth of evidence to the contrary. Consider the idea that rock stars die at 27 – a fallacy that crops up time and again in the media. Once you have heard of the “27 club”, it is easy to cite a handful of examples that fit the bill – Janis Joplin, Kurt Cobain, Amy Winehouse – while forgetting the countless other musicians who survived their excesses past the age of 30.

The confirmation bias is just one of a truckload of flaws in our thinking that psychologists have steadily documented over the past few decades. Indeed, everything from your choice of cellphone to your political agenda is probably clouded by several kinds of fuzzy logic that sway the way you weigh up evidence and come to a decision.

Why did we evolve such an apparently flawed instrument? Our irrational nature is very difficult to explain if you maintain that human intelligence evolved to solve complex problems, where clear, logical thought should offer the advantage. As such, it has remained something of a puzzle.

An elegant explanation may have arrived. Hugo Mercier at the University of Neuchâtel, Switzerland, and Dan Sperber at the Central European University in Budapest, Hungary, believe that human reasoning evolved to help

us to argue. An ability to argue convincingly would have been in our ancestors' interest as they evolved more advanced forms of communication, the researchers propose. Since the most persuasive lines of reasoning are not always the most logical, our brains' apparent foibles may result from this need to justify our actions and convince others to see our point of view – whether it is right or wrong. “You end up making decisions that look rational, rather than making genuinely rational decisions,” says Mercier.

The flip side, of course, is that we also face the risk of being duped by others, so we developed a healthy scepticism and an ability to see the flaws in others' reasoning. This ability to argue back and forth may have been crucial to humanity's success – allowing us to come to extraordinary solutions as a group that we could never reach alone.

Mercier and Sperber are by no means the first to suggest that the human mind evolved to help us manage a complex social life. It has long been recognised that group living

is fraught with mental challenges that could drive the evolution of the brain. Primates living in a large group have to form and maintain alliances, track who owes what to whom, and keep alert to being misled by others in the group. Sure enough, there is a very clear correlation between the number of individuals in a primate group, and the species' average brain size, providing support for the “social brain” – or “Machiavellian intelligence” – hypothesis (*New Scientist*, 24 September 2011, p 40).

The evolution of language a few hundred thousand years ago would have changed the rules of the game. The benefits are clear – by enabling the exchange of ideas, complex communication would have fostered innovation and invention, leading to better tools, new ways to hunt and trap animals, and more comfortable homes. But the gift of the gab would also have presented a series of challenges. In particular, our ancestors had to discern who to trust. Signs of expertise and examples of past benevolence would offer

The argumentative ape

Forget rationality and right or wrong. Your brain evolved to persuade, finds Dan Jones

"Whether we are debating a friend's infidelity or the 'war on terror', we are simply justifying our gut reactions rather than looking for a fair conclusion"

reasons to listen to some people, but our ancestors would have also needed to evaluate the ideas of people they may not have known well enough to trust implicitly.

A powerful way to overcome this challenge would have been to judge the quality of their arguments before accepting or rejecting what they had to say, helping the group arrive at the best strategies for hunting and gathering, for instance. "Providing and evaluating reasons is fundamental to the success of human communication," says Sperber, who has spent years considering the ways an argumentative mind might ease our way through the "bottleneck of distrust", as he calls it.

On the one hand, a healthy scepticism would have been essential, leading us to more critical thought. Equally beneficial, however, would have been an ability to persuade others and justify our point of view with the most convincing arguments. It was Mercier who began to wonder whether this need to sway other people's opinions might explain some of our biases, which might skew our logic but

which may nevertheless give us the edge when arguing our opinions. So the pair set about reviewing an enormous body of psychological studies of human reasoning.

Consider the confirmation bias. It is surprisingly pervasive, playing a large part in the way we consider the behaviour of different politicians, for instance, so that we will rack up evidence in favour of our chosen candidate while ignoring their competitor's virtues. Yet people rarely have any awareness that they are not being objective. Such a bias looks like a definite bug if we evolved to solve problems: you are not going to get the best solution by considering evidence in such a partisan way.

But if we evolved to be argumentative apes, then the confirmation bias takes on a much more functional role. "You won't waste time searching out evidence that doesn't support your case, and you'll home in on evidence that does," says Mercier.

Mercier and Sperber offer a similar explanation for the "attraction effect" – when faced with a choice between different

options, irrelevant alternatives can sway our judgement from the logical choice. It is perhaps best illustrated by considering a range of smartphone contracts: people who would tend to choose the cheapest option can be persuaded to opt for a slightly up-market model if an even more expensive, supposedly luxury model is added to the mix (see "Decisions, decisions", below left).

According to Mercier and Sperber's argumentative theory, the luxury option might sway our decision by offering an easy justification for our decision to go with the middle option – we can use it to claim that we have landed a bargain. Notably, the attraction effect is strongest when people are told that they will have to defend publicly whatever choice they make. "In these kinds of situations, reasoning plays its argumentative role and drives you towards decisions that you can easily justify rather than the best decision for you," says Mercier.

Framing effect

The duo found further evidence from the framing effect, first identified 30 years ago by psychologists Daniel Kahneman of Princeton University and Amos Tversky. In a series of studies, they found that people treat identical options very differently depending on how the options are presented, or framed. One classic experiment asks people to imagine an outbreak of disease threatening a small town of 600 people. The subjects are offered two forms of treatment: Plan A, which will definitely save exactly 200 people, and Plan B, which has a 1-in-3 chance of saving everyone and a 2-in-3 chance of saving no one.

Most people choose Plan A. But they tend to change their mind when exactly the same plans are rephrased with a different emphasis. The subjects are now told that if Plan A is selected, 400 people, but no more, will definitely die. Plan B stays the same: there's a 1-in-3 chance no one will die, and a 2-in-3 chance that everyone will die. In this case, most people opt for Plan B – the choice they had previously shunned (*Science*, vol 211, p 453). Kahneman and Tversky explained this inconsistency in terms of "loss aversion": in the second set-up, the loss of life seems especially salient, so people avoid it. But the argumentative theory offers a new twist, suggesting that participants in these experiments choose the response that will be easiest to justify if challenged. In the first scenario, there is a direct argument for their choice – it will definitely save 200 lives –

Decisions, decisions

The "attraction effect" is a prime example of human irrationality. To see how it works, imagine you are weighing up two smartphone contracts. Which one would you choose?

BASIC Free mid-range phone 300 minutes free 500MB download £20 a month	ADVANCED Free high-end phone 600 minutes free 1GB download £35 a month
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Let's say you picked the cheaper contract because it was adequate for your needs. Now, what would you have done if there had been a third option?

BASIC Free mid-range phone 300 minutes free 500MB download £20 a month	ADVANCED Free high-end phone 600 minutes free 1GB download £35 a month	PREMIUM Free high-end phone 600 minutes free 1GB download £40 a month
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People who previously chose the **BASIC** option are now more likely to choose the **Advanced** contract, because it looks like a better deal than **Premium**, even though the **BASIC** option best matched their needs

The Goldilocks network



DAVID HOLLENBACH

whereas in the second scenario, they can instead argue that their decision might save 400 people from certain death.

Once again, experiments have shown that people are more susceptible to the bias when they are told that they will have to defend their decision, just as you would expect if we evolved to convince others of our actions (*Journal of Behavioral Decision Making*, vol 20, p 125). The effect may weigh heavily on the way we weigh up the benefits and risks of certain lifestyle choices – it is the reason that “90 per cent fat-free” food sounds healthy, when a product advertised with “10 per cent fat content” would seem less attractive.

Drawing together all the difference strands of evidence, Mercier and Sperber published a paper in *Behavioral and Brain Sciences* journal last year outlining their theory (vol 34, p 57). In addition to confirmation bias and the framing and attraction effects, they cited many other seemingly irrational biases that might be explained by our argumentative past, including the sunk-cost fallacy – our reluctance to cut our losses and abandon a project even when it would be more rational to move on – and feature creep, which includes our tendency to buy goods with more features than we would ever actually use.

The paper has caused quite a stir since it was published. Jonathan Haidt, a moral psychologist at the University of Virginia

in Charlottesville, believes the theory is so important that “the abstract of their paper should be posted above the photocopier machine in every psychology department”. Mercier and Sperber’s ideas dovetail neatly with Haidt’s influential view that our moral judgements stem from our gut reactions to moral transgressions, and not from rational reflection. In one example, Haidt and Thalia Wheatley of Dartmouth College in Hanover, New Hampshire, showed that hypnotically inducing the feeling of disgust leads people to make harsher moral judgments, even in cases when no one has done anything wrong – supporting the idea that emotion rather than logical reasoning drives morality (*Psychological Science*, vol 16, p 780). We still spend masses of time arguing about the morality of certain situations – whether we are considering a friend’s infidelity or debating the “war on terror” – but according to Haidt’s research, we are simply trying to justify our

“Hypnotically inducing the feeling of disgust leads people to make harsher moral judgements”

gut reactions and persuade others to believe our judgments, rather than attempting to come to the most just conclusion. “Moral argumentation is not a search for moral truth, but a tool for moral persuasion,” says Haidt.

The idea that we evolved to argue and persuade, sometimes at the expense of the truth, may seem to offer a pessimistic view of human reasoning. But there may also be a very definite benefit to our argumentative minds – one that has proved essential to our species’ success. Crucial to Sperber and Mercier’s idea is the fact that we are not only good at producing convincing arguments, but we are also adept at puncturing other people’s faulty reasoning. This means that when people get together to debate and argue against each other, they can counterbalance the biased reasoning that each individual brings to the table.

As a result, group thinking can produce some surprisingly smart results, surpassing the efforts of the irrational individuals. In one convincing study, psychologists David Moshman and Molly Geil at the University of Nebraska-Lincoln looked at performance in the Wason selection test – a simple card game based on logical deduction. When thinking about this task on their own, less than 10 per cent of people got the right answer. When groups of 5 or 6 people tackled it, however, 75 per cent of the groups eventually succeeded.

Crucially for the argumentative theory, this was not simply down to smart people imposing the correct answer on the rest of the group: even groups whose members had all previously failed the test were able to come to the correct solution by formulating ideas and revising them in light of criticism (*Thinking and Reasoning*, vol 4, p 231). There is also good evidence that groups are more creative than individual lone thinkers (see page 37).

Collective intelligence

Given that the skills of the individual members do not seem to predict a group's overall performance, what other factors determine whether it sinks or swims? Anita Williams Woolley of Carnegie Mellon University in Pittsburgh, Pennsylvania, helped to answer this question with a series of studies designed to measure a group's "collective intelligence", in much the same way an individual's general intelligence can be measured by IQ tests. The tasks ranged from solving visual puzzles and brainstorming ideas to negotiating how to distribute scarce resources.

She concluded that a group's performance bears little relation to the average or maximum intelligence of the individuals in the group. Instead, collective intelligence is determined by the way the group argues – those who scored best on her tests allowed each person to play a part in the conversations. The best groups also tended to include members who were more sensitive to the moods and feelings of other people. Groups with more women, in particular, outperformed the others – perhaps because women tend to be more sensitive to social cues (*Science*, vol 330, p 686).

Such results are exactly what you might expect from a species that evolved not to think individually, but to argue in groups. Mercier and Sperber do not believe this was the primary benefit of our argumentative minds, though. "We think that argumentation evolved to improve communication between individuals, helping communicators to persuade a reticent audience, and helping listeners to see the merits of information offered by sources they might not trust," says Sperber. "As a side effect, you get better reasoning in a group context."

Others aren't so sure, believing instead that improved group reasoning drove the evolution of our ability to argue. "If reasoning works so much better in a group context, then why shouldn't it have evolved for collective reasoning, given that we are a social animal?" asks philosopher Keith Frankish of the

"A group's performance bears little relation to the intelligence of its members. Instead, it is determined by the way they argue"

University of Crete in Greece, who nevertheless remains undecided on the issue.

That is not to say that group thinking does not backfire occasionally. "The problem is that in many high-stakes situations, vested interests and emotions run high," says Robert Sternberg, a psychologist at Oklahoma State University in Stillwater. This is especially true when groups of like-minded individuals focus on emotionally charged topics. "In these situations, people egg each other on to more extreme positions, while more moderate thinkers are chased out," says Sternberg.

This can all too easily lead to dangerous "groupthink", in which dissent is stifled and alternative courses of action are ignored, often resulting in disastrous decisions. When Irving Janis developed the idea of groupthink in the 1970s, he used it to explain catastrophic group decisions such as the escalation of the Vietnam war under US president Lyndon Johnson. Today, the same perils can be seen

in the decision to invade Iraq despite the lack of compelling evidence for weapons of mass destruction.

Even though thinking things through in groups can go awry, some researchers believe it is high time to make better use of our argumentative brains for collective reasoning. For the past decade, Neil Mercer, an educational psychologist at the University of Cambridge has been leading the "Thinking Together" project, which explores collaborative reasoning and learning in the classroom. His work shows that when children think together, they engage with tasks more effectively, and use better reasoning as they solve problems. The results are striking in science and mathematics problems; not only do groups often do better on these tasks, but individuals who participate in group reasoning also end up doing better in their exams in these subjects. Similar improvements can be seen in the kinds of non-verbal reasoning tasks used in IQ tests. "Kids can learn to see group reasoning as a kind of enlightened self-interest that benefits everyone," says Mercer.

His work suggests a few pointers to get the best results. Group reasoning was most productive when the children were asked to engage in "exploratory talk", he says, where ideas can be openly aired and criticised, and when they entered the task with the clear goal of seeking agreement, even if this goal remained elusive.

Although such collaborative forms of teaching have gained some measure of popularity in recent years, Sternberg believes educational systems are still too focused on developing individual knowledge and analytical reasoning – which, as the research shows, can encourage us to justify our biases and bolster our prejudices.

"We believe that our intelligence makes us wise when it actually makes us more susceptible to foolishness," says Sternberg. Puncture this belief, and we may be able to cash in on our argumentative nature while escaping its pitfalls. ■



Schools could help children reap the benefits of their argumentative minds

Dan Jones is a writer based in Brighton, UK