

## Rethinking thinking

Economists are starting to abandon their assumption that humans behave rationally, and instead are finally coming to grips with the crazy, mixed up creatures we seem to be.

### *Comment and suggested tasks*

1. Good reading on behavioral anomalies and rationality.
  2. Compile a list of all the behavioral anomalies mentioned in the article.
  3. Explain one example per each of the anomalies, different than the ones mentioned in the article.
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### *Irrationality: Rethinking thinking*

Source: *The Economist*, 18 December 1999, pp. 69-71.

“ARE economists human?” is not a question that occurs to many practitioners of the dismal science, but it is one that springs to the minds of many non-economists exposed to conventional economic explanations. Economists have typically described the thought processes of *homo sapiens* as more like that of Star Trek’s Mr Spock—strictly logical, centred on a clearly defined goal and free from the unsteady influences of emotion or irrationality—than the uncertain, error-prone groping with which most of us are familiar. Of course, some human behaviour does fit the rational pattern so beloved of economists. But remember, Mr Spock is a Vulcan, not a human.

Even economists are finally waking up to this fact. A wind of change is now blowing some human spirit back into the ivory towers where economic theory is made. It is becoming increasingly fashionable for economists, especially the younger, more ambitious ones, to borrow insights from psychologists (and sometimes even biologists) to try to explain drug addiction, the working habits of New York taxi-drivers, current sky-high American share prices and other types of behaviour which seem to defy rationality. Alan Greenspan, the chairman of the Federal Reserve, made a bow to this new trend when he wondered about the “irrational exuberance” of American stockmarkets way back in December 1996 (after an initial flutter of concern, investors ignored him).

Many economic rationalists still hold true to their faith, and some have fought back by devising rational explanations for the apparent irrationalities studied by the growing school of “behavioural economists”. Ironically, orthodox economists have been forced to fight this rearguard action against heretics in their own ranks just as their own approach has begun to be more widely applied in other social sciences such as the study of law and politics.

The golden age of rational economic man began in the 1940s. Famous earlier economists, such as Adam Smith, Irving Fisher and John Maynard Keynes, had made use of irrationality and other aspects of psychology in their theories. But in the post-war years these aspects were mostly brushed aside by the new wave of rationalists. The dominance of rationality went hand-in-glove with the growing use in economics of

mathematics, which also happened to be much easier to apply if humans were assumed to be rational.

Rational behaviour was understood to have several components. At a minimum—so-called “narrow rationality”—*homo economicus* was assumed to be trying always to maximise his general “happiness”: what John Stuart Mill, a 19th-century philosopher, called “utility”. In other words, given a choice he would take the option with the highest “expected utility”. And he would be consistent in his choices: if he preferred apples to oranges, and oranges to pears, he also preferred apples to pears. In addition, there is a broader definition of rationality which includes the notion of a person’s beliefs being based on logical, objective analysis of all the available evidence. Whether this is a meaningful definition continues to be the subject of much philosophical debate.

By the late 1970s, economic rationality was not only the orthodoxy, it began to effect events in the real world. Macroeconomic policy, notably in America and Britain, fell into the hands of believers in the theory of “rational expectations”. This said that, rather than forming expectations on the basis of limited information drawn from previous experience, people take into account all available information. This includes making an accurate assessment of government policy. Thus, when governments announced that they would do whatever was necessary to bring down inflation, people would adjust their expectations accordingly.

In the same way, Wall Street investment firms, too, increasingly fell under the spell of the “efficient markets hypothesis”, an economic theory that assumes that the prices of financial assets such as shares and bonds are rationally based on all available information. Even if there are many stupid investors, went the theory, they would be driven out of the market by rational investors who could profit by trading against the investments of the foolish. As a result, economists scoffed at the notion that investors could consistently earn a higher return than the market average by picking shares. How times have changed. Some of those same economists have now become investment managers—although their performance has suggested that they should have paid heed to their earlier beliefs about the difficulty of beating the market.

During the 1980s, macroeconomic policies based on rational expectations failed to live up to their promise (although this was probably because people rationally refused to believe government promises). And the stockmarket crash of October 1987 shattered the confidence of many economists in efficient markets. The crash seemed to have occurred without any new information or reason. Thus, the door of the ivory tower opened, at first only slightly, to theories that included irrational behaviour. Today there is a growing school of economists who are drawing on a vast range of behavioural traits identified by experimental psychologists which amount to a frontal assault on the whole idea that people, individually or as a group, mostly act rationally.

A quick tour of the key observations made by these psychologists would make even Mr Spock’s head spin. For example, people appear to be disproportionately influenced by the fear of feeling **regret**, and will often pass up even benefits within reach to avoid a small risk of feeling they have failed. They are also prone to **cognitive dissonance**: holding a belief plainly at odds with the evidence, usually because the belief has been held and cherished for a long time. Psychiatrists sometimes call this “denial”.

And then there is **anchoring**: people are often overly influenced by outside suggestion. People can be influenced even when they know that the suggestion is not being made by someone who is better informed. In one experiment, volunteers were asked a series of questions whose answers were in percentages—such as what percentage of African

countries is in the United Nations? A wheel with numbers from one to 100 was spun in front of them; they were then asked to say whether their answer was higher or lower than the number on the wheel, and then to give their answer. These answers were strongly influenced by the randomly selected, irrelevant number on the wheel. The average guess when the wheel showed 10 was 25%; when it showed 65 it was 45%.

Experiments show that most people apparently also suffer from **status quo bias**: they are willing to take bigger gambles to maintain the status quo than they would be to acquire it in the first place. In one common experiment, mugs are allocated randomly to some people in a group. Those who have them are asked to name a price to sell their mug; those without one are asked to name a price at which they will buy. Usually, the average sales price is considerably higher than the average offer price.

Expected-utility theory assumes that people look at individual decisions in the context of the big picture. But psychologists have found that, in fact, they tend to **compartmentalise**, often on superficial grounds. They then make choices about things in one particular mental compartment without taking account of the implications for things in other compartments.

There is also a huge amount of evidence that people are persistently, and irrationally, **over-confident**. Asked to answer a factual question, then asked to give the probability that their answer was correct, people typically overestimate this probability. This may be due to a **representativeness heuristic**: a tendency to treat events as representative of some well-known class or pattern. This gives people a sense of familiarity with an event and thus confidence that they have accurately diagnosed it. This can lead people to “see” patterns in data even where there are none. A closely related phenomenon is the **availability heuristic**: people focus excessive attention on a particular fact or event, rather than the big picture, simply because it is more visible or fresher in their mind.

Another delightfully human habit is **magical thinking**: attributing to one’s own actions something that had nothing to do with them, and thus assuming that one has a greater influence over events than is actually the case. For instance, an investor who luckily buys a share that goes on to beat the market may become convinced that he is a skilful investor rather than a merely fortunate one. He may also fall prey to **quasi-magical thinking**—behaving as if he believes his thoughts can influence events, even though he knows that they can’t.

Most people, say psychologists, are also vulnerable to **hindsight bias**: once something happens, they overestimate the extent to which they could have predicted it. Closely related to this is **memory bias**: when something happens people often persuade themselves that they actually predicted it, even when they didn’t.

Finally, who can deny that people often become **emotional**, cutting off their noses to spite their faces. One of the psychologists’ favourite experiments is the “ultimatum game” in which one player, the proposer, is given a sum of money, say \$10, and offers some portion of it to the other player, the responder. The responder can either accept the offer, in which case he gets the sum offered and the proposer gets the rest, or reject the offer in which case both players get nothing. In experiments, very low offers (less than 20% of the total sum) are often rejected, even though it is rational for the responder to accept any offer (even one cent!) which the proposer makes. And yet responders seem to reject offers out of sheer indignation at being made to accept such a small proportion of the whole sum, and they seem to get more satisfaction from taking revenge on the proposer than in maximising their own financial gain. Mr Spock would be appalled if a Vulcan made this mistake.

The psychological idea that has so far had the greatest impact on economics is “prospect theory”. This was developed by Daniel Kahneman of Princeton University and the late Amos Tversky of Stanford University. It brings together several aspects of psychological research and differs in crucial respects from expected-utility theory—although, equally crucially, it shares its advantage of being able to be modelled mathematically. It is based on the results of hundreds of experiments in which people have been asked to choose between pairs of gambles.

What Messrs Kahneman and Tversky claim to have found is that people are “loss averse”: they have an asymmetric attitude to gains and losses, getting less utility from gaining, say, \$100 than they would lose if they lost \$100. This is not the same as “risk aversion”, any particular level of which can be rational if consistently applied. But those suffering from loss aversion do not measure risk consistently. They take fewer risks that might result in suffering losses than if they were acting as rational utility maximisers. Prospect theory also claims that people regularly miscalculate probabilities: they assume that outcomes which are very probable are less likely than they really are, that outcomes which are quite unlikely are more likely than they are, and that extremely improbable, but still possible, outcomes have no chance at all of happening. They also tend to view decisions in isolation, rather than as part of a bigger picture.

Several real-world examples of how this theory can explain human decisions are reported in a forthcoming paper, “Prospect Theory in the Wild”, by Colin Camerer, an economist at the California Institute of Technology\*. Many New York taxi drivers, points out Mr Camerer, decide when to finish work each day by setting themselves a daily income target, and on reaching it they stop. This means that they typically work fewer hours on a busy day than on a slow day. Rational labour-market theory predicts that they will do the opposite, working longer on the busy day when their effective hourly wage-rate is higher, and less on the slow day when their wage-rate is lower. Prospect theory can explain this irrational behaviour: failing to achieve the daily income target feels like incurring a loss, so drivers put in longer hours to avoid it, and beating the target feels like a win, so once they have done that, there is less incentive to keep working.

### **Racing and the equity premium**

People betting on horse races back long-shots over favourites far more often than they should. Prospect theory suggests this is because they attach too low a probability to likely outcomes and too high a probability to quite unlikely ones. Gamblers also tend to shift their bets away from favourites towards long-shots as the day’s racing nears its end. Because of the cut taken by the bookies, by the time later races are run most racegoers have lost some money. For many of them, a successful bet on an outsider would probably turn a losing day into a winning one. Mathematically, and rationally, this should not matter. The last race of the day is no different from the first race of the next day. But most racegoers close their “mental account” at the end of each racing day, and they hate to leave the track a loser.

Perhaps the best-known example of prospect theory in action is in suggesting a solution to the “equity-premium puzzle”. In America, shares have long delivered much higher returns to investors relative to bonds than seems justified by the difference in riskiness of shares and bonds. Orthodox economists have ascribed this simply to the fact that

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\* In *Choices, Values and Frames*, edited by Daniel Kahneman and Amos Tversky, forthcoming from Cambridge University Press and the Russell Sage Foundation.

people have less appetite for risk than expected. But prospect theory suggests that if investors, rather like racegoers, are averse to losses during any given year, this might justify such a high equity premium. Annual losses on shares are much more frequent than annual losses on bonds, so investors demand a much higher premium for holding shares to compensate them for the greater risk of suffering a loss in any given year.

A common response of believers in *homo economicus* is to claim that apparently irrational behaviour is in fact rational. Gary Becker, of the University of Chicago, was doing this long before behavioural economics came along to challenge rationality. He has won a Nobel prize for his work, which has often shed light on topics from education and family life to suicide, drug addiction and religion. Recently, he has developed “rational” models of the formation of emotions and of religious belief.

Rationalists such as Mr Becker often accuse behaviouralists of picking whichever psychological explanation happens to suit the particular alleged irrationality they are explaining, rather than using a rigorous, consistent scientific approach. Caltech’s Mr Camerer argues that rationalists are guilty of exactly the same error. For instance, rationalists explain away people’s fondness for betting on long-shots in horse races by claiming that most are simply more risk-loving than expected, and then claim precisely the opposite about investors to explain the equity premium. Both are possible, but as explanations they leave something to be desired.

Being irrational may even be rational, according to some rationalists. Irrationality can be a good to be consumed like any other, argues Bryan Caplan, an economist at George Mason University—in the sense that the less it costs a person, the more of it they buy. A peculiar feature of beliefs about politics and religion, he says, is that the costs to an individual of error are “virtually non-existent, setting the private cost of irrationality at zero; it is therefore in these areas that irrational views are most apparent.” Maybe, although Mr Caplan may grow sick of having those views read back to him for eternity should he ever end up in hell.

In his book, “Alchemies of the Mind: Rationality and the Emotions”, Jon Elster of New York’s Columbia University prefers to look at the other side of the same coin. Observing that “those who are most likely to make unbiased cognitive assessments are the clinically depressed,” he argues that the “emotional price to pay for cognitive rationality may be too high.”

In fact, the battle between rationalists and behaviouralists may be largely in the past. Those who believe in *homo economicus* no longer routinely ignore his emotional and spiritual dimensions. Nor do behaviouralists any longer assume people are wholly irrational. Instead, most now view them as “quasi-rational”: trying as hard as they can to be rational but making the same mistakes over and over.

Robert Shiller, an economist at Yale who is writing a book on psychology and the stockmarket, and is said to have prompted Mr Greenspan’s “irrational exuberance” remark, argues that “conventional efficient-markets theory is not completely out the window...Doing research that is sensitive to lessons from behavioural research does not mean entirely abandoning research in the conventional expected-utility framework.”

Mr Kahneman, the psychologist who inspired much of the economic research on irrationality, goes further: “as a first approximation, it makes sense to assume rational behaviour.” He believes that economists cannot give up the rational model entirely. “They will be doing it one assumption at a time. Otherwise the analysis will very soon become intractable; the great strength of the rational model is that it is very tractable.”

### **Rational taxi drivers!**

What seems certain is that economics will increasingly embrace the insights of other disciplines, from psychologists to biologists. Andrew Lo, an economist at Massachusetts Institute of Technology, is hopeful that natural scientists will help social scientists by discovering the genetic basis for different attitudes to risk-taking. Considerable attention will be paid to discoveries about how people form their emotions, tastes and beliefs. Understanding better how people learn will also be a priority. Strikingly, even New York taxi drivers seem to become less irrational over time: with experience, they learn to do more work on busy days and less when things are slow. But how representative are they of the rest of humanity?

Richard Thaler was an almost lone pioneer in the use of psychology in financial economics during the 1980s and early 1990s. Today he is a professor at the University of Chicago, the high temple of rational economics. He believes that in future, “economists will routinely incorporate as much ‘behaviour’ into their models as they observe in the real world. After all, to do otherwise would be irrational.” Mr Spock could not have said it better.