The Myth of Rationality

by Robert Stone

Introduction

Rationality, in the sense of reasoning, is a very important concept to philosophers. Plato thinks intelligent reasoning gives us all the answers to everything; Kant claims that no one does anything genuinely moral unless she does it because her reason tells him that it is the one moral choice. Yet there is also a tradition of scepticism about our ability to reason. Plato wants to restrict political power to the handful of men, and women, who alone are governed by their reason rather than by some lower mental capacity - which just happens to be philosophers like him. And Kant is so pessimistic about the prospect of anyone being able to listen to his reason rather than to other inclinations that he places reason outside the perceptible world of natural cause and effect and locates it in the transcendent world of things-in-themselves. Poor Bertrand Russell complained that "It has been said that man is a rational animal. All my life I have been searching for evidence which could support this."

I don't think that the pessimistic philosophers are worried about people's IQ. They have noticed what we all notice about other people: even the cleverest of them do stupid things and think stupid thoughts. It is as though our minds are overwhelmed by inclinations other than the desire to reason clearly, and so any ability we may have to reason is negated by all that baggage. What I aim to do in this talk - which of course will be an entirely rational exception to the general rule I have just mentioned - is, first, to show how what we think is rational thinking is often nothing of the sort, and, second, to look closely at what remains - what seems like genuine reasoning - and show that, insofar as it has any real worth, it is not really what we mean by reasoning at all.

Some of you will have read the recent book by Daniel Kahneman, *Thinking, Fast and Slow*, which gives the conclusions of a mass of research carried out over the last few decades into the way people think. It has the merit of being very clear, very thorough, and very entertaining – though that last point, according to its own thesis, is a good reason to be especially careful when judging its contents. Most of the research is in the form of administering tests - usually questions - to large numbers of people, often students at American universities and so, we presume, moderately intelligent. The tests can be, and often have been, easily replicated by other psychologists who are only too keen to show up methodological failings; and so there are some controversies, at least about the implications of some results. But the general findings seem pretty well established. Furthermore, when you read about them, you quickly recognise your own limitations, or at least those of others.

1. Cognitive biases

Kahneman distinguishes two 'systems' in our way of thinking, which he calls 'System 1' and 'System 2'. He does stress that these are not meant to be a literal description of two parts of the brain or mind, just a device for distinguishing two different ways in which we think. System 2 is the rational one, which thinks clearly and logically and, for that reason, often slowly. But it is System 1 that is dominant, even when we believe we are thinking rationally. The result is that we tend to believe things not because there is some reason to suppose they are true, but because of certain 'cognitive biases'.

Here are a few examples.

- We accept an idea because it is familiar to us, or it is presented to us in a nice

way, or it fits what we already believe.

- We are also happy to jump to conclusions on the basis of minimal evidence, as if 'what you see is all there is' (WYSIATI).
- We are influenced by words or pictures we see just before we are told something - whether by accident, or placed there by people trying to influence us - including things we don't even know we've seen, as in subliminal advertising. If a small number has just come up on the roulette table, you will be likely to make a lower estimate of some totally unrelated fact – like the price of a champagne bottle – than if it had been a high number.
- We are particularly hopeless in dealing with statistics, and I want to dwell on one example to illustrate.

Here is the famous 'Linda Problem', where this scenario was presented to students (in the 1980s in America).

Linda is thirty-one years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in antinuclear demonstrations.

The students were asked to rank these scenarios in order of probability:

a) Linda is a teacher in elementary school
b) Linda works in a bookstore and takes yoga classes
c) Linda is active in the feminist movement
d) Linda is a psychiatric social worker
e) Linda is a member of the League of Women Voters
f) Linda is a bank teller
g) Linda is an insurance salesperson
h) Linda is a bank teller and is active in the feminist movement

The only feature I am interested in is scenarios (f) and (h). Nearly all ranked (h) above (f). And, even when only those two alternatives were presented to groups of students in several universities, between 85% and 90% put (h) above (f). Of course, I don't have to explain to you that, regardless of what qualities Linda has, it is simply more likely that she, or anyone at all, is a bank teller than that she is a bank teller with feminist tendencies: the latter category is a sub-category of the former, and therefore smaller. Just to check that this wasn't a cognitive flaw prevalent only in the young, I gave the 'test', or an equivalent one, to various people nearer my age that I've met in the last few months. The result is the same: nearly everyone puts (h) above (f). They all saw the point immediately when I explained it, and felt rather sheepish; I had to admit that I'd made the same mistake when I first read the Linda problem. But they still hated me.

There is some dispute about the implications of such tests. I suspect that, when people read 'bank teller' along with 'bank teller . . . active in the feminist movement', they imagine the mere bank teller as one who is not active in the feminist movement, even though that's not what it says; so they are comparing a non-feminist bank teller with a feminist bank teller. They do not consciously think to themselves, " 'bank teller' means 'bank teller who is not active in the feminist movement' ". But it forms part of their thinking. And that is a crucial aspect of thinking: much of what is included in the process is not consciously present. In the case of subliminal suggestions, we don't *ever* know that they are, at least until someone tells us. In the case of tests like these, we realise afterwards what we must have been thinking unconsciously, but were not aware at the time.

The great mass of psychological evidence amassed by Kahneman demonstrates that the intuition that shapes most of our thinking, though essential for getting through life without getting bogged down every few seconds in systematic reasoning, is full of cognitive biases which makes much of it plain wrong.

In a way this is not surprising. When I engage in thinking, I am not using some special faculty of the mind or switching on some dedicated rational neurons in the brain. When philosophers discuss the nature of the 'self' - i.e. the nature of 'me' or 'I' - it is always assumed that, whatever it is, it is something unified, or at least something that gives us the illusion of being unified. It is the same 'I' that sees, hears, feels, thinks and remembers, and the same 'I' as the one that saw, heard, felt, thought and remembered yesterday and ten years ago. The 'I' that engages in thinking at a particular moment is the 'I' that I have become over a number of decades, with all kinds of ingrained attitudes, memories, tastes, feelings that are a background to any experience I have whatsoever, not to mention more temporary accompaniments such as mood, tension, discomfort in the leg, and what I have just heard or seen. So, if I have to do some simple piece of reasoning such as multiplying 15 by 17 in my head, there will be a context in which I am doing it. Maybe someone has asked me, "What is 15 by 17?" My reaction to the question may be a desire to help someone I like, irritation that I have to take my mind off the TV, suspicion that the inquirer is testing me. I contend that it is simply impossible to have nothing in my mind except the process of reasoning.

In the case of something fairly simple, like multiplication, it is unlikely that any of those things will affect the answer, though they may slow me down, or speed me up, or possibly lead me to think too quickly and make a silly mistake. How much more susceptible to distortion by acquired personality and surrounding feelings is a more complicated piece of reasoning, especially where practical judgment is involved rather than merely following mathematical or logical rules. We've all noticed that just about everybody in the world holds more or less exactly the same beliefs about important matters as their parents, or, if not their parents, the kind of people among whom they live. If someone is asked why he holds that belief, he does not usually say "because my parents brought me up to believe it", but gives some kind of rationale. It is hard to avoid the conclusion that almost all reasons given to justify beliefs about anything important are not the actual *reason for*, in the sense of *cause of*, the belief's being held; they are thought up in order to justify a belief that is going to be held regardless of the relevant evidence and reasons. Not quite all reasons, however; each one of us, in our own minds, is an exception to that rule!

2. Genuine 'reasoning'

Now some might think that I'm exaggerating. You may agree that an awful lot of what people believe to be rational thought is in fact not rational at all, but hopelessly skewed by forms of cognitive bias, such as wishful thinking, laziness, love of the familiar, loyalty to one's earlier beliefs or those of the family or community. But, at the end of the day, you still believe, it is possible to transcend (in a not necessarily Kantian sense) all those anti-rational influences and to think rationally, according to Kahneman's 'System 2'. To express the contrast in a different way, Tim Bayne – a professor of psychology who wrote the OUP *Very Short Guide to Thought* – wrote in the New Scientist of a year ago today that there are two types of train of thought: the associative one, where one thought leads naturally to another, like a game of word association, and the systematic variety which uses evidence and logic. I shall argue that the distinction is illusory, and that the apparently systematic type of thought is merely a subset of the associative one. So let us see what actually happens in the systematic kind of thinking.

You are set a problem to solve by sheer thinking. The first thing to note is that different people - even those who come up with the same answer – have quite different things going on in their minds. Some may talk to themselves out loud, others may have their minds full of pictures, or images of words, or imagined sounds of words. Different things will occur to them at different times, such as earlier problems about Linda the bank teller which warn them against certain ideas, or for that matter quite extraneous memories of something associated with a word or name in the problem. Some might think systematically along a certain route, others might keep being sidetracked by memories and ideas from their experience - including ideas that make the solution suddenly easier but which don't occur to the more single-minded. How do we judge whether you are thinking rationally or not? Simply by the result that you give at the end of it. If you wanted to convince others that you had thought rationally, you would not try to reconstruct all the things that flitted through your mind, but would explain how the answer is a correct answer to the question. It is the analysis of the *outcome* of the thinking, as expressed in words or other symbols, that decides whether the thinking that produced it, and indeed the thinker, are rational.

Let us look at three ways of problem-solving. First, a simple problem of arithmetic, or logic, which has one right answer. 7 x 2. Like most people, I simply remember from learning it years ago that the answer is 14. No reasoning needed there. OK, let's take the more complicated 7 x 15. The tables I learned at school only went up to 12, and so I do not have an automatic remembered response to the question. So what do I do? I DO remember, because it immediately occurs to me, that to multiply 7 by 15, you can multiply 7 by 10 (which is easy) and 7 by 5 (which is easy), and add the two results together. So 7 x 10 is an automatic 70 - learned it in the tables. Ditto 7 x 5, which is 35. So I need to add 70 and 35. No automatic response, perhaps. But again I can do it in steps: first add 30 to 70 (easy, 100 - I just know it), and add the other 5 to 100, which is 105 (obvious).

That entire operation consists of memories – whether of learnt facts or of learnt methods – each prompted by the one before, in the way that I've been trained. Another problem of the same sort is this, which I remember hearing from Peter Millican in this very room. There is a medical condition which one person in a million has. A man goes to see the doctor and asks if he has it. The doctor gives him a test which he says is 99% reliable, i.e. it gives the right answer on 99% of occasions. The test is positive: it says the man has the condition. How worried should he be? Again, I followed the inexorable logic: if the test is 99% likely to be right, and it says the man has the condition, then the man is 99% likely to have the condition. My thinking was as systematic as you can get; pure logic, pure rationality. Except that, as I'm sure you all know, such an inference is completely wrong. Peter Millican explained the true logic of the situation, and showed that the man's chances of having the condition have in fact risen from 1 in a million to about 1 in 10,000. From now on, when given a similar problem, I shall remember the method and quite likely get it right. It's all a matter of having learnt, and being prompted by the situation to remember, the correct steps to take. Whether I get the answer to such questions right or wrong depends entirely on whether I have learnt the correct facts and procedures, and whether – if I have learnt them – they occur to me when prompted.

My second type of problem also has a single answer, but I do not have the time or inclination to go through all the steps necessary to work it out systematically.

This was the *Times* 'Polygon' puzzle on 26 August; you have to make as many words as you can from the letters in the polygon, and there is always at least one familiar word that consists of all the letters. There are 7 letters here, and you probably know the counterintuitive fact that there are 5040 different orders in which they can be put; only one of those orders is a proper word. How do you set about finding it? If you are a system-obsessive, or a computer, you run through all 5040 combinations, matching each against your dictionary, until you come to a real word. That would take me all day, though a computer can do it in less than a second (as I checked on a programme called 'Andy's Anagrams'). I, being a mere human being, just look at the letters, moving them around a little in my imagination, and spot the answer; in this case, it took me about 2 seconds, though on other days an equally familiar word may take 10 minutes to spot. The result of my unsystematic staring is entirely rational: the word 'unscrew' is the only English word (of the 209,000 in the 'Andy's Anagrams' dictionary) which is an anagram of those letters.

How does my brain do it? I have no idea, but it is *not* systematic rational analysis; it's a kind of inspiration, or intuition, or some other such word, which produces an answer which I can then check against the letters to make sure it works. Sometimes my intuition comes up with the wrong answer at first, as I realise when I check the letters off; and so I have another stare. It is not sheer randomness. When I saw those letters, I immediately noticed that the word might start UN, and then I spotted 'unscrew' straightaway. And the fact that I have more than 50 years' experience of doing crosswords must be a factor in my success. But the process is one of seeing what occurs to me, and then checking it to see if it works.

My third type of problem is the much more interesting, and difficult, kind where there is no one right answer waiting to be worked out. For example, what does it mean to have a soul? How can we bring peace to the Middle East? I shall use a rather more manageable example, as I have only 30 minutes. Let us suppose that, when I arrive at school tomorrow, the headmaster asks me to solve a problem that no one has yet managed. There are 40 periods a week on the timetable, but the total number of lessons that pupils in the 5th year (year 11 in government-speak) absolutely MUST have amounts to 43. "Sort it, Stone," he says! Quite apart from all the irrelevant feelings that are likely to occur to me – the desire to impress a brand-new head, irritation that I thought I'd left this kind of stuff behind when I retired from full-time teaching, etc – all kinds of relevant idea might occur to me, or to anyone else, differing according to our experience and temperament. Some of these are facts about the school I think I know, and facts that I don't know won't occur to me; some are bright ideas – e.g. abolish games lessons, reintroduce Saturday morning school for the 5th form. It may occur to me (I hope it would) to ask other people's advice, so that my thoughts are not prompted only by things that I happen to remember or think of. When I eventually produce my

solution, it will be judged as rational or not according to whether it stands up to analysis. If it is judged as rational, then people will say that I am a rational thinker, or that my thinking was rational. But that will not be a comment on the series of thoughts, images, words, moments of despair that happened to pass through my mind; it will be a comment on the *outcome* of that process.

My contention is that *all* rational thinking, of any of those types, is just like any other conscious activity: a sequence of thoughts that prompt each other, with the sequence determined by the existing personality and experience of the thinker and any input from the senses or from other people. A small amount of thinking may be fairly systematic – but only in simple, one-right-answer tasks, where each step in the method leads by memory association to the next. But a lot consists of ideas and memories just occurring to me.

That last phrase might suggest that our thinking is not deliberate but in a sense out of our control. Quite right. Think about memory. It is either triggered by the situation, or it isn't. Whether it is triggered depends partly on the situation itself - e.g. the question that is posed - but even more on the past history of the person concerned. You cannot deliberately remember something, in the sense of deliberately bringing it to mind at a particular moment. If it is already in your mind, and if you happen to have a desire to keep it there, and if there is nothing to distract you, then you can keep remembering it for a time. Similarly, you cannot *avoid* remembering something if the memory is triggered. When I was about 7, my father told me that, if I went down to the kitchen at 3 in the morning, I would find there, on the table, all for me to spend as I pleased, one million pounds . . . just so long as I didn't think about crocodiles. I got the point immediately, and I've spent the last 60 years (nearly) trying to think of some way round it - like getting so old that I really do forget what it is I'm not allowed to think about. The point is that what comes into our minds is triggered by a combination of what is in there already and stimuli from outside. This is not some wacky point, but sheer logic: you can't *decide* to think about something unless you are already thinking about it. We are at the mercy of what occurs to us.

Not only is thinking, even rational thinking, not something we deliberately do. It is often not even done consciously. We are sometimes told that animals cannot reason because they do not have language, which implies an assumption that language and reasoning go hand in hand. So let's see if that stands up. What happens when we talk? Most of us, unless we are drunk or asleep or mad, talk rationally, in the sense that what we say makes sense, is understood by the speaker, conveys what we mean, is understood by the listener. At least some of the things that are said by us are intelligent, thoughtful, logical. But an occasion like this, where I am saying words that I have already thought up, is quite exceptional. In the vast majority of cases where people talk, as in the question session coming soon, or over lunch, we talk impromptu. That means that, although we know roughly what point we want to make, or what impression to convey, the words just come out unplanned. We don't know the end of the sentence we have started, how many clauses it will have, and so on. Sometimes that gets us into trouble, and we lose our way; but generally we produce a perfectly grammatical and syntactically coherent sentence or paragraph with no planning.

No doubt something is going on neurologically, which we may one day discover, but one thing that is NOT going on is a conscious, deliberate decision to say this word or phrase, then this one, then this, etc. We may be speaking consciously and deliberately, but the selection of *this* sequence of words rather than *that* is not accompanied by a conscious, deliberate act of choosing. It just happens automatically, a product of our

past history and the requirements of the moment. Like walking, we just do it because we know how to, without thinking. Every now and then we adjust our movement to avoid a pothole in the pavement, just as we avoid saying a word we realise we were about to say when we remember that it might offend the listener. At those moments we are conscious of what we are about to do, and deliberately adapt; but in between we walk and talk almost effortlessly. And, for the most part, perfectly rationally.

Conclusion

And so to conclude. First of all, much of our thinking is in the form of gut reactions, System 1, and it is very often perfectly adequate. But we are prone to all kinds of cognitive bias, even when we think we are being intelligent and rational.

Secondly, even when we are being as rational as we can be, the rational solutions we come up with are *either* triggered automatically by remembered cues, e.g. 7+5=12, whether we like it or not - a kind of Pavlovian system of stimulus and response, occurring only in the most basic calculations and achievable by the least intellectual of people, and parrots; *or* they occur to us in a variety of non-systematic ways, a kind of thought association, each thought triggered by the previous thought in a way that is determined by our experience, our memories, our mood, in particular the people we are talking or working with.

My contention is that the phrase 'rational thinking' is a transferred epithet: 'rational' properly applies not to the anarchic constituents of our conscious minds – the images, the imagined words, the extraneous interruptions – but to the outcome. The thinking itself is not done in some inferentially connected sequence; it consists of just one damn thought after another. Thoughts, like everything else in the world, just happen.

Recommended Reading:

Thinking, Fast and Slow by Daniel Kahneman (2011), Penguin)
The Intellectual Powers by Peter Hacker (2013), Wiley Blackwell
Thought: A Very Short Introduction by Tim Bayne (2013), OUP
The Concept of Mind by Gilbert Ryle (1949), Penguin