

## Steven Pinker on Rationality – by Jos Burton

### How rational are you?

Here's a quick sample from the book to get you thinking: the Monty Hall Dilemma comes from a famous US gameshow from the 1950s – 80s, that involved a three-door choice. Behind one of the doors was a car and behind the other two are goats. After the contestant selected a door, to heighten the tension, the host would open one of the other remaining two doors, revealing a goat. Then the contestant would be offered the opportunity to change her choice of door or stick with her first choice.

What should the contestant do: stick or switch? All will be revealed later.....

Pinker's latest book: *Rationality* leans heavily on one of my all-time favourite non-fiction books, the Nobel Prize winning: *Thinking, Fast and Slow* by Daniel Kahneman.

It was in *this* book that Kahneman first suggested we have two distinct types of cognitive systems:

System 1 operates rapidly and effortlessly, using short-cuts and heuristics that form our intuition and instincts. It is, as Kahneman ably demonstrates, very prone to cognitive biases.

System 2 requires concentration, motivation and the effortful application of learned rules, and evidenced-based principles of decision making.

### In *Rationality*

Pinker builds on research by Kahneman, Tversky et al – to further illustrate, in more accessible language and examples, what rationality is, why it seems scarce, and why it matters (to quote the blurb on the cover).

As he writes: "Fashionable academic movements like postmodernism... hold that reason, truth and objectivity are social constructions that justify the privilege of dominant groups." Pinker's line is that while we may never definitely establish objective truth, objective truth nonetheless exists, and our best means of getting closest to it is through rational understanding.

But what does rationality actually mean? Essentially, it amounts to a set of rules and tools that help us to eliminate bias, bigotries, phobias, superstitions and what Pinker calls the "cognitive illusions" (noise) that stand between us and our clearest perception of reality. Among these tools are systems of logic, probability and empirical reasoning.

As Pinker points out, rationality is really just a means of getting what we want, thus even the most irrational people are capable of making rational choices. Where things become difficult is when our brains, which have evolved to seek mental shortcuts, lead us astray – a fate that regularly visits even the sharpest of minds.

In the book, Pinker explores a range of cognitive 'rules and tools' using accessible analogies and then relating them to the more complex and serious issues such as our responses to the pandemic, cancer diagnoses, investment banking, the legal system and political governance etc.

The chapters cover such related topics as: Bayesian Reasoning, Probability and Randomness, Correlation and Causation, Logic, Risk Analysis, and Game Theory.

### **Whose side are you on?**

One of my favourite examples of cognitive bias is called: Myside Bias – where researchers show complex and potentially controversial data to two competing/conflicting social groups i.e. Republicans and Democrats, on issues such as gun control, or abortion. The research shows that each side picks out the data that reinforces their side of the argument and overlooks the base-rate data. We all consistently miss or fail to grasp the base rate!

A paradigm case of base-rate neglect is medical diagnosis. Suppose that the prevalence of breast cancer in the population of women is 1 percent. Suppose that the sensitivity of a breast cancer test (its true-positive rate) is 90 percent. Suppose that its false-positive rate is 9 percent. A woman tests positive. What is the chance that she has the disease?

The most popular answer from samples of doctors given these numbers ranged from 80 to 90 percent.

The correct answer is 9 percent. Even medical professionals consistently miss the base-rate and think there's a 90 percent chance she has cancer whereas in reality, there's a 90 percent chance she doesn't!

Medical students are often told: if you hear hooves beating up to your door, it's probably horses and not zebras!

And then there's Irwin, the hypochondriac who told his doctor, "I'm sure I have liver disease." "That's impossible," replied the doctor. "If you had liver disease, you'd never know it – there's no discomfort or signs of any kind." Irwin replies, "Those are my symptoms exactly!"

### **And in real life?**

So, how does a gameshow brainteaser have any application in real life? Because we jump to wrong conclusions all the time, by relying on habit and intuition, and by fearing change. The anti-vaccine movement, says Pinker, is a case in point. It focuses on extremely rare reactions to vaccines and ignores the far more common consequences of not taking a vaccine.

Returning to the top of this paper and the Monty Hall Dilemma what did you think the contestant should do: stick or switch??

Most people choose to stick – they reason that as one door has been eliminated, they now have a 50/50 chance and want to stick with their first choice out of inertia, pride, or fear of

loss (our fear of loss consistently outweighs our joy of gain, even when the odds are the same for both!).

Marilyn vos Savant was known at the time as 'the world's smartest woman' because of her entry in the Guinness Book of Records for the highest score on an intelligence test. Vos Savant wrote that you should switch: the odds of the car being behind Door 1 is one in three, whereas the odds for Door 2 is two in three.

At the time her reasoning drew tens of thousands of angry letters, many from PhDs in maths and sciences – saying she was wrong. Even today, Andrew Anthony, the Guardian columnist who reviewed this very book, still got it wrong, even whilst trying to explain how it worked!! It's so counter-intuitive, but the maths hold up. System 2 is way more accurate than System 1.

Imagine instead of three doors there are one hundred. After you've made your choice, the gameshow host (who knows exactly where the car is, remember) opens 98 doors revealing all goats. There's now only one door other than your original choice, would you still stick, or switch?

### **Rationality and Morality**

Pinker admits his "greatest surprise in making sense of moral progress is how many times in history it starts with reasoned argument. A philosopher wrote a brief which laid out arguments on why some practice was indefensible, or irrational, or inconsistent with the values that everyone claimed to hold. The pamphlet or manifesto went viral, was translated into other languages, was debated in pubs and salons and coffeehouses, and then influenced leaders, legislators, and popular opinion. Eventually the conclusion was absorbed into the conventional wisdom and common decency of a society, erasing the tracks of the arguments that brought it there. Few people today feel the need, or could muster the ability, to formulate a coherent argument on why slavery is wrong, or public disembowelment, or the beating of children; it's just obvious. Yet exactly those debates took place centuries ago."

And when it comes to arguing against reason, as soon as you show up, according to Pinker, you lose. Thomas Nagel compared it to Descartes' argument that our own existence is the one thing we can't doubt, because the very fact of wondering whether we exist presupposes the existence of the wonderer. The very fact of interrogating the concept of reason using reason presupposes the validity of reason. In a similar way, Pinker suggests that if you were to claim everything is subjective, he could ask, "Is that *statement* subjective?" If it is, then you are free to believe it, but he doesn't have to. Likewise, when claiming everything is relative, "Is *that* statement relative?....."

At the end of the book, Pinker writes: "Our ability to eke the increments of wellbeing out of a pitiless cosmos and to be good to others, despite our flawed nature, depends on grasping impartial principles that transcend our parochial experience." (System 2 over System 1). His quest for reason has, after all, segued into a recognition that transcendence is no flight from critical thinking, but an inescapable part of our humanity.