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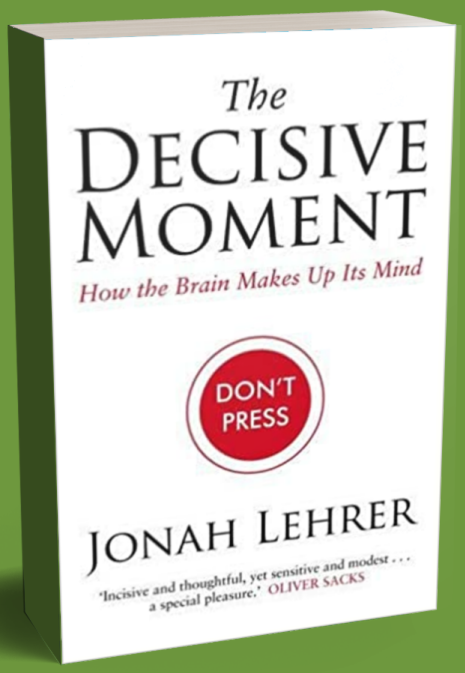
A READING LIST
TO STIMULATE DEBATE

JIM'S READING CORNER

THE DECISIVE MOMENT
HOW THE BRAIN MAKES UP ITS MIND

BY JONAH LEHRER



This book is in the same vein as Taleb's "The black swan" and Kahneman's "Thinking fast, thinking slow". It is fascinating and a really good read. Depending on the situation, says Lehrer, we should go with instinct or analysis. The old occidental 'wisdom' starting with Plato and going on to Descartes and Kant is disproved by imagery of the brain: it is wrong to assume that development means the intellect or reason overcoming instinct and emotion. Psychopaths or autistic people do not suffer from a lack of intellect but from a lack of emotion. Pure reason, unadulterated by emotion, can turn people into monsters or into people incapable of taking any decisions. In fact, our best decisions are a finely tuned blend of both feeling and reason. The trick is to know when to lean more on one than the other.

Lehrer, who draws on research done by Kahneman, looks at the experiences of pilots, sportsmen, investors, serial killers. In the typical American fashion, he always starts with concrete examples or happenings and then draws lessons from them. He shows that both reason and feelings have important strengths and weaknesses.

The Quarterback in the pocket: this is about how a football player chooses the right option at the right time, deciding without having the time to think. The metaphor of Plato's chariot is wrong, and so is Freud's view of the "id" of crude desires versus the "ego" of the rational brain. The example of a man who underwent brain surgery and lost his emotions shows that when we are cut off from our feelings, the most banal decisions become impossible (see also Damasio's research). The OFC (orbitofrontal cortex) is responsible for integrating visceral emotions into our decision-making process. It connects feelings generated by the primitive brain (brain stem, amygdale, etc. in the limbic system) to the stream of conscious thought. Its role is not to protect us from our emotions or to fortify reason against emotions, it is the opposite.

The Predictions of Dopamine: how in 1991, during the first Iraq war, Michael Riley, monitoring a radar screen on board the HMS Gloucester, had just a few seconds to decide whether a dot on the screen was an American fighter returning to its base or an Iraqi missile... and got it right. It was a missile and it was shot down. Something had struck him while watching the screen, even though the radar could not distinguish between a missile and a plane. It took the investigators two years to find out why Riley had picked out the missile among all the fighter

planes; the timing was the secret. Unlike the fighter planes, flying at 3,000 feet, the missiles travelled at 1,000 feet and the signal was initially masked by ground interference (before the missile reached the sea). But how did Riley spot this time lag in the appearance of the dot on the screen? The answer lies in a single molecule called dopamine: it produces pleasure, but in fact helps regulate all our emotions. The Anterior Cingulate Cortex (ACC) is involved in the detection of errors. It contains spindle neurons (cells) that convey emotions to the whole brain. Dopamine neurons predict feelings, and when there is an error, they raise the alert. If the "error" persists, they will adjust (see what happens in the case of seasickness). Learning from mistakes is a natural way of progressing: dopamine neurons need to be continually trained and retrained, or else their predictive accuracy declines. Self-criticism is the secret of self-improvement; negative feedback is useful.

Fooled by a feeling: the story of a woman treated for Parkinson's' disease with a drug imitating the activity of dopamine in the brain. This helped her, but as a result she developed a severe gambling addiction. The neurons became obsessed with surprising rewards, which excite more than predictable ones. For people on dopamine agonists, the rewards of the casino trigger a massive release of chemical bliss. While dopamine neurons help us predict events, they can also lead us astray, when we are confronted with randomness (the illusion of streaks of luck!). That is why it is silly to try and beat the market with your brain. Dopamine neurons are not designed to deal with the random oscillations of Wall Street. Over the long run, a randomly selected stock portfolio will beat the expensive experts with their fancy computer models (see Taleb on this, too!). Another instance of "fooled by feelings": the pain of losing makes you take irrational decisions (see also Kahneman about loss aversion). Bad is stronger (has a stronger emotional charge) than good, there is a negativity bias. It takes only one wounding remark to spoil the relationship with your spouse, while to repair it you need many positive strokes. Emotions also overvalue immediate gains at the cost of future expenses: this is why credit cards can become quite toxic for people. Clever marketing experts therefore print the immediate advantage in big print and the future pain in small print.

The uses of reason: here, Lehrer tells the story of the fire-fighter beating the pursuing wall of fire with ...fire. All his colleagues died, trying to run away from the wall of the fire (Mann Gulch fire in Montana in 1949). They were in the grip of panic, with the perceptual narrowing that goes with it, they did not use their prefrontal cortex where rational thought is located and which acts as the conductor of an orchestra. Lehrer also mentions the case of this pilot whose plan's three hydraulic systems had collapsed and who used the thrust levers to stabilise the plane. He could do it because he kept his emotions under control and made his rational brain work. Adolescents on the other hand engage in risky, compulsive behaviour because their mind has not yet learned to restrain them. While the emotional brain is operating at full throttle, the mental muscles that check the emotions are still being built.

Choking on thought: a little rational thought can save the day, but you can also choke on thought; sometimes rationality leads astray. Take the example of opera singer Renée Fleming, who one day started analysing her singing, or this golf player who suddenly lost his game by thinking too much about his strokes. The brain can only handle a limited amount of information. If you overload it, the result will be worse. There is another interesting phenomenon: our prefrontal cortex can be hoodwinked quite easily. This happens with the so-called 'anchoring effect', for instance (see Kahneman). The prefrontal cortex has a certain inability to dismiss irrelevant information. A wealth of information often creates a poverty of attention. With Magnetic Resonance Imaging, doctors suddenly find a lot of cases of disc abnormalities and are tempted to link back pain systematically to those abnormalities. But if fact they are very often not the true origin of the pain!

After these examples illustrating the effect of the brain's duelling systems, Lehrer turns to a separate realm of decision-making: as it happens, some of our most important decisions are about how we treat other people.

The moral mind: the psychopath does not feel any empathy with others and thus makes poor moral choices. The lack of emotion is what characterises him. The problem seems to be a broken amygdale, a brain area that is responsible for propagating aversive emotions such as fear and aversion and anxiety. All our history of enlightenment is based on the assumption that rationality engenders morality (see Leibnitz, Descartes, Kant...). Our legal system is also based on a similar assumption: people who demonstrate a lack of rationality often are not condemned because the rational brain allegedly is responsible for distinguishing between right and wrong. Neuroscience however proves that there is nothing rational about moral decisions. In fact, the rational brain is rather used to provide persuasive reasons for justifying moral intuition. Moral decisions above all require taking into account other people. Autistic people have the problem that they look at people with the part of the brain that normally recognises objects. They feel no emotion. This is a permanent phenomenon, but it is also possible to

induce a temporary state of mind blindness in which the parts of the brain that help sympathise with others is turned off: if you hide the other person from your view, if you look at statistics rather than persons, if you bomb from a great distance...

The brain is an argument: the brain is like an editorial board where rival parts are struggling to make decisions. There is a vigorous cortical debate. In this respect, the nucleus accumbens (NAcc) play an important role; they are part of the dopamine reward pathway and reflect the desire for an item. But then the insula and the prefrontal cortex are activated to check the process. The insula produces aversive feelings, for instance when spending money. The prefrontal cortex weighs the costs and benefits. But the reasoning is not necessarily flawless; party affiliates, for instance, tend to use reason to preserve their partisan certainty. Actually, pundits and politicians do often just that and are more often wrong than random choice would have it. The fact that the arguments inside the brain are unsettling - which is an advantage in some ways (you analyse problems from various angles) - can turn into a handicap by making you insecure. That is why people tend to fall for the certainty bias, turning off the brain areas that contradict their assumptions. The ability to tolerate dissent is absolutely crucial for good leadership.

The Poker hand: here, Lehrer describes the tactics of Michael Binger, who excels in poker. He looks at his hand both with a mathematical eye (probabilities) and with his feelings. This is important because of randomness and because of the finite capacity of the brain. When you buy a car, and look at too many criteria, you end up losing sight of the really important elements for you. Studies show that the longer shoppers pore over their options at IKEA, the less satisfied they are with their decisions. Paradoxically, it is the easy problems that are best suited to the conscious brain. When buying a house or a car; it is important to use your intuition as well. You must use both sides of your brain.