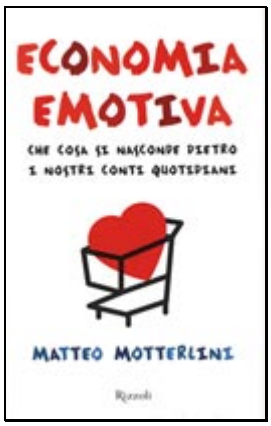
MATTEO MOTTERLINI –
ECONOMIA EMOTIVA / *EMOTIONAL ECONOMICS*



They said about this book:

Daniel Kahneman

"I am happy that this book will make available the exciting developments in the behavioural economics and neuro-economics, and hope that its publication will increase interest in the topic, both in the general public and among policy makers."

Massimo Piattelli Palmarini (author of "Inevitable illusions")

This book is an entertaining and stimulating, but also exhaustive and subtle, synthesis of a fascinating new research field with endless practical applications. With rare mastery in scientific communication, the author casts light on the intimate fusion of economics and psychology.

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Introduction (pp.11-15)

In our everyday economic choices we deceive ourselves. Rather like Charlie Brown, with his bewilderment on meeting the "little ed-haired girl", our minds are often over-heated with emotion and befuddled. When we save, spend and invest, we are not the rational and lightning-fast calculators of 'utility' envisaged by the mathematical models of economists. Instead, the computer between our ears has a very slow processor, little memory, and more bugs than we care to admit. As if this were not enough, in our everyday lives we feel joy, fear, anger, jealousy, envy, disgust, and many other emotions which condition our decisions in largely uncalculated ways.

There is nothing wrong with this as long as we are aware of it. And the best way to gain this awareness is to put ourselves to the test. This the reader will shortly be able to do with a series of small-scale experiments, concrete cases, tests, puzzles and riddles illustrating recurrent paradoxes and anomalies in our everyday economic choices. This book is an invitation to understand how we are made, to investigate our cognitive processes and the workings of our brain. Obviously in the hope that we will learn to use it better, so that we may decide more wisely, or simply become more discerning consumers.

Some of our errors are the rule rather than the exception. That is to say they are systematic, and once they have been pointed out to us, we can avoid repeating them. For example, have you ever asked why we spend our salaries and our bonuses differently? We do so because – as Part One shows – we tend to keep separate 'mental accounts'. As a consequence, we set different monetary value on an euro according to how we have acquired it and how we are going to spend it.

Errors like this are obstinate and insidious. Like optical illusions, they have us believe that false impressions are true. Both visual and cognitive illusions are induced by automatic and spontaneous processes whereby we decode reality in rapid and intuitive manner, but also carelessly and misleadingly. We sometimes make diametrically opposed decisions about the same problem because of how we have conceived it or how it has, perhaps deceitfully, been presented to us. Otherwise, why do we prefer a 95 percent low-fat yoghurt to one containing 5 percent fat? Or a 80 percent cashmere sweater to one containing a 20 percent wool mix? Similarly, our attitude to risk differs according to whether it is likely to bring us gains or losses. The latter vex us much more than the former gratify us, and to avoid them we do the impossible: we act so recklessly as to be self-destructive.

We live amid uncertainty. And uncertainty constantly forces us to make decisions. But not always are these decisions wise, not even when we put ourselves in the shoes of a financial guru or an expert family physician. As Part Two of this book shows, our perception of risk is variable, and the way in which we understand figures, proportions, percentages and statistics is easily influenced. Numbers are anything but cold and objective to our minds, which frequently colour them emotionally, with consequences as irrational as they are surprising. We are also betrayed by our tendency to think that we know things that we do not, or to believe that we are more skilled or competent than we actually are. This is the overconfidence trap. We fall into it, for example, when we blame our failures on bad luck but claim all merit for our successes. Or when we see only what we want to see, clinging to beliefs and prejudices even when they conflict with the evidence.

The process by which we make our choices has been subjected to intriguing inquiry by cognitive psychologists, neuroscientists and experimental economists. Their researches have highlighted the inadequacy of an economic theory which has every decision depend on the pursuit of-"utility maximization". They also show how people tend to be irrational, and above all why. From this point of view, the Nobel Prize for economics awarded to a psychologist like Daniel Kahneman – the declared hero of this book – marks a watershed.

We may be wrong-headed, but there is method in out stupidity. Our errors are pervasive, recurrent and predictable. They stem from a logic different from that of mathematics, but no less systematic, which follows mental (or heuristic) patterns investigated by numerous ingenious experiments. The result is a "gallery of economic errors (or horrors!)" explained by some sort of cognitive unconscious which filters reality and determines our reactions.

This hypothesis has been born out by studies on the brain and on the neurobiology of rationality discussed in Part Three. This research has generally employed instruments which allow the monitoring and visualization of cerebral activity. It suggests that our decisions derive from ceaseless negotiation between automatic and controlled processes, between affect and cognition – or more banally between emotions and reason – and from the interplay among the synapses of the corresponding cerebral areas.

The two processes often compete against each other – as when we make irrational choices by falling into some cognitive trap. This happens when we are driven by an (heuristic) gremlin which frets and fusses inside us, leaving us no time to reflect. Or when we gorge on chocolate even though we know that we are supposed to be on a diet. Prey to our urges, we thus sacrifice a little of our future well-being for immediate pleasure. Yet we shall see that this inner gremlin is not always an obstacle against our choices. It is not enough to know what should be done to make the right decision; also the body must 'feel' that the decision is right. As if the instruments of rationality require special assistance in pursuit of their plans: a bit of passion helps!

Perhaps, if our minds were governed solely by reflective and deliberate processes, and if our brains consisted only of the prefrontal cortex (the part that distinguishes us from reptiles and from other mammals, the seat of higher cognitive activities), then conventional economics would be a good theory of our real choices. But in this case, rather than inhabitants of planet Earth, we would be extraterrestrials. Perhaps we would be Vulcans, with pointed ears and logical minds entirely devoid of emotions, like Doctor Spock in the *Star Trek* television series. Luckily, life is different from what we see in our favourite TV series, and our emotional economy is much more rich, varied, alive, astute, bizarre, fickle, and entertaining than described by the textbooks. The ways of our neural circuitry are infinite, and we learn different lessons from them according to the circumstances. Rarely are they obvious lessons, but this we only discover in the end.

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Towards a neuroeconomics of everyday life

Neuroeconomics has further interesting lessons to teach us, and some of them undermine the received wisdom.

For example, it is often assumed that the value of money depends on what it can buy; that is, on the pleasure received on possessing something purchased with one's own money. But the neurobiological evidence says differently; it says that money produces pleasure in and of itself. Rather like Scrooge McDuck in the Mickey Mouse cartoons, who gloats his money without the slightest intention of spending a single dollar on a new top hat . In fact, the dopaminergic circuits of gratification activated in the subcortical area of the striatum are the same as those excited by food and drugs (cocaine in particular): all the more so, the more they are directly and immediately gratifying to us.

If money gives pleasure in itself, then we may assume that spending money is painful. Otherwise, how can we explain the use of credit cards (plastic money), flat-rate tariffs (e.g. for ASDL connections), package holidays, or all the solutions designed to attenuate the pain of payment? And they are designed well, if it is true – as it seems – that we are willing to pay more for a purchase by credit card than in cash. Opening our wallets and counting out banknotes is evidently more painful than handing over an attractively designed credit card.

Observation of neuronal activity also shows that the striatum reacts directly not only to money, but also to the simple anticipation of a monetary gain. Indeed, it does so proportionally to the amount. Corresponding to a quantitative increase in money is an increase in the neuronal excitation of the area involved. But it is not excited when the anticipation concerns a monetary loss. In this case, a very different area – that connected with fear and danger signalling – is excited: the amygdala. As the reader of this book well knows, we give different weights to gains and losses; and so too, it appears, do our brains.

Moreover, the direct pleasure that we get from money depends on how we have obtained it. Functional magnetic resonance records greater activity in the cerebral reward areas if we have earned the money, than if we have won it on the lottery, or if it has been given to us. We know that hard-won successes give us the greatest satisfaction. So does the brain, which has the utility of money depend upon its provenance. Do you remember mental accounts (described at the beginning of this book)? They may correspond to the economy of your brain.

Another interesting lesson concerns the neurological correlates of risk evaluation As we know, emotions influence risk-perception in systematic and predicable ways. For example, it is believed that anger makes us more likely to take risks, overriding the threat. Sadness instead makes us more cautious: in the sense that, as the perception of danger increases, we grow more risk averse, and therefore more thoughtful in our choices.

Also fear makes us cautious of risk. And this concerns the amygdala: the area of the brain which constantly sifts signals of external danger, reacting to them by activating automatic processes. But the amyglada also receives instructions from the neocortex, which may accentuate or adjust the automatic responses. The amygdala is a sort of archive of the emotional memory. If it is resected from the rest of the brain, the result is an inability to assess the emotional significance of events. Without the amygdala we are affectively blind. When it is resected in animals, they no longer feel anger or fear.

Give its crucial role in shunting affective and cognitive mechanisms, the amygdala has rightly been the protagonist of numerous experiments. The already-mentioned ones by Joseph LeDoux on rats are among the most illuminating. The rats are 'conditioned' to fear by making them hear a sound which is invariably followed soon after by a painful electric shock. After a while, an association is established between the sound and the electric shock, so that the rats immediately react to the sound by showing fear: that is, by jumping.

However, if in a second phase of the experiment, the rats are repeatedly made to hear the sound without it being followed by a shock, after a while the conditioning disappears. This second rapid learning process may signify two things: that the memory of the sound/pain association in the amygdala has faded; or that the neocortex has corrected the conditioned reflex, replacing it with the appropriate response to the new circumstances.

Knowing which of these two hypotheses is correct requires investigation of the relation between the amygdala and the neocortex, and therefore between automatic processes and controlled processes. The answer can be obtained by acting directly on the rats' brains – after their conditioning to fear, and after the subsequent deconditioning whereby the relation between sound and electric shock is severed – by selectively damaging the neural connections between amygdala and neocortex. Now, on hearing the sound, a rat whose connection has been severed once again displays fear (by jumping). It is therefore likely that the sound/fear nexus has not disappeared from the amygdala's 'memory', but has instead been suppressed by the deliberate operation of the neocortex.

From rats to humans, it is reasonable to suppose that the connection between amygdala and neocortex follows similar neuronal routes. Also in humans, certain simple and immediate emotions are felt in the core of the body before the mind becomes aware of them.

The amygdala also plays an important role in choices made under conditions of risk and uncertainty. It has been shown in experimental settings that, in the case of a game with a clearly stated reward, it is the dorsal striatum (the reward centre we are now familiar with) that is activated. But when, in an almost identical game, the odds of winning are unknown or ambiguous, it is the amygdala that is activated. The latter also intervenes in processing the risk-perception of events which we feel beyond our control – for example, mad cow disease, avian flu, air travel, or terrorist attacks – so that they seem riskier than the cold statistics state.

Advertising messages are designed to activate the 'right parts' of the brain. And the right parts in this case are the areas of gratification and empathy – that is, the striatum, the orbitofrontal cortex, and the mirror neurons.

Let us return briefly to rats. These can obviously be conditioned not only to the sound/fear relation, i.e. fear, but also to the relation between a sound and any other stimulus, for example sound/food, i.e. pleasure. Also humans can be conditioned, and this is the aim of advertising (and not only). For a television commercial, for example, to be effective, it must stimulate the areas responsible for self-imagination and reward, and associate them with the product being advertised.

If we could apply *f*MRI to the brain of someone watching a television commercial, we would be able to say which cerebral regions are effectively activated; and therefore whether the commercial has fulfilled its purpose. This is roughly what Marco Iacoboni from the UCLA did during the American Superbowl. This is an event that attracts millions of viewers and, during the commercial breaks, it is also the arena for an equally fierce contest among advertisers.

While a number of volunteers watched, under functional magnetic resonance, some of these extremely expensive commercials – which were being broadcast for

the first time – the scientists could see what was happening to their brains. They were therefore able to determine the difference between what the brain 'said' and what its owner said. They found in particular that a commercial could be judged positively but not be at all effective, and vice versa. This was because the judgement expressed might be influenced by social pressure: for example, by the fact that we all want to be 'politically correct'. So the women (the majority of them) said what they believed that they were supposed say, and rejected a commercial because it used a raunchy model to publicize a cell phone, for example. But their brains might indicate something very different: namely that the commercial exploiting women effectively activated (unconsciously) the cerebral areas concerned with empathy and identification. Thus, in general, a pleasant commercial, telling a good story, morally edifying, and able in a few seconds to arouse our explicitly declared enthusiasm, may be entirely unable to activate our centres of pleasure and empathy, and therefore fail to stimulate us automatically, so to speak, to purchase the product advertised.