

Nature and Nurture Behind our Decision-Making

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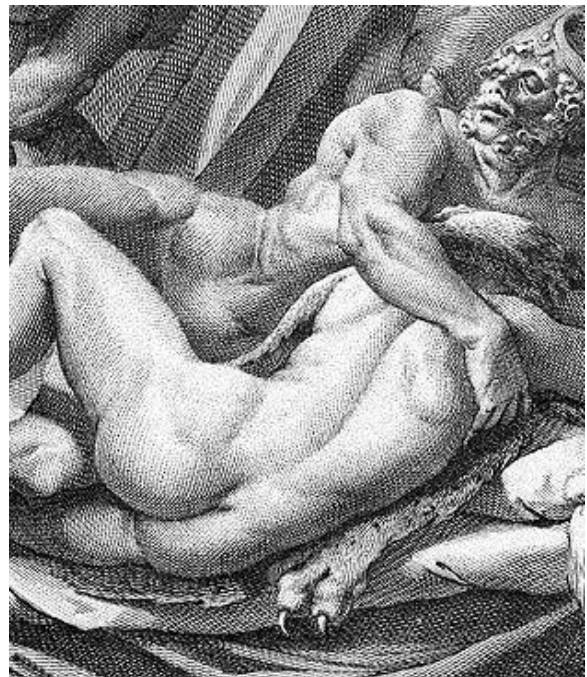
A couple of years ago, around April 2018, I attended what has probably turned out to be the most interesting speeches of the last few years. (I could be a bit biased here, as, of course, it was the last conference I have physically attended – and not only joined via Zoom or WebEx or whatever). Plus, it was held in Naples, a unique city in which incredible history, culture and costumes seem to naturally encourage you to reflect on the relationship between nature and nurture.

I was one of over 500 participants. We were talking about the future (little did we know...).

Among the keynote speakers in a plenary session, a well-known Italian philosopher explained how technology has come to prevail over humans (also, little did HE know).

With his presentation, he conveyed to the audience the fascination of humanistic culture, with references ranging from Plato to Heidegger, to the most important historical events that have marked the 20th century. At the

end of the presentation, he received one of the warmest applause of the whole conference. I was obviously among those who cheered for him, fascinated by his ability to synthesize so many elements and connect so many important dots throughout the history of humanity. However, I did not agree with his premises nor with part of his conclusions.



Epimeteo and Pandora – Agostino Carracci

The philosopher told the story – narrated by Plato – of Prometheus and Epimetheus (Fig. 1 in this representation, together with Pandora), according to which the twin Titans were responsible for distributing different traits among the newly created animals. Epimetheus was responsible for giving a positive trait to every animal. He also allocated different “*instincts*” until, when he arrived at the human being, he realized that there were no more left (Epimetheus, indeed, might mean “hindsight,” or “afterthinker”). So, man would differ from animals – according to the philosopher – for the absence of instincts, in place of which he was given technical expertise and the art of fire.

This is a very important point. A part of classical culture has ignored for a long time, even in economic studies, that the behavior of human beings is determined by their nature, as well as their culture, and that nature and culture are linked by a relationship of mutual conditioning.

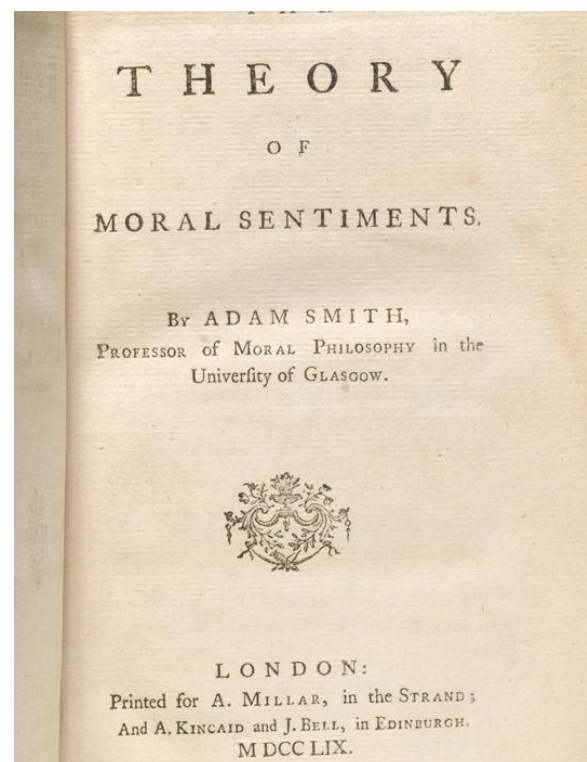
In the third millennium, we certainly cannot ignore evolutionism and scientific discoveries about the way our biology determines our behavior. We do not come into the world as a “*tabula rasa*” that only acquires behavior as a function of education, social and environmental contamination across a lifespan. At birth, we are already equipped with some operating rules – written in our genes – although many of these rules still need to be activated by experience [1].

Neuroeconomics and Neuromarketing

We are biological creatures; everything we originate from a biological process.

Neuroeconomics studies the neural basis of our economic decisions; neuromarketing studies the neural basis of one part of those decisions: purchase/consumption decisions.

In his Theory of Moral Sentiments, Adam Smith suggested that consciousness and humans’ positive behavior are intrinsic parts of their psychological structure and are activated quite naturally by social relations.



Theory of Moral Sentiments, Adam Smith

In his book, Smith describes an acrobat who walks suspended on a rope swinging in the air. The spectators below him also swing, as if to imitate the movement of the acrobat.

Today, we explain this behavior with mirror neurons, aka “neurons of empathy.” Their discovery was so important that Vilayanur Ramachandran compared it to that of DNA.

Mirror Neurons

Giacomo Rizzolatti and his research team discovered that the frontal and parietal cortex of the macaque monkey brain are characterized by neurons that respond selectively to specific gestures. The mirror neuron responds to the “purpose” of a gesture, not the gesture itself, both when the gesture is performed and when the gesture is simply observed.

Mirror neurons allow us to understand the intentions that guide the gestures of others; they are the basis of empathy and our ability to understand others. Also, thanks to mirror neurons, human beings have been able to start learning by imitation, thus being able to “read” the actions of others as if they were their own, giving rise to the formation of culture (for a more in-depth study of the subject, I recommend reading “Mirrors in the Brain”, a text in which Rizzolatti and colleagues explain – with outstanding clarity – how our minds are biologically created to share actions, emotions and experiences in a social way).

Therefore, culture draws its origin from nature. Evolution leaves no room for alternative explanations.

The Ultimatum Game

Orthodox economics did not take this into account when building its theories on the hypothesis of *homo economicus*, i.e., a rational subject who continuously maximizes his own utility. A subject that puts personal gain first place.

An experiment based on a game – called the Ultimatum Game [2] – was enough to shake *homo-economicus*-based economic theories.

How does the game work?

Imagine that you are involved in this activity together with another player that we will call the proposer.

The game is not repeated and is anonymous.

You know that we have given the proposer 100 euros to play. The proposer will have to decide which part of the 100 euros to offer you, knowing that:

- if you accept, you keep the proposed amount for yourself, and the proposer keeps the rest;
- if you don't accept, no one will take anything.

For example, the proposer proposes the following distribution of the sum:

- 5 euros for you and 95 euros for himself

If you accept, you earn 5 euros, and the proposer earns 95 euros. If you refuse, you are both left empty-handed. Game over. What do you do, do you accept?

A *Homo Economicus* would accept any positive amount, even 1 euro, because that is the decision that maximizes their profit. Contrarily, during behavioral experiments, real flesh-and-bone people will hardly accept sums below 30% of the prize money.

So, this game shows that, when personal gain comes into conflict with a sense of fairness, behavior may deviate from pure rationality.

Is this deviation due to our culture – more specifically, to the environment in which we grew up – or to our nature?

Experiments with the ultimatum game were repeated, this time with the support of fMRI (Functional Magnetic Resonance Imaging). It was discovered that, when individuals are confronted with a proposal that they consider unfair, such feeling or perception of unfairness activates a part of the brain called the insula, which – among other things – is associated with disgust.

In short, we tend not to accept an offer that we consider unfair because it triggers disgust. The ultimatum game is just one of the many examples of how behavioral and neuroeconomic research

has led to a rethinking of the foundations of the economic discipline.

Nature and culture are intimately linked.

Culture & Nature: the Pepsi Challenge

If it is true that nature, at some point in human evolutionary history, began to generate culture, it is also true that the latter can influence the former. A well-known experiment shows how cultural preferences can influence brain activity (thus our nature).



[John Fornander](#) on Unsplash

Anyone who has gained experience in marketing knows the story of the Pepsi Challenge.

In 1975, Pepsi Cola Company executives decided to launch an experiment called the Pepsi Challenge [3] generating a great impact on the public.

The experiment was very simple. Blind taste tests were set up in thousands of shopping malls and supermarkets and recorded the preferences of whoever

was willing to take part in the test. One glass contained Pepsi cola, the other Coke.

After a blind tasting of the two options, more than half of the volunteers preferred the taste of Pepsi to that of Coke. Pepsi's executives believed that their product would have substantially eroded Coca-Cola's market share.

It is pointless to underline that the forecast was proven wrong.

The debate was alive for many years and was based on the following dilemma: why do consumers prefer Pepsi but still buy Coca-Cola?

One possible explanation is related to the fact that the Pepsi challenge was a "sip test." For just one sip, people would tend to prefer the sweeter product (in this case, Pepsi), which might not be the case when drinking a whole can (for more details I invite you to read "Neuromarketing" by Martin Lindstrom, a book that provides several anecdotes about how the brain, the brand and emotions drive consumer choices).

Neuromarketing techniques developed in more recent years, however, have allowed measuring the role of the emotional dimension driving the choice between Pepsi and Coke.

One of the most important neuromarketing studies (a study with stated medical purposes published on Neuron) investigated how associations between favorable expectations and

brand alter the value signals experienced [4].

Some 30 years after the Pepsi Challenge, McClure and colleagues replicated the experiment using both classical survey techniques (self-report) and fMRI.

The goal was to assess which part of the brain was activated by tasting under blind and brand-viewing conditions. The behavioral part of the study confirmed that, in the blind condition, the participants are not able to distinguish between the two colas and showed that their stated preferences are influenced by what they believe to be the brand of cola they are tasting.

The most interesting part of the study is the one carried out in magnetic-functional resonance. The study in fact showed how, in the two tasting conditions (blind / not blind), different areas of the brain were activated when tasting Coke and Pepsi cola.

By making participants taste the two colas telling them that they were (first condition) drinking Coke (even when it was Pepsi) and (second condition) drinking Pepsi (even when it was Coke), it was found that believing they were drinking Pepsi did not produce significant results, while believing they were drinking Coke was associated with changes in activity in brain areas associated with memory. When we think of drinking Coca-Cola, we automatically retrieve from memory all the experience

of the brand's advertising campaigns, campaigns that probably accompany us from early childhood, and this mnemonic activity is associated with an increase in brain activity related to the evaluation of pleasant experiences.

Marketing can be used to build a brand so strong that it enters our culture and influences our biology.

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There may be several reasons why it is useful to understand human behavior. In

any case, the study of human behavior cannot be separated from the study of our nature, a nature so strong that it leads us to make decisions of which we are very often unaware.

P.S. The careful reader will have observed that it was not indispensable to recall the image of Epimetheus and Pandora to support this story. The truth is that I also thought to exploit human nature to make the article more catchy based on one of the most "ancient" discoveries of marketing: nudes sell!

Recommended Reading

(1) **Rizzolatti, G.** (2016). In te mi specchio. Per una scienza dell'empatia, BUR, p. 41.

(2) **Güth, W., Schmittberger, R., & Schwarze, B.** (1982). An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior & Organization*, 3, 367-388.

(3) **Lindstrom, M.** (2008). *Neuromarketing. Attività cerebrale e comportamenti d'acquisto*, Maggioli Editore.

(4) **McClure, S. M., Li, J., Tomlin, D., Cypert, K. S., Montague, L. M., Montague P. R.** (2004). Neural Correlates of Behavioral Preference for Culturally Familiar Drinks, *Neuron*, 44, 379–387.