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FILM BY VINCENT AMOUROUX

WRITTEN BY JOEL LEYENDECKER

Your brain plays tricks on you

YOUR BRAIN PLAYS TRICKS ON YOU

LOGLINE

Our brain constantly plays tricks on us. For the sake of speed and efficiency, it constantly reconstructs and simplifies reality, opening the door to misleading and falsely logical thought patterns: cognitive bias. These intuitive and automatic brain mechanisms are responsible for many errors of judgment that affect our behavior at the individual and societal levels.

SUMMARY

The human brain is an incredible organ, which ensures us a special place in the world of living beings. But our attention and reflection capacities are limited. So, most of the time, the brain works by approximation. It filters information, interprets and reconstructs reality constantly, simplifies it, automates certain processes. This is its strength... but also its weakness. Because these automatisms are responsible for numerous distortions, what we call “cognitive biases”.

There is a multitude of biases anchored deep in our brain, like so many logical and unconscious psychological reflexes that twist reality by applying shortcuts of reasoning that lead to errors of perception, evaluation, interpretation, etc.

Magicians rely on these biases to elaborate their tricks; swindlers exploit them to their profit; marketing and advertising never stop playing with them; fake news make full use of them. Through them we can explain some of our prejudices, and better understand some of our mental blocks – stress, fear of speaking in public, etc.

Originally, their function is to allow our brain to save time and energy by developing mental shortcuts. They have also facilitated our sociability. But in the complexity of our modern world, this brain trick sometimes turns against us, and some ancestral mechanisms are no longer adapted to the reality of our daily life.

Since our brain plays tricks on us, better understanding its functioning is a real individual and societal challenge, in order to learn how to thwart our illusions, avoid being manipulated, and stimulate our ability to doubt and think for ourselves.

PROJECT PRESENTATION

This film is conceived as a journey to the center of the brain, to decipher the mechanisms and modes of operation of this fundamental and mysterious organ.

Original and playful in its form, without sacrificing anything in substance, it relies on a captivating main character: a scientist able to transmit his knowledge to the greatest number of people.

A formula that has already proven itself with the documentary *Le Blob, un génie sans cerveau* (The Blob, a Brainless Genius) directed by Jacques Mitsch and produced by Hauteville Productions for ARTE France in 2019. Awarded in many international festivals, broadcast worldwide (NOVA/WGBH Boston, Radio-Canada, NHK, BBC, SVT, RSI, etc.), this documentary has managed to find a large audience, captivated by this form of pop-science where a bold direction is entirely at the service of the subject.

For this new project, we rely on the French-Lebanese neuroscientist and clinical psychologist Albert Moukheiber. Young and sympathetic, pedagogue and polyglot, he is the author of the best-selling book *Votre cerveau vous joue des tours* (Your Brain Plays Tricks on You), which received a lot of media coverage. This book having been published by Guillaume Allary, the editor and co-founder of Hauteville Productions with the producer Karina Si Ahmed, Albert very logically trusted us and put his knowledge and his teaching acumen at the service of this documentary – a journey of discovery into cognitive biases.

In the inventive hands of Vincent Amouroux, this particularly ambitious subject, with its wealth of concepts, becomes the occasion for a playful and fun production, yet always rich in teachings. Inspired by Albert's talents as an illusionist – he is also a magician – Vincent welcomes us to a fairground universe, between magic and illusion, through a dizzying direction device that constantly questions the limits of our perception of the reality that surrounds us.

To understand what cognitive biases are, and the importance they have in our thoughts and actions, it is essential to be aware of the limits of our brain. To realize that, far from being an all-powerful supercomputer, our brain has limited capabilities, and that its strength is precisely to have managed to optimize its functioning to the maximum.

What is the secret of its speed and efficiency? Approximation! Faced with the multitude of problems we are confronted with every day, choices to be made, data to be memorized, we would simply be unable to act if we had to study each piece of information we have access to in detail, select the most relevant, consider the potential repercussions of all our actions, etc.

This is the whole point of what scientists call “judgmental heuristics” – these cerebral reflexes are cognitive shortcuts based on an approximate and rapid apprehension of reality.

The film tries to shed a light on the omnipresence of these cognitive shortcuts, which are useful for most of our brains' every day tasks, but which we also use to form our opinions and judge our own and others' behavior. These mental processes are deeply rooted in our brain, since the dawn of time. They are at the heart of our reasoning, of our prediction capacity, of our reflexes of thought and action.

However, our brain's "simplifications" expose us to numerous biases – overestimation of our abilities, illusion of knowledge, tendency to favor information that confirms our preconceived ideas...

Because our brain is a formidable storyteller. To satisfy its need to understand and explain the world around us, to preserve our mental coherence and stability, it loves to tell us stories, to build plausible scenarios that justify these infamous cognitive shortcuts and that respond to our certainties and beliefs. Understanding the importance of the biases that structure the functioning of our brain implies admitting that what seems precise, justified and rational in our behaviors as well as in our opinions, is in reality almost never so. And it allows us to realize the importance of context and the way things are presented, which are determining factors in our decision making.

It is not a question of explaining or justifying everything with our biases, contrary popular belief. Be careful, for example, not to use them to make individuals entirely unaccountable and to naturalize certain behaviors, such as the rejection of otherness or difference, in the name of the ancestral nature of our biases. Beware also of going too far in the opposite direction: over-responsibilizing individuals by denouncing their irrational behaviors, when very often we can point to the paradoxical and ambiguous political or social norms.

The scientific discoveries presented in this film allow us to better understand the way our brain works, and invite us to take the time to reflect, to analyze the context in which we make our decisions, to deconstruct the manipulations we are subjected to, to counter the negative effects of the biases as much as possible, in order to cultivate our true free will.

This is what this film is all about. We are using a lively narration punctuated with enlightening examples to create space and time for reflection that will allow the audience to take that proverbial step back – the most effective remedy against our biases.

DIRECTOR'S INTENT

A documentary on cognitive bias must play with the viewer's brain. How better to illustrate biases than to recreate them? This is why I chose to make the fairground the center of this documentary. It is a spectacular and colorful popular theme. The fairground world makes full use of our biases, whether it be the illusionists, the games of chance, the games of skill, etc.

From the opening sequence, the credits will revolve around the hands of an illusionist manipulating and doing close up tricks with cards. The hands will be filmed in slow motion sometimes, or frozen by bullet time effects. In order to immediately introduce the idea of a funfair, images in silhouette of big wheels and wooden horses will be inlaid on the images in the manner of James Bond films.

The common thread guiding our documentary will be shot in the Musée des Arts Forains (Museum of Fairground Arts) in Paris. A colorful place allowing us to travel through the illusions and the biases that deceive our brain.

Existing attractions, or elements of scenery that we will have set up ourselves, will directly illustrate certain biases – like Three-card Monte, which plays with our brain and our habit of anticipating movements. This card manipulation sequence will first be presented “normally” to the spectator, who will inevitably be tricked. Then we will show the scene in slow motion and with a transparent table to reveal the trick – we will thus realize how much our brain can influence us. In another room we find a giant and a dwarf. As the camera moves, it shows us that this is not the case, that it is a perspective effect. We will also play with the orientation of the camera in relation to the scenery to create surprising situations (in the manner of the 1960s series).

Our main character, Albert Moukheiber, will thrive at the heart of this magical, baroque yet deceiving universe. He will interact with the scenery to give examples of bias, but also to launch or conclude each of the film's sequences.

This is the charm and the efficiency of this device, which offers an absolute aesthetic unity while freeing itself from the constraints of space and time. Thus, a simple door pushed by Albert can lead us to the other side of the world. The frozen image of a painting can come to life, the reflection of a mirror can be transformed into an interactive screen, a magic lantern can house surprising archives... And the speakers' interviews – filmed at a distance in front of a green screen or in a decor with geometric figures conducive to deception – fit harmoniously in this world of illusions, just like the scientific archives or the experiments conducted under Albert's watchful eye.

We will continue to play with a pop and retro look regarding computer graphics. We will use animations made with cut-out shapes (Monty Python style) to describe certain brain mechanisms or behaviors generating cognitive biases. We will also use fake video games (inspired by vintage games) to illustrate certain behaviors where cognitive biases can come into play.

It is thus a whole audiovisual mechanism that we will put at the service of our subject. The audience will actually be deceived and thus realize by themselves their brain plays tricks on them.

Vincent Amouroux

MOODBOARD



The hands will be filmed in slow motion sometimes, or frozen by bullet time effects.



[...] silhouettes of big wheels and wooden horses will be inlaid on the images in the manner of James Bond films.



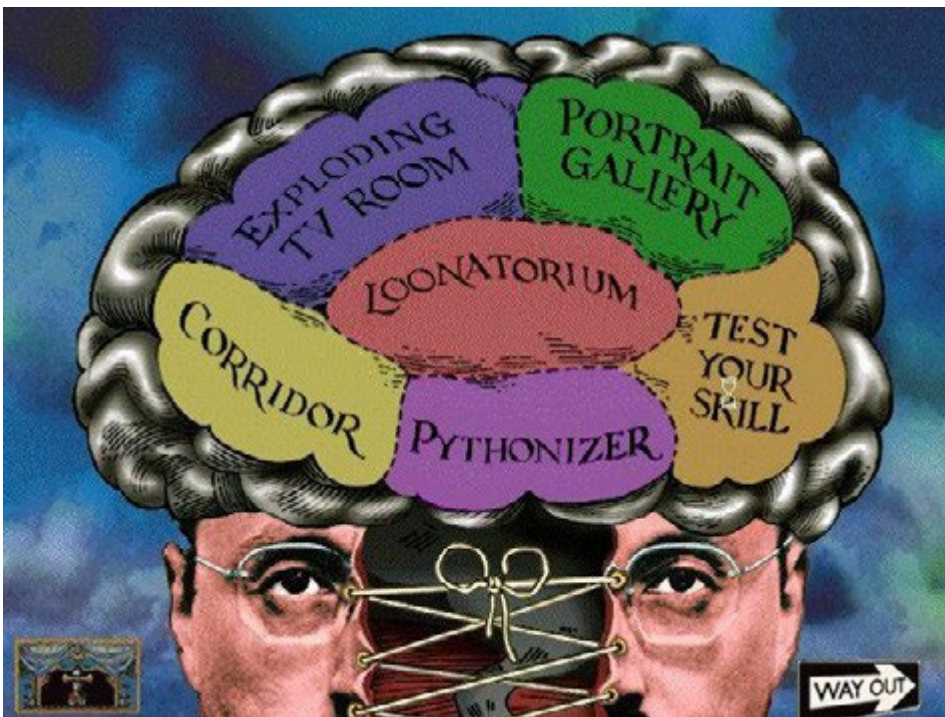
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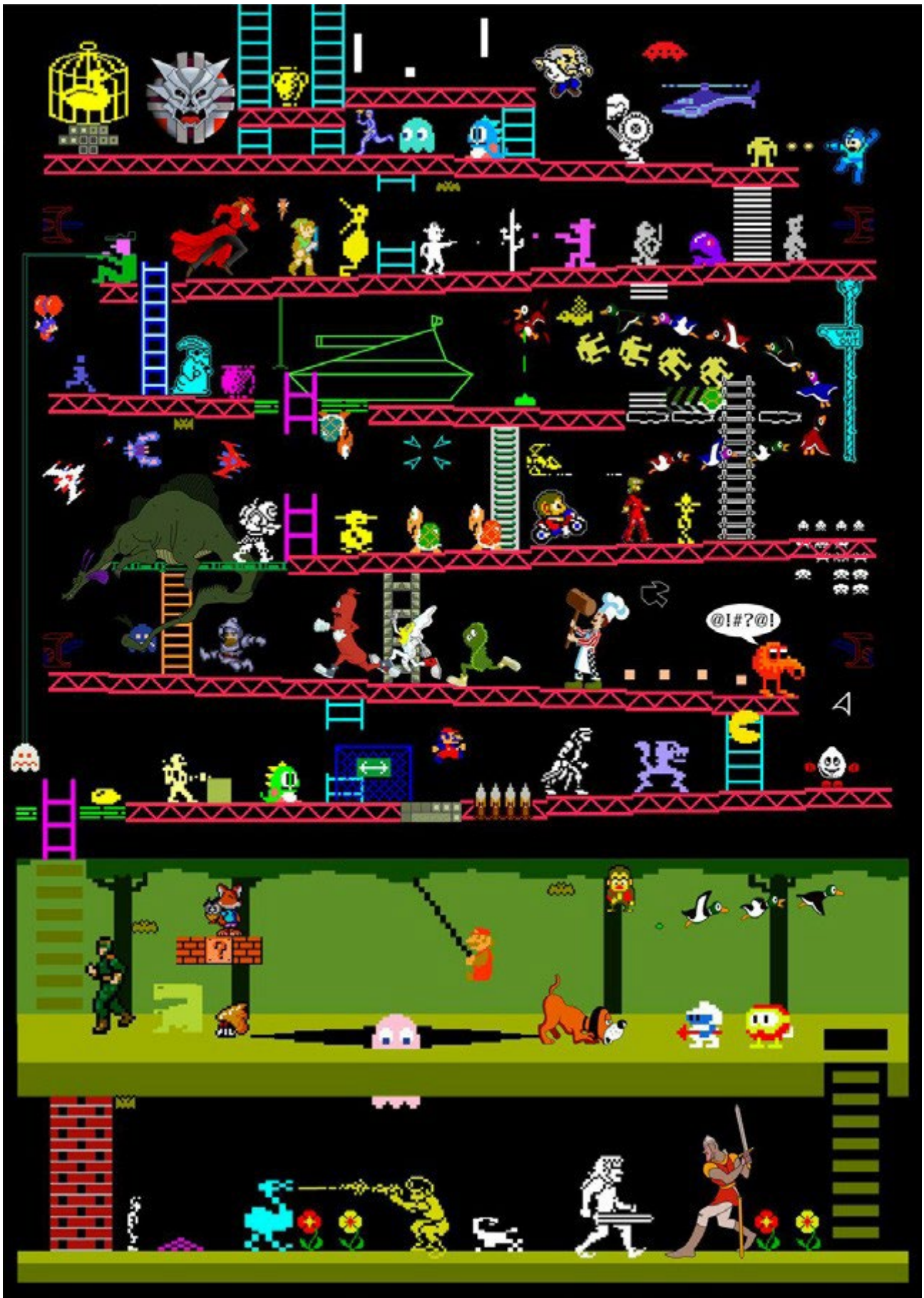
In another room we find a giant and a dwarf. As the camera moves, it shows us that this is not the case, that it is a perspective effect.



The interviews will be carried out in rooms with geometrical figures painted on the walls



We will use animations made with cut-out shapes (Monty Python style) to describe certain brain mechanisms or behaviors generating cognitive biases.



We will also use fake video games (inspired by vintage games) to illustrate certain behaviors where cognitive biases can come into play.

SYNOPSIS

OPENING SEQUENCE

Close-ups of hands shuffling playing cards; a marble passing in slow motion from one upturned cup to another in a frenzied game of cups and balls; rabbit ears protruding from a magician's top hat... The aesthetics plunge us into a fairy-tale world of magic and illusion.

We often think that only magicians are capable of deceiving us, but we blindly trust our brain, this incredible organ that allows us to thrive harmoniously in the world around us. However, our brain constantly deceives us. It plays tricks on us, for better or for worse...

1. THE BRAIN, AN EXTRAORDINARY MACHINE

Everyday scenes (children playing, a dog on a leash, a pensioner feeding pigeons) are seen subjectively through the eyes of a young man sitting on a bench in a public garden – we soon discover that this is Albert Moukheiber, who will be our guide during this film, and that it is his voice that we hear.

The world around us seems familiar, but it is a very simplified representation of reality. To begin with, a multitude of information never reaches our brain because our senses, which are much less developed than those of other species, are unable to perceive it.

A pigeon flinches – it has heard an ultrasound that our ears cannot perceive – while the dog pulls on its leash after smelling the tempting scent of a sandwich unwrapped at the other end of the park.

Despite their limitations, our senses send a considerable amount of information to our brain every second. Processing such a large amount of data in real time is a prodigious feat.

We take a deep dive into Albert's mind through a Terry Gilliam-style cut-out paper animation that allows us to visualize its functioning in a playful way: visual, sound and olfactory information circulates constantly while our character observes the world around him. Suddenly, the bottle next to him wavers. A reflex action is triggered: in a fraction of a second he catches the object before it falls.

The remarkable coordination between perception and action of which we are capable seems almost supernatural, given its speed. Yet our brain is not a supercomputer: the speed at which information travels through the neurons is limited, as is the amount of information that the brain is able to process simultaneously. Depending on the stimuli it receives from its environment, our brain switches from one focus to another, giving priority to the most recent or most important information.

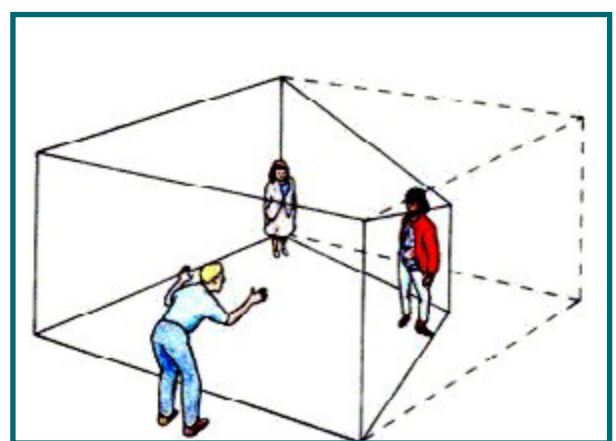


Confusions of the senses and competition of information are visually represented: camera rotating on itself, fast editing of fisheye shots, superimpositions, alternating slow and fast motion... An audio fade in takes us from the distorted sounds of the street to the sound ambiance of an imaginary fair. A brief montage of close-ups of the attractions offered by this mysterious place allows us to leave everyday reality to enter a dreamlike universe: we are in the Musée des Arts Forains (Museum of Fairground Arts), in Paris-Bercy.

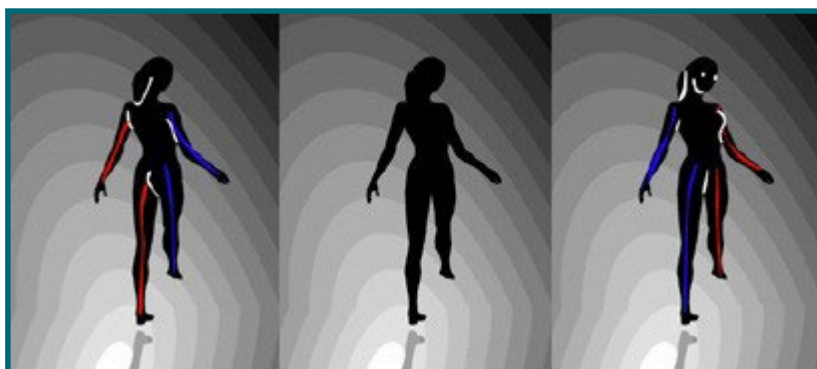
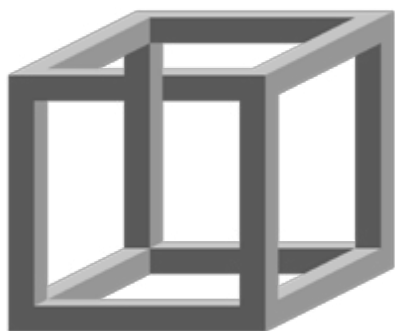


2. THE DECEIVED BRAIN

This is the moment to introduce Albert Moukheiber in a more formal way: we discover that he is a doctor in cognitive neuroscience. He is leaning in the corner of a room. When he starts to move, he suddenly appears immense – the set's perspectives have been rigged. *Some of what we think we see is in fact a fabrication of our brain that does not necessarily correspond to reality. **Our brain selects the information** that seems the most important or plausible in a given situation, **it interprets and reconstructs reality constantly.***



Around Albert, the beams of several projectors light up, casting various optical illusions: a circular animation where patches of color fade away when you stare at it; a Necker cube (without any indication of perspective); a dancer's silhouette that turns alternately in two directions depending on who is looking at it... Albert deciphers the mechanisms at work in these optical illusions.



*In the first case, our brain makes the fixed parts of the image disappear and only takes into account those that change. It simplifies reality for a good reason: **to save the energy it consumes** (nearly 25% of the energy consumed by the human body). As for this dancer, she turns neither in one direction nor in the other because the drawing lacks a dimension of depth. It is an “ambiguous situation” that our brain cannot interpret: it therefore arbitrarily chooses a direction of rotation. This is a fundamental characteristic of our brain: **it needs coherence**, so when it misses elements, it weaves in new ones, it recomposes, even if it means moving away from reality...*

The whirlwind of visual and audio effects in which the audience has been plunged since the beginning calms down for a moment, while Albert takes the time for a first reflective pause. *What we must understand is that **all these little twists of reality are characteristic of our brain’s normal functioning**. This is what allows it to be so efficient and fast despite its limited capacities.*

3. DISCOVERING COGNITIVE BIAIS

An experienced magician, Albert takes a deck of cards from his pocket and performs a magic trick – all the while addressing the viewer:

This operation relies on a number of loopholes that magicians usually play with to amaze and entertain us... While others exploit them for less savory motives.

Albert resumes his path, and turns at the corner of a corridor: he finds himself in the middle of a group yelling around a game of Three-card Monte.

Three-card Monte is an age-old game of deception: you always feel like you’ve got the hang of it – unlike that naive onlooker who just lost. But when you decide to bet money, the manipulator reverses the cards much faster and in a totally different way than the previous times, to which your brain had become accustomed.

In slow motion images, Albert describes the double subterfuge at work. Beyond the sleight of hand, the trick is based on actual psychological manipulation: the manipulator’s initial clumsiness is feigned, the player who lost and the onlookers are in fact accomplices whose role is essential to put you in confidence.

*The manipulator and his accomplices have skilfully exploited what is called **a cognitive bias**. A natural tendency that is found in all of us: instead of judging a situation objectively and reflectively, we fall into thought patterns – **impulsive but false ways of reasoning** that push us to act against common sense. Here, the swindlers have exploited what is called **the overconfidence bias**, i.e. **the tendency that almost all of us have to overestimate our abilities**.*

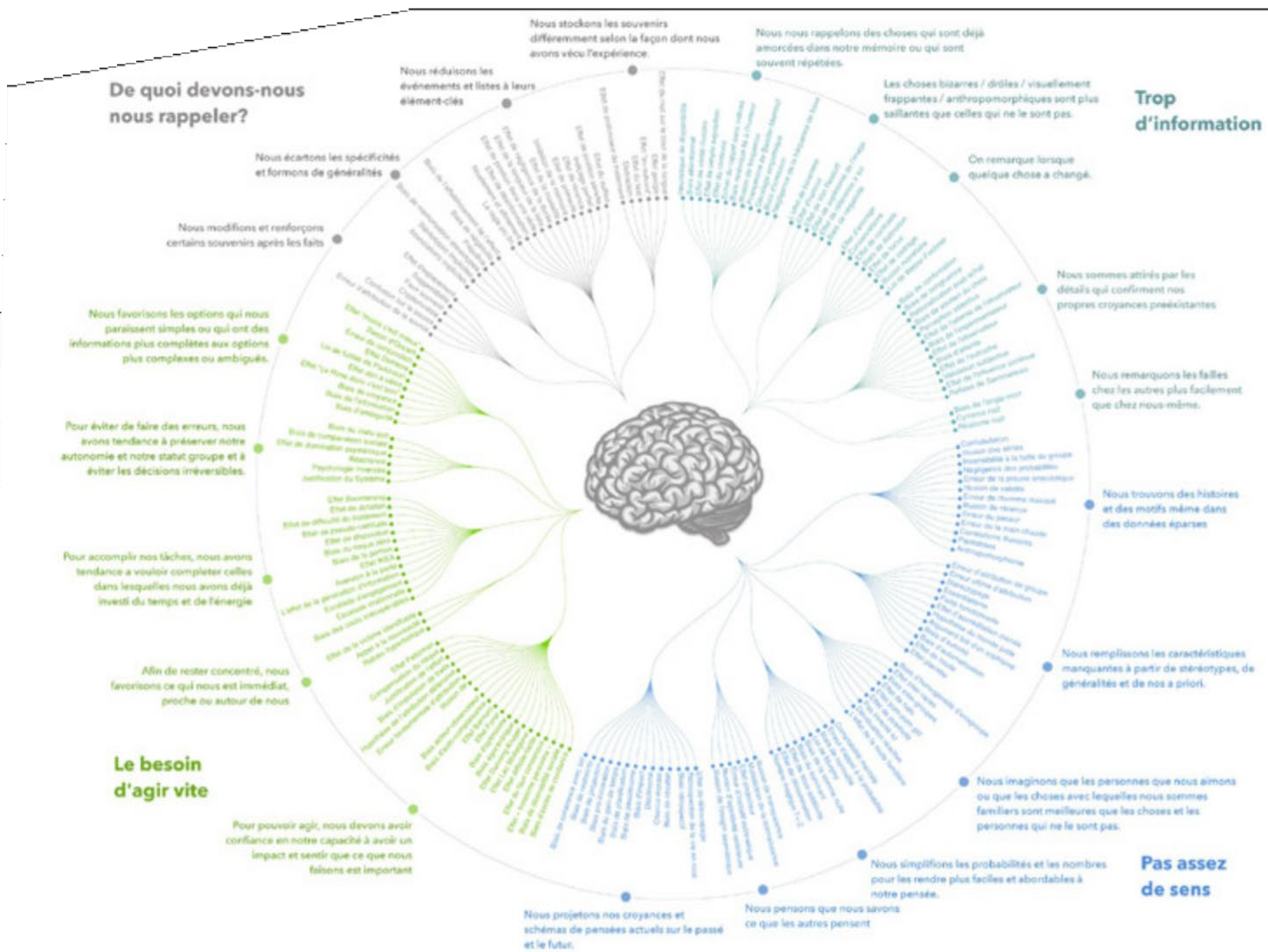


We find Albert in front of a new fairground attraction: a punching bag that tests his strength. Looking confident, Albert rolls up his sleeves and hits with all his might. The verdict is in: “flyweight”; “nerd” or “doctor of neuroscience”. Disillusioned, our scientist continues on his way, and pushes a door which transports us in a “house of mirrors”, a labyrinth of disconcerting mirrors. In reality, it is a series of large displays, which light up successively. In two of them appear the **Swedish researchers Lars Hall and Peter Johansson** of the University of Cognitive Sciences of Lund. In 2010, they conducted a groundbreaking experiment that they begin to describe, interacting with Albert. On another screen, filmed archives of the experiment start rolling.

In a supermarket, customers are invited to taste two samples of jam, and choose their favorite. They are then asked to taste again the one they have chosen, and to explain the reasons for their choice. But in the meantime, the jars have been swapped and the second tasting is done with the initially rejected jam. However, in 2/3 of the cases, the guinea pigs do not notice the deception: involved in the justification of their initial choice, they confuse two very different flavors and defend their taste for the jam they do not like without batting an eye. This is what Lars Hall and Peter Johansson have called “choice blindness”. **A particularly powerful cognitive bias that pushes us to rationalize our choice after the fact, to the point of distorting reality**, in good faith, without even realizing that we are contradicting ourselves

We can see to what extent the power of bias on our brain is immense. After more than fifty years of research, psychologists have identified dozens of biases that influence our behavior and our way of thinking in one way or another.

Albert backs out of the house of mirrors. In front of the door, there is now a gigantic wheel of fortune, on which are written the different types of biases, grouped by category.



4. HISTORY OF COGNITIVE BIASES

Forward tracking shot in the direction of Albert who is spinning the wheel. The camera moves closer as the rotation accelerates to dizzying speeds, plunging us into a sort of vortex from which emerge pastel-colored archives: this is one of Albert's idols, the scientist **Daniel Kahneman**, accompanied by his associate **Amos Tversky**. Surprisingly, the discovery of cognitive biases was not in the field of psychology or neurology, but in economics. In the 1970s, **Daniel Kahneman and Amos Tversky** were interested in the mechanisms that govern decision-making in a situation of uncertainty.



The wheel keeps spinning in a frenzy. The images are in B&W, shots of the stock market panic of 1929.



They have shown that, contrary to what classical economic theory suggests, individuals do not always make their choices rationally. When they have to make a decision, they often act impulsively, under the influence of instinctive reasoning.

We find Albert next to his wheel of fortune, which becomes a pedagogical tool to clarify in a playful way a part of the “prospect theory” that earned Daniel Kahneman the Nobel Prize in 2002.

Our relationship to risk, for example, is not linear or rational: *it depends above all on the context and the way things are presented. Let's imagine that you are given the choice between winning €100 for sure or participating in a draw that gives you a 50% chance of winning €200 and a 50% chance of winning nothing at all.*

The wheel is split into two equal parts: “Win €100” and “Draw”. Albert spins the wheel, making sure there is enough time for the audience to make their mind up. When it stops, “100 €” takes up most of the wheel and “Draw” only a small portion.

*84% of people choose the sure win: this is called “**risk aversion**”. This seems to be a common sense decision, motivated by prudence. But when we reverse the experiment, we get wildly different results.*

The wheel is now split between “Lose €100” and “Draw”, which gives a 50% chance of losing €200 or a 50% chance of losing nothing. This time, 69% of people bet on the draw.

*The common sense and prudence of the first experiment are gone: faced with the possibility of a financial loss, the individuals show an **attraction for risk**, in total contradiction with their previous reasoning, whereas mathematically the 2 propositions are equivalent.*

What this experiment shows is that our relationship to risk is not linear or rational: the fear of losing is much more intense than the hope of winning, and this completely distorts the rationality of our choices.

Kahneman and Tversky have highlighted dozens of logical flaws of this kind. This has completely revolutionized economics, and above all it has opened up a whole new field of study in the field of cognitive psychology and the study of our behavior.



Albert is now in front of a weathered arcade machine; he starts a game. An animation straight out of a retro video game fills the screen. A gardener has to water a flower located on the other side of a labyrinth garden. He has at his disposal all sorts of bent pipes that he struggles to assemble carefully to feed taps that fill basins that lead to other pipes, while time flies...



What Kahneman's work has shown is that when it comes to solving problems, our brain works by approximation, for the sake of efficiency. **We almost always prefer an approximate but quick solution to a complex but correct one.**

A light bulb suddenly goes on above our character's head: he grabs a rubber hose, and races across the garden, uncoiling his hose to reach the plant in a fraction of a second.

*These intuitive thought processes are called **judgmental heuristics: quick cognitive shortcuts, requiring little time and energy to think**, often based on analogies with situations already encountered, on the principle of "this is how it usually works".*

The frame widens, and we discover that the hedge maze follows the shape of the convolutions of a brain, in which Albert wanders.



5. BIASES EVERYWHERE!

The latter turns the handle of a new door, and enters a kind of video control room worthy of the worst “villains” of the James Bond films of the 70s. It is made up of a dozen screens showing images of the streets of Paris, as if filmed by surveillance cameras: pedestrians walking along the sidewalks, cars driving along large, congested avenues... Albert sits comfortably in the chair facing the screens, and swivels towards the camera.



*In fact, **the vast majority of our daily behaviors are based on these heuristics**: rounding the time to an easily memorable and communicable number when we look at our watch (12:30 p.m. rather than 12:27 p.m.), mechanically shaking an outstretched hand... these are the approximations and simplifications that keep our brain from cluttering up – and this is precisely what makes it so strong.*

The shot tightens on one of the screens: we discover... Albert, zigzagging among the pedestrians, while continuing his explanation.

For example, to move around, unlike an autonomous car like Tesla's, which detects and analyzes precisely and continuously a large number of data, we don't need to analyze our trajectory to the nearest centimeter or to calculate the force necessary to move our foot in such or such direction. Our approximate heuristics are quite sufficient.

On another screen: montage of images from highway surveillance cameras showing chaotic traffic and illustrating some drivers' aberrant behavior.



On the whole it works quite well. But since they are based on an approximate and rapid apprehension of reality, and a partial processing of the available information, heuristics can make us fall prey to biases.

*For example, we have **a tough time evaluating risks when they concern us**. This is what we call the optimism bias. We also have, as we have seen previously, a tendency to **overestimate our abilities**. An American study showed that nearly 80% of drivers thought they were better than the average driver.*

On another screen, a close-up of a driver whose car is slowing down in a traffic jam while he is on his phone. Suddenly, the sound of brakes screeching and crumpling metal. A buzzer sounds while a red text appears on the screen: “ILLUSORY SUPERIORITY BIAS” *We also tend to take credit for our successes but blame others for our failures.*

We find the driver standing next to his dented vehicle. Still on the phone, he comments aloud on the accident: “You’re not going to believe it, this guy just stumbled in front of me, just like that, for no reason. I swear I hit the brakes but I couldn’t do anything. ” Another buzzer rings and the display reads: “SELF-SERVING BIAS”.

Sitting in his chair, Albert comments:

All these biases, which are omnipresent in our behavior and in our social interactions, stem from a fundamental bias that we call the “fundamental attribution error”. Lacking access to their thoughts, we judge others by their actions. For example, if a car tailgates us, we rant: “What a reckless driver, you must be completely irresponsible to drive like that”. But if we are late for work and we overtake someone in the same way, we tell ourselves “it’s not a big deal, I have a good reason, it’s just this time”.

Our brain, which likes to tell stories, finds all possible justifications to explain our choice according to the context. *Paradoxically, this is the same mechanism that allows us to remain friends with our loved ones: we excuse a grumpy friend – he must have had a rough day – while the same behavior in a stranger would be unbearable.*

Albert enters a retrofuturistic elevator, which goes up a seemingly endless shaft. Visual of high towers evoking the world of big business. Executives in a hurry cross the Parvis de la Défense in long strides.



Our judgment on others is as biased as the one we have on ourselves. As such, our inability to assess ourselves correctly leads to a paradox known as the Dunning-Kruger effect, named after two American psychologists who demonstrated that the least competent people in a field generally overestimate their competence, while the most capable tend to underestimate it.

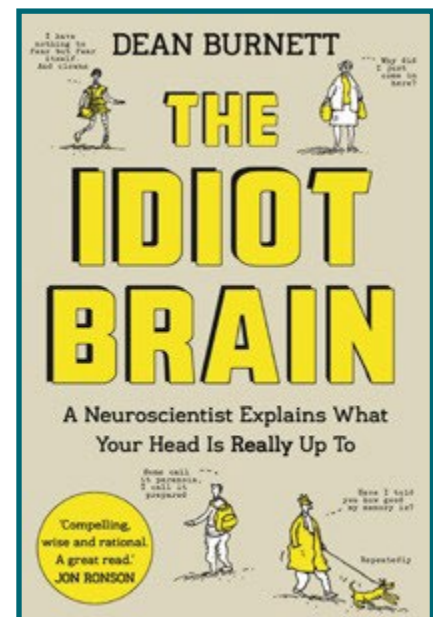
Large lobby of a publicly traded company. Glass elevators go up and down like sliders, as careers progress or decline.

In some companies, a sort of aberrant hierarchy is established, where self-confident mediocre people lead others who are much more qualified than them, but overly self-conscious.

On the screen, a curve appears: it is not the price of a share on the stock market, but the curve of self-confidence as modeled by Dunning and Kruger.

*This is a well-known bias, the “**illusion of knowledge**”: to know just how much you don’t know, you must already have a certain knowledge of the subject. The problem is that some people remain forever stuck on this confidence peak.*

On one of the screens in the control room, a montage of excerpts from continuous news images scrolls by: Jair Bolsonaro, Boris Johnson and Donald Trump. Still in his elevator, Albert leafs through the day’s The Guardian. He stops at an article entitled “Why people keep electing idiots”. Below the title, a photo of the author comes to life: it is the **neuroscientist Dean Burnett**, whom we meet again in an interview.



He describes the cognitive mechanisms that explain the emergence of political leaders who are not always very qualified but confident to the point of arrogance. A clever mix of biased thinking that can be summarized as follows: self-confidence inspires confidence; the simplest solutions are the most attractive; people don’t like to be told what they don’t want to hear...

These examples show us that, on a societal scale, cognitive biases can have serious consequences.

6. THE ORIGIN OF BIAS

Terry Gilliam-style animation: facing his work table, a paper-cut Darwin holds a hominid skull in his hand. First thoughtful, then upset, he throws the skull over his shoulder and angrily throws his *On the Origin of Species* in the shredder.

But how could our wonderful Homo Sapiens brains – the result of hundreds of thousands of years of evolution – be so parasitized by biases, whose consequences are so often negative?

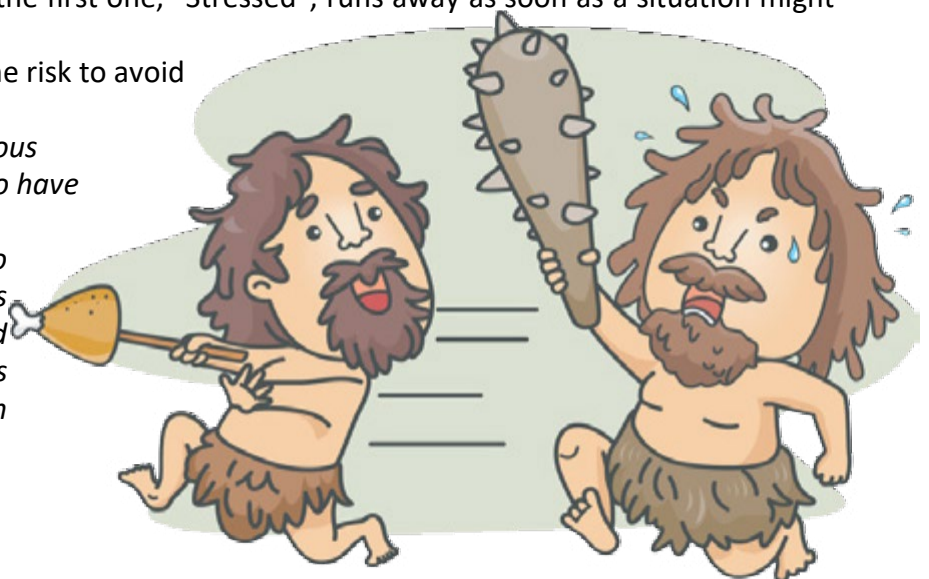


Finally, the elevator arrives at the top floor. The door opens on a video game room where one wall is a giant monitor. Albert starts a game.

*In fact, **the cognitive mechanisms that hamper us are the same ones that have allowed us to survive throughout evolution.** In that regard, no example is more telling than stress. Stress used to be a purely positive mechanism. One our brain engaged in an emergency situation to allow us to survive.*

The game Albert is playing – in fact an animation in the style of a vintage video game – features two “Flintstones”-like characters: the first one, “Stressed”, runs away as soon as a situation might seem dangerous. The second, “Cool”, is willing to take the risk to avoid wasting energy.

The first option represents an obvious evolutionary advantage: those who have survived and can be called our ancestors are those of Homo Sapiens who favored false alarms rather than ignoring them, and preferred to risk triggering a stress reaction for nothing rather than exposing themselves to danger.



Animation: we find Darwin bent over his desk. He is reconstructing *On the Origin of Species* from its shreds...

Judgmental heuristics and cognitive biases are therefore deeply rooted in our brain. For more than 300,000 years, these thought patterns – which are very useful when you are a hunter-gatherer surviving in a hostile environment – have shaped our brain. But the radical changes in our lifestyles have been extremely rapid on an evolutionary scale. Is our brain really adapted to our modern world?

7. THE SOCIAL COST OF COGNITIVE BIAS

In a twilight atmosphere, an oppressive sound montage from the din of daily life in big cities: horns, sirens, shrill brake noises...

The vital threats we face today are in fact much less numerous than when our ancestors lived, under the constant threat of predators. However, we are very often in a situation of hyper-vigilance, stressed by the innumerable micro-aggressions of modern life.

The sounds seem to come from a kind of contemporary ghost train, which we can make out from behind a heavy curtain that Albert drops with a worried look.

Stress even influences some of our feelings that we imagine to be rooted in the depths of our being, such as empathy or compassion.

Albert pushes the door to an “emergency exit” – the blinding light coming from outside allows us a transition to the impersonal setting of a university.

This was measured by two American researchers at Princeton University, John M. Darley and Daniel Batson. In 1973, in an experiment inspired by the Parable of the Good Samaritan, they sought to determine whether certain people were intrinsically more willing than others to help someone in distress by taking as guinea pigs seminarians – individuals who, we can imagine, are therefore predisposed to altruism.



In a brief recreation of the experiment, three young actors dressed as seminarians re-enact the protocol, while Albert describes the course of the experiment and comments on its results. On the way to a studio where the theology students are supposed to record a presentation on a religious theme, a slouching “victim” seems to need help. Depending on the case, more or less time pressure is put on the seminarians. Filmed in still shots, in fast motion, the situations follow one another, superimposed in an endless ballet. In some cases, the seminarians stop. In others, they hesitate and then continue on their way, sometimes not even glancing at the man on the ground.

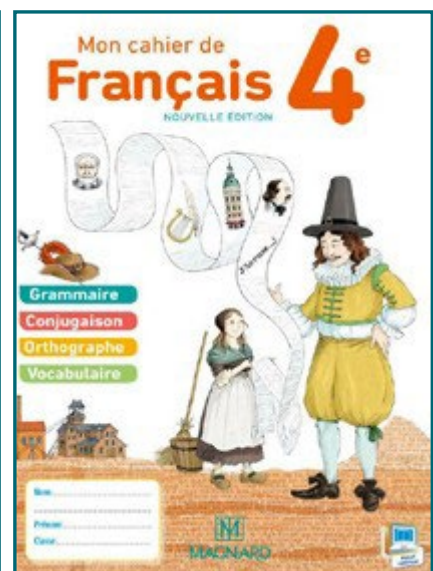
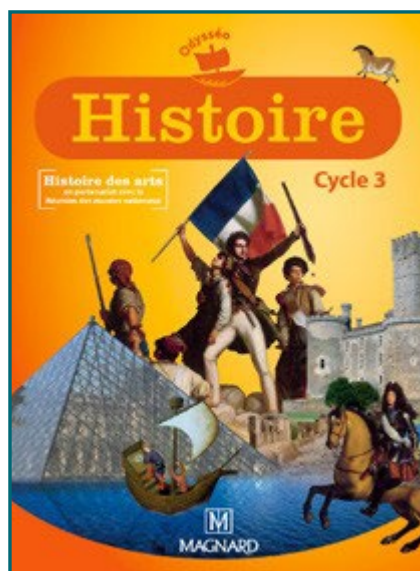
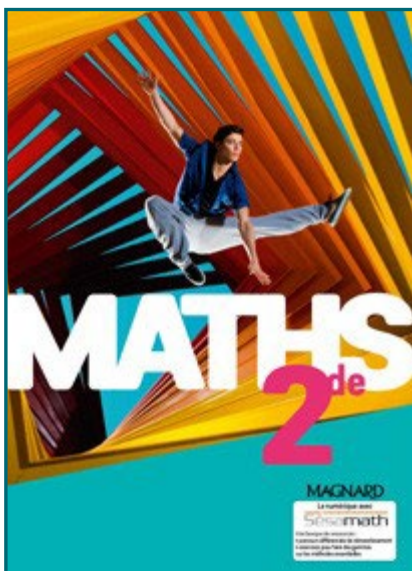
The results are enlightening. When they are not pressed for time, 63% of the seminarians stop to offer their help. When they are moderately pressed for time, only 45% do so. And when they are stressed for time, there are only 10% true “Good Samaritans”. Under pressure, even the most virtuous of individuals can see their sense of morality and religious ethics vanish.

*This experiment shows once again to what extent external factors – context, the way things are presented and perceived by our brain – are determining factors in our behavior. This is what two CNRS (French National Centre for Scientific Research) researchers, **Angela Sirigu** (director of research in cognitive neuroscience) and **Pascal Huguët** (director of research in social and cognitive psychology) have also shown, by debunking a particularly tenacious cliché: girls are less talented in mathematics than boys.*

Leaning into the “sham TV interview” setup, Albert discusses with his fellow researchers on the screen. They describe their experience. They gave mental calculation tests to students in preparatory classes for engineering schools who were locked in an MRI chamber that recorded their brain activity. When the students were told that “girls and boys do equally well”, the success rates were identical (75%). But if they were told that test results were “different” between men and women, this simple assertion was enough to activate a negative stereotype in the girls, who then only got 70% of their answers right. On the MRI, we can see that the parietal lobe – the part we use in these mental calculation exercises – is more mobilized by girls when the stereotype is activated, as if they were making more effort. But, at the same time, there is intense activity in the orbitofrontal area, which indicates emotion, and their performance collapses.

Even more edifying: in the first case, “girls and boys succeed in the same way”, we see activity in an area of the brain specialized in detecting abnormal things. Simply put: **the idea that boys and girls are equal**

unconsciously “shocks” the male brain... It is simply not used to this kind of truth! And for good reason: in school textbooks, the vast majority of success models are men. Stereotypes have a major impact, especially when they have been ingrained for generations.



8. FROM BIAS TO MANIPULATION

Albert wanders through a house of distorted mirrors, whose convex and concave ones make him lose all spatial reference and sense of orientation.

But scientists have shown that even in a relatively short period of time, false information can end up being accepted as true... if it is repeated enough. This is called the “illusory truth effect”. A young American researcher, Lisa Fazio, for example, has succeeded in having a panel of people accept as “true” the statement that the Sari was the name of the traditional Scottish garment – simply because this statement appeared in every test they were given.



Off screen, **Gordon Pennycook, a psychology researcher at the University of Saskatchewan in Canada**, chimes in: *in today’s digital and mass information age, our brain’s natural tendency to use shortcuts can be very damaging as it is exploited as never before, in marketing as well as in politics.*

As an archive of Donald Trump’s statements gradually fills the room, the image of the Canadian scientist appears in one of the mirrors. He describes the experiment he conducted in 2018: 500 people with different political affinities had to rate the former US President’s claims. The result was crystal clear: regardless of the person’s political affiliation, statements repeated several times were systematically considered more true than they actually were.

When our brain is already familiar with a piece of information, it systematically tends to consider it more likely than another, still unknown, piece of information. We find here the principle of speed of reaction and energy saving characteristic of judgment heuristics... and the problems that can arise.

Gordon Pennycook, a specialist in fake news, has also shown that the fact of having a pre-established political opinion does not play a big role in our ability to detect the false from the true. **What is important is the time we spend thinking about it.** As soon as we give our brain more time to think, our analytical capacity kicks in and we judge information more effectively. Heuristics then have less influence on our choices.



9. MANIPULATED FOR OUR OWN GOOD?

After this disturbing sequence, let us relax a little in a place of ease... Namely, the men's room of our fair! A row of surprisingly clean urinals lines up along the wall. At the bottom of each one, a fly was drawn on the porcelain

The voice of **Richard Thaler, an economist and psychologist at the University of Chicago**, rings out. We are in the presence of the most famous “nudge”, as he calls them. Literally, like a little nudge. Tested at the Amsterdam airport, this simple nudge instinctively prompts men to adjust their trajectory, reducing splashes. It has cut maintenance expenses by 80%.

Richard Thaler tells us more about this idea of harnessing our brain's automatisms to encourage us to be more civic-minded – a concept whose theorization won him the Nobel Prize in Economics in 2017. Most often nudges take the form of small visual tricks. For example, there are now ashtrays in urban spaces that take the form of a poll between two proposals as they fill up; or “piano-staircases” that encourage passers-by to do some physical exercise by hitting a few notes instead of taking the easy way with the escalators. In the area of dietary health, behavioral nudges – reducing portion sizes or serving lower-calorie dishes first – have been shown to be far more effective among targeted consumers than cognitive nudges (descriptive labeling) or affective nudges (appeals to eat better, for instance).



But beware, our natural inclinations can also be exploited for less noble causes: this is what we now call “sludges” – a way of exploiting our innate tendency to neglect what bores us in order to overlook it. This is the case, for example, with the endless forms set up by some sites to disable advertising cookies, when a simple click is enough to accept everything. Or the policies of automatic de-registration of voters who do not clearly express their wish to remain on the electoral rolls put in place in some American states before the presidential elections.

10. CAN WE CORRECT BIAS?

Thanks to the magic of our setting, only one door separates Albert from his students at the University of Paris 8. The topic of the day: positive or negative, can we correct our biases? The professor describes the surest way to fight against our natural inclination to use heuristics instead of reflection and analysis: take a step back, and do not give in to the impulse of immediacy. On his computer screen, a multitude of tabs are open in his browser, what he calls “horizontal reading”.

Rather than sharing a sensational piece of information with all our contacts, let's take the time to verify it. It has become a natural reflex for me: as soon as I read a news item that provokes a strong emotional charge, I tend to doubt its veracity, and I give myself time to think about it by going to check it.

What's more, technology has its perks – he says, putting on a virtual reality headset...

Looking through the headset's lens, a roadside check is now unfolding before our eyes. An American policeman courteously addresses the driver of the car he has just stopped. After checking the vehicle's papers, he wishes its African-American occupants a safe journey with a broad smile. **Jennifer Eberhardt, a psychologist at Stanford University**, explains that this kind of interaction was unthinkable in the late 1990s in Oakland, California, a city marked by racist police abuse.

Commissioned by the city to conduct an audit, the psychologist analyzed thousands of traffic stop reports. She found that the African-American community accounted for 60% of the stops, even though it made up only 28% of the population, and that the stops were really motivated in only 5% of cases – contrary to what the police officers claimed, whether they were black or white themselves.



Thanks to the on-board cameras, she also analyzed the transcripts of what was said during the roadside checks. She thus demonstrated that the vocabulary used by the police officers differed greatly depending on the ethnicity of their interlocutors. By role-playing with police officers, using virtual reality tools to simulate roadside check situations and then analyzing the results together, Jennifer Eberhardt's team achieved a remarkable result: the clear cases of racial profiling decreased by 43%. She agrees with Albert: fighting bias is not an easy task. But since most of them are easy solutions to which our brain automatically resorts, giving ourselves some time to think before acting is a good way to defuse them.

CONCLUSION

Back in the house of mirrors, we meet again with our speakers, who talk about ways to fight against bias: giving our brain time to switch to an analytical and reflexive mode, deactivating our "autopilot", etc. As Albert leaves the room and resumes his stroll, a crane shot shows us the whole setting in which he has been walking since the beginning of the film: **an immense brain of which he has only covered a tiny portion, leaving the majority of it uncharted.**

The brain is such a complex organ that much about it remains unknown. But what little we do know already makes us think about the mechanisms that are at work when we think, when we believe, when we judge.

If you feel tense because a subject is stressing you, take a step back and take stock of the situation. If you feel that a belief is so important to you that you cannot bear to see it questioned, try to pay attention to the information that could nuance it, and ask yourself the question: are you not falling prey to your cognitive biases? If you judge someone spontaneously, ask yourself what the basis for your judgment is, think about the context, doubt a little. Remind yourself that this person functions according to the same mechanisms as you do, and try to reserve judgment until you have understood what could have made them act in this way.

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