

# Deconstructing Unconscious Biases

*Neuropsychological insights into how we construct our reality*

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## Deconstructing Unconscious Bias

*A neuropsychological approach into  
how we construct our reality*



Presentation by Patrick Schmidt

**Slide:** Good afternoon. I welcome you to my presentation on unconscious biases. I'd like to begin with a simple example of how our biases affect our perceptions.

(Holding up my right hand, showing four fingers extended and the thumb down, I ask:)

What do you see?

For most of you, it will be four fingers. However, some of you may say, "I see five fingers". And others may simply say, "I see a hand".

The different answers summarize the whole problematic of perception. There's no real, absolute answer — it can be four... or five fingers... or something else. It all depends on how your unconscious biases interpret what you are seeing. And this problematic of perception has intrigued many people with countless questions, such as:

Are our perceptions reliable, i.e. can we trust what our perceptions are telling us?

What are the cognitive processes that prompt people to prefer one reality over another?

And when there are different realities, does it mean that our perceptions have a conflicting relationship to reality?

One approach to answering these questions is to examine how early life experiences can influence our thinking, perceptions and the decisions we make, especially those concerning our lifestyle and preference for certain people. These preferences are our biases, most of which are unconscious.

What I wish to do in this short presentation is deconstruct the phenomenon of unconscious bias by demonstrating through examples how memories of early life experiences, which are mostly forgotten but deeply embedded in your mind, largely dictate our perceptions and behavior. This is the premise of the talk. My hope is that the ideas presented today will stimulate critical thinking about who we actually are.

As to my background, I have a degree in experimental psychology but I'm not a neuropsychologist. What led me to this field of study are my many years as an intercultural facilitator. What I've learned is that the vast majority of people aren't aware that their behavior is, for the most part, a result of their early cultural upbringing. Working as a cross-cultural facilitator means helping people to become aware of their own cultural values, assumptions and beliefs — which essentially are our unconscious biases.

**Slide:** Before beginning, it would be useful to examine the origins and meanings of unconscious bias.

## The origins and meaning of unconscious bias



- **Unconscious (Latin)**  
Lacking awareness
- **Bias (Old Provençal French)**  
A preference, predisposition or inclination

Unconscious means lacking awareness; it's outside our conscious control. The word originated from the Latin *inconscius*: the prefix “in”, meaning “not”, and the word “conscius”, meaning “aware” or “conscious”.

Bias is simply a preference, an inclination that hinders neutrality, impartiality. The word originated from the old Provençal French *biais*, which meant a slant, or slope. It was first used in English around the 1560s in the game of “bowls”, to describe balls made with greater weight on one side, causing them to curve. Over time, it became a commonly-used word meaning preference or inclination.

Today, the word “bias” has a mostly negative connotation, so many interculturalists use terms such as “lens”, “predisposition” and “frame”. For the purposes of this presentation, we will define unconscious bias as: *a preference or inclination that exists outside our conscious control.*

**Slide:** With that definition, let's now delve into the question — how do biases develop?

## How do biases develop?



- Biases (filters) are based on past experiences, memories
- Over time these biases generates brain circuits (templates) to save on cognitive energy
- These pre-established patterns strongly influence our perception and categorization of people and objects
- Deeply ingrained in the unconscious

But first, let me state a fact: Your perception of reality has less to do with what's out there and more to do with what's happening in your mind. Neurological research shows that our five senses feed the brain staggering amounts of information every second.

However, as we will learn later, the brain can't and doesn't want to process all this data — it needs to function like a perceptual lens, quickly filtering new information. These filters are essentially your biases.

These biases evolved for a reason — to reduce the enormous intake of information, that is to save cognitive resources and use cognitive energy more effectively. It's all part of the brain's evolutionary design to retain only key information necessary for survival. The survival instinct is the primary and overriding function of the brain, allowing us to make quick decisions on whether a situation or person is safe or dangerous. Your whole brain circuitry

is constructed in a defensive “survival mode” which works 24 hours a day, non-stop.

From a physiological perspective, these biases are neurological pathways, pre-established templates that contain your memories and past experiences. Most of them are developed at an early age, when we begin to experience life and make assumptions about family, friends and school. They are rooted in your preferences, mostly associated with pleasure or pain. For example, “I love chocolate.”, “I don’t like the noise of city traffic.”

These biases are so profoundly ingrained in our minds that we are unaware of most of them, let alone the way they influence our behavior. Yet, it is these unconscious recollections that influence essentially what we see, hear, and interpret. And they, in turn, dictate most of our decision-making and judgments.

Now, let’s explore the neurobiological mechanism that generates our biases.

Here, I wish to introduce the term “imprinting”, a process that takes place in the very early period of our childhood. The person who revealed the importance of this process was Austrian zoologist, Konrad Lorenz. His observations of imprinting in animal behavior, especially that of baby geese, got him the Nobel Prize in Medicine in 1973. So, why did he place so much importance on imprinting?

## Konrad Lorenz

An Austrian zoologist who studied attachment behavior and how it is 'imprinted' at an early age, shaping our social behavior later in adult life. He won the Nobel Prize in medicine in 1973 for his imprinting experiments with baby geese.



**Slide:** His work began in the 1930s with the study of “attachment”, the mechanism that makes newborn geese follow their mother. He discovered the process was a combination of instinct and learned experience, which he called *imprinting*.

Imprinting can be defined as a distinctive form of learning that occurs during a brief but critical period in young animals, who absorb the characteristics of a separate organism and form an attachment. Once the process is complete, it's virtually irreversible.

Lorenz came to understand this process by experimenting with unhatched goose eggs. He'd take about a half dozen and divide them into two groups, one to be hatched in an incubator, the other naturally. Newborn “incubator geese” were exposed to his walking in boots from their thirteenth to sixteenth hour. When the babies were returned to their mother, they didn't follow her but followed him instead.

He theorized that baby geese would instinctively follow a moving object shortly after hatching, normally the mother. In this case, it was the movement of his boots, which also triggered attachment, suggesting it's innate, or genetically programmed.

Neuroscientists today have extrapolated Lorenz's findings to human beings. The critical period of human brain development is generally said to be from birth to the age of 12. During this time, almost all stimuli are absorbed indiscriminately, like water to a sponge. And the more a certain behavior is repeated, the more likely it will remain in the unconscious for life. These established neural pathways affect our subsequent adult behavior, becoming the foundation for our thoughts, habits and behavior and they can appear later on unexpectedly.

Take Marcel Proust's masterpiece *In Search of Lost Time (A la recherche du temps perdu)*. Proust wrote that tasting a *madeleine* cake as an adult triggered a happy childhood memory of his aunt giving him one of the small sponge-cakes on a long-ago Sunday morning.

We've all experienced this phenomenon. Take myself. French bread with butter and mirabelle jam for breakfast prompts my mind to remember the happy times when I ate the same thing as an eleven-year-old at my grandparents' home in France.

## But I'm an objective and consciously aware person!



- Really? Neurological research tells a different story.
- Your conscious reality is just a subjective interpretation, constructed with limited pieces of information.
- The brain is amazingly good at filtering incoming information to extract patterns and assigning meaning (illusion) into your conscious, i.e., subjective world.

**Slide:** Despite what I have just said about the impact of imprinting and unconscious biases, many of you will still claim to be objective and consciously aware... You assume consciousness is the dominant feature of the brain.

Neurological research suggests a rather different picture.

Back in the 1980s, German researcher Manfred Zimmermann at the University of Heidelberg undertook the task of counting the number of binary units of information, that is bits of information, which flow through our five senses every single second. He and his team did this by first calculating the number of receptors each sensory organ possesses — how many visual cells the eye has, how many sensitive points the skin has, how many taste buds the tongue has... They then counted how many nerve endings of each sensory organ send information to the brain per second.

Can anyone of you guess the number of bits of information our five senses receive per second?

Believe it or not, these neuroscientists calculated that our five senses capture and send 11 million bits of information per second to the brain.

The eyes receive most bits, about 10,000,000; skin, a little less than 1,000,000; ears 100,000; nose 100,000, tongue 1 000.

Even more interesting, Zimmerman's team found that a person's conscious actually receives only a small amount of this incoming information — about 40 to 50 bits per second.

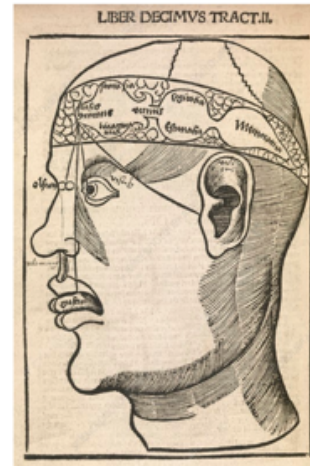
What this means is that our conscious captures very little of reality and that 99.99% of the incoming information is processed by our unconscious biases. It's our unconscious mind, working in the auto-pilot mode, that triggers practically all our actions, such as driving a car, playing a musical instrument, riding a bike, or communicating appropriately with people in our cultural group.

Your conscious is actually just a passive recipient of the information processing that has taken place in the unconscious. It can only generate and assign a meaning, i.e. a simplified picture of reality, an image, an illusion of reality. What we can say is that the conscious mind is a tiny pond compared to the vast ocean of the unconscious. How little the conscious mind captures reality comes as a surprise to most people and clashes with their gut instinct of what awareness is.

**Slide:** With all that in mind, let me state three facts about the brain.

## Three facts about the brain

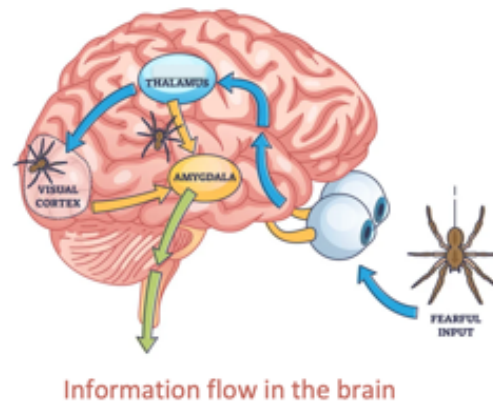
- The brain just knows where to send incoming stimuli
- The brain is is “lazy” in that it uses mental shortcuts (heuristics) to save on cognitive energy
- The brain doesn’t hear or see — it only experiences electric-chemical signals



1. The brain doesn't know and doesn't care where it gets data from. Whatever information comes in, the brain just figures out what to do with it. Despite all the years of research, neuroscientists still haven't figured out how the brain — with its 86 billion neurons — goes about interacting with the 11 million bits of information.
2. The brain is “lazy” in the sense it doesn't want to process all the incoming stimuli. Remember, the brain has developed filter mechanisms, i.e., biases, to conserve cognitive energy. These filters are known as mental short-cuts, or heuristics. By retaining only key information, our biases allow us to make quick decisions that is most relevant to our survival.
3. Your brain does not hear or see any of what you are saying or doing; it's locked in a vault of silence and darkness in your skull. All it ever sees are electrochemical signals coming in from the different data cables and this is all it has to work with — nothing more.

Now to the question "How is the incoming information sent to the right places in the brain?" As I just said, the brain just knows what to do with the incoming information.

## How is the incoming information sent to the right parts of the brain?



**Slide:** The process begins when incoming stimuli (heat, sound waves, photons of light) are transformed into what neuroscientists call “action potentials”, i.e. electrical-chemical signals.

In this example, the eyes pick up the photons of light emitted by the spider and transform them into electric signals. They go to the thalamus, in the middle brain, which serves as a relay station, regulating the reception and transmission of sensory signals.

These signals are then sent out to the corresponding parts of the brain, in this case, the visual cortex. Here, they interact with neurological set patterns, i.e., your biases, your preferences and are filtered, retaining only key information pertinent to the spider, which is “don’t touch it”. This reduced information is sent to the amygdala, an organic structure that looks out for

danger and guides you away from it. The amygdala then sends this information to motor neurons to trigger muscle movement that have you move away from the spider. At the same time, an image of the spider, or “story”, is created and flows in your subjective world, which we call our conscious.

All this is done within one or two tenth of a second.

Conscious perception is only what you think is important



*The Conjurer by Hieronymus Bosch - circa 1502*

**Slide:** Going deeper, your conscious perception is only what you think is important. This means our conscious captures only one part of reality. And this can be experienced in this painting *The Conjurer* by the Dutch painter Hieronymus Bosch.

His goal was to demonstrate how people perceive only what they think is critical. The picture draws your attention to the main characters, the conjurer and the nobleman, who leans in and is looking at the pearl in the magician's

hand, which he thinks is most meaningful. He's not paying attention to anything else. Now, you may notice the man behind the nobleman, dressed in white, maybe a Dominican priest, who is stealing his purse. But the nobleman is not aware of this because his attention is on the pearl. Now, notice what's going on in your mind: although your eyes have captured the whole image in a millisecond, your unconscious biases have focused on only what you think is crucial. First, the magician and the nobleman, then the priest. Now look at the child, staring at the nobleman being robbed. Hieronymus Bosch is illustrating the Flemish proverb: "He who lets himself be fooled by magic tricks loses his money and becomes the laughing stock of children."

Bosch's painting shows how our consciousness doesn't generate an all-encompassing view of reality but rather a selective, biased view, influenced by what we choose to pay attention to. Or to express it in another way, your consciousness is not identical to what your mind perceived initially. You mind senses more unconsciously than it does consciously.

**Slide:** A modern version to Bosch's painting is the famous "invisible gorilla" experiment.

## The Invisible Gorilla



An example of inattentional blindness

In the 1990s, American researchers Christopher Chabris and Daniel Simons conducted this exercise to demonstrate how our biases can blind us to certain aspects of reality, a phenomenon of what psychologists call “inattentional blindness”. It’s defined as the inability to perceive an event or stimulus in plain sight.

Participants were asked to watch a video of people passing a basketball to each other and were instructed to count the number of passes made by those wearing a white tee-shirt. During the video, a person dressed in a gorilla costume walked through the scene as you can see here, right in front of the participants, for about nine seconds.

Approximately half of the participants completely failed to notice the gorilla! When you’re intently focused on a specific task, you can easily miss other significant events or stimuli that are right in front of you. Again, let me repeat: our conscious perception doesn’t generate an all-encompassing view of

reality but, rather, a selective and biased interpretation, influenced by what we choose to pay attention to.

## So, are we all naturally biased? Yes!

- Biases are unavoidable, as it is part of our survival instinct
- Biases do not make us bad people
- Members of any group have biases



**Slide:** So, the question we can ask now: Are we all naturally biased?

Yes! Biases are unavoidable, they are part of our human DNA. Your whole brain's circuitry is constructed in a defensive "survival mode" which is fully dependent on your biases. Once you recognize that we all need biases to survive, you realize that it doesn't make you a bad person, just a normal human being.

*Simply put*  
**unconscious biases**

are survival processes,  
using unknowingly prior memories  
that strongly affect our  
decision-making and interactions.



**Slide:** To sum up, your unconscious biases are simply survival processes that use latent memories to affect our perception, decision-making and interaction with other people.

**Slide:** Now, let me take you through a series of other biases that can play tricks on your mind.



What do you see in the picture on the left side — an old lady or a young woman? This famous optical illusion first appeared on a German postcard in 1888. The young woman, facing away, is looking over her right shoulder. The old lady is looking toward the side. The young lady's chin is the old lady's nose. And the bottom of the young lady's neck is the old woman's chin.

This illusion gives us fascinating insight into how our brains work. When I show this picture to students, about a third see an old lady, a third see a young woman and a third are able to experience a “Gestalt switch”, seeing the image either as an old lady or a young woman.

## Baby food fiasco in Africa



**Slide:** The wrong interpretation of a picture can sometimes lead to serious perceptual, intercultural misunderstandings. In the early 1960s, a major U.S. manufacturer of baby food started to sell its product worldwide, using the same successful label as for its home market — a picture of a smiling baby. But sales in some parts of Africa were lackluster, to put it mildly.

A task force was sent to find out why the baby food didn't sell well and discovered that many Africans were illiterate and bought things by looking at the label. And some assumed the food in the jar was chopped-up babies!

### Tide soap fiasco in Arabic countries



**Slide:** Likewise, a detergent company wanted to use picture-only frames worldwide to get around the language barrier. The idea behind the images was simple — in the first frame, you see a dirty shirt next to a washing machine. The second shows the shirt in the machine alongside the detergent. In the final frame, you see the now-clean shirt. The images projected a clear message of cause and effect: the detergent cleans your dirty shirt, which is how people understood it in most countries.

In the Arabic-speaking world, however, people read text and images from right to left. The message was the detergent would dirty your nice, clean clothes.

These two examples show that we often don't question our own unconscious assumptions and biases; instead, we project them on to others. It is the

cause of more than a few costly and embarrassing missteps in our increasingly multicultural world.

## What would you prefer?

1. One million euros now



1. A cent that doubles every day for 31 days



**Slide:** What would you prefer? To have one million Euros now or take one cent that doubles every day for 31 days?

Choosing a million Euros now — which is what most people do — indicates you're an intuitive thinker, relying on instinct or “gut feeling”, a behavior driven by our primordial need for instant gratification.

Choosing one cent doubling every day indicates that you tend to analyze opportunities in a conscious, systematic way. And, in calculating exponential growth over 31 days, you'd be rewarded with 10 700 000 Euros!

Why do most people choose a million Euros and not one cent? In his best-selling book, *Thinking, Fast and Slow*, Nobel Prize-winner Daniel Kahneman demonstrates in hundreds of studies that people are much more likely to use their intuitive brain in making decisions, which he designates as System-1

thinking. Far fewer people use reason-based thinking because it requires far more effort and mental energy, an approach he calls System-2 thinking.

It should be pointed out that neither unconscious intuitiveness nor conscious rationality is “better”. Rather than being two independent systems, the conscious and unconscious are two aspects of one complex system. What is important is becoming aware of which you prefer

### The wealth bias and its effect on empathy



*Der Streichholzhändler* (The Match Seller) by Otto Dix - 1919

**Slide:** Now, I'd like us to look at this picture, *Der Streichholzhändler* (The Match Seller) painted in 1919 by German artist Otto Dix. He portrays a maimed and blinded war veteran, now reduced to selling matches, in an extremely satirical manner. As you can see, people who appear to be healthy, well-off and well-dressed are fleeing him. Adding insult to injury, Dix has a dog urinating on the leg stump of the hungry war veteran. The message Dix is making is that people generally don't want to deal with a situation out the norm, here a crippled and blinded veteran.

In its April, 2012 issue, *Scientific American* published a fascinating article, entitled *How Wealth Reduces Compassion*. It reviews the latest studies on the relationship between empathy and material wealth and comes to the conclusion that the richer you are, the less likely you are to act fairly!

On first reflection, this would seem to go against common sense. If you already have enough to take care of yourself and your family, wouldn't you be more inclined to think about other people's needs? Not according to UC Berkeley psychologists Paul Piff and Dacher Keltner.

They conducted experiments on whether social class (education, wealth, job prestige) influences how much we care about the feelings of others. In one study, they surveyed drivers at a busy four-way intersection. Drivers of luxury cars were more likely to cut off other drivers instead of waiting their turn. And these upper-class drivers also tended not to stop for pedestrians trying to cross the street, even after making eye contact. Almost all drivers of small or regular cars stopped for pedestrians.

Later, Piff and his colleagues conducted another experiment on whether selfishness leads to wealth. Participants were asked to compare themselves to people, either as better or worse off. Before leaving, they were shown a jar of candy and told they could take home as much as they wished; what was left would be given to children in another room. The participants who thought of themselves as better off took far more candy, leaving little behind for the children.

The intriguing question is why does research consistently show that wealth and status decrease our feelings of empathy? Or to phrase it differently, if

you have fewer resources, wouldn't you be more likely to be selfish? Piff suspects this paradox is related to the feelings that abundance gives us: a sense of self-importance and independence. In other word, the less we depend on others, the less we may care about their feelings.

Let's go on to stereotypes...A stereotype is a form of "thinking shortcut" that describes the characteristics of a particular group. Contrary to general opinion, everyone thinks in stereotypes, which are essentially our unconscious biases at work, part of the brain's effort to use quick, mental shortcuts to save on cognitive energy.

One form of stereotyping is the "halo and horn effect". It's a well-known social-psychological phenomenon — when a person or situation appears to be attractive (halo effect), it prompts us to move towards the desired object and doing so unconsciously provides a feeling of safety. Ugliness or discomfort (horn effect) triggers a moving away, driven by an unconscious fear of danger.

## The Halo and Horn Effect



Ruth and Rebecca

**Slide:** In the YouTube video *The Halo Effect*, two young women, Ruth and Rebecca, are struggling to go upstairs with heavy suitcases in a London train station. It took Rebecca, who is cute, an average of 24 seconds to have a man offer to help. Ruth, who is somewhat plain-looking, waited an average of 70 seconds to receive help. Many interpreted this behavior as a primal drive of men that connects beauty with higher levels of intelligence, physical health and social skill.

## The Halo and Horn Effect



Melvin and Marcus

**Slide:** In the same clip, two young actors, with similar looks but of different heights, were presented separately and randomly to pedestrians in New York City, who were asked what they did for a living and how much they earned. Marcus (1 m 93) was described by most as a doctor, banker or lawyer, earning between \$ 200,000 and half a million dollars a year. Melvin (1 m 58) was thought to be a cook or dishwasher, earning between \$ 20,000 and \$ 25,000 a year and seen as not very happy. This study suggests that a man's height is associated with safety and survival.

The preference for attractive people, as well as people from our own race, can even be observed in babies. In several studies, researchers discovered that two-month old babies stared longer and displayed a strong preference for faces rated as physically attractive. Additionally, six- to nine-month-old infants demonstrated bias in favor of members of their own race and against those of other races.

Although politically incorrect, these studies are significant in offering a new perspective on how unconscious bias impacts behavior and indirectly confirms what social scientists have long said: people erroneously believe they are in control of their thoughts, emotions and decisions. In reality, we are shaped by the innate nature of the mind, which is, for the most part, not accessible to our conscious state.

As biases are mostly based on early life experiences deeply embedded in the brain, all you can do is to try to become aware, learning to deal with them.

**Slide:** And it's with this idea that I wish to conclude with the following quote from Swiss psychoanalyst Carl Jung: "Unless you make the unconscious conscious, it will direct your life and you will call it fate."

*"Unless you make the unconscious  
conscious, it will direct your life  
and you will call it fate."*



Carl Jung

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