SCHOLARLY REVIEW

The role of subconscious processes in decision-making: Insights from neuroeconomics

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Author Biography

Kayan Mbarki, a high school senior, explores human behavior through the lens of neuroscience and psychology. Passionate about personal growth and self-awareness, she analyzes emotions and behavior to uncover deeper insights into the mind and its impact on the world.

Abstract

This paper explores the underlying influences that affect human choices, especially in economic situations. By incorporating findings from neuroeconomics, it examines how emotions, cognitive biases, and unconscious mechanisms frequently influence choices before conscious thoughts take place. Recent developments in neuroscience have shown that decision-making is affected by brain regions tied to emotional processing and reward assessment, questioning conventional models that prioritize rationality. The research emphasizes how biases like confirmation bias can sway judgment and actions, causing people to make decisions that reflect existing beliefs rather than facts. Using the perspective of neuroeconomic theory, this paper examines the consequences of these unconscious influences in fields such as marketing and policy-making. Using examples such as Phineas Gage's brain trauma, the paper emphasizes the essential function of emotions in decision-making. In the end, this study encourages a more profound comprehension of how unseen cognitive processes influence our decisions, offering important insights for both individuals and organizations aiming to better understand decision-making outcomes.

Keywords: Subconscious processes, Subconscious, Decision-making, Neuroeconomics, Neuroscience, Cognitive Behavior, Cognitive Bias, Unconsciousness, Phineas Gage, Human Behavior, Psychology.

Introduction

Neuroeconomics is the interdisciplinary study of how the brain makes decisions, drawing from neuroscience, psychology, economics, and cognitive science. This emerging field provides valuable insights into the complex mechanisms underlying economic decision-making. Recent theoretical developments in neuroeconomics and psychology have highlighted the importance of unconscious factors in decision-making. The decision-making process involves several cognitive steps: recognizing a problem or decision, acquiring relevant information, weighing options, and finally, making a choice. However, this seemingly logical order is often influenced by a subconscious interplay of emotions, memories, and cognitive biases that can color our interpretations of choices and their consequences. Understanding these factors' complex interplay is crucial for a comprehensive understanding of human economic behavior and decision-making.

The role of subconscious processes in decision-making

Neuroeconomic research has shed light on the neural correlates of economic decision-making, revealing that emotional and cognitive processes are closely intertwined (Griffith et al., 2019). Studies utilizing brain imaging techniques, such as functional MRI- a method that measures brain activity by detecting changes in blood flow- illustrate that brain areas linked to reward and emotion activate before a conscious decision is reached (Phan et al., 2004). This implies that the brain does a lot of "behind the scenes" evaluation of options, especially when the situation is vague or risky. In economic contexts, subconscious preferences and biases can substantially influence how individuals assess costs and benefits, often leading to choices that deviate from rational behavior models. As Shankar Vedantam discusses in his keynote The Hidden Brain (2014), much of our decision-making process is unconscious, and how much it affects our behaviors without us even knowing it. Vedantam's lecture points out that even though we like to think that our decisions come from logical thought processes, many of our choices are influenced by hidden biases, feelings, and mental heuristics (Vedantam, 2010). This interplay between conscious and subconscious processes is central to human cognition. Although the conscious mind seems to perform all the thinking and decision-making, most mental processing occurs in the subconscious. Cognitive scientists have found that many decisions are influenced by subconscious factors such as emotions, previous experiences, and cognitive biases. This dual nature of human cognition—conscious rationality and subconscious intuition—plays a central role in decision-making, with the subconscious often guiding behavior without overt awareness. According to cognitive scientist Gerald Zaltman's research, he found that a staggering 95% of all human decisions are made at a subconscious level. As Zaltman puts it, “A lot goes on in our minds that we’re unaware of. Most of what controls what we say and do happens below the level of consciousness” (2003).

Zaltman’s idea is supported by research done by Manfred Zimmerman, a psychologist most notable for his research in cognitive psychology and human information processing, which is studying how much information the human brain takes in. His research suggests that while the brain is capable of processing 11 million bits of information, only 50 bits per second are processed in a conscious state. Most of this processing occurs at a subconscious or nonconscious level, influencing behavior without our control or awareness (Zimmerman, 1986). Fascinatingly enough, almost 10 million of those bits have to do with the visual system, underscoring how powerful and dominant visual stimuli are regarding human perception and choice. The conscious mind, however, only handles a small number of bits (estimated to be around 40 to 50), which is why so much of what drives behavior and decision-making is rooted in non-conscious processes. Research confirms that 80% to 90% of human processes are happening at a nonconscious level (Walla, 2011).

The role of emotion in decision-making: Phineas Gage's case

Emotions play a pivotal role in decision-making by shaping how we perceive and evaluate choices, often serving as an essential link between rational thought and subconscious processes. Standard economic models assume that humans are rational agents, always making decisions that will maximize their utility. However, neuroeconomic research disputes this notion by showing that humans often behave irrationally because of the impact of emotions, cognitive biases, and subliminal processes (Damasio, 1994). While rationality contributes to decision-making, it does not fully account for all factors. Emotions influence decisions by providing context, and helping to prioritize certain choices based on past experiences and learned patterns.

Phineas Gage was a railroad worker in the 1800s, responsible for placing dynamite during railroad construction. One day, an accident caused the dynamite to explode prematurely, driving an iron rod through his left eye and out of his skull (see Figure 1). Remarkably, Gage survived, but experienced a profound personality change. He was always a very hard worker and very responsible until the accident. Afterward, however, he became erratic, unable to maintain a job, and he even joined the circus to display the iron rod that went through his head.

Figure 1

Phineas Gage's brain injury, with frontal lobe damage highlighted in red. Image from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Phineas_Gage_Injury.svg).

In the public domain.

For years, doctors blamed the change in Gage's behavior on trauma. However, neuroscientist Antonio Damasio revisited Gage's case by examining his preserved skull and using computer reconstruction to study the damage to his brain. Damasio found that the accident had destroyed Gage's ventromedial prefrontal cortex (vmPFC), which is an area of the brain that is very important in emotional processing and decision-making. The ventromedial prefrontal cortex plays an important role in the weighting of emotional influences in decision-making processes. In this region of the brain, decisions are made based on the risk/reward evaluation, utilizing emotional feedback from previous stimuli to inform current behavior. Damasio found the same behavior in other patients who had sustained damage to the same area, verifying its function as a bridge between emotion and decision-making processes (Neylan, 1999). These patients remained perfectly intelligent and capable of rationally comprehending choices, but they could not seem to make a decision, demonstrating the necessity of feeling when making a decision. Damasio's work on Phineas Gage and subsequent research on the brain's emotional centers illustrate that emotions are deeply intertwined with rational thought. Rather than being separate from rationality, emotions guide our responses to complex situations by influencing our perceptions and priorities (Damasio, 1994).

Cognitive biases & decision-making

Cognitive biases often arise from prior knowledge and experiences. Although knowledge allows for making educated decisions, it can also strengthen prejudices. For instance, confirmation bias, the tendency of individuals to seek out or overweight evidence that confirms their beliefs while avoiding or underweighting evidence that contradicts them, causes individuals to prioritize information that aligns with their preexisting views (Kaanders et al., 2022). Allowing new data to be filtered through past experiences can lead to distorted decision-making processes and cause individuals to trust their mental models, which are often flawed.

Shankar Vedantam, in his book The Hidden Brain, discusses how knowledge can paradoxically lead to more bias rather than reducing it. He says that as people gain more and more information or knowledge, they tend to become more stubborn about their beliefs. However, this arrogance can only strengthen preconceived notions instead of testing them, and people tend to overlook conflicting evidence or even twist new information to fit their original beliefs. Vedantam points out that just because one knows something doesn't necessarily mean one will make a more objective decision. People don't use their knowledge that way; they use it selectively to prove what they already know. This is known as confirmation bias. As people know more, they can rationalize their prejudiced conclusions instead of rising above them (Vedantam, 2010). This coincides with research in cognitive psychology stating that experts, even though they have more knowledge, are often just as vulnerable to bias as laymen because their extensive knowledge strengthens their preconceived mental models.

Specifically, studies have shown that even experts, such as doctors, are susceptible to confirmation bias. In one study, doctors were presented with patient medical records and asked to make diagnoses. The doctors tended to seek out and prioritize information that aligned with their initial hypothesis, even when presented with contradicting evidence. This led to them overlooking important details that could have changed their diagnosis, demonstrating how experts' preexisting beliefs can bias their decision-making processes (Bhatti, 2018).

Practical implications

There are many implications to this understanding of the subconscious decision-making processes in marketing, policy-making, finance, etc. The concept that consumers base their perceptions of products on idealized forms and not necessarily reality is something marketers can use. Companies can construct much more enticing stories if they focus on how their products represent these ideals (quality, luxury, sustainability, etc.) and appeal to the consumer emotionally. For example, Apple Inc. has made its products seem almost tangible expressions of creativity and innovation, allowing the consumer to feel that they will inherently share in these qualities by purchasing the product. This strategy is evident in their advertising campaigns, which often focus on how Apple products enhance creativity and connectivity, tapping into consumers' desires for self-expression and belonging (Woodside et al., 2008; Lan, 2021). Also, the "Truth" campaign to stop smoking used emotional storytelling and powerful images to reach the youth; it just showed how emotional contact can change behavior dramatically (Hicks, 2001). Whether it is businesses trying to sell a product or policymakers trying to enact change, neuroscience understanding can create better marketing schemes and policies that play with the consumers' emotions and cognitive biases, which will, in turn, increase involvement and behavior change.

Conclusion

In conclusion, recent advancements in neuroscience have revealed that emotions are inextricably linked to cognitive processes, particularly in the domain of decision-making. The groundbreaking work of researchers like Antonio Damasio has illuminated the critical role that emotional processing plays in informing and guiding our choices and behaviors. Rather than being separate from rationality, emotions serve as a vital bridge, weighting the risk-reward evaluation and drawing upon previous experiences to shape our perceptions

and priorities. This intimate interplay between emotion and cognition underscores the necessity of considering both factors to fully understand the complex mechanisms underlying human decision-making.

By leveraging this growing body of neuroscientific knowledge, we can develop more effective strategies that account for the powerful influence of emotions in guiding individual and collective choices across a wide range of fields, from marketing and policy-making to finance and beyond. Understanding the subconscious processes that drive our decisions is crucial, as it allows us to create more nuanced and impactful interventions that can influence behavior in meaningful ways. As we continue to explore the intricate neural underpinnings of this relationship, the practical applications of this knowledge will become increasingly valuable in addressing the complex challenges facing our world.

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