Journal of Sociology and Ethnology (2023)
Clausius Scientific Press, Canada

DOI: 10.23977/jsoce.2023.050606
ISSN 2616-2318 Vol. 5 Num. 6

Relationship between Cognitive Biases in Decision-Making

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Keywords: Cognitive Biases, Decision-making, Confirmation Bias, Sunk cost fallacy

Abstract: This essay explores the relationship between cognitive biases and decision-making, drawing on relevant literature to support its arguments. Cognitive biases are systematic errors that individuals make in their thinking [16], while decision-making involves evaluating and making choices based on available information [13]. It has been estimated that 70% of all decisions made by humans are affected by cognitive biases [10], highlighting the significance of understanding the relationship between the two concepts in various industries and fields, such as business, healthcare, law, and public policy[4] .

1. Introduction

Individual judgment and behavior are some of the most important aspects of human life as they play a critical role in determining the quality of life for each person. Numerous factors, including cognitive biases and decision-making, impact these two aspects. Cognitive biases are the systematic errors people make in their thinking process, influencing decisions [2]. Cognitive biases develop when an individual has limitations in processing some information. They also develop from motivational factors that affect the individual's perception, memory, and reasoning. On the other hand, decision-making is about evaluating and making certain choices based on available options and available information. 70% of all decisions made by humans are affected by cognitive biases [10]. Therefore, there is a direct relationship between cognitive biases and decision-making, as cognitive biases significantly impact the decision-making process and the quality of individual decisions. This essay will explore the relationship between cognitive biases and decision-making and provide insight into how cognitive biases impact decision-making.

The relationship between cognitive biases and decision-making is a critical area of study in cognitive psychology. Considering that decision-making is one of the most important aspects of an individual's daily life[9] . Understanding the relationship between these two concepts is important to understanding the effects of poor decision-making. The effects of poor-decision making are mostly from financial losses to health risks. For example, poor-decision making may due to factors like cognitive biases is the causes for more than 50% of financial losses in organizations and businesses[15] . The relationship between cognitive biases and decision-making helps people to understand the role of effective decision-making in various fields, like business/healthcare/public policy. Therefore, understanding the relationship between cognitive biases and decision-making is essential to develop effective strategies to minimize the biases' effects in decision-making.

2. Cognitive Biases in Cognitive Psychology

Cognitive biases exist in several forms, manifesting in different situations based on individual experiences and dispositions. Confirmation bias is one of the most common cognitive biases as three in every ten people make decisions that are precedented by this bias[12]. This bias is an individual's propensity to search, interpret, and recall information through methods that confirm their pre-existing beliefs or hypotheses. This bias also causes individuals to ignore or dismiss contradictory evidence that is available against their already pre-existing beliefs. People with a confirmation bias are overconfident about their beliefs, which prevents them from considering alternative perspectives and making objective decisions. For example, a person who believes vaccines are harmful will likely search for information supporting this belief while ignoring or rejecting information contradicting contrary evidence.

Availability bias is also one of the most common types of cognitive bias. This bias is characterized by a tendency to rely on easily accessible or readily available information when making judgments or decisions, regardless of its accuracy or relevance[5] .Usually, this bias occurs because people are more likely to remember and give more attention to salient or memorable information. Salient of memorable information impacts more than five in every ten decisions that humans make daily[18]. When this bias occurs, the individual gives less attention to less memorable information. For example, if an individual has watched multiple news reports of airplane crashes, they may overestimate the likelihood of an airplane crash, despite t that airplane crashes are statistically rare.

In addition, the sunk cost fallacy is also one of the most common cognitive biases. The sunk cost effect is manifested in a greater tendency to continue an endeavor once an investment in money, effort, or time has been made[1] . 40% of businesses and organizations are affected by this bias[6] .One of the reasons why this bias occurs is the perception that the sunk cost is a loss; hence the individual harbors a psychological pressure to continue investing in the decision or project to recoup the cost. However, continuing to invest in a decision or project that is not likely to succeed is likely to lead to more losses. For example, an individual who has invested a significant amount of money in a failing business may continue to invest additional resources in the same business instead of closing the business.

Cognitive biases originate from various factors. One of the primary origins of cognitive biases is an evolutionary adaptation. Over the years, humans have evolved in an environment where fast and heuristic decision-making is important for survival. Therefore, cognitive biases have developed due to evolutionary processes that favor fast and efficient decision-making, especially in situations of uncertainty or danger [11] .For example, the availability bias evolved as a survival mechanism to help individuals make quick decisions based on limited information. Social and cultural influences are also some of the origins of cognitive biases. This is because humans receive information from their social and cultural environments and are influenced by the beliefs and attitudes that exist in their social and cultural environments. This leads to the development of cognitive biases that reflect the cultural norms and values of a particular group or society. For example, confirmation bias is more prevalent in cultures that value conformity and discourage dissenting opinions.

2.1 The Concept of Decision-Making

Decision-making is determining or establishing a course of action among multiple alternatives based on criteria or preferences. It is a process that entails evaluating the available options and choosing the most appropriate option based on the expected outcomes, risks, benefits, and costs. Decision-making involves several emotional, social, and contextual factors. Effective decision-making requires careful consideration of all relevant factors and balancing competing interests and

goals[3]. Types of decision-making are based on the process that an individual used to decide a course of action when presented with multiple options. The most type of decision-making is intuitive decision-making. In this type of decision-making, the decisions are based on intuition feeling instead of deliberate analysis. This type of decision-making relies on heuristics, a mental shortcut, or rules of thumb to make fast decisions. Intuitive decision-making is often effective when time is limited, or the available information is incomplete. However, this type of decision–making is impacted by cognitive biases such as confirmation and availability biases. The second type of decision-making is rational decision-making. This type of decision-making entails systematically and deliberately analyzing all available information and choosing the best alternative based on pre-set criteria and preferences[7]. In this type of decision-making, the individual follows a step-by-step process: identify the problem, generate alternative solutions, evaluate the alternatives based on the criteria, select the best alternative, and implement and monitor the decision. Rational decision-making often consumes more time than other types of decision-making. It is also challenging for many people to make this type of decision when in situations with limited information or high levels of uncertainty. Cognitive biases also impact this type of decision-making. However, it is less prone to cognitive biases, leading to more optimal decisions.

External and internal factors influence the decision-making process. The internal factors are those related to the individual making the decision. For example, cognitive factors such as the individual's cognitive abilities, knowledge, and expertise are some of the internal factors that impact the decision-making process. Emotional factors such as the individual's mood, attitudes, and values, which can affect their decision-making by influencing their preferences and priorities, are also internal factors impacting the process[8] .In addition, personality factors like the individual's traits, such as risk-taking propensity, which influence their decision-making style and approach, are also internal factors affecting the decision-making process. Lastly, motivational factors like the individual's goals, incentives, and interests, which influence their decision-making by guiding their choices, also constitute the internal factors affecting the decision-making process.

External factors influencing the decision-making process are the factors that are related to the environment where the decision is made. Some of the most important external factors in this context include social factors such as the opinions and attitudes of others, social norms, and cultural values, as they influence the individual's decision-making by affecting their perceptions of what is acceptable or desirable in their social environment, such as among friends. In addition, organizational factors such as the policies, procedures, and structures of the organization, which influence the individual's decision-making by providing guidelines or constraints, are also some of the external factors that impact decision-making[14] . Lastly, situational factors such as the level of uncertainty, the complexity of the decision, and the time pressure, which influence the individual's decision-making by affecting the information available or the time available to analyze that information, also constitute the external factors affecting the process of decision-making.

2.2 Cognitive Biases in relation to Decision-making

The concepts of cognitive biases and decision-making are related due to cognitive biases' critical role in decision-making during the entire decision-making process. The various types of cognitive biases have a direct relationship with decision-making as they impact different types of decision-making. When an individual harbors a confirmation bias during the decision-making process, the bias has a 50% chance of leading to selecting options that confirm pre-existing beliefs while ignoring or rejecting potentially better alternatives[12] . For example, A manager who gets an initial positive impression from a candidate when conducting a job interview is likely to primarily focus on the candidate's strengths as they confirm the manager's initial positive impression. At the same

time, the manager ignores or downplays negative feedback from others and also fails to consider any noticeable weaknesses in the candidate's resume. This leads to the selection of unsuitable candidates, while more qualified and suitable candidates are left out of the hiring, which in turn leads to decreased productivity in the business or organization. It also leads to a lack of diversity in the workforce, as candidates who fail to fit the hiring manager's preconceived notions are overlooked.

In addition, if an individual develops an availability bias during the decision-making process, the individual relies more on information that is easily accessible or readily available in memory instead of considering all relevant information. This bias leads to making more salient or memorable decisions, despite that such decisions are not the best alternatives based on objective criteria[2] . For example, in every two doctors, one is likely to rely too heavily on the most recent cases or their personal experiences when diagnosing a patient instead of considering all relevant information, such as the patient's medical history, leading to a misdiagnosis or missed diagnosis[17] . This, in turn, results in delayed or ineffective treatment, leading to poor patient outcomes and more severe outcomes like increased mortality.

Lastly, when individuals develop a sunk cost fallacy during a decision-making process, they persist with a course of action, despite the course of action being irrational and non-optimal due to the investment of resources or effort already made. This bias leads to the selection of unviable options[2].The individual making the decision also fails to consider the opportunity costs of continuing with the same course of action. For example, a company that has invested heavily in a failing project may continue to invest resources to try to salvage the project instead of discontinuing the project and redirecting resources to more promising projects. In this context, the sunk cost fallacy leads to increased wastage of resources and missed opportunities. It also leads to a lack of innovation, as individuals and companies are reluctant to discontinue unsuccessful projects.

3. Strategies to Address Cognitive Biases in Decision-Making

There are several strategies that individuals can use to overcome cognitive biases in decision-making. One of the first steps in overcoming cognitive biases is developing awareness of such biases and their potential impact on decision-making. Developing awareness of cognitive biases is the first step toward addressing such biases in decision-making [19] .Education and training individuals on cognitive biases and how they affect decision-making is also one of the most effective strategies to address the biases and their role in decision-making. Education and training entail enrolling individuals, such as employees, in formal training programs like workshops, which help individuals better understand cognitive biases. Systematic decision-making, which entails using a structured approach to decision-making, such as decision trees or flowcharts, also helps individuals identify and address potential biases in their decision-making process.

In addition, using the devil's advocate approach is also an effective strategy for addressing cognitive biases. It involves deliberately seeking out and considering alternative viewpoints or arguments. It helps individuals to challenge their assumptions and identify potential biases in their decision-making [19] .Considering diverse perspectives and input to address cognitive biases in decision-making helps individuals avoid groupthink and identify potential biases in their decision-making. This strategy includes considering input from individuals with different backgrounds, experiences, or perspectives. Another effective strategy in this context is controlling emotions. According to Zhou et al., 2022, emotions affect approximately 40% or forty in one hundred of all intertemporal decisions made by individuals[20] . Therefore, controlling emotions helps people to make more rational and objective decisions. Lastly, considering feedback from other players helps individuals to identify potential biases in their decision-making; hence it is an effective strategy to

address cognitive biases in decision-making.

4. Conclusion

In summary, cognitive biases have a considerable influence on decision-making, usually resulting in unfavorable outcomes. Grasping the concept of cognitive biases, the various types/origins/elements affecting decision-making, and the repercussions of cognitive biases allows individuals to make more informed, rational, and unbiased choices. Several strategy can be used to address cognitive biases, including raising awareness, education, methodical decision-making, embracing diverse viewpoints, managing emotions, and soliciting feedback from others. By adopting these strategies, individuals can enhance the quality of their decision-making process, minimizing the adverse effects from cognitive biases. Finally, cognitive biases represent a vital aspect of cognitive psychology, as they contribute to a deeper comprehension of the factors influencing effective decision-making in both personal and professional settings.

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