ESIC2024, Vol 8.2, S2 Posted: 04/09/2024

Cognitive Biases and Decision Making

Vallejo-Chávez, Luz Maribel[1], Vinueza-Salinas, Ana.Julia[2], Perugachi-Cahueñas, Nelly Patricia[2], Vasco-Vasco, Jorge Antonio[3]

[1]Carrera de Mercadotecnia; Grupo de Investigación GIRETME; Facultad de Administración de Empresas "Escuela Superior Politécnica de Chimborazo (ESPOCH)"; luz.vallejo @espoch.edu.ec
[2]Carrera de Mercadotecnia; Facultad de Administración de Empresas; "Escuela Superior Politécnica de Chimborazo (ESPOCH)"
[3]Facultad de Administración de Empresas, Carrera de mercadotecnia; Grupo de Investigación Bidata, Facultad de Administración de Empresas; "Escuela Superior Politécnica de Chimborazo (ESPOCH)",

Abstract

The objective is to identify cognitive biases in managers when making decisions. A bibliographic review of the main postulates of cognitive psychology was carried out, part of the contributions of March and Simón, authors of the cognitive school of organization. The descriptive, cross-sectional and intra-individual study, the sample of 58 managers from the city of Riobamba, Ecuador, in middle age (age 25-35 years), women 28%, men, 72%. A 12-item survey was used to identify (10 biases): recency, anchorage, confirmation, halo, excessive optimism, availability, planning, group, sunk cost, possession effect, a high percentage confirming the use of these is evident. cognitive biases in managers' decision making; In addition, it was identified that there were gender differences in cognitive biases when making decisions: women are analytical and less risky in their decisions, while men accept greater risk and uncertainty when making decisions, this study will allow in Future research will make a comparison of the ages of the managers; Cognitive biases allow us to understand and explain the behavior of managers in highly complex situations in managerial functions.

Keywords: reasoned thinking, perception errors, interpretations, cognitive biases, economic theories, decision making.

1. Introduction

The cognitive theory of the organization is part of the strategic management study; which covers the different approaches to thinking that are developed in organizations, and contributes to the definition of strategies, from design, planning, formulation, implementation and control (Mintzberg, Ahlstrand & Lampel, 1999). The cognitive school, its foundations are They are collected in a series of investigations with a focus aimed at studying the mind of the manager, specifically how he formulates the strategy, using the postulates of cognitive psychology.

Schwenk (1995) describes it as a theoretical perspective with practical implications, oriented to the processes that influence decision making, from the conceptualization of the strategic plan, the definition of the processes, the implementation and execution, to the description of certain performance characteristics and behavior of managers in the organization they direct. According to Zapata & Hernández (2014), the cognitive perspective focuses attention on decision-making processes in complex, dynamic and uncertain conditions, focused from the point of view of the individual's cognition.

Decision making is an inherent human activity, which is also found in management processes, that is, it is analyzed from the point of view of the individual and the organization. This implies considering complex aspects, such as: the conditions of the changing and competitive environment, the strengths and weaknesses of the organization, the decisions made in the past and their effects on the results of the present, the future projection, the decisions taken by other organizations, the consequences on interorganizational relationships, and expectations about results, organizational culture, among others. Méndez, L. & Rotundo, G. (2018).

According to Simon (1947), human beings perceive the world as a simplified model, of great confusion and complexity, and in their effort to achieve rationality they are restricted within the limits of their own knowledge. This idea constitutes, in essence, the starting point for defining the concept of limited rationality, a core aspect for the construction and cognitive theory of the organization. In this way, limited rationality proposes that the classical economic man makes optimal decisions in a clearly known and well-defined environment; Unlike administrative man, he considers fractional aspects of reality (March & Simon, 1958). An important part of this fractional vision is determined by cognitive biases, considered as filters, mental predispositions and particular judgments of each individual that condition their thinking and, consequently, their actions (Zapata & Canet, 2009).

The objective of the study of cognitive biases is to determine the relationship in the decision-making processes of managers, it is based on the concepts: cognitive psychology and the cognitive perspective of the organization. It begins with the bibliographic review of the main postulates of cognitive psychology, its beginnings and applications in the organization, and the contributions of (March and Simon, et al.), recognized authors of the cognitive theory of organization. Subsequently, the cognitive biases and the cognitive process of the perception of those who direct the company in their administrative functions are identified, identifying the cognitive biases most used by managers in the organization's decision making and their implications. Finally, the conclusions of the research are presented.

From cognitive psychology to the cognitive perspective of the organization.

Cognitive psychology arises as a response to common sense psychology or behaviorism, it supports the idea that people act based on knowledge and internal representations (experiences, perceptions, beliefs) in this way they give meaning to the world, with certain criteria of objectivity. Although both currents coexist, it is the “notion of objectivity” that has been criticized, creating a bias in “mental complexity” (Riviere, 1991).

With the publication of Neisser's book (1967), entitled Cognitive Psychology, he gives a response to the behaviorist model and considers that scientific studies focus only on that which has observable properties in behavior and in environmental stimuli. On the contrary, cognitive psychology focuses on unobservable processes that involve complex functions of thought, such as: perception, memory, language, concept formation and problem solving (Escobedo, 1993). In cognitive psychology, it studies topics related to the mind, such as: the amount of information that individuals receive, the steps for processing that information and the global strategies they use to solve problems (Gardner, 1987).

Mental functions have been the object of analysis in philosophy, in this way there are approaches from philosophers in cognitive psychology studies; In this context, in recent years there has been an attempt to experimentally verify these hypotheses, to provide an answer to how the mind works, and based on these results, establish models and conclusions. Another characteristic of cognitive psychology is the analogy between human thinking and the operation of a computer; studies allow comparisons to be made to identify, analyze and describe whether there are coincidences in these processes (Escobedo, et al.).

(March & Simon et al.) studied the characteristics of human behavior in organizations, starting from the premise that an organization is a selector entity that makes decisions and solves problems; However, in these processes it is limited by the number of alternatives and activities that are resolved at the same time; due to the amount of information received and available in the memory and in the environment of the decision maker, which is also limited.

The application of cognitive psychology in strategic management is known as “cognitive perspective theory of the organization”. For authors such as Mintzberg et. to the. (1999), this perspective, is a closed school of thought, which teaches and practices its strategies from the point of view of cognition, which focuses on mental processes and the way in which individuals perceive, process and use information in the organizational context. That is, this perspective is based on the idea that the interpretation of information and decision making are key processes that affect organizational behavior.

(Zapata & Hernández et al.) analyze this perspective of why the members of the organization act in a certain way, how they make decisions in different circumstances and, finally, what the strategic decision process consists of, which are based on concepts and aspects related to the individual's cognition, which are related to “selective interpretation” in how an individual prefers certain information over another; In this way there is a cognitive simplification to reduce the information complexity process and facilitate decision making. Additionally, this theory also refers to organizational memory, how past experiences influence the way present situations are perceived and handled. In summary, perspective theory studies how individual and collective cognitive structures influence the way organizations process information, make decisions, and adapt to the environment.

Banyard, Cassells, Green, Hartland, Hayes & Reddy (1995), cognition is the thinking and understanding of how the human mind works in the processes of: perception, attention, thinking, memory and language; The human being has psychological characteristics at the individual level;

However, it is strongly influenced by social systems, family, school and organizations, among others.

Nonaka (1994), organizational knowledge structures are formed based on the individual learning and cognition of those who comprise it; This means that individual knowledge is shared and institutionalized to become the knowledge system of the organization. Weick (1969) proposes a psychological approach to the organization expressed in terms of tasks. From this perspective, organization and the function of organizing is basically a cognitive process that must be recognized at its different levels of analysis. Below are the levels of analysis of this theory shown in Figure 1.

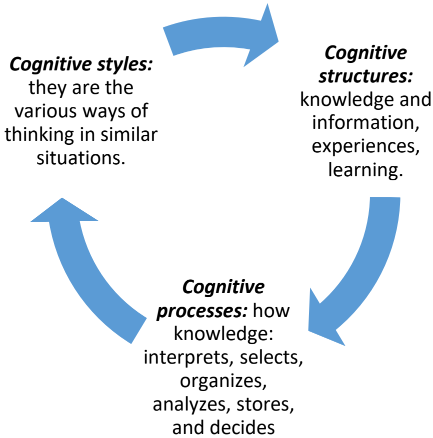

Figure 1. Levels of analysis of the cognitive perspective of the organization.

Source: Zapata and Hernández (2014)

Figure 1 shows the three levels of analysis of the cognitive perspective: structure, processes and cognitive styles. These levels of analysis are described below according to Zapata & Hernández (2014).

Structures represent how information is organized, according to categories, construct systems, causal systems and scripts, which is dynamic, constantly modified through experiences, and contrasted with existing knowledge. previous steps to generate new information and knowledge. Structures also involve retrieving stored knowledge (memory) and incorporating new knowledge. For their part, cognitive processes are related to the processing of information in the generation of knowledge from new information.

Both cognitive structures and processes are directly determined by cognitive styles, which are related to the way of thinking of each individual. Cognitive styles are individual and organizational (joint decisions) according to the importance, attention, and interest in the information that is available and considered essential, decisions are made; However, an analysis of the information that is not available should also be carried out, so that cognitive biases do not occur. (Blaylock & Rees, 1984; Cheng, Luckett & Schulz, 2003). The combination of probability and utility is a judgment that is quite difficult to achieve in practice, and in this way a cognitive bias is generated (Cortada & Macbeth, 2006).

Simon opposed limited rationality to the classic model of rational choice, applied to the world of organizations and managerial decision-making. In the field of psychology, Kahneman and Tversky (1974) develop the study of human judgments in the face of risk and uncertainty and introduce heuristic theory and cognitive biases, also in order to challenge the models that dominated in psychology. the time and that they were strictly rational, thus developing their own perspective of limited rationality. The approach of these authors generated research in the field of Psychology, Economics, Law, Sociology, Medicine and Political Sciences (Cortada, 2008). His work has been developed to study the aspects that determine decision-making in situations where benefits and losses are uncertain (Chahin, 2016).

Schwenk (1984, p. 111) defines strategic decisions "as a special kind of decision-making under uncertainty. Such decisions involve the activities of formulating objectives, identifying problems, generating alternatives and evaluating/selecting." Duhaime & Schwenk (1985) indicate that strategic decisions are characterized by the lack of accuracy in their structure, and this is due to the complexity of strategic problems. This complexity is explained because the strategic problem does not have a clear formulation; it is difficult to describe the problem and determine the criteria by which individuals should be guided to judge appropriate solutions.

Thus, researchers of cognitive psychology and behavioral decision theories have identified a series of heuristics and cognitive biases that individuals are subject to in their judgment or decision-making processes under situations of uncertainty and complexity (Tversky & Kahneman, 1973, 1991; Makridakis, 1990; Kahneman, Slovic & Tversky, 1982; Das & Teng, 1999; Fisk, 2002; Vidar & Lechner, 2013; Otuteye & Siddiquee, 2015, Duhaime & Schwenk, 1985) all agree That, individuals responsible for making strategic decisions in organizations use strategic simplification or cognitive biases in decision-making processes.

Cognitive biases, according to (Zapata & Canet et.al.), are value judgment rules that allow decision makers to simplify complex situations, to define the most convenient models of decisions and actions. Thus, cognitive biases allow the development of simplified models of the world or reality that surrounds directors and managers, with the purpose of facilitating the decision-making process under complex situations and the development of solution proposals. to business problems; That is, they allow difficult mental tasks to be reduced to simpler tasks, in the decisions of the organizational structure of the company. (Zapata & Canet, et.al., p.244). (Busenitz & Barney, 1997) take a positive view of heuristics and cognitive biases; They state that they provide adequate solutions to approach appropriate decisions.

Katz (1992) develops the proposed psychosocial cognitive model of choice, and recognizes that heuristic processes contribute to how people make their individual choices or decisions. For their part, (Kahneman et.al., 2011) affirm that the influence of cognitive biases is more reflected when moving from the individual to the group. Therefore, it is more difficult for a decision maker to detect their own cognitive biases, and these are more evident when they are integrated into the analysis in the group within the organization, which is responsible for making an important decision. The authors state that biases that cannot be seen in themselves become visible in the minimal analysis in pairs, for this reason it is favorable for decisions to be made by several people. This position coincides with Schneider & Angelmar (1993), who propose that the cognitive model for organizational analysis should be fundamentally oriented to the study of cognition at the organizational group level, always considering the relationships between cognition, action and organizational performance.

In this context, Liu (2017) states that shared cognition during organizational processes constitutes an important factor in the decision-making of senior management teams. This cognition reflects understanding and agreement in decision making regarding organizational goals and strategies; Furthermore, shared cognition does not mean that heterogeneity or conflict does not exist, but rather contributes to resolution through effective interaction and communication between different members, which brings improvements in team efficiency.

The benefits of group decision are directly related to the two thinking systems of (Kahneman, 2012) in his book Think Fast, Think Slow. In this work, the author describes two systems of thought, one intuitive and emotional that he identifies as thought system 1, and another analytical and rational, which he identifies as thought system 2, which coexist and constantly interact in the human mind. Applying the notion of these two systems to the circumstances involving a group decision, Kahneman et al. (2011) state that thinking system 2 allows us to identify errors in the recommendations given by other team members in the use of the thinking system (Simon & Houghton, 1999) and (Simon, Hougton & Aquino, 2000) point out that bias The illusion of control makes the individual think that they can believe they control, to a large extent, uncontrollable events, which leads to accurately predicting the results of such events.

(Kahneman & Tversky et al., 1974), make a distinction between the terms: heuristic and cognitive biases, highlighting those heuristics are the principles used to evaluate and predict values, and cognitive biases are associated with these heuristics. But there is another trend, adopted by (Schwenk, et al., 1984) and Busenitz & Barney (1997), who used the two terms interchangeably in their research. Based on these approaches, in this research the position of using the term cognitive biases is assumed. Table 2 shows some cognitive biases that are applied in decision making.

Table 1. Types of cognitive biases in decision making.

Cognitive biases	Description
Reason by analogy.	It is applying the same recipe to solve similar problems. We lose sight of the fact that different problems require different solutions.
Observant tendency.	Impossibility of changing one's opinion in the face of new evidence.
Illusion of control.	Managers overestimate the degree of their abilities. This involves increasing performance in situations in which skills do not play a fundamental role by underestimating the effects of possible uncontrolled events.
Availability.	Managers use readily available or experiential information that is easily remembered, and may exclude information that might be relevant and useful.
Anchorage.	Decisions are made from initial information to the first impression.
Selective perception.	Problems are observed in terms of perception and experience.

Insensitivity to sample size.	The probabilities are evaluated through the representativeness of the statistical sample in highly global judgments.
Commitment.	Managers may be committed to continuing to invest, even if there is evidence of poor performance.
Underestimation of uncertainty.	Managers have excessive optimism, an illusory correlation and the need to reduce the anxiety produced by an underestimation of the uncertainty of the future.
Imagination.	Managers have reflections that do not correspond to reality, distorting their evaluation in decision-making.
Sunk cost.	Managers think that they have invested so much money, time and effort and that is why they cannot stop now, instead of considering the current and future situation objectively. Managers must ask themselves, yes, under the current circumstances, is this the best decision for the future of the company?

Source: Makridakis (1990); Duhaime & Shwenk (1985); Kahneman, Slovic & Tversky (1982) adapted and modified.

(Urra Medina & Acosta, 2011) affirm that cognitive biases are intercultural and resistant to knowledge. They define them as those simplifying normative processes of selection, processing and adjustment of information that lead to valuation and prediction biases, these being understood from their negative or deviation connotation. This view of cognitive biases as causing decisions that are more adjusted to the thinking of the decision-makers than to the real conditions that motivate them, gives them the property of being potentially distorting and causing negative effects on the organization. For this reason, these authors highlight the attention that management must give to cognitive biases and the importance of managers focusing on contributing to their understanding and management, since knowledge of how they operate and the consequences they entail It allows managing contingency factors that can be configured and, therefore, controlled, as a measure to prevent harmful effects on organizational decision-making processes.

Montibeller & VonWinterfeldt (2015) make a distinction between difficult biases and biases that are easy to correct. They claim that difficult biases are resistant to logic, decomposition, and the use of training tools. Among these biases they mention overconfidence and anchoring. Among the biases that the authors consider easy to correct, through tools such as the use of statistical data, probability and logic, is the illusory correlation.

Management processes involve making strategic decisions in various aspects of the organization, from structure design, processes, organizational culture and relationships with interest groups, among others. Zapata, Mirabal & Canet (2015) describe the organizational environment as competitive, being represented by opportunities and threats to which the organization must adjust, balancing the internal variables of organizational design, with the external variables of the environment where it operates.

Zapata et al. (2015, p. 791) managers select or create the environment where they want to participate, compete and structure the decisions necessary to adjust their perceptions about the world around them. For these authors, the perception of the environment is a cognitive process that serves as a guide that guides the organizational structure and processes, as well as the environmental factors with the greatest impact, with a directive vision, linked to the way the company should be managed. . One of the aspects that affects the perception of the environment is uncertainty, which is one of the main problems that company management faces. Schwenk (1988) states that the cognitive process of perception is fundamental in the study to link the environment, strategy and structure of the organization. Wilson, Centerbar & Gilbert (2005) state that uncertainty is one of the reasons that causes the human mind to be weakened by anxiety and, consequently, it is a primary objective to eliminate it or at least reduce it. The way people face the events of their daily lives depends on the image created by their points of view and theorizations about how to move from a state of ignorance to one of knowledge, in order to reduce uncertainty and increase uncertainty. predictability (Bahmani, Reza & Hamidi, 2015).

Milliken (1987, p. 136) defines environmental uncertainty as "the inability of an individual to predict something accurately, due to a lack of sufficient information to predict events or a poor ability to discriminate between relevant and irrelevant data." This definition of environmental uncertainty is closely related to the concept of limited rationality described above, in terms of the partial vision of reality; It is also linked to the biases or value judgments that determine the perspective of decision-making when trying to face and simplify highly complex situations.

Practices aimed at reducing the negative effects of cognitive biases in organizational processes are becoming more common; the Unconscious Bias sessions that are carried out with increasing frequency are aimed at positioning the creation of a culture of inclusion in the company, as a collective effort to promote equality and non-discrimination and, at the same time, avoid unconscious prejudices towards certain groups. Ross (2008), entitled Proven Strategies for Addressing Unconscious Bias in the Workplace, provides executives and managers with tools aimed at recognizing biases and avoiding discrimination within organizations, aligning them with global goals such as gender equality and the inclution.

Although companies, thinking about companies as producers of decisions points to other aspects that can be affected by biases, such as quality control, which is subjective; This order of ideas, in the business field, efforts to design strategies and counteract the adverse effects of cognitive biases are increasingly common. (Klein, 2007) states that one of the reasons why a high number of projects fail is because some people resist expressing their reservations during the planning phase.

2. Methodology.

With the objective of identifying cognitive biases in managers, the following cognitive biases were identified in decision-making judgments. A descriptive, cross-sectional and intra-individual study was carried out in a sample of managers of 58 managers from the city of Riobamba, Ecuador in middle age (age 25 - 35 years), women = 28%; men, 72%). A 12-item survey was used to identify (10 biases): recency, anchorage, confirmation, halo, excessive optimism, availability, planning, group, sunk cost, possession effect.

The study is based on a bibliographic review and scientific articles that show the application of cognitive biases in various knowledge disciplines; Then, an instrument for obtaining information and applying the survey to company managers in the city of Riobamba was developed, in order to identify the biases most used in administrative functions when making decisions.

3. Results.

Table 2. Sex and differences in cognitive biases in the managers surveyed.

Sex	Managers surveyed	Percentage
Women	16	28%
Men	42	72%
Total	58	100%

Table 3 shows the total of 58 managers aged 25 - 35 years, 28% represent women, and 72% men, it was identified that there were gender differences in biases in decision making, women They were more rational and reflective and less risky in their decisions, while men accepted greater risk and uncertainty when making decisions.

Table 3. Survey results on cognitive biases and management functions.

Functions of managers in decision making	Cognitive Biases	Questions to managers.	%
1. Definition of Objectives.			
Establish clear goals and objectives for the organization. Define the purpose and direction of decision making.	Recency Bias.	It is influenced by recent events when defining objectives and does not consider a long-term perspective.	57%
	Anchorage Bias.	The first information, impression or estimate available becomes an anchor that influences the way subsequent objectives are established.	61%
2. Identification of Problems.			
Recognize problems and opportunities that require decisions. Analyze the current and future situation.	Confirmation bias.	You look for information that supports your existing beliefs, ignoring data that contradicts you. You give more weight to information that confirms your existing beliefs and less weight to opposing information.	75%
3.Generation of alternative solutions.			
Develop possible options to address identified problems or opportunities. Promote creativity and innovation in the generation of solutions.	Halo effect.	Forms global opinions about a person or situation based on a single characteristic, or particular aspect.	70%
4. Evaluation of Alternatives.			
Analyze and compare options based on relevant criteria. Evaluate the risks and benefits associated with each alternative.	Excessive Optimism.	It overestimates the probability of positive outcomes and underestimates the risks.	68%
	Planning Bias.	You underestimate the time, costs, and risks associated with future events and projects because you believe you have invested in them.	83%
	Availability Bias.	Your decisions are based on the information you have available at the moment, instead of looking for more relevant data to make your evaluations.	61%
5. Decision Making.			
Select the best alternative based on analysis and evaluation. Make decisions considering the short- and long-term impact.	Anchorage Bias.	Gives too much importance to the first information received to make individual decisions.	87%
	Group Bias	Make decisions to maintain harmony within the group, even if they are not the most effective decisions.	74%
6. Implementation.			
Put the decision made into practice.	Sunk Cost Bias.	You continue to invest in the present because of a past decision out of affection or because you believe you invested time, money and	89%

Effectively communicate the decision to team members.		effort in that decision, rather than evaluating it in another way.	
	Possession Effect.	It gives more value to physical, material and economic assets, even though these may affect investment or disinvestment decisions.	59%

The results of Table 3 show the cognition processes in the perception, attention, thinking, memory and language of managers in decision-making where the use of cognitive biases in the decision-making process is evidenced with high percentages. of decisions, these biases are: recency, anchorage, confirmation, halo, excessive optimism, availability, planning, group, sunk cost, possession effect.

Next. The bibliographic sources are presented as a summary of research articles in different disciplines.

Table 4. Research with cognitive biases in different disciplines.

Article: Gender differences in five cognitive biases in university students.
Authors: (2022). Azzara, Sergio Héctor; Grinhauz, Aldana Sola; Cosentino, Alejandro César; Simkin, Hugo; Azzollini, Susana Celeste
Abstract. The literature indicates that there is diversity between women and men in moral, political and social behavior. Objective: To identify gender differences in decision-making and determine whether gender acts as a moderator of five cognitive biases in decision-making judgments. Bias measurement: base rate, framing, conjunction, outcome, and anchor biases. Conclusions: there were differences in judgments when making decisions: women were more conservative and less risky in their decisions, while men accepted greater risk and uncertainty when making decisions.
Fuente: elaboración propia basada en los autores Azzara, S & Grinhauz, A, et al. (2022).

Article: Cognitive biases and accounting and management control systems.
Authors: Ernesto Lopez-Valeiras; Jacobo Gomez-Conde; David Naranjo-Gil
Abstract. Objective: to contribute to the management control literature by providing a conceptual framework that allows a better understanding of the relationship between Accounting and Management Control Systems (SCCG) and the existence of biases in evaluations and decision making. Measurement of biases: two variables were related: the characteristics of the user (cognitive limitations, motivational aspects) with the characteristics of the SCCG (presentation of information, degree of subjectivity). Then, they established the judgments present in this relationship, classifying them as beneficial or dysfunctional. Conclusions: SCCG designers play a determining role in their objectivity and neutrality, since both their cognitive limitations and their motivational aspects can condition the design of these tools, causing obstacles in evaluations, as well as biased decisions.
Source: authors López, Gómez & Naranjo (2016).

Article: Cognitive biases and the Law: the influence of the irrational
Author: Arturo Muñóz Aranguren (2012).
Abstract. Objectives: study how cognitive biases affect judicial decision making. Measurement of biases: for the study, the author is based on the review of Spanish judicial rulings and jurisprudence of North American courts. Conclusions: it is necessary to combat judicial decisions based exclusively on subjective intuitions or preconceived ideas (normally biased), in which the conclusion is first reached and then ad hoc reasoning is chosen to justify them, when the working method should be the inverse.

Source: own elaboration based on the author Muñoz (2012).

Article: Overconfidence and optimism in capital budgeting decisions: Corporate finance from a behavioral approach.
Author: Useche, A. (2014)
Abstract. Objective: to comparatively analyze the process of evaluating investment decisions, from traditional financial theory and from a new complementary approach that arises from corporate finance based on behavior (Behavioral Corporate Finance). Measurement of biases: it is carried out through a theoretical review of the scientific literature referring to the biases of overconfidence and optimism. Conclusions: Eliminating behavioral biases is both impossible and undesirable. The most convenient thing is for the company to recognize the existence of behavioral influences on its financial decisions, identify their positive and negative impacts and introduce these elements explicitly into its decision making.
Source: own elaboration based on the author (Useche et al.)

Article: Heuristics and cognitive biases in the performance of hotel service employees.
Author: Armenio PM. & Aimara, RF. (2021).
In the current context, the performance of hotel service employees is essential for the satisfaction of customer expectations, however, sometimes behavior deviates from the norms and values, as stable elements of regulation of conduct. The objective of this article is to theoretically argue the manifestations of behavioral deviations caused by the presence of heuristics and cognitive biases in the performance of the hotel services employee. The methodology used is a longitudinal study to observe the performance in the gastronomic and reception services of a hotel facility. The main results acknowledge the existence of multiple heuristics and cognitive biases, linked to the manifestations in the performance of the hotel services employee. An opportunity has been created to carry out new research in this area of knowledge. The conclusions show appreciated manifestations in the performance of the hotel services employee, allowing us to identify the presence of several heuristics and cognitive biases that have not been studied in depth.
Source: own elaboration based on the author Armenio, PM,Aimara, RF, (2021).

Studies of cognitive biases are applied in different areas of knowledge, to understand how and why individuals select, choose and decide alternatives. This knowledge has been used in articles on: accounting and management control systems, law, gambling, capital budgeting, medical diagnoses, consumer behavior, among others. There are numerous examples in the scientific literature in designs, both theoretical and experimental, that aim to measure cognitive biases, showing the potential of the cognitive perspective to predict, even if only approximately, the behavior of managers. in order to anticipate the effects of these behaviors in all areas of the organization's performance.

4. Discussion

Bounded rationality is understood as the restriction on the amount of information about reality, where managers can have and process the information. To facilitate the decision-making process, thought resorts to cognitive biases that serve as shortcuts to simplify and compensate for the effects of its incomplete and, therefore, imprecise vision. These thinking shortcuts or cognitive biases are closely related to the decision making of managers.

In the business environment, decisions involve vital aspects for the organization that can translate into competitive advantages or disadvantages, which can even compromise the survival of the organization. Deciding involves analysing uncertain situations, with the limitations of the information available at the moment, according to the manager's cognitive biases. The implications have a distorting effect; For this reason, they can have a negative connotation in a decision-making process, making it important to develop strategies aimed at minimizing their impact.

For this reason, the scientific community is oriented towards studying the organization, from the point of view of cognitive processes, recognizing that cognitive biases are a potential distortion of decisions. Recognizing the existence of biases is the first step to begin a process of review and study of their characteristics, which allows their understanding and identification in the organization's decision makers, understanding that the thinking style of an organization is directly determined by the combination of cognitive biases in the managers who administer it; From this arises the importance of cognitive theory in the organization. Identifying the main biases that can affect the decision-making process of an organization allows us to reduce the possible effects that they may have on future decision-making, constituting a valuable resource for management. In this way, decision teams make it possible to counteract possible distortions of cognitive biases, since it is difficult to recognize one's own biases, while it is easier to recognize them in others from different perspectives.

Another aspect related to cognitive biases is the perception of the environment by managers; According to the cognitive perspective, the environment is not real and objective, but the result of managers' perception of the opportunities and threats it represents. It is considered that one of the main factors that affects the perception of the environment is uncertainty, therefore, cognitive biases can provide ways to counteract the effects of the stress that it can cause, by predicting events and making them predictable and, therefore, these are perceived as more controllable than they really are. Studies of cognitive theory show the possibilities it offers to strategic management, which range from tools to understand and facilitate decision-making under conditions of complexity and uncertainty to the identification of patterns that allow managers to be categorized according to the areas of the organization where they operate, also in other strategic aspects such as: knowledge management, internationalization processes, the establishment of associations and cooperation networks, the design of the organizational structure and the development of processes organizational, among others.

The research shows differences in the cognitive biases of women and men, subsequently studies of cognitive biases could be carried out based on ages, while older age could reduce biases in decision making in organizations, there remains a wide range of future research.

5. Conclusions

The cognitive biases most used by managers in organizations are: recency, anchorage, confirmation, halo, excessive optimism, availability, planning, group, sunk cost, possession effect, a high percentage is evident that confirms the use of these biases cognitive in the decision making of managers; In addition, it was identified that there were gender differences in cognitive biases when making decisions: women are analytical and less risky in their decisions, while men accept greater risk and uncertainty when making decisions, this study will allow in Future research will make a comparison of the ages of the managers; Cognitive biases allow us to understand and explain the behaviour of managers in highly complex situations in managerial functions.

Awareness of these cognitive biases allows managers to make more informed and objective decisions. Implementing thoughtful decision-making practices and seeking different perspectives can help minimize these biases. It is important for business leaders to be aware of cognitive biases when setting organizational objectives and decision making to ensure that goals are realistic, based on solid data and supported by critical analysis. Diversity of perspectives and involvement of multiple stakeholders can also help mitigate these biases.

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