

Cognitive biases in decision-making: applications on strategic management and rationality improvement

Vieses cognitivos na tomada de decisões: aplicações em gestão estratégica e melhoria da racionalidade

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ABSTRACT

Every decision is faced with the unknown. Decisions with strategic density, more than others, carry by themselves a greater burden of responsibility on the firm performance, crucial to obtain the positive results desired by both managers and shareholders. The scope, space of states of strategies formulation and implementation is, customarily wide, and still, the game is open with other forces of the internal and external environment acting. Many studies have shown that the decision-making, formulation and implementation process, considered in moments as part of the strategy process set, comprises emotional and rational phases. In the decision there are mixtures of emotions, intuitions and empirical elements that in the construction of the process present cognitive biases. The decision maker's previous experiences, the brain circuits involved, notably, somatic markers will be involved in the process. While these biases can creatively contribute to the decision-making process, it is always possible, if not often, that undesired (negative) outcomes derive from this interference of cognitive "guessing" in decision-making. This essay seeks to define cognitive biases in strategic management and how they can influence managers in the decision-making process. This article seeks to analyze the commonalities between the analyzed authors of strategy that deal with the theme. The research also seeks to list the cognitive biases most cited by these authors,

with the aim of highlighting which should be considered possibly the most relevant to the decision-making process.

Keywords: strategic management, cognitive biases, decision-making, company growth, rationality.

RESUMO

Toda decisão se depara com o desconhecido. As decisões com densidade estratégica, mais do que outras, carregam em si uma carga maior de responsabilidade sobre o desempenho da empresa, crucial para a obtenção dos resultados positivos desejados pelos gerentes e acionistas. O escopo, o espaço dos estados de formulação e implementação de estratégias é, em geral, amplo, e ainda assim o jogo está aberto com a atuação de outras forças do ambiente interno e externo. Muitos estudos mostraram que o processo de tomada de decisão, formulação e implementação, considerado em momentos como parte do conjunto de processos estratégicos, compreende fases emocionais e racionais. Na decisão, há uma mistura de emoções, intuições e elementos empíricos que, na construção do processo, apresentam vieses cognitivos. As experiências anteriores do tomador de decisão, os circuitos cerebrais envolvidos e, principalmente, os marcadores somáticos estarão envolvidos no processo. Embora esses vieses possam contribuir de forma criativa para o processo decisório, é sempre possível, se não frequente, que resultados indesejados (negativos) decorram dessa interferência de "adivinhação" cognitiva na tomada de decisão. Este ensaio procura definir os vieses cognitivos na gestão estratégica e como eles podem influenciar os gerentes no processo de tomada de decisão. Este artigo busca analisar os pontos em comum entre os autores de estratégia analisados que tratam do tema. A pesquisa também busca listar os vieses cognitivos mais citados por esses autores, com o objetivo de destacar quais devem ser considerados possivelmente os mais relevantes para o processo decisório.

Palavras-chave: gestão estratégica, vieses cognitivos, tomada de decisão, crescimento da empresa, racionalidade.

1 INTRODUCTION

The strategic decision to grow an organization, especially through the acquisition of another company, be it with horizontal expansion through the acquisition of a competitor, or in a vertical integration in the same industry is a relatively common fact. To make sense, this type of decision must be based on some sort of gain for the acquiring company and on preserving the qualities of the structures and resources of the acquired company. In a summarized view, the strategic advantages with an acquisition should reveal, at least, a movement of self-preservation or defense that ensures the maintenance of the organization's current

gains. What is expected from an acquisition, however, is to bring 'above-average-returns' (AAR) to the new integrated organization and its shareholders.

It happens that strategic decisions, although increasingly supported by automated (computerized) systems, including artificial intelligence, always fall on the shoulders of human beings. These people, in turn, are subject to so-called 'behavioral biases', which, as we will say, result from the combination of known cognitive biases with political biases. Authors such as ROTHAERMEL (2017) and HITT et al. (2019) point out that personal motivations of managers of one organization can influence both the acquisition of one company by another, as well as involve the acquiring organization in disproportionate efforts for integration, including risking the original and the integrated company's core business. Similarly, due to the management of a company being carried out by humans who are influenced by behavioral biases, it is logical to assume that these same trends could explain the insistence of some managers in businesses that have not worked. This pointless insistence can temporarily compromise the gains of the acquiring organization, or the new integrated organization, or even compromise their results irreversibly.

In this brief study, first we will seek to outline an overview of the motivation of companies for growth, including acquisition strategies. Next, we will make a brief review of the didactic literature on Strategic Management, among the classic HITT et al. (2019), HILL et al. (2017), ROTHAERMEL (2017) and DESS et al. (2021), in them seeking references to cognitive biases and their impacts on decision-making processes in organizations. This search is justified by the influence that these manuals exert on the training of new management professionals and managers, including at the graduate level. Then, we will seek a conceptualization of cognitive biases in their impact on strategic decision-making processes, from the point of view of some academics. We will also present a recent academic approach, carried out by FLYVBJERG & RASMUSSEN (2021), in whose work are analyzed those that the authors consider as the 10 main behavioral biases (as they prefer to name them, to the detriment of 'cognitive biases') that affect project management. Finally, in contrast to the view of the didactic authors to this specific academic study, we will seek to list

the cognitive (or behavioral) biases that seem more significant for strategic decision-making, including in relation to the growth of companies through acquisition and integration. In this way, we intend to contribute to emphasize the importance of the biases in the decision-making processes in management and administration.

2 MANAGERS AND THEIR ROLES IN ORGANIZATION GROWTH AS DECISION-MAKERS

Managers are the actors that move an organization ahead, as they are those responsible to organize a firm's operation, after a careful strategic planning. Because resources are limited, managers must carefully consider their strategic choices and challenges in the quest for enhancing the firm's competitive advantage, improving its performance and the likelihood of its continued survival. It is important that managers observe not only their own firm's performance, but to compare it with other competitors in the same industry, or against the industry average. Besides that, managers are also frequently demanded to maintain and improve not only the firm's economic performance but its social and ecological performance as well. The shared value creation framework, for example, recommend that managers to focus on shareholder value creation and in value creation for society. This dual-purpose positioning recognize that markets are not only about economic needs but also societal needs (ROTHAERMEL, 2017).

Even if considering that returns to shareholders and the society are essential, the key point, states ROTHAERMEL (2017) is that "managers' actions tend to be more important in determining firm performance than the forces exerted on the firm by its external environment. Empirical research studies indicate that a firm's strategy can explain up to 55 percent of its performance." This puts a lot of pressure on managers decisions as, in the end of the day, they may or may not confirm the so much desired above-average- returns for their companies.

Ultimately, all this is sought out on behalf of the company's stakeholders claims. To accomplish that, as shown by ROTHAERMEL (2017), "impact analysis takes managers through a five-step process of recognizing stakeholders' claims. In each step, managers must pay particular attention to three important stakeholder

attributes: power, legitimacy, and urgency.” These attributes help to prioritize the legitimate claims and to address them accordingly.

At the same time that managers are implementing strategy, they are also analyzing if and what is necessary to adjust and fine tune it before changing circumstances (ROTHAERMEL, 2017). Given that the only constant is change, ROTHAERMEL (2017) arises the question: “Should managers even try to strategically plan for the future? The answer is yes—but they also need to expect that unpredictable events will happen.”

One way to prevent a company from failing while acting in a changing industry is making it grow. That means to make the firm grow following its industry’s growth, or growing into its industry before a competitor does it and thus occupying a valued space in the market. Firms may decide to grow for a handful different reasons. ROTHAERMEL (2017) lists at least five. The first four motives for a company growing would be to (1) Increase profits, thus offering the possibility of a higher return to stakeholders, (2) Lower costs, achieving a minimum efficient scale and so benefitting from economies of scale, (3) Increase Market Power, while making a company more relevant and influential in its industry and (4) reducing risk while diversifying the company’s product and service portfolio in different industries. The fifth motive, stated by ROTHAERMEL (2017) doesn’t seem so logic, yet understandable: ‘Managerial Motives’.

As ROTHAERMEL (2017) explains, sometimes firms may grow not exactly to achieve goals that will benefit the company or its stockholders, but to fulfill some personal expectations from its managers, completing that “Managers may be more interested in pursuing their own interests such as empire building and job security—plus managerial perks such as corporate jets or executive retreats at expensive resorts—rather than increasing shareholder value”. The author also states that some promising businesses fail after growing unwisely, either too fast or too soon, and sometimes based on unreliable assumptions about the future.

ROTHAERMEL (2017) explains that growth is not necessarily imperative. Small-business owners, for example, may seek other goals while managing its organizations, like convenience, stability, and lifestyle. For this firms, the need of

solving some social problem is more important than to ensure its longevity beyond the solution of the problem, and thus, growth is not an obligation.

The point is that the managers' decisions, including firm's growth may not necessarily follow market/customer demands or even accomplish stakeholders demands. As ROTHAERMEL (2017) puts, it is possible that the managers are pursuing their own interests, in what he calls 'The principal-agent problem'. This happens with the separation of who owns the firm (which would supposedly be someone concerned with the company performance in the short and long terms or creating stakeholder value) and who controls it (while seeking, for example, job security and managerial perks).

One would guess that managers would always act in the best interest of the firm's principals, which would be the shareholders, but many times managers have incentives to grow their firms through acquisitions. The purpose, as explains ROTHAERMEL (2017), may be to build a larger empire, acquiring prestige, power, higher compensation, more corporate perks and more job security if the company seeks unrelated diversification.

Considering diversification, which is usually associated with a purpose on organization's growth, HITT et al. (2019) agrees that "top-level executives may diversify a firm in order to spread their own employment risk, as long as profitability does not suffer excessively". The authors also state that managers get additional benefits from their company's diversification that shareholders do not enjoy, being one of them the increased size of the company. A simplified mechanics, according to HITT et al. (2019) would be something like with more diversification, the company gets more complex and this fact, by its turn, justify more compensation for managers. At some point, an overdiversification could compromise the firm's ability to create value and get above-average returns. HITT et al. (2019) say that the loss of adequate internal governance may result in relatively poor performance, thereby triggering a threat of takeover. However, the authors mention that evidence suggests that 'many top-level executives seek to be good stewards of the firm's assets and avoid diversifying the firm in ways that destroy value.'

Either acting consciously or not in a divergent path from shareholders or even customers satisfaction, as ROTHARMEL (2017) and other authors recognize, managers' decisions in relation to their company's strategies, including growth, diversification and even day- by-day operations are affected by the fact that they are human beings. As so, while taking decisions, and concerning to a firm's growth or any other matter, managers are subject to the widely known 'cognitive biases' or 'cognitive behaviors', as preferred by FLYVBJERG & RASMUSSEN (2021).

In the next section, we will explain the meaning of cognitive biases, behavioral biases and their impacts in the strategic decision-making. After that, we will compare some of the biases listed by strategic management authors to those listed by FLYVBJERG & RASMUSSEN (2021) as the 'top ten' related to project management, then searching for electing the top biases that specifically and potentially affect managers while deciding why and how to grow their firms.

3 COGNITIVE BEHAVIOR AFFECTING STRATEGIC DECISIONS AS SEEN IN DIDACTIC TEXTBOOKS

Amongst the textbooks analyzed in this essay, however HITT et al. (2019), ROTHARMEL (2017), DESS et al. (2021) and HILL et al. (2017) all address the importance of cognition to strategic decisions and how it may interfere on them, each author approaches the matter in greater or lesser detail.

HITT et al. (2019) sticks with the concept of biases affecting decision making and don't give us examples. Very appropriately, though, the authors point out that, to make better decisions, a top management team is that which integrates a better human capital, management skills and cognitive abilities. Also, when HITT et al. (2019) say that it is usual that the personal ideology experience influences a leaders' style, we could think on biases. The authors mention, for example, that in concern to managing firm's resources as to form core competencies, managers face uncertainty with which they may cope with taking biased decisions. The authors state that as decision makers, managers must be aware of some cognitive biases affecting their discernment, as for example, overconfidence. HITT et al. (2019) explains that if the decision maker is overconfident in its own decisions on how to use the firm's

resources, he or she may fail to fully consider the contingencies that could affect those decisions.

Thinking about a biased vision of the future, ROTHAERMEL (2017) warns that managers often lean on optimistic scenarios, while overlooking pessimistic future scenarios that would be imperative to be considered. The author also warns that managers may ‘fall prey’ to an illusion of control, while overestimating their ability to control events. One way of falling in this pit would be to rely too much on hard numbers, which convey a false sense of security to managers, rather than in an aspiring vision. All kinds of sources of information, states ROTHAERMEL (2017), including soft sources can generate new insights, including personal experience, including “personal experience, deep domain expertise, or the insights of front-line employees”.

ROTHAERMEL (2017) also mentions the risk that a common bias when managers tend to focus on the (known) similarities rather than on (unknown) differences. In other words, this bias would be a tendency to embrace more easily, what is known, in detriment of what is unknown. This could also sacrifice great opportunities for a company when facing a challenge. ROTHAERMEL (2017) gives an example of this bias: “An executive at a newspaper publisher such as The New York Times may conclude that the researching, reporting, writing, and editing activities done for a printed newspaper are similar to those done for an online one. Although the activities may be similar, they are also different because the underlying business model and technology for online publishing are radically different from that of traditional print media.”

ROTHAERMEL (2017) also gives us what he calls ‘managerial hubris’, which would be a kind of self-delusion through which managers convince themselves of their superior skills while the clear evidence shows the contrary. This ‘hubris’ concept is inspired by the seminal 1986’s article from Richard Roll, “The Hubris Hypothesis of Corporate Takeovers” in which the author presents the ‘hubris hypotheses’, while explaining that that ‘Hubris on the part of decision makers in bidding firms can explain why bids are made even when a valuation above the current

market price presents a positive valuation error'. Roll explains that 'Bidding firms infected by hubris simply pay too much for their targets.'

As explained by ROTHAERMEL (2017), this 'managerial hubris' would come in two forms. One form is that, while conducting the acquisition of another firm, usually following an unrelated diversification strategy, managers may convince themselves that they are able to manage the business of the acquired company more effectively and thus creating shareholder value, something that is not usually true. The other form of 'managerial hubris' would be when top-level managers insist that acquisition create shareholder value (when most acquisitions processes show the opposite) because they see themselves as the exceptions to the rule.

DESS et al. (2021) have a very particular view over biases and how they affect strategic decisions. The first bias mentioned by the author would be a kind of 'background bias', which we could explain by a manager being biased in his/her decisions due to his/her education background, work experiences and functional area background. Influenced by this bias, the manager would give more attention and importance to the areas of work or knowledge he/she is better experienced at. Influenced by this bias, managers may also have a "paralyzing tendency to avoid responsibility" and may be 'reluctant to deal with tough issues', which constrains "the ability of the firm to learn and change".

The 'confirmation bias' is another one pointed out by DESS et al. (2021) that leads managers to entrench themselves while focusing only on data that suggest they've made the right choice. This bias could lead, for example, to overinvestments that may come to regret, as the managers refrain from admit the company's mistakes or bad choices. 'Overconfidence bias' is mentioned by DESS et al. (2021) and it occurs when 'decision makers who have made successful choices in the past come to believe that they possess superior expertise for managing uncertainty. They believe that their abilities can reduce the risks inherent in decision making to a much greater extent than they actually can'.

As ROTHAERMEL (2017), but a bit different approach, another cognitive bias mentioned by DESS et al. (2021) is the 'illusion of control'. When affected by this bias, the decision maker believes that when getting into action with the

background of a careful previous planning phase or when ‘minor’ problems show up during implementation, they should not deserve a greater attention. As put by DESS et al. (2021), ‘Managers may fail to respond appropriately because they overlook the problem or believe that since it is small, they can easily resolve it.’

In a similar way to what ROTHARMEL (2017) calls ‘managerial hubris’, DESS et al. (2021)’ ‘Irrational Escalation of Commitment’ may be, according to the author, as good as bad to a firm. In the good side, it moves managers into (entrepreneurial mindset) action, taking account for their autonomous decisions. On the bad side, managers could be biased in the decisions they have invested themselves into, even when they show up to be wrong. As put by DESS et al. (2021), it proves harder for managers to ‘lose face by reversing course. For managers making the decision, it feels as if they made the wrong decision in the first place, even if it was initially a good decision. Thus, they are likely to continue an existing project even if it should perhaps be ended”.

Finally, amongst our focused authors and textbooks, we have HILL et al. (2017) vision, which happens to be the more extensively dedicated to the cognitive bias. The authors recognize that ‘the rationality of decision making is bound by one’s cognitive capabilities.’ The human dimension is brought by the authors when they recognize that we are not supercomputers capable to absorb and process large amounts of information effectively. The result, they explain, is that when we make decisions, we are affected by a kind of heuristics ‘that help us to make sense out of a complex and uncertain world’. However, explain HILL et al. (2017), these rules are connected to cognitive biases that lead us to severe and systematic errors as we process information and reach decisions which therefore can be strategically poor.

Then half a dozen cognitive biases are presented by HILL et al. (2017) starting from ‘prior hypothesis bias’. The authors explain that this bias ‘refers to the fact that decision makers who have strong prior beliefs about the relationship between two variables tend to make decisions on the basis of these beliefs, even when presented with evidence that their beliefs are incorrect’. Other bias which the authors consider well-known is ‘escalating commitment’ – which, as we have seen, DESS et al. (2021) complements with the term ‘irrational’ and to which ROTHARMEL (2017) refers

as ‘managerial hubris’. This bias would be noticed when, despite receiving feedback that the project is failing, managers commit even more resources on it as a justification for the already significant amount invested.

‘Reasoning by analogy’ is a cognitive bias highlighted by HILL et al. (2017), corresponding to the situations when managers make use of simple analogies (which may not be valid) to make sense of complex problems. A fourth bias according to HILL et al. (2017) would be ‘representativeness’, which relates to ‘the tendency of a manager to generalize from a small sample or even a single, vivid anecdote.’ The question here is that this bias goes against the statistical law of large numbers, which stands that is inappropriate to generalize from a small sample and even worse to do it from a single case.

HILL et al. (2017) extend their presentation with a fifth bias, which would be ‘the illusion of control’, also presented by ROTHARMEL (2017) and DESS et al. (2021). HILL et al. (2017) interprets this bias in the same way of the other authors, explaining it as a tendency to overestimate one’s ability to control events. The author directly mentions ROLL (1986) stating that such overconfidence from the managers, leads to what Richard Roll has termed the hubris hypothesis of takeovers. What happens is thanks to ‘the illusion of control’, managers are up to ‘make poor acquisition decisions, often paying far too much for the companies they acquire.’

One last common bias, “availability error” is listed by HILL et al. (2017), explaining that this bias ‘arises from our predisposition to estimate the probability of an outcome based on how easy the outcome is to imagine.’ The impact in an organization, the authors state is that ‘managers might allocate resources to a project with an outcome that is easier to imagine, rather than to one that might have the highest return.’

4 COGNITIVE BEHAVIOR AFFECTING STRATEGIC DECISIONS AS SEEN BY SCHOLARS

Amos Tversky and Daniel Kahneman were responsible for introducing us in 1972 to the notion of cognitive biases, yet not by then constructing this term. In the introduction of the seminal article “Subjective Probability: A Judgment of

Representativeness”, on which the authors state that: “Subjective probabilities play an important role in our lives. The decisions we make, the conclusions we reach, and the explanations we offer are usually based on our judgments of the likelihood of uncertain events such as success in a new job, the outcome of an election, or the state of the market.” In other words, the decision-making process could be explained in terms of heuristics, or the mental shortcuts through which we estimate the possibility of uncertain occurrences. As a matter of fact, Kahneman was awarded a “Nobel Prize in Economics for his pathbreaking work with Amos Tversky (who died in 1996) on heuristics and biases in decision-making, including optimism bias”.

In the original article, KAHNEMAN & TVERSKY (1972) affirmed that what they offered was just ‘an outline of a heuristic approach to the study of man’s competence and performance as a judge of uncertainty’. Their preferred question in that investigation was ‘how *well* do people evaluate uncertainty?’. The authors justify their preference saying that an optimal performance by a S is often attributable to “a fortuitous interaction between the optimal strategy and whatever simple rule he arrived at in his groping attempts to ease cognitive strain. (Slavic and Lichtenstein, 1971)”. They complete concluding that ‘Heuristics such as representativeness and availability, however, are not likely to be adopted merely because they reduce cognitive strain. They are probably adopted because they often work with a rate of success that is more than fortuitous.’ In other words, we would say, the subjective decisions, affected by cognition through a heuristic approach is adopted because it works most of times, or frequently and is also simple to be processed by our brains. We know now, however that this kind of heuristics, like the cognitive biases may act for better or for the worst decisions.

As much studied as they have been, at least more intensively in the last two decades, no author seems to deny either the existence or the importance that the cognitive biases have while affecting decision-making processes. However, authors have somewhat different visions on what exactly are the cognitive biases and how they interfere with decisions.

Some authors, like FLYVBJERG & RASMUSSEN (2021) even prefer to consider that the ‘behavior biases’ and not solely the ‘cognitive biases’ are the true responsible for the effects of biases in decision-making, as we will see.

Much has been added to the conceptualization of cognitive biases. ACCIARINI et al. (2021) tells us that cognitive biases can be defined as “cases in which human cognition reliably produces representations that are systematically distorted compared to some aspect of objective reality” (HASELTON et al., 2015) and are an ingredient that is always present in strategic decision-making process. (DAS & TENG, 1999). Another definition to cognitive biases state that they are “common types of mental shortcuts used to make judgments” (Simon et al., 2000 in: ACCIARINI et al., 2021). In turn, cognitive biases create specific team abilities and tendencies (Wiersema and Bantel, 1992 in: ACCIARINI et al., 2021). In our vision, these definitions, by themselves would be enough to tell that these biases are of great importance of study concerning decision-making. As stated by ACCIARINI et al. (2021), ‘previous studies considered cognitive biases as important factors in strategic decision-making and planning’ (citing James and Barnes, 1984; Schwenk, 1986; Busenitz and Barney, 1997; Hodgkinson et al., 1999; Deligonul et al., 2008).

HASELTON (2009) divided the explanations of apparent cognitive biases into three types. The first type would be that ‘the cognitive biases would be byproducts of an otherwise useful way of thinking’. This explanation presented by the author defends that, at some point, a decision-maker own way of thinking would be useful to the quality of its decisions, as we can imagine, for example, how creativity helps to find solutions to a problem, but sometimes this ‘personal’ way of thinking derives into a not so desirable condition, which would result in a biased decision. Another type of cognitive biases as put by HASELTON (2009) tells that the biases are “artifacts of research designs that produce apparent flaws in thinking that are actually unlikely to happen in the natural world”, which gives these biases a status of an undesired and unnatural existence. Finally, the author sums it up saying that cognitive biases could be ‘genuine errors or flaws in the mind.’ From Haselton’s vision, we could conclude that cognitive biases, in general, are not exactly welcome to the

decision-making process, as being a form of degradation of the thinking capabilities we have.

In the defending side of cognitive biases, if we could put this way, ACCIARINI et al. (2021) cite Nutt and Wilson (2010) to recognize that “Decision-making always has elements of uncertainty and lack of information”. In the present, the authors state, ‘we face an overload of information and ‘becomes more difficult to find the right information amidst the vast amount of data available’. However, ACCIARINI et al. (2021) also affirm, ‘other authors like Simon et al. (2000) assumed that cognitive biases play a crucial role in influencing the interpretations of certain critical events. In fact, when transformations occur, managers tend to formulate and implement strategic decisions in accordance with their values, experiences, and biases. In addition, the interpretation of specific events is different on the basis of certain types of cognitive biases used to make judgments.” The authors recognize that certain cognitive biases influence the process of making decisions, notably during environmental transformations, which have a complex nature. This, ACCIARINI et al. (2021) say, “requires decision-makers capable to manage their cognitive biases (Helfat and Peteraf, 2015) with the aim of properly investigating changes (Schneier, 1979) as well as implementing effective strategic decisions.” Before these affirmations we could say we are perfectly aware that cognitive biases interfere on decision-making, but could be useful in some situations, if managers are capable of manage this biases themselves.

Considering that many dozens of cognitive biases have been already identified and that not all of those could be considered significantly influential in decision-making process in organizations, DAS & TENG (1999) classified cognitive biases into four basic forms into each most or barely all biases would fit. Their intention was not to affirm that other biases do not exist, but to ‘concentrate on those key biases which seem to be generally present in strategic decision processes’. The authors also stress that ‘not all of the four basic types of cognitive bias are present in every specific decision process’ and that ‘certain modes of decision process seem to elicit particular combinations of cognitive bias’.

DAS & TENG (1999) summarize the first basic form of cognitive biases, (1) ‘prior hypotheses with a focus on limited targets’ saying that “bringing ANALOGY hypotheses to decision making and attention to selected targets together result in a biased perception of the environment and the problem at hand”. The second basic form, (2) ‘exposure to limited alternatives’ occur in decision-making when ‘rather than attempting to specify all

relevant values and goals and generate a number of alternative courses of action as normative theory would suggest’, decision makers are exposed to limited options’, as DAS & TENG (1999) explain, citing SCHWENK (1984, p.119). The third basic form, (3) ‘insensitivity to outcome probabilities’ could be summarized in the fact that many managers ignore the importance or the mechanics of estimates of outcome probabilities, or even refrain to rely on computing or in standard statistics based on probabilities, focusing on only a few key values to describe a situation or in the belief of (maybe a false) uniqueness of the situation. The (4) ‘illusion of manageability’ would be the other basic form for cognitive biases is mostly the ‘illusion of control’, when managers many times ignore risks, once again ignoring probabilities, while too confident on their own capabilities and experience.

More recently, FLYVBJERG & RASMUSSEN (2021) state that ‘Cognitive bias is therefore only half the story in behavioral science. Political bias is the other half.’ The authors explain that the political bias “understood as deliberate strategic distortions – arises from power relations, instead of from cognition, and has long been the object of study in political economy. Political bias is particularly important for big, consequential decisions and projects, which are often subject to high political-organizational pressures.” In other words, FLYVBJERG & RASMUSSEN (2021) say that cognitive biases don’t explain everything when considering the acts of the people, for instance, decision-makers. The ‘behavioral biases’ would effectively do it, as a combination of ‘cognitive’ and ‘political’ biases, resulting in ‘behavior’ (that is what ultimately ‘do’ things). The authors stress the importance of studying behavior and especially behavior biases, because most of times, when a project fails, the first idea is to look for errors, but, as they put, “The problem with project cost overruns and benefit shortfalls is not error but bias, and as long as we try to solve the

problem as something it is not (error), we will not succeed. Estimates and decisions need to be de-biased, which is fundamentally different from eliminating error.”

Anyway, FLYVBJERG & RASMUSSEN (2021), as so many others, recognize that cognitive biases - even if just a part of the actual behavioral bias, as the nomenclature they defend that are responsible for affecting the decision-making process, and frequently, in a bad way, while producing in undesired (project) outcomes. Then, defending the term ‘behavioral biases’, they name 10 of them as the most influential in decision-making for (strategic) projects, as we can see below.

Table 1: Top-ten behavioral biases in project planning and management

Bias #	Name of bias	Description
1	Strategic misrepresentation	The tendency to deliberately and systematically distort or misstate information for strategic purposes. A.k.a. political bias, strategic bias, or power bias.
2	Optimism bias	The tendency to be overly optimistic about the outcome of planned actions, including overestimation of the frequency and size of positive events and underestimation of the frequency and size of negative ones.
3	Uniqueness bias	The tendency to see one's project as more singular than it actually is.
4	Planning fallacy (writ large)	The tendency to underestimate costs, schedule, and risk and overestimate benefits and opportunities.
5	Overconfidence bias	The tendency to have excessive confidence in one's own answers to questions.
6	Hindsight bias	The tendency to see past events as being predictable at the time those events happened. Also known as the I-knew-it-all-along effect.
7	Availability bias	The tendency to overestimate the likelihood of events with greater ease of retrieval (availability) in memory.
8	Base-rate fallacy	The tendency to ignore generic base-rate information and focus on specific information pertaining to a certain case or small sample.
9	Anchoring	The tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions, typically the first piece of information acquired on the relevant subject.
10	Escalation of commitment	The tendency to justify increased investment in a decision, based on the cumulative prior investment, despite new evidence suggesting the decision may be wrong. Also known as the sunk-cost fallacy.

Source: FLYVBJERG & RASMUSSEN (2021)

FLYVBJERG & RASMUSSEN (2021) explain that their list of biases is not exhaustive but concentrate on the most relevant or important to project planning and management as influential ‘with the most direct impact on project outcomes’. For this reason, some ‘popular’ biases like illusion of control, conservatism bias, normalcy bias, recency bias, probability neglect, the ostrich effect, and more were left outside the list.

5 A SELECTION OF THE MOST RELEVANT COGNITIVE BIASES TO STRATEGIC PLANNING

In Table 2, we crossed the vision from the authors of didactic ‘Strategic Management’ with some academic authors. The focus was on the biases listed by all these authors, and we have grouped some of the bias when similar, even with different nomenclature.

Table 2: Most cited cognitive biases in this research and authors who cited it

Bias/ Author	FLYVBJERG & RASMUSSEN (2021)	KANEHNMANN & TVERSKY (1972)	DAS & TENG (1999)	HILL & JONES (2017)	DESS et al (2021)	ROTHAERMEL (2017)	HITT et al (2019)	TOTAL
Strategic misrepresentation	x							1
Optimism bias	x					x		2
Uniqueness bias	x		x					2
Planning fallacy (writ large)	x							1
Overconfidence bias	x				x			2
Hindsight bias	x							1
Availability bias	x	X		x				3
Base-rate fallacy (or representativeness bias or limited exposure bias)	x	X	X	x				4
Anchoring	x	X						2
Escalation of commitment	x			x	x	x		4
Prior hypothesis bias'			X	x				2
Reasoning by analogy			X	x				2
illusion of control			x	x	x	x		4
Confirmation bias					x			1
Background bias					x			1
(Known) Similarities rather than on (unknown) differences						x		1

Source: FLYVBJERG & RASMUSSEN (2021)

6 DISCUSSION

Analyzing the table, we can see that only a few biases were considered by all authors. The three most cited biases are the 'Base-rate fallacy (or representativeness bias or limited exposure bias)', 'escalation of commitment' and 'illusion of control', with 4 mentions. Of the three, only 'illusion of control' was not included in FLYVBJERG & RASMUSSEN (2021) list however they have mentioned it was intentional, even if popular, but in their vision, not deserving to be amongst the top 10 linked to project management.

Considering the top three, we could start specifically from 'illusion of control', which in summary would be the tendency for people (and managers) to overestimate their ability to control events (which they really don't control). In our vision, it makes total sense when considering management, as one of the expectations related to managers is the ability of control (processes, projects development). If this control is biased by an illusion is very worrisome.

Other of the most cited biases, 'Base-rate fallacy (or representativeness bias or limited exposure bias)' somewhat derive directly from KAHNEMAN & TVERSKY original work as the 'representativeness' heuristic. This we also see as very important for managers because the capacity of correctly estimating the real outcomes from their decisions analyzing a reasonable amount and quality of data is extremely important. When the managers get satisfied with incorrect or limited samples of data to generalize, is also something to worry about.

The third most cited biases would be the 'escalation of commitment', which could be summarized by a manager insisting on a path of action even though it has proved to be an unsuccessful idea or action, due to a difficulty on admitting their mistakes. The point here is that, as human beings, we make mistakes all the time and because of that, more important than avoiding mistakes (which could, for example, compromise creativity), is the capacity of detecting and admitting errors and, even more important, taking actions to fix the errors.

In our research, the 'availability bias' would get a 'second place', with three mentions. This bias is also important as it also derives from KAHNEMAN & TVERSKY as one of the essential heuristics affecting decision-making. As we have

seen, HILL et al. (2017) explains that this bias ‘arises from our predisposition to estimate the probability of an outcome based on how easy the outcome is to imagine.’ This sort of ‘laziness’ from our cognition system may be dangerous because strategic decision-making is everything but simple and easy. To understand the outcomes of our decisions and planning creativity and hard work is necessary.

With two mentions, come biases like ‘Optimism bias’, ‘Uniqueness bias’, ‘Overconfidence bias’, ‘Anchoring bias’, ‘Prior hypothesis bias’ and ‘Reasoning by analogy bias’. They all seem to make sense to decision-making, as much as all the biases mentioned by only one author, like ‘Strategic misrepresentation’, ‘Planning fallacy (writ large)’, ‘Hindsight bias’, ‘Confirmation bias’, ‘Background bias’ and the bias ROTHARMEL (2017) described as the tendency of managers to attach to (known) similarities rather than on (unknown) differences when making decisions.

It is relevant to notice that only 16 biases were considered important to be mentioned by the authors in their texts analyzed in this study. Considering that some consolidated lists of cognitive biases, as Wikipedia’s in 2021, contains more than two hundred items, (FLYVBJERG & RASMUSSEN, 2021) it is notable the fact that the selection represents just a fraction of a list that is already large and growing.

It calls the attention the fact that, however all Strategic Management textbooks authors have mentioned the effect of cognitive biases on decision-making in their texts, the detailing they give to the matter is uneven. HITT et al. (2019) which we consider a very complete and well-structured textbook correctly presents the concept of cognitive biases and recognizes its importance on biasing managers decisions, but, as far as we know, the authors don’t present a single example of a bias, leaving it to the imagination of the student or reader – something that can be difficult.

ROTHARMEL (2017), by its turn, gives us three examples of well-known cognitive biases (Illusion of control; Escalation of commitment and Optimism bias) but introduces one bias which we were not able to connect with known (already studied, listed, or mentioned by other authors) biases. This bias he mentions would happen when making a decision, a manager clings to the (known) similarities rather than on (unknown) differences, for example, between an acquiring and an acquired

company, which can be good in some cases, but can hide some differences that should be worked out and that could compromise the aimed results.

At last, HILL et al. (2017) and DESS et al. (2021) both give a significant space in their texts to the cognitive biases influence on decision-making by managers, list from five to six examples of biases which we could classify as ‘traditional’ or already mentioned or listed by other authors. Our opinion the main difference is that while the former talks about cognitive biases and their effects in a more ‘literary’ fashion, HILL et al. (2017) are more didactic as they clearly list and explain half a dozen biases in a way that eases to the reader to capture the content and refer to the information in the future more easily.

7 CONCLUSION

In this short compilation we have made, we noticed that there are great variations on which biases each author sees as the most relevant to strategic decision-making. While some authors give no objective example of cognitive biases, others are more detailed, and others do it in a more didactic way (considering the documents analyzed are textbooks). When we crossed the information from each textbook and scholar articles, we could notice some hints on which biases are popular amongst these authors, which puts light on some of the biases that could be ‘the most important or relevant’ to be noticed and studied. This is something FLYVBJERG & RASMUSSEN (2021) tried to do in their article, while electing the ‘top ten’ behavioral (cognitive) biases to project management, however without explaining how they elected these ‘top ten’ biases and why, for example, they left out of the list a bias that is widely recognized by other authors, like ‘illusion of control’. Although the authors, who are experienced scholars, explain each selected bias in the ‘top ten’, including its connection to project management, it is not clear why these specific biases entered the list and why others didn’t.

We would risk affirm that the three most mentioned biases should be highlighted by future studies, especially those focusing on strategic management, and they seem to be very important in decision-making, even if it is hard to elect without extensive research which biases are really the most relevant to managers in their

decisions. When we consider decisions related to the growth of a firm, including acquisitions and mergers, which are always risky and hard to revert, these biases would integrate a wise summary on the subject.

However, we think that the 16 biases we detected in our study as mentioned by some scholars and strategic-management authors (of textbooks) deserve to be consolidated and further analyzed to provide managers a less biased decision-making process.

Of course, our study has many limitations. First, we didn't intend to exhaust the vast 'cognitive biases' subject and, as an example, we have not explored the critics to the importance given to them, which is a point from some authors. Second, we have selected some recent texts from well known scholars, while seeking to compare their cognitive biases selection to those of the Strategic Management textbooks but are aware that a vast number of texts from scholars in varied fields of study are available, even if texts on defining the 'most important or relevant' biases are so common. Third, the same limitations occur with the textbook's selection: we have chosen some of the most known and respected Strategic Management textbooks authors but are aware that other good books could be considered. Fourth, textbooks are dynamic texts which are due to periodic updating and error fixing. Despite we have considered recent versions of these books, to which we had access, possible newer editions, different as the ones we mentioned, should bring different text or content from the ones we analyzed.

We suggest, for future research, the production of more grounded lists of cognitive biases more prone to interfere on managerial decision-making, apart from personal opinions. If we consider the extensive list of cognitive biases as seen in Wikipedia and other fonts, it is not easy for a strategic management student or a corporate manager to find some of the most important biases in an objective selection (and not a biased selection) that could interfere with his/her work while making decisions.

As an outcome of this research, we have an increased awareness that one very important task for managers, besides all the other items they already manage is to manage their own biases when deciding the future of a company. Their exemption in

the process of decision- making is required and at least desirable, but considering we are talking about human beings, we must consider that it is an endless or continuous concern. When investing in the growth of a company, through an acquisition, vertical or horizontal integration or merger, the human beings in control should try to act as objectively they can, trying not to making mistakes, but admitting and fixing them shall they occur and understand that they are definitely in control of everything, as the environment in its multiple facets is powerful enough to suggest that, while not acting as computers, we should calculate and predict the future correctly, but also creatively.

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