

THE ROLE OF COGNITIVE BIASES IN MANAGERIAL DECISION- MAKING AND MECHANISMS FOR THEIR REDUCTION

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Abstract: This article analyzes the manifestation characteristics of the human factor, specifically various cognitive biases (psychological biases), within the managerial decision-making processes of organizations and enterprises, as well as their negative and positive impacts on the final quality of decisions. The psychological nature of cognitive errors frequently encountered by managers during information processing, situational assessment, and strategic planning phases—such as confirmation bias, overconfidence, and the anchoring effect—is examined. Over the course of the study, pedagogical-psychological and organizational-methodical mechanisms, including de-biasing techniques, aimed at the early detection of these destructive systemic biases within management systems and the mitigation of their adverse consequences were developed, and their effectiveness was scientifically substantiated.

Keywords: managerial decisions, cognitive biases, psychological biases, confirmation bias, de-biasing mechanisms.

Introduction

One of the most complex and urgent directions in modern management sciences and organizational psychology is the study of subjective psychological factors that arise during the adoption of strategic and tactical decisions by a leader. In today's rapidly changing economic and social environment, under conditions of information overload and time constraints, managers must find solutions to complex problems within extremely short timeframes. In such high-stress situations and uncertain environments, the human brain utilizes heuristic methods—psychological shortcuts—to conserve energy and arrive at rapid conclusions. However, it has been scientifically proven that heuristic thinking frequently leads to systemic errors removed from logical and objective analysis, namely cognitive biases.

Cognitive biases refer to systemic deviations in human perception, memory, and thinking processes that lead to an inaccurate or subjective interpretation of objective reality. In managerial psychology, a leader's cognitive errors can cause not only the failure of individual projects but also the crisis of an entire organization or enterprise. For instance, due to confirmation bias, which is highly prevalent among managers, a decision-maker seeks only information that supports their personal opinion or initial hypothesis and disregards all opposing objective facts. This stifles alternative and innovative ideas within the organization and leads to a flawed assessment of risks.

Concurrently, overconfidence bias is characterized by a manager's excessively high

evaluation of their own knowledge, experience, and predictive capabilities. Managers under the influence of such a bias fail to adequately account for financial and strategic risks, which often results in major losses in investment projects. Another widespread phenomenon, the anchoring effect, occurs when a decision-maker relies too heavily on the first piece of information encountered and builds subsequent analyses strictly around that reference point, which disrupts flexible management mechanisms.

To eliminate these problems, it is necessary to develop the psychological and cognitive competencies of future specialists and managerial cadres during their preparation within the higher education system. The integration of modern pedagogy and psychology requires the creation of programs that enhance the self-awareness and cognitive flexibility of managers. Furthermore, there is a clear need to embed de-biasing mechanisms—widespread in international practice for eliminating or reducing biases—into the corporate culture of organizations.

The purpose of this study is to psychologically analyze the patterns of cognitive biases manifested during managerial decision-making by leaders, to classify their types, and to develop and substantiate a system of scientific-pedagogical and organizational-psychological mechanisms to minimize these errors.

Methods

The research work was conducted in accordance with the research plan of the Department of Social Sciences and Humanities at Navoiy Innovations University, with the participation of management personnel and organization leaders across various levels. A total of 50 middle and top-level managers were selected to participate in the study. To determine the role of cognitive biases in managerial decision-making and to test reduction mechanisms, the following set of methods was utilized:

First, the psychological diagnostics and testing method. To identify the personal characteristics, self-confidence levels, risk propensity, and cognitive styles of the managers, heuristic tasks and the Cognitive Reflection Test (CRT) developed by D. Kahneman and A. Tversky were applied. Through this, the intuitive (Fast System 1) and analytical (Slow System 2) thinking levels of the managers were studied.

Second, the pedagogical-psychological experiment method. Participants were divided equally into two groups: the control group (n=25) and the experimental group (n=25). Managers in the control group continued their traditional management activities. For the managers in the experimental group, a specially designed psychological training and methodical recommendations program titled "Cognitive Effectiveness and De-biasing in Management" was implemented.

Within the framework of this program, the following cognitive bias reduction mechanisms were taught to the experimental group and applied in practice:

The "Pre-mortem" technique: Before a decision is finalized, it is assumed that the project has completely failed in the future, and all members search for the reasons behind this failure. This method helps shatter excessive confidence and optimism biases.

The "Devil's advocate" institution: In every discussion of a strategic decision, one of the group members is tasked exclusively with criticizing the project and finding its weaknesses. This reduces the risk of confirmation bias.

A system for anonymous information gathering and alternative option analysis, which prevents groupthink and the anchoring effect.

Third, the case study method. Both groups were given strategic cases related to complex economic and organizational problems, and their decision-making speed, depth of alternative option review, and level of risk consideration were evaluated. The collected data were processed using mathematical-statistical methods and Student's t-test to verify the level of statistical significance.

Results

The conducted research and pedagogical-psychological experiment results demonstrated that the quality and objectivity of managerial decisions rose sharply in the group where cognitive bias reduction mechanisms were applied in practice.

According to the initial test results, both groups of managers exhibited high levels of at least 3-4 types of cognitive biases (especially confirmation bias and overconfidence). However, as a result of the 3-month trainings and the introduction of special organizational procedures, a radical breakthrough occurred in the performance indicators of the experimental group.

Digital analysis revealed that managers in the experimental group allocated 40 percent more time to analyzing alternative options compared to those in the control group, which reduced the anchoring effect and the likelihood of making rapid but erroneous conclusions (System 1). Following the experiment, the level of cognitive errors committed by the groups during case assignments was examined and summarized in the following table:

Types of cognitive biases and indicators	Control group (post-experiment, %)	Experimental group (post-experiment, %)	Reduction rate (%)	Statistical significance (p)
Confirmation bias (one-sided information gathering)	72.5	28.4	44.1	$p < 0.01$
Overconfidence (insufficient risk assessment)	65.0	22.5	42.5	$p < 0.01$

Anchoring effect (binding to initial figures)	58.0	31.0	27.0	$p < 0.05$
Ability to develop alternative strategies	41.2	84.6	43.4	$p < 0.01$
Quality of group discussion in decision-making	48.0	89.2	41.2	$p < 0.01$

As can be seen from the table data, the manifestation of confirmation bias in the experimental group where de-biasing mechanisms were applied fell from 72.5 percent to 28.4 percent (a positive effect of 44.1 percent). The indicator for overconfidence and overevaluating one's own knowledge also decreased by 42.5 percent, enhancing the managers' skills in accounting for objective risks and properly planning project budgets. Most importantly, the level of developing alternative strategies among managers in the experimental group reached 84.6 percent, which indicates the formation of an environment of flexibility and creativity within the management system.

Discussion

The research results clearly confirm that managerial decision-making is a complex cognitive process closely linked with individual-psychological and subjective factors. Many traditional management theories view managers as "economic humans" who act completely rationally and perfectly analyze all information. However, practice and our experiment results showed that the human mind possesses bounded rationality, and managers regularly fall into cognitive traps.

Reducing confirmation bias in management ensures the strategic stability of the organization. If a leader listens only to reports that approve of their own opinion, they will fail to see market changes, competitor actions, and internal problems. The "Devil's Advocate" method we applied created an environment of resilience against the leader's personal bias, because a staff member granted the formal right to criticize exposes the flaws of a decision without any social pressure. This eliminates errors stemming from groupthink or sycophancy toward the leader's persona.

Overconfidence bias was found to manifest uniquely strongly in experienced leaders. Relying on past successes, they tend to ignore entirely different risks in new conditions. The "Pre-mortem" methodology served as an excellent vaccine against this psychological defect. By imagining that a future project has already failed, managers were forced to step out of the optimism trap and view real threats.

From a pedagogical perspective, the competence to manage cognitive biases must be shaped in students as early as the higher education stage. In the fields of pedagogy and

psychology, it is necessary to deeply teach cognitive psychology and decision-making theories to future managers and organizers, and to improve the system of organizing trainings. Reducing systemic errors in managerial decisions also improves the moral-psychological climate within the organization, because decisions based on objectivity increase the sense of justice and motivation among employees.

Conclusions

Based on the scientific and practical research results dedicated to studying the role of cognitive biases in managerial decision-making and the mechanisms for their reduction, the following conclusions can be drawn:

Cognitive biases manifest systemically within the information processing and strategic planning activities of managers, lowering the objectivity of decisions and generating organizational risks. Confirmation bias, overconfidence, and the anchoring effect are the psychological factors that exert the greatest negative impact on a leader's management style.

Adopting decisions by relying solely on personal experience or intuition breeds high risks in today's complex and uncertain environment. Developing the cognitive reflections of leaders and shifting them into an analytical thinking mode (System 2) requires specialized pedagogical-psychological preparation.

The de-biasing mechanisms ("Pre-mortem", "Devil's Advocate", anonymous analysis, and alternatives) introduced into practice during the study allowed for a 40-44 percent reduction in cognitive errors within the experimental group. These mechanisms are recommended as critical factors for shaping a corporate decision-making culture, increasing the reliability of strategic plans, and ensuring managerial efficiency.

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