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The influence of analytical reasoning on decision-making ability in managers and subordinates.

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Abstract: This research investigates the influence of analytical reasoning on decision-making ability and examines differences in this ability between managers and subordinates in the organizational environment. For this, we used the Analytical Reasoning Test and the Decision-Making Ability Test on a sample of 40 subjects from a company in Bucharest (N=40). In the sample used, 19 participants were managers, and 23 were subordinates. The results demonstrated a significant correlation between the level of analytical reasoning and decision-making ability in managers and subordinates. Participants with higher analytical reasoning skills tend to make more informed and effective decisions. The study highlighted significant differences in decision-making ability between managers and subordinates. Thus, managers generally demonstrated a more remarkable ability to make decisions toward long-term goals and more accurately evaluate options and their consequences compared to subordinates. These findings underscore the essential nature of analytical reasoning in decision-making and highlight the need to develop and promote these skills within organizations. Understanding the differences in decision-making ability between managers and subordinates can provide valuable clues for improving organizational management practices and decision-making processes, thereby increasing their performance and success.

Keywords: manager, analytical reasoning, decision-making capacity, subordinate

1. Decision-making capacity.

The specialized literature highlights the essential role of decision-making ability in organizational performance and adaptation to the work environment. Decision-making ability is vital for managers and employees, influencing how resources and workplace demands are managed and individual and collective performance. Recent studies show that good decision-making competence is associated with high work performance, especially under reduced job demands (Ceschi et al., 2017). In addition, cognitive factors such as cognitive biases can significantly influence the decision-making process, and the recognition and mitigation of these



biases are essential for making informed and correct decisions (Berthet, 2022). Research also emphasizes the importance of self-control and the ability to adapt to unpredictable work environments, highlighting that employees with good decision-making skills can better develop effective strategies to deal with changes and challenges. Thus, improving decision-making capacity is crucial for organizational success and maintaining a productive and adaptable work environment.

With these aspects in mind, we cannot help but wonder how the decision-making process works and how people in leadership positions make confident decisions. Since managers have a wide range of decisions to make, it is necessary to investigate the significance of the type of decision for the decision-making process's rationality. Also, research found that decision-making power rests entirely with management in some organizations, while in other companies, it is shared between employees and managers. Researching the decision-making ability of managers and subordinates is essential for improving organizational performance and creating a harmonious work environment. Mutual understanding of decision-making skills allows for more effective communication and closer collaboration, reducing conflicts and ambiguities related to responsibilities (Ceschi et al., 2017). In addition, the involvement of subordinates in the decision-making process increases trust and motivation, promoting a sense of value and commitment within the team (Berthet, 2022). Thus, in the Romanian organizational context, it is necessary to ask whether rigid management mentalities still lead to deep separatism between managers and subordinates.

Decision-making capacity is defined as a person's ability to process relevant information, evaluate options, and make informed decisions that are appropriate to the context and based on logical and analytical reasoning (Tversky & Kahneman, 1988). This involves cognitive skills and emotional and social factors that influence the decision-making process, highlighting the complexity and multidimensionality of this skill (Kolva et al., 2014). In the organizational context, decision-making ability is essential for performance and adaptability in the face of challenges and dynamic changes in the work environment (Jones, 1994). Decision-making ability in management is crucial to the health and survival of organizations because it involves making strategic decisions that critically affect the organization. It is characterized by complexity, ambiguity, and risk, often requiring heuristics to manage uncertain environments.

Thus, decision-making for people in leadership positions is a central aspect of managerial activity, which has been explored in detail in the specialized literature. Specialists in the field have analyzed how organizations make decisions and proposed different models. A crucial theoretical framework is the Process-Based Decision-Making Model (MDP) proposed by Bazerman and Moore (2012). It emphasizes the importance of understanding the decision-making process instead of focusing only on the results of decisions. This model highlights the role of contextual influences, such as organizational and social constraints, in the decision-making process. Another important model is the Vroom-Yetton-Jago (VYJ) model, which explores how leaders make decisions, including factors such as the degree of participation of subordinates and the importance of the decision (Vroom & Jago, 2007).

Also, here we can mention the Prospect Theory proposed by Kahneman and Tversky (1979), which analyzes how individuals make decisions under uncertainty, highlighting the influence of loss aversion and subjective risk assessment. Starting from these theories, the way decisions are made has been intensively studied over time, which led to their grouping and the introduction of decision styles. For example, Scott & Bruce (1995) identified four decision-making styles: rational style (subject logically analyzes alternatives to make a decision),



intuitive style (based on intuition/hunch), dependent style (calls on the help of other people to make a decision) and avoidant style (avoid making decisions).

Decision-making in management can have significant positive and negative effects on organizations. By making effective and wise decisions, managers can increase organizational performance and achieve strategic goals (Finkelstein et al., 2009). Well-founded decisions can improve the organization's operational efficiency, innovation, and adaptability to changes in the external environment (Eisenhardt, 1999). In addition, strong decision-making ability can strengthen employees' trust in leaders and contribute to a positive organizational culture (Hartog & Belschak, 2012). However, a poor decision-making capacity can have negative consequences for the organization. Poor decisions or delays in making them can lead to lost opportunities, lower employee morale, and damaged relationships with customers or other stakeholders (Kotter, 1995). Moreover, in today's dynamic business environment, making quick and well-informed decisions is critical to long-term organizational success (Eisenhardt & Zbaracki, 1992).

So, decisional capacity plays an essential role in work psychology, significantly influencing performance and job satisfaction. Well-informed decisions contribute to operational efficiency and adaptability to dynamic work environments. Analytical thinking enables employees to identify problems, evaluate options, and anticipate consequences, reducing the risk of errors and increasing productivity. In addition, good decision-making ability is associated with better resource and stress management, thus improving organizational climate and employee well-being.

2. Analytical reasoning.

Analytical reasoning is the process by which individuals evaluate available information, analyze options, and make decisions based on logical reasoning and objective data evaluation. According to Stanovich and West (2000), analytical reasoning involves using logical reasoning and valid arguments to arrive at rational and well-founded conclusions. Likewise, analytical reasoning can also involve identifying and evaluating possible thinking errors and applying strategies to correct them (Pennycook et al., 2015). Thus, analytical reasoning is essential for effective decision-making and the appropriate management of information in various contexts, including management and organizational decision-making.

In general, reasoning involves inferences drawn from principles and evidence by which individuals can deduce new conclusions or evaluate proposed solutions based on known knowledge. There are two main types of reasoning: inductive and deductive. Deductive reasoning is the process of drawing valid logical conclusions from a set of general premises, and inductive reasoning is the process of drawing general conclusions from specific premises. Inductive reasoning involves empirical generalizations starting from a particular case or experience to strengthen statements, while deductive reasoning concludes implicit in the information. In management, analytical reasoning represents the ability to analyze available information, evaluate options, and make well-informed decisions in the organizational context.

One of the key aspects of this process is the ability to apply logic and critical thinking in evaluating different alternatives. According to Hodges & Baron (1992), analytical reasoning involves using a rational and systematic approach to decision-making, where arguments are evaluated objectively and particular attention is paid to each option's positive and negative aspects. Also, analytical reasoning may include using analytical tools and techniques, such as



SWOT analysis or mathematical modeling, to evaluate and quantify the relevant aspects of a decision situation (Bransford & Stein, 1993). By cultivating analytical reasoning skills among managers, organizations can improve the quality of decisions and enhance performance in the face of challenges in the competitive and dynamic business environment.

In the organizational environment, analytical reasoning significantly influences decision-making, contributing to better-founded and more rational decisions. According to Kahneman (2011), the analytical approach involves rigorously evaluating available information and options and using logical reasoning to reach objective conclusions. Applying analytical reasoning in the decision-making process allows managers to identify and evaluate alternatives adequately, anticipate the consequences of decisions, and minimize cognitive errors (Stanovich & West, 2000). Also, Pennycook et al. (2015) emphasize the importance of analytical reasoning in reducing cognitive biases and thinking errors, leading to more accurate and effective decisions. Therefore, developing and promoting analytical reasoning skills among managers can strengthen organizations' ability to make strategic and operational decisions effectively, contributing to long-term success and competitiveness.

At the same time, the adverse effects that analytical reasoning can have on the decision-making process have also been highlighted in the specialized literature. For example, while overly analytical reasoning may lead to exhaustive analysis and identification of all possible options, this may slow the decision-making process and lead to decision fatigue (Shafir et al., 1993). In addition, over-analysis can lead to decision paralysis or a lack of flexibility in dealing with complex problems (Gino & Pisano, 2008). Thus, despite its apparent benefits, managers need to balance analytical reasoning with other decision-making skills and be aware of the potential limitations associated with excess analysis in decision-making.

In conclusion, analytical reasoning represents an essential element of decision-making capacity in management, significantly impacting the decision-making process and, implicitly, organizational performance. Using logical reasoning and objective analysis can lead to better informed and rational decisions, increasing efficiency and accuracy in handling complex situations. Therefore, promoting and developing analytical reasoning skills among managers is crucial to organizational success. However, it is essential to balance the use of analysis with other skills and pay attention to each decision-making situation's specific context.

3. Research methodology.

3.1. Research objectives.

The main objective of this research is to identify whether analytical reasoning influences decision-making ability among managers and subordinates.

Secondary objectives are:

- Identification of a significantly positive correlation between analytical reasoning and decision-making ability.
- Identifying a difference between managers and subordinates in terms of decision-making ability.

3.2. Research hypotheses.

Regarding the hypotheses of the study, they are as follows:



Hypothesis 1: It is assumed that there is a significant positive correlation between analytical reasoning and decision-making ability.

Hypothesis 2: It is hypothesized that there is a significant difference between managers and subordinates in terms of decision-making ability.

3.3. Description of the group of participants.

The sample on which this research was carried out is comprised of 40 employees from a company in Bucharest and is made up according to gender, place of origin, position occupied, and age. The sample consists of 17 men and 23 women, both categories having the urban environment as their environment of origin. Regarding the age of the subjects, they are between 23 and 51 years old. Of these, 19 hold a management position, and 23 hold an executive position. Convenience sampling was used as the sampling method.

3.4. Research tools.

Two work tools were used to carry out this research: the Analytical Reasoning Test and the Decisional Capacity Test. The tools were applied in the pen-and-paper version to subjects.

3.4.1. Analytical Reasoning Test.

The Analytical Reasoning test assesses the ability to discover rules and use them to solve reasoning problems. The tool can be used to assess people aged 12 to 67 years. This comprises two subscales with a completion time limit of 7 minutes, so 14 minutes to complete the entire test. The first subscale of the test is inductive reasoning (Reasoning A), which aims to produce general knowledge from particular data. The second is Deductive Reasoning (Reasoning B). According to the correction grid, subjects' answers are rated with 1 or 0 points, summed, and then reported to a standard by classes, depending on the person's age and gender – class 5 represents the excellent level (Miclea et al., 2009).

3.4.2. Decision-making capacity test.

The decision-making capacity test evaluates the subject's rationality in decision-making. It consists of 14 items describing decision-making situations in which the subjects can choose alternatives are presented. The tool can be applied in pen-and-paper or soft form, with a time limit of 7 minutes for completion. For the test's rating, the correct answers are rated with 1 point, then summed and reported to a 5-class benchmark, depending on the subject's age group and gender. Of course, grade 5 represents an excellent decision-making ability (Miclea et al., 2009).

4. Research results.

4.1. Interpretation of hypothesis number 1.

Hypothesis 1: It is hypothesized that there is a significant positive correlation between analytical reasoning and decision-making ability.



In order to test the issued hypothesis, with the help of the statistical program SPSS, we analyzed the answers given by the subjects. In this regard, we checked the normality of the data distribution. After testing the normality of the data, we obtained a significance threshold higher than 0.05 for the analytical reasoning variable (normal distribution) and lower than 0.05 for the decision-making capacity variable (asymmetric distribution), which is why we will use the Spearman non-parametric correlation method to verify the results.

Table 1. The normality test for the analytical reasoning variable and the decision-making ability variable.

| | Tests of Normality | | | | | |
|--------------------------|---------------------------------|----|-------|--------------|----|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| analytical. reasoning | .144 | 19 | .200* | .886 | 19 | .027 |
| decision-making.capacity | .250 | 19 | .003 | .823 | 19 | .003 |

Next, we calculated the correlation coefficient between the two variables. As a result of the Spearman correlation test (*table 2*), the existence of a significantly positive correlation between the level of stress and performance at work resulted in the significance threshold $p < 0.01$ (0.002). Also, a correlation coefficient equal to 0.655 was obtained, indicating a strong link between analytical reasoning and decision-making ability. The statistical analysis of the data obtained after testing the study participants indicates that the hypothesis supporting the existence of a significantly positive correlation between decision-making ability and analytical reasoning is confirmed.

Table 2. Spearman test for the analytical reasoning and decision-making ability variable.

| Correlations | | | | |
|----------------|------------------------------|-------------------------|--------------------------|------------------------------|
| | | | analytical. reasoning | decision- making.capacity |
| Spearman's rho | analytical. reasoning | Correlation Coefficient | 1.000 | .655** |
| | | Sig. (2-tailed) | . | .002 |
| | | N | 19 | 19 |
| | decision- making.capacity | Correlation Coefficient | .655** | 1.000 |
| | | Sig. (2-tailed) | .002 | . |
| | | N | 19 | 19 |

** . Correlation is significant at the 0.01 level (2-tailed).

So, in the organizational environment, there is a strong relationship between analytical reasoning and decision-making ability; they mutually influence each other. Precisely, when the level of analytical reasoning increases, so does decision-making ability. Thus, the results suggest that individuals who excel at analyzing and interpreting complex information can also better make effective and well-informed decisions. This link indicates that the cognitive processes of analytical reasoning, such as critical thinking, evaluating options, and anticipating



consequences, are critical to quality decision-making. Therefore, people with superior analytical skills are better equipped to approach problems logically and systematically, reducing the risk of errors and increasing the probability of choosing optimal solutions.

They also indicate that people with high analytical skills tend to more rigorously evaluate available information, identify causal relationships, and anticipate the consequences of different options, which allows them to make well-informed and effective decisions. This suggests that analytical reasoning facilitates the understanding of complex problems and increases confidence in decisions made, reducing uncertainty and ambiguity. Thus, a collection of the necessary data is carried out to obtain different alternatives, and this information is used in making the final decision, resulting in intentional reasoning, also called procedural rationality. Procedural rationality represents the extent to which the decision-making process reflects the desire to make the best possible decision in a given context (Dean et al., 1993). Therefore, the decision-making process involves collecting decision-relevant information based on the choice, suggesting that analytical reasoning strongly influences decision-making ability.

In the specialized literature, studies support the existence of a strong correlation between analytical reasoning and decision-making ability, highlighting the significant impact of analytical skills on the quality of decisions. Ayal et al. (2015) examined how analytical thinking influences susceptibility to cognitive errors and biases. The results showed that participants with an analytical processing style showed fewer cognitive errors than those with an intuitive thinking style. This suggests that analytical reasoning reduces the influence of biases on decisions, thus improving their quality and, implicitly, the decision-making capacity process.

Moreover, the study by Meyer et al. (2010) explored the role of visual analytical reasoning in data-driven decision-making. Research has shown that using interactive visual interfaces to facilitate analytical reasoning leads to better informed and effective decisions. This study underlines the importance of tools to support analytical reasoning and that such approaches can significantly improve decision-making results. Similar results were obtained by Pratt and Zangari (2008). They used the concept of decision intelligence to analyze decision-making processes in organizations. The results obtained by them demonstrated that the application of structured analytical reasoning through the use of decision diagrams and simulation models led to well-informed and efficient decisions. This approach allowed individuals to analyze and better manage the external and internal factors influencing decision outcomes through analytical reasoning.

Therefore, we can say that the results of the present study are consistent with those obtained previously and supported by them. It can also be stated that they highlight the importance of analytical reasoning in the decision-making process, suggesting that developing this cognitive skill can significantly improve the quality of decisions in various contexts. Therefore, analytical reasoning strongly influences decision-making ability in the organizational environment.

4.2. Interpretation of hypothesis number 2.

Hypothesis 2: It is assumed that there is a significant difference between managers and subordinates in terms of decision-making ability.



Of course, to test the hypothesis issued, the normality of the data was checked on the two samples of subjects. The results of the normality test show that for both the sample of managers and the sample of subordinates, an asymmetric distribution of the results was obtained, with a threshold of significance smaller than 0.05 (Table 3). Therefore, in testing the hypothesis, a non-parametric method will be used to compare the results.

Table 3. The normality test for the sample of managers and subordinates on decision-making ability.

| management. function | Tests of Normality | | | | | | |
|--------------------------|---------------------------------|------|------|--------------|------|------|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | | |
| | Statistic | df | Sig. | Statistic | df | Sig. | |
| decision-making.capacity | managers | .250 | 19 | .003 | .823 | 19 | .003 |
| | subordinates | .286 | 21 | .000 | .832 | 21 | .002 |

a. Lilliefors Significance Correction

Next, the non-parametric test U Mann–Whitney was used to test the issued hypothesis. In the table below (*table 4*) are the U Mann–Whitney and Wilcoxon W test values, the transformation of the U value into a z score, and the associated significance threshold. For the Mann–Whitney test, the value found is 54.000, and for Wilcoxon W, the value is 285.000. We observe that $z = -3.963$, at a $p = 0.001$ significance threshold, is smaller than $p = 0.05$. Therefore, we can state that there are significant differences between managers and subordinates regarding decision-making ability, which suggests that the hypothesis is confirmed. Thus, we can consider that managers have a greater decision-making capacity than subordinates.

Table 4 . U Mann–Whitney test for the sample of managers and subordinates on decision-making ability.

| Test Statistics | |
|----------------------------------|--------------------------|
| | decision-making.capacity |
| Mann-Whitney U | 54.000 |
| Wilcoxon W | 285.000 |
| Z | -3.963 |
| Asymp. Sig. (2-tailed) | .000 |
| Exactly Sig. [2*(1-tailed Sig.)] | .000 ^b |

a. Grouping Variable: management. function

b. Not corrected for ties.

Thus, the results suggest that managers have a better decision-making capacity and are much more involved in decision-making than subordinates in the organizational environment. By the nature of their roles, managers are often involved in strategic and complex decision-making, which develops their analytical reasoning and decision-making skills under conditions of uncertainty. Thus, managers tend to develop a higher level of self-efficacy due to their experience in making strategic and complex decisions. This increased self-efficacy enables them to approach decision-making situations more confidently and competently (Kerr & Tindale, 2004). Also, frequent exposure of managers to decision-making situations under



pressure contributes to developing their skills in managing stress and uncertainty, which are essential for effective decision-making.

These experiences contribute to greater confidence in one's decisions and an increased ability to anticipate and manage risks (Mintzberg, 1973). Conversely, subordinates may have fewer opportunities to participate in complex decision-making processes, limiting their skills development. This disparity can influence organizational dynamics, as managers are better equipped to evaluate information and make effective decisions, while subordinates may need additional guidance and support to develop these skills (Yukl, 2013). Moreover, cultural and organizational differences also play an essential role. For example, studies have shown that subordinates are more involved in decision-making processes in organizations where a participative leadership style is practiced, which contributes to developing their decision-making capacities, which would otherwise have remained at the same level (Riggio, 2018). These psychological differences emphasize the importance of continuous training and involvement of subordinates in decision-making processes to improve the organization's overall performance.

The specialized literature shows that numerous studies support the significant differences in decision-making ability between managers and non-executives by highlighting specific aspects of the experience and responsibilities associated with these roles. Thus, Fisher et al. (2002) investigated whether Belbin's Theory of Team Roles also applies to subordinates. They showed managers scored higher in Belbin's team roles in business games, suggesting that decision-making and coordination skills are more developed than subordinates or non-managers. Janis and Mann (1977) also analyzed the decision-making process from a psychological perspective and concluded that managers and subordinates adopt different approaches in the decision-making process. In particular, they found that managers are more oriented towards long-term goals and the totality of the number of alternatives in making a decision. At the same time, subordinates focus on short-term goals and allow themselves to be influenced by different factors, such as pressure from superiors or group norms. Therefore, managers have a higher level of decision-making ability, are more prone to take risks, and are less influenced by immediate pressures when making a decision.

Another study by Caspers et al. (2012) investigated differences in neural decision processing between managers and non-managers. They used functional magnetic resonance imaging to observe brain activity for both categories during decision-making. Their results show that managers and subordinates activate different brain regions in the decision process, suggesting that different cognitive mechanisms are involved. Specifically, managers showed increased activity in the dorsolateral prefrontal regions associated with planning, logical reasoning, and risk assessment, meaning managers use more structured and deliberate decision-making strategies. In contrast, subordinates showed more pronounced activation of limbic regions, such as the amygdala, involved in emotional processing and rapid reactions. These results suggest that their decisions are more influenced by emotional and heuristic responses, which may lead to more impulsive and less analyzed decisions.

Therefore, the results of this study, as well as previous ones, show that there are significant differences in decision-making ability between managers and subordinates. Managers, generally having more experience and a broader perspective on the organization, tend to be more oriented toward long-term goals and consider more alternatives in the decision-making process, while subordinates, because of their position within the organization and their lower level of authority, they may be more focused on the immediate aspects of a situation and maybe more influenced by factors such as pressure from superiors or group norms.



Understanding these differences is critical to effectively managing organizations and improving their performance.

Conclusions.

The present research aimed to identify the impact of analytical reasoning on decision-making capacity in the organizational environment and highlight the differences in decision-making capacity between managers and subordinates. The results show that the study's purpose was achieved through a strong link between analytical reasoning and decision-making capacity and a significant difference between people with management positions and those without decision-making capacity.

We believe that the present study reveals the crucial importance of analytical reasoning in the organizational environment and its profound influence on the effectiveness and success of the organization, supporting the findings in the field of specialized literature. In the Romanian sample, it could be observed that the ability to evaluate information, identify alternative options, and anticipate the consequences of decisions is fundamental for effective leadership and management in an organization in a constantly changing environment. Analytical reasoning helps leaders and team members make informed choices, solve complex problems, and approach challenges strategically and pragmatically. This skill can help create a more efficient and innovative organizational environment that promotes well-informed decision-making and optimal problem-solving.

In addition, analytical reasoning can foster a culture of critical thinking and creativity in the organization, stimulating new and innovative ideas and promoting evidence-based approaches to decision-making. By developing analytical reasoning skills at all organizational levels, one can improve the decision-making process and the results and performance of the organization. Thus, this is a central element in the organizational environment, contributing to effective decision-making because employees and subordinates with higher analytical reasoning skills tend to make more informed and effective decisions. Having an impact on the decision-making ability of managers and subordinates, investment in developing and promoting these skills can bring significant benefits to organizations, strengthening their competitive position and contributing to their long-term success.

We also believe that the study results are relevant regarding the differences between managers and subordinates in decision-making. Although analytical reasoning strongly influences decision-making throughout the organization, it can be argued that there are differences between managers and subordinates in decision-making and how they use and apply their analytical reasoning skills. Managers, generally having a broader and more strategic perspective on the organization, can better use their analytical reasoning skills to evaluate options and the long-term consequences of their decisions. Thus, they are more likely to more accurately evaluate available information, identify alternative options, and anticipate the consequences of their decisions. They may be better able to handle the complexity of decisions and solve problems more strategically and effectively.

On the other hand, subordinates can use their analytical reasoning skills to solve immediate problems and deal with concrete situations in their daily work. They can approach decisions more pragmatically and focus more on implementing practical solutions. Therefore, they use analytical reasoning to be more autonomous in decision-making and provide innovative and creative solutions to their daily work problems. They can approach situations with a more critical perspective and contribute to improving organizational processes through



new suggestions and ideas. Due to their position within the organization and lower level of authority, they are more influenced by emotional responses, which may focus more on the immediate aspects of a situation, leading to poorly analyzed and impulsive decisions.

So, decision-making ability is influenced by the level of analytical reasoning in managers and subordinates. Understanding the differences between the two groups can contribute to developing management practices and implementing more effective organizational decision-making strategies. Regarding future research directions, we suggest researching a larger sample of subjects to ensure as much representativeness of the results as possible. We also want to suggest the possibility of a study carried out within several organizations or companies in which the previously analyzed aspects, practices, and organizational culture present within the companies are considered.

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