APPLICATION OF NEUROSCIENCE AND COGNITIVE STUDIES IN PSYCHOLOGY

APLICAÇÃO DE NEUROCIÊNCIA E ESTUDOS COGNITIVOS EM PSICOLOGIA

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Abstract. In recent years, interest in using neuroscientific tools and techniques to study human behavior has increased. Many psychology researchers have tried to emphasize the influential role of brain processes in people's decisions and performance by using terms such as organizational cognitive neuroscience. While the previous teachings have emphasized the importance of the concept of schemas or mental templates as the infrastructure of new learning, cognitive neuroscience is looking for how knowledge, insight and experience are processed in the brain and how the neural connections in the brain cause learning and provide new behavior. In this paper, an attempt has been made to examine and introduce neural strategy in different stages of human behavior and its application in people's jobs and lives by reviewing the work done and categorizing neuroscience techniques.

Keywords: Neuroscience, Cognitive Studies, Psychology, Human Behavior.

Resumo. Nos últimos anos, aumentou o interesse no uso de ferramentas e técnicas neurocientíficas para estudar o comportamento humano. Muitos pesquisadores de psicologia tentaram enfatizar o papel influente dos processos cerebrais nas decisões e no desempenho das pessoas usando termos como neurociência cognitiva organizacional. Embora os ensinamentos anteriores tenham enfatizado a importância do conceito de esquemas ou modelos mentais como infra-estrutura de nova aprendizagem, a neurociência cognitiva está procurando saber como o conhecimento, o insight e a experiência são processados no cérebro e como as conexões neurais no cérebro causam a aprendizagem e fornecer novo comportamento. Neste artigo, foi feita uma tentativa de examinar e introduzir a estratégia neural em diferentes estágios do comportamento humano e sua aplicação no trabalho e na vida das pessoas, revisando o trabalho realizado e categorizando as técnicas da neurociência.

Palavras-chave: Neurociências, Estudos Cognitivos, Psicologia, Comportamento Humano.

1. INTRODUCTION

Neuroscience, especially a branch of it called cognitive neuroscience, has used electrophysiological tools and brain imaging methods to understand how "knowledge, insight and experience in the mind/brain" is processed and the neural pathways involved in them (Katzir & Pare-Blagoev, 2006). On the other hand, many reasons have been proposed for the necessity of explaining the relationship between cognitive neuroscience and teaching and learning (Bryck & Fisher, 2012). Improving the education situation, especially for children, is one of the most important strategic priorities of many countries. Since the brain is the main organ involved in the learning process, the production and development of knowledge about the function of the brain can lead to the improvement of educational programs.

Cognitive neuroscience is growing with a significant speed and acceleration, and based on its findings, the scientific approach to education in classrooms can move away from the current path day by day. It has affected human learning (Posner & DiGirolamo, 2000). The constructive development of the mind of the new generation is largely dependent on the exploitation of new technologies (Johnson, 2016). With the benefit of advanced technologies, such as brain imaging, information about brain functions over two decades. Recently, it has multiplied (Patterson & Forneris, 2023). The researchers' findings have brought a wave of new insights about memory, attention and alertness, thinking, excitement, motivation and learning (Carter, 2005) so that planning about human issues and it has clearly affected social issues (Kable, 2011).

Neuroscience has had a significant impact on fields such as psychology and has provided the basis for the development of fields such as cognitive neuroscience, developmental cognitive psychology, social cognition, and social neuroscience. In the meantime, the application of neuroscience in the field of educational sciences has been more widespread than in other fields (Luk & Christodoulou, 2024). Knowing the details of the brain's function in the process of teaching and learning by using neuroimaging studies has provided valuable information and in In the light of that, scientists in the field of learning and teaching have applied the findings of neuroscience in the field of education (Gómez-Carrillo, et al., 2023) a new field of study under the title of educational neuroscience, by combining the methods of cognitive neuroscience, especially functional brain imaging, with educational science, tries to investigate Science has teaching and learning issues (Zorowitz & Niv, 2023).

The interaction of neuroscience and educational science can be effective in improving theory, thinking and practice in the field of teaching-learning science. Of course, familiarity with how the brain learns is a prerequisite for any discussion on the practical integration of these two fields (Smith et al., 2021). Neuroscience research has shown that learning takes place during the change of the brain's functional organization, and therefore teaching is a kind of art of changing the brain. It creates new links between stimuli, experiences and inclusive behavior (Gagné & Franzen, 2023). The flexibility of the brain, which requires the constant adaptation of the brain to the changing conditions of the environment, makes it possible to create such links (Kaur, 2024). Therefore, the most important link between neuroscience and Education is the study of the nature and manner of learning and memory formation.

Despite the reasons briefly mentioned above, cognitive neuroscience has not yet gained its place in education as it should. Despite the nascent nature of educational neuroscience, it is necessary to examine the role of this new science in explaining educational programs and strategies in general and medical education in particular. Therefore, in this article, the impact of the use and knowledge of neuroscience in education, job and human behavior in the society has been evaluated.

2. METHOD

The word "neurostrategy" was coined by (Clithero et al., 2024) and has been used in academic language ever since. This is part of the mission of words: from strategy, in the field of management knowledge, strategic management and neuroscience, which is characterized by the study of the nervous system. The noteworthy point is that neuroscience is an interdisciplinary science and there are several disciplines in neuroscience that may be more or less directly related to the issue of strategic management, including cognitive neuroscience (Liu et al., 2024); In other words, it can be said in the definition of the basic neuro strategy that the basic neuro strategy is the application of neuroscience in strategic management. Neurostrategy builds on strategy's longstanding emphasis on CEOs. The Academy of Management defines business policies and strategies as "the field concerned with the roles and problems of CEOs

and those who manage multi-business firms or multi-functional business units (Gagné & Franzen, 2023).

3. NEUROSCIENCE AND COGNITIVE SCIENCE

Neuroscience and cognitive science are two fields of science that study the nervous system and human behavior. Neuroscience studies the structure and function of the nervous system, including the behaviors controlled by it, how nerves and nerve cells function, the effects of diseases and injuries on the nervous system, and methods of diagnosis and treatment. On the other hand, cognitive science studies the cognitive processes of the brain and human behavior. This branch of science also studies cognitive psychology, cognitive linguistics, adaptation science, memory, attention, spatial and temporal cognition and other issues related to brain function and behavior.

The main goal of these two scientific disciplines is to better understand the nervous system and human behavior, and this knowledge can help improve people's health and quality of life through clinical and scientific research (figure 1). In addition, knowledge in this field has made these disciplines very important for researchers in the field of medicine, psychology and engineering. In general, neuroscience and cognitive science are two popular and important scientific fields that are very attractive and useful for researchers, students and those interested in these fields.

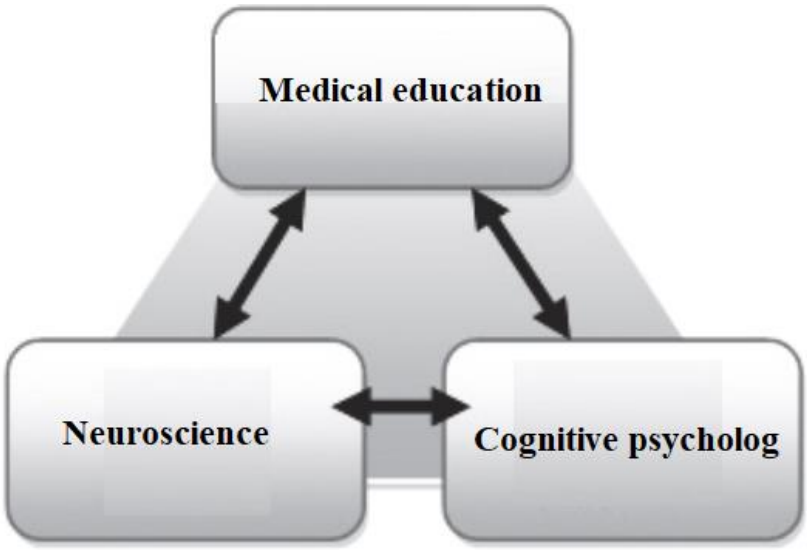

Figure 1. The mutual influence of medical education and cognitive neuroscience through cognitive psychology.

4. RESULTS

Neurosciences or cognitive sciences are two fields of science that are considered separately in some societies, but in fact, these two fields are highly interrelated. Therefore, comparing and examining these two scientific fields improves the understanding of their differences and intersections.

One of the reasons for comparing these two fields is the similarity of brain resources and structures in these two fields. Cognitive science focuses on the cognitive processes of the brain and human behavior, while neuroscience focuses on the structure and function of the nervous system. However, both fields study the nervous system and the factors that influence human behavior. Another reason for comparing these two fields is the high importance they have in society. In today's world, neuroscience and cognitive science are considered as two very important scientific fields in fighting brain and mental diseases and improving the quality of

people's lives. Another reason for comparing these two areas is the high importance they have in clinical and medical research. The research conducted in these two fields helps to improve people's health and quality of life and leads to the development of better methods in the diagnosis and treatment of brain and mental diseases.

In general, comparing and examining these two scientific fields is very important and improves the understanding of their differences and intersections. These two scientific fields, jointly, help to improve people's health and quality of life, and are also very important in clinical and medical research.

The difference between neuroscience and cognitive science

In this section, we want to examine the difference between neuroscience and cognitive science. Comparing neuroscience and cognitive science is very important in medical science and therapeutic research. These two scientific fields are highly regarded in clinical and medical research due to their high impact on people's health and quality of life.

Comparing neuroscience and cognitive science helps to better understand different approaches in diagnosis and treatment of brain and mental diseases. For example, the treatment of brain diseases such as Parkinson's, epilepsy and depression requires a detailed understanding of the nervous system and brain cognitive processes. In addition, the comparison of these two scientific fields improves researchers and specialists in the field of clinical and medical research and helps them to propose the best treatment methods and solutions for patients. This comparison also helps in the development of medical methods and devices (Collins, 2023). For example, the research done in the field of neuroscience and cognitive science helps in the development of brain imaging devices and neuromuscular systems.

In general, the comparison of neuroscience and cognitive science is very important in medical science and therapeutic research. These two scientific fields help to improve people's health and quality of life and are very important in clinical and medical research. Neuroscience and cognitive science are two scientific fields that in some cases seem to be completely similar. But in fact, these two areas have fundamental differences that we will mention below.

One of the basic differences between neuroscience and cognitive science is in the subject of their study. Neuroscience focuses on the nervous system and its function, while cognitive science focuses on the cognitive processes of the brain and human behavior. In other words, neuroscience studies the nervous system and its structures, while cognitive science studies the cognitive processes of the brain and human behavior. Another difference between neuroscience and cognitive science is in research methods. Neuroscience mostly uses chemical and physical methods to study the nervous system, while cognitive science mostly uses psychological and behavioral methods to study the cognitive processes of the brain. Another difference that can be observed between neuroscience and cognitive science is in the type of study conducted for each of these fields. In neuroscience, research is often done on animals to study their nervous system. While in cognitive science, research is often done on humans to investigate the cognitive processes of the human brain. Another difference that can be seen between neuroscience and cognitive science is in the way research is conducted. In neuroscience, most research focuses on brain structures and their functions, while in cognitive science, most research focuses on investigating human behavior and the cognitive processes of his brain. For example, in neuroscience, it is possible to examine brain structures such as neurons and their relationship with their function. In cognitive science, the investigation of brain cognitive function is done through the study of people's behavior and brain measurements such as EEG and fMRI.

In general, neuroscience and cognitive science are two fields of science that are highly regarded in clinical and medical research. While neuroscience focuses on the nervous system and its function, cognitive science focuses on the cognitive processes of the brain and human

behavior. Considering the fundamental differences between these two scientific fields, their comparison and combination can help improve people's health and quality of life and improve researchers and specialists in the field of clinical and medical research and help them find the best treatment methods and solutions for patients.

Neuroscience focuses on the structure and function of the brain and nervous system

Neuroscience is a branch of basic science that focuses on the structure and function of the brain and nervous system. The nervous system is one of the most complex biological systems in the human body and includes more than 100 billion neurons that are interconnected and form neuronal connections.

Neuroscience focuses on the study of the nervous system and its function. This includes examining brain structures, neural activity, cognitive processes, behavior and addiction. Neurological research is done in two ways: human research and animal research. In human research, analysis of brain function using techniques such as MRI and EEG is used. In animal research, animals are used to study the functioning of the brain and nervous system.

Research in neuroscience has received much attention due to the high importance of the nervous system for humans. For example, recent research on the functioning of the brain and how different factors affect it, such as the use of drugs and drugs, has attracted a lot of attention. As a result, neuroscience is very important and plays a very important role in many areas of medicine and therapy, such as neurological diseases, addiction, cognitive disorders, brain damage and age-related diseases. In general, research in neuroscience has led to many advances in our understanding of the nervous system of the human body and developments in neurotherapy and therapy (Verdejo-Garcia et al., 2023).

Cognitive science focuses on cognitive, human, language, memory and decision-making processes

Cognitive sciences are a branch of basic sciences that focus on cognitive processes in humans. This includes the study of language, memory, decision making, attention and other cognitive processes. Research in cognitive science has received a lot of attention due to the high importance of cognitive processes for humans.

In the case of language, cognitive science research focuses on how the language learning process works, language differences, and how language is processed in the brain. Cognitive science helps us to better understand how the human brain is able to recognize and process language.

In the field of memory, cognitive science research focuses on how information is stored and retrieved in memory. This includes examining short-term and long-term memory, visual and auditory memory, and working memory. Research in this area can help us better understand how the human brain stores and retrieves information in its memory.

Regarding decision-making, cognitive science research focuses on the decision-making process and the influence of various factors on it, such as psychological and social factors. This includes examining decision making in different situations, decision making in the face of risk and other factors. Research in this area can help us better understand how to make decisions when faced with different situations. As a result, cognitive science is very important and plays a very important role in many fields of medicine and therapy, such as neurological and mental diseases. In general, research in cognitive science has led to many advances in our understanding of human cognitive processes and cognitive therapy and therapeutic developments.

Interference and cooperation between neuroscience and cognitive science

Neuroscience and cognitive science are two important branches of basic sciences that cover many common issues in the field of research. These two branches of science have a lot of

influence on each other due to their focus on cognitive processes and the functioning of the brain and nervous system.

The overlap between neuroscience and cognitive science emerges due to the focus on brain and nervous system function. For example, research in neuroscience can help us better understand how the human brain is able to recognize and process information, and research in cognitive science can help us better understand how these cognitive processes change over time. And they change in different conditions. Also, collaboration between neuroscience and cognitive science can help us better understand how disorders in the nervous system can have effects on cognitive performance. For example, cognitive disorders such as depression and anxiety disorders may occur due to changes in neural networks related to cognition and emotions.

As a result, the interaction and cooperation between neuroscience and cognitive science is very important and can help us to better understand how our brain and nervous system work and how we can use this knowledge to improve our cognitive performance. In general, the cooperation between neuroscience and cognitive science has played a very important role in the development of research related to the human nervous and cognitive system.

Using neuroscience technology in cognitive research and vice versa

The use of neuroscience technology in cognitive research is very useful and can help us to have the best understanding of human cognitive processes. These technologies include subtractive magnetic resonance imaging (MRI), electroencephalography (EEG), single-focal neuroimaging (fMRI) and other research methods.

By using these technologies, it is possible to examine the changes in brain activity over time in response to various stimuli and obtain the best understanding of human cognitive processes. For example, by using MRI, it is possible to examine how brain activity changes in response to cognitive exercises and different behaviors, and the results obtained can facilitate research in the field of improving cognitive performance.

In addition, cognitive research can also help improve neuroscience technology. With a better understanding of human cognitive processes, it is possible to design and improve technologies that can provide the best performance in dealing with cognitive needs. For example, by better understanding how the decision-making process is carried out, it is possible to design technologies that provide the best performance in this field. Therefore, the use of neuroscience technology in cognitive research and vice versa, clearly has a very important role in improving human understanding and cognitive performance. With further research in this field, improvements in research methods and improvements in neuroscience technology can be facilitated and human cognitive performance can be improved.

Strategic thinking flow in the organization

The strategic performance of the organization strongly depends on the beliefs and perceptions of senior managers. The basic nerve strategy as an enabler for strategic thinking helps to promote and improve strategic thinking in the organization. This enabler derived from neuroscience helps us to better understand the reason for people's behavior and thinking, to be able to analyze the structure of people's brains, to predict the strategic behaviors of the organization's members, and finally to control them in such a way that the organization can through the current Creating strategic thinking both on the first level, which means where to compete, and on the second level, which means how to compete, should work effectively.

Strategic thinking requires a strategic culture, a culture that strengthens strategic conversations, strategic questioning, learning and the desire to win. Strategic thinking must be able to overcome organizational obstacles, including problems caused by groupthink, the lack of participation of people, opposing forces, and the ideas of the organization. Cultivate creative

and rule-breaking. All of these things will be channeled through the strategy of nerve base as an enabler. The important points that a strategy should act on in streamlining strategic thinking in the organization are: refraining from anger during strategic discussions and meetings. It is possible that your meetings will be held with the presence of people with more experience than you, regardless of the organizational position, experience and age, always maintain your composure and behave politely if you want to consider yourself higher than others and show your knowledge and experience to them. Kill or underestimate them, you will definitely not get the result, be careful of all your movements and encounters. The use of body language during conversations and meetings is very effective. The body postures that different people use to convey their feelings and emotions to others depend on many factors, including age, gender, culture, and social contexts. You should be aware that the change in a person's emotions and feelings is reflected in his physical states, so it is very important to be able to recognize people's emotions from their physical states in strategist conversations and be careful with your own physical states to avoid sending the wrong message to the audience. Do not transmit (xx). Use your logic in convincing others and never look for illogical justification.

Note that people are different, they have divergent and some converging thought patterns, these differences are not a reason for the superiority of one person over others, so emphasize the differences as strengths of yourself and others, not as an excuse to humiliate them. Encourage new creative and unconventional ideas, maybe an idea that seems strange or simple can be effective. Think about listening more than talking. Listen carefully to all conversations. Think about learning more than teaching. Different people with different ages, different experiences and different professions have different knowledge. Try to be a good learner. Strategic thinking is a collective learning process, so encourage participation and dynamism.

Neurostrategy (nerve-based strategy) in organization science

The use of neuroscientific tools and techniques to study human behavior in organizations has increased to increase system productivity. Many organizational researchers, using terms such as organizational cognitive neuroscience, have tried to emphasize the influential role of brain processes in managerial decisions and the performance of people in the organization.

The role of the basic nerve strategy is not only limited to the stage of strategy formulation, but it has a special place throughout the planning and strategic management process. The strategic management process includes three general stages of strategy formulation, execution and evaluation. In the strategy formulation stage, it is necessary for senior managers to be open-minded and creative. be innovative and comprehensive and at the same time be able to use their planning and analysis skills in the drafting stage and other stages of how to participate and gain the support of organization members in the process of strategic management is very important during the implementation of the strategy as well as the basic nerve strategy The discussion of how to allocate resources to different organizational units plays a role, the conflict between the line units and the headquarters, the political and power games of the influential people to get a special position, the non-participation of some members in the implementation of the strategy, and other important matters that are related to the basic nerve strategy in practice. The basic nerve strategy can greatly help in the growth and promotion of strategic thinking in the organization.

One of the important applications of the findings of neuroscience and basic neural strategy in strategic thinking related to the field of education and learning is how to improve organizational learning and create a learning organization, basic neural strategy, important points in the topic of organizational learning and improving strategic thinking. Although analytical and linear teaching methods that are specific to left-brain learners are considered well-known and common teaching methods, but in order to strengthen the right hemisphere of

the brain, it is necessary to pay attention to the visual teaching methods of exercises related to the three-dimensional visualization capabilities of creativity and self-education. .

Strategic thinking can be analyzed on two levels, individual and organizational. The individual level includes the general understanding of the organization and its environment, creativity and building a future vision. The organizational level also includes the promotion of strategic dialogue and the use of employee initiative. The strategic performance of the organization has a strong dependence on the beliefs and perceptions of senior managers. The basic neuro strategy as an enabler for strategic thinking helps to promote and improve strategic thinking in the organization, as mentioned in the definition of the basic neuro strategy. This enabler derived from neuroscience helps us It makes us better understand the reason for people's behaviors and thinking, we can analyze the structure of people's brains, predict and finally control the strategic behaviors of organization members in such a way that the organization can be able to compete through strategic thinking at its first level. And on the second level, it means how to compete effectively.

5. CONCLUSION

Cognitive neuroscience is an interdisciplinary research field that brings together researchers with specializations in psychology, communication, education, cognitive science, and computer science brought together with the aim of using neuroscience tools to create a deeper understanding, its impact on people, and its application to society.

Both research areas examine the functioning of the brain and the nervous system, with the difference that in neuroscience, the focus is more on the physiology of the brain, while in cognitive science, the focus is more on the behavior and cognitive function of the brain. There are many commonalities in both research areas and the ultimate goal of both research areas is to better understand the functioning of the brain and nervous system.

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