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THE USE OF NEUROSCIENCE IN UNDERSTANDING FINANCIAL BEHAVIOR

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Abstract: This article approaches financial education within the context of neuroscience and how its study is able to help in the understanding of decision-making and financial behaviors. Such an approach is necessary due to the great difficulty found in changing financial behaviors based on consumption and quick rewards, as seen on a large scale in Brazil. The purpose of this study is to conceptualize some of the various neurological aspects that happen in the human brain at all times, and how the understanding of its functioning can help the understanding of the financial profile of each individual, enabling the construction of healthy financial habits with a greater understanding of their neural triggers, providing better control over changing financial behavior. This purpose is achieved through a literature review, where secondary data were collected through document analysis. This work proposes a discussion between neuroscience and the study of financial education, which has shown that, based on neuroscience principles learned during the process, it is possible to identify how the human brain reacts when faced with the need to change behavior, as well as new information to be treated about finances, thus being able to understand how the brain will instinctively respond, and inferring the possibility of making use of these factors to help financial change in a more assertive and lasting way.

Keywords: Financial education. Neuroscience. Behavior.

INTRODUCTION

Society as a whole lives in constant change, where new technologies and new aspects linked to human knowledge are discovered every day and in an increasingly accelerated way.

The entire financial system has been undergoing changes, especially in the last 20

years where changes at work and throughout the financial system have undergone exponential changes, filling the market with information, generating more questions than answers about how to adapt to new arrivals for the whole society.

Biased by the country's cultural and economic history, Brazilians have become vulnerable when it comes to financial education, moving them away from important concepts for their future, such as knowledge about personal budget, consumption behavior and financial planning.

The present research is in order to create the possibility of discussion between the concept of financial education, consumption behavior and savings of the individual within aspects of neuroscience, where in-depth studies of the human brain and mind can bring a better understanding of how the natural reaction of the human brain can be used to build good financial habits, thus creating a path of self-knowledge for each individual within their particularities, to create a richer life and with the accumulation of desired wealth.

RESEARCH METHODOLOGY

According to Eva Maria and Lakatos (2003), scientific methodology extends beyond the discipline itself, introducing the interlocutor to systematic and rational procedures, thus providing a basis for training the scholar and the professional, since both act, in addition to practice, in the field of ideas.

Therefore, this work uses a qualitative methodology, with an exploratory bibliographic nature, where data were collected through document analysis. The proposal used proposes the possibility of discussion, in addition to the traditional fields of financial education, as well as through a more in-depth study of neuroscience, thus demonstrating the great transdisciplinary nature of the topic addressed.

THEORETICAL DEVELOPMENT

THE CONCEPTS OF FINANCIAL EDUCATION

According to the OECD (Organization for Economic Co-operation and Development), there are recommendations on basic principles of financial awareness that generate knowledge of high priority for society, prepared in July 2005, the recommendations suggest that each individual's awareness of personal financial planning, basic savings, notions of financial mathematics, economics and debt management enhance the power of making more assertive decisions on the part of each one, thus being able to evaluate their own retirements with their public, private and/or own pension plans. Thus, according to the OECD (2005), financial education can be understood as a tool for economic growth that leads the social and economic system to more balanced processes, allied to the regulators of this system, aiming to make each individual capable of managing their income, savings and investments efficiently, in a complementary relationship, making them able to avoid being victims of fraud, as can also be seen through the text:

“Financial education can be defined as “the process by which financial consumers/ investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective steps to improve their financial well-being”. Financial education, therefore, goes beyond providing financial information and advice, which must be regulated, as is often the case, especially for the protection of financial customers (eg consumers in contractual relationships).

According to Sebrae (2020), financial

education translates into skills that lead people to organize their own financial lives according to their goals and objectives, so financial education transcends the plan of learning to save, improving the quality of life. This way, bringing the possibility for the individual to acquire the necessary skills to avoid credit card debts or high interest rates, allow the analysis of financial priorities within a plan, achieving financial balance and enabling the obtaining of resources to invest for their own future.

Another approach to the concept of financial education is described by Reinaldo Domingos (2012) where, as the author highlights, financial education is part of a human science that aims to seek financial autonomy, based on methodologies based on human behavior, with a central objective to create a mental model that enables the individual to create healthy habits, providing a balance between if, doing and having, with conscious decisions to make dreams come true.

Thus, it is believed that, as described by Robert Kiyosaki (2000), the construction of financial sustainability must not be based solely on obtaining more money, nor at any cost, but on the search for financial and emotional intelligence so that the individual can create new opportunities in the midst of adversities and support themselves using their accumulated assets and their decision-making expertise in possible crises. As Kiyosaki (2000) quotes in his work:

“If you want to build an Empire State Building, the first thing to do is dig deep into the ground and build a solid foundation. If you're going to build a house in the suburbs, all you have to do is place it on a six-inch slab of concrete. Most people, in their eagerness to get rich, try to build an Empire State Building on a six-inch slab.”

This way, it is possible to verify that the use of economic psychology and direct attention

to emotions and how they happen in the brain are of great importance, as it is possible to analyze in the proposition of Gustavo Cerbasi (2008), where the management of expectations becomes a key point. in the implementation of pre-established financial plans, since the intensity and speed of the financial gains that can be achieved are directly proportional to the frustration with small losses of the assets already accumulated.

IMPLICATIONS OF NEUROSCIENCE IN FINANCIAL EDUCATION

A first aspect conceptualizes neuroscience as a scientific field with study focused on the nervous system, which is formed by the brain, spinal cord and peripheral nerves, objects of research by scientists.

Also according to Fundação Instituto de Administração (2020), neurosciences were treated under biological aspects, that is, where there were commands given by the brain that were transported and executed by the organism, thus highlighting how societies did not directly relate the brain to human consciousness. however, the brain began to be used as a protagonist in experiments where its relationship with consciousness provoked questions about its relevance in human decisions.

Sidarta Ribeiro (2013) states that human consciousness is not found as an object or specific location of the brain, but in a process of flows that are distributed across various brain regions, where interactions with the environment, conscious or not, are created. Thus, it can be seen that, from studies and experiments, the effectiveness of training brain activity for different purposes was noted. This way, it is possible to control, through human consciousness, the automatic responses of organisms that, in principle, are unconscious.

Similarly, author Daniel Kahneman (2012) says that for several decades scholars have

been interested in the two spheres of thought, associating them with the terms System 1 and System 2. Where System 1 operates automatically and fast, using little energy and no sense of voluntary control. System 2, on the other hand, is responsible for allocating greater attention to mental activities that require greater reflection, such as complex calculations. Such brain operations are generally associated with the experience of activity, choice, and concentration.

It is therefore noted that both System 1 and System 2, their relationships and correlations, influence how each individual makes their decisions regarding their financial life, as cited by Morgan Housel (2021), where every financial decision made by a person is directly linked to his mental model of how the world works and from the information he has.

In this sense Kahneman (2012) adds that Systems 1 and 2 are always active while the individual is awake. With System 1 in automatic mode and System 2 in order to use only a fraction of its energy. At all times, System 1 generates suggestions to System 2, which are impressions, intuitions, intentions and feelings. When given as assertions by System 2, impressions and intuitions become beliefs, while impulses become voluntary actions.

In line with these aspects, the discovery made by Luigi Galvani in 1791, according to the Fundação Instituto de Administração, showed that neurons actually work from electrical impulses, not by water as was believed.

Based on the principles of Kahneman (2012) and the discovery of Luigi Galvani (1791), there is a distinct brain feature, automatic brain programming, created to save as much energy as possible at all times, making any change in habits susceptible to increased consumption of brain energy, requiring focus and persistence of the individual.

As shown by Greg McKeown (2015), the routine can be used as a tool to remove obstacles and paradigms from the person. This way, it is possible to remove distractions so that they do not dominate the individual's consciousness. Thus, creating routines capable of preserving what is essential in planning, it is possible to start executing them on autopilot. Which makes a direct connection with what Daniel Kahneman (2012) said, where he explains how from the moment when a more complex activity that requires System 2 has the perception of recurrence, then System 2 starts to use less energy for this habit. thus migrating to System 1 where it runs with less energy use and more automatically.

This mechanism capable of making more complex tasks simpler to perform and with less effort was described by a set of scientific research, as cited by McKeon (2015). This

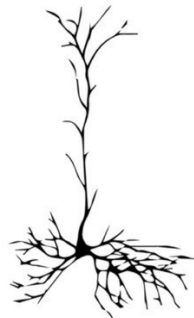
process is defined when an individual creates and fulfills a certain task, from which neurons create new brain connections in communication pathways called synapses. Then, with the recurrence in the execution of the same habits, the connections created by neurons are strengthened, making their activation easier with less effort, so it is believed that the abandonment of a behavior, be it investing or saving, becomes less likely to be abandoned, as the neural connections that support the behavior are stronger, making it easier to maintain the positive habit.

The figure below represents, according to Pedro Calabrez (2021) how the connections of neurons are strengthened and create new connections when stimulated from new learning and the repetition of behavior to change habits:

Normal neuron



Stimulated neuron



Non-stimulated neuron



Source: Pedro Calabrez (2021)

A survey carried out in 2018 by the agency Brasil revealed, according to Souza (2018), that 58% of Brazilians do not actively take care of their own finances, together with this survey, 17% of consumers often make use of the credit system to be able to pay the monthly bills, this percentage being even higher when considering young people, rising to 24%. Thus, it is noticed how the habit of active control of finances is not part of the culture of most individuals, so the change in behavior becomes more complex in the sense of having more brain energy spent for such a change, in order to create new neural connections that with repetition would make it easier to maintain the behavior of managing one's own resources. Data obtained by SPC Brasil revealed that the financial organization does not attract consumers, thus showing the relevance of understanding the importance of financial education programs and attention to why consumers tend to procrastinate with regard to their own financial lives.

In agreement with Serasa Experian (2013) conducted a research highlighting that increasing income does not improve financial behavior. In this sense, it is possible to notice how the monetary increase of an individual without a proper understanding of their behaviors and goals, becomes ineffective in building a healthy and perennial financial life.

Along with the understanding of the behavior itself, there are strategies applicable to the type of financial behavior, among them are two strategies in which, one is based on financial psychology, where the focus is directed towards giving importance to the saving behavior that overlaps the profitability that you may have in investments and a strategy aimed at understanding how the personal cash flow must be built, especially in the mental model.

According to Morgan Housel (2021), people on a large scale need to be convinced to

save money, a simple strategy of accumulating wealth, but easily ignored, so a fortune appears to have little to do with their income or asset returns. invested, and a lot to do with the consistency of contributions made regularly. Investment returns are unknown within any strategy, in the sense of, if they will work, for how long they will work and if the market will remain cooperative to the defined strategy. On the other hand, savings and frugality, which are related to the conservation of wealth and the efficiency of finance, are variables under the individual's control, so the guarantee of efficiency for the future and for the present is 100%, provided that, the strategy is followed.

Equally important, Robert Kiyosaki (2000) describes, financial intelligence has an important aspect situated in understanding the difference between assets and liabilities, thus showing how the construction of equity based on the purchase of financial assets becomes more assertive, compared to the financial models normally adopted. for people. Thus Robert (2000) cites a teaching based on teaching with simplicity, not decreasing the depth of the discipline, where financial awareness is increased continuously and with ease of understanding. Based on the observation of the possible aridity of financial discipline for people, a teaching model was described, based on images, without any use of numbers, using few words, for a greater understanding of the flow of money in decision-making processes.

The tables below make a parallel between the cash flows of individuals with different behaviors, demonstrating the simplicity of Kiyosaki's (2000) strategy for learning to accumulate wealth:

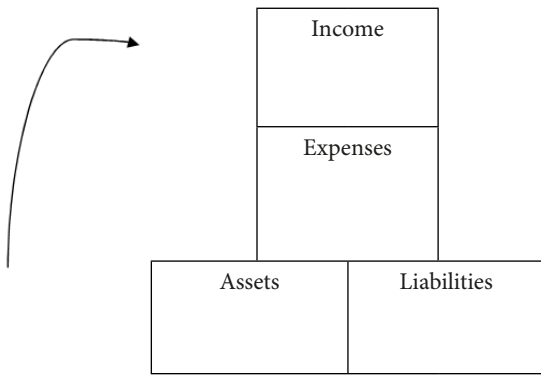


TABLE 1- This is an asset's cash flow chart.

Source: Robert Kiyosaki (2000)

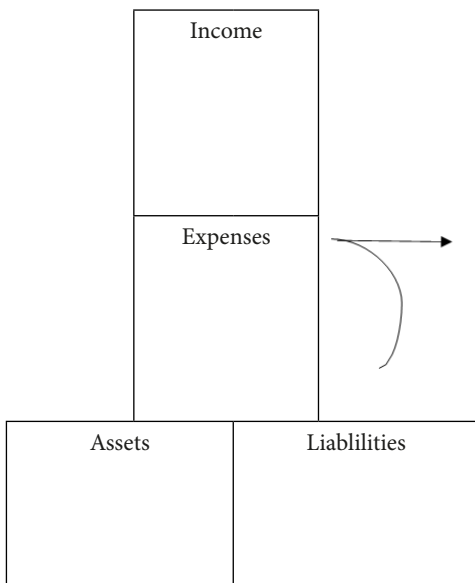


TABLE 2- This is the cash flow chart for a liability.

Source: Robert Kiyosaki (2000)

Based on these definitions, it is noted that understanding can be facilitated by simpler means, where in this specific case it demonstrates that:

An asset is something that puts money in your pocket. A liability is something that takes money out of your pocket.

Within these aspects, it is understood that part of the financial problems faced by the population stem from the lack of understanding in the differentiation between assets and liabilities, causing a behavior based on consumption and with immediacy,

since, according to Gustavo Cerbasi (2008), the mathematical analyzes carried out in enrichment strategies are important, but more than understanding economic ways to achieve goals or identifying the investment portfolio with the best efficiency, it is necessary to direct great attention to how a person deals with their own emotions such as ambition, vanity, pride, compulsion, complacency and greed.

FINAL CONSIDERATIONS

Returning to the initial objective, financial behavior is seen today in Brazil as a problem linked to numbers in personal finance, but the study of financial education goes into deeper branches, analyzing various aspects about each person, so that one can understand their own behaviors and make their financial lives more sustainable. In a deeper way, the present work sought to address how the study of neurosciences can be widely useful in changing behavior and consequently in greater assertiveness with regard to financial decisions for the short, medium and long term.

We can say that changing behavior and creating habits is, according to the data presented, easily abandoned by people, this way, analyzing how brain stimuli work, it can be seen that the creation of goals for the construction of financial life by itself, it does not generate a method capable of ensuring that you do not give up following a financial plan until it is materialized in the future, which is possible to circumvent using strategies linked to the way the brain works, not overloading neurons with many goals at the same time, focusing on the strategy of each specific objective and allied to that, using triggers that generally lead to consumption, leading to the savings effort to achieve the objectives.

Another aspect to be mentioned is the creation of a model of approach to new

financial behaviors that must be actively and consciously reinforced, thus allowing the human brain to adapt to this information, strengthening synaptic connections and transforming such behaviors that, start allocated in system 2 of the brain where it uses greater computational energy to operate the information, in behaviors operated largely by system 1 of the brain, capable of operating with low computational energy use, transforming these behaviors into habits that can be easily maintained as they are stimulated.

This study requires a greater depth in the field of neurosciences, due to its great breadth of depth, and can still be explored with regard to the various cognitive biases present in human behavior as well as all science in the fields of neuropsychology, neuroanatomy and behavioral neuroscience, being able to understand even more how the human brain is able to adapt and create new paths for the realization of all the dreams present in people's minds.

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