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Investigation of Human Brain in the Relationship between Entrepreneurship and Economic Growth

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Abstract

One of the most basic assumptions of economics is that human beings are rational. The field of economics refers to this hypothetical human type as "*Homo Economicus*". Thus, the behavioral and psychological characteristics of the human factor in mainstream economics have not found much study area. However, thanks to the fields of behavioral economics, experimental economics, and neuroeconomics that have developed in recent years, it has begun to be investigated in economics literature with the help of other disciplines, especially psychology, too. Along with these studies, the structure of the brain has met with economics, especially neuroeconomics, in studies conducted after the 2000s. However, most of these studies have primarily focused on microeconomic analysis. Macroeconomic issues related to the brain have been addressed only to a limited extent in the economics literature. The aim of the study is to contribute to the literature by establishing a relationship between the brain and economic growth. In the study, the relationship between the human brain and economic growth is discussed on the basis of the concept of entrepreneurship. While evaluating the concept of entrepreneurship, studies on the right brain, which is the creative and innovative side of the brain, have been examined. As a result of the study, it was concluded that individuals who is right-brain dominant and use this lobe effectively will be successful entrepreneurs and thus contribute to economic growth. In addition, recommendations for the development of the right brain and the identification and support of potential right-brain dominant entrepreneurs are presented as a result of the review.

Key Words

Human brain • Economic growth • Right brain • Right brain training • Neuroeconomics • Holistic brain model

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Introduction

According to economic theory, the entrepreneur serves as both one of the factors of production, the one who brings these factors together. In economics, human beings are referred to as entrepreneurs in discussions of production factors, consumers in consumption theory, labor in production theory, policy makers in decision-making, investors in financial markets, and taxpayers when fulfilling their tax duties. They may even be considered free-riders when benefiting from public goods/services for free. Although these examples can be multiplied and the role of human changes within the economic structure, humans are consistently assumed to be rational in mainstream economic theory. The concept of "Homo Economicus", which assumes human rationality, is believed to facilitate economic analysis but also limits economists in their understanding of human behavior. Recently, the fields of behavioral economics and experimental economics have increased the interest of economists in behavioral sciences. With the development of neuroeconomics after the 2000s, economists have begun to examine the human nervous system and brain, thanks to the contributions of various disciplines. Considering that humankind's fascination with the brain dates back to ancient times, the intersection between the brain and the economy is relatively new. However, these new studies primarily fall within the realm of microeconomics. While studies on the human brain in the field of microeconomics, aided by various disciplines, continue to gain momentum and popularity, the relationship between economic growth and the human brain is not a topic frequently discussed in the economics literature.

In this study, the relationship between the brain and economic growth will be discussed within the framework of entrepreneurship. The connection between entrepreneurship and and the brain will be examined in terms of creativity and innovation, which are crucial characteristics of successful entrepreneurs. While explaining the concepts of creativity and innovation, these two terms are considered as a whole.

The main purpose of the study is to explore the connection between the human brain and entrepreneurship, particularly in relation to economic growth. The study has uncovered evidence linking the right brain to economic growth and offers suggestions for enhancing economic development through the cultivation and efficient utilization of the right brain.

The study is organized in four titles. Following the introduction, the relationship between entrepreneurship and economic growth. The third section delves into the structure of the brain, while the fourth section reviews the existing literature in this field. The study concludes with a final section for conclusions and evaluation.

1. The Relationship between Entrepreneurship and Economic Growth

When we examine developing countries grappling with resource scarcity, entrepreneurship emerges as a vital avenue for their economic and social advancement. Entrepreneurship represents a bold initiative, offering not only a path to economic growth but also the freedom to carve one's unique journey while challenging global stereotypes. From a historical perspective, entrepreneurship acted as an intermediary, actively assuming risks through agreements with capital owners during earlier eras. In the MiddleAges and the 17th century, entrepreneurs were the individuals responsible for planning and overseeing substantial projects such as public buildings, religious structures, and defensive fortifications, often without exposing state resources to risk. The transition to the Industrial Age in the

18th century saw entrepreneurs distinguished from contemporary real or legal entities providing risk-capital. In the 19th century, inventions and innovations increased in the light of successive technological developments, and the belief that the entrepreneur was "*the person at the key point of the economy and a catalyst of economic change and development*" was established. With Schumpeter, the creative and destructive effect of entrepreneurship has gained widespread influence since the 19th century, and the understanding of "replacing the actually existing products, processes, ideas and businesses with better ones (Tunç, 2007)" has dominated. With Schumpeter, entrepreneurship has been characterized as a God-given power that can be possessed by the extraordinary, and is at the forefront of innovation. Entrepreneurs, on the other hand, are people who meet possible and current demands and needs through innovation, activate businesses, which are the main catalysts of economic life, increase their capacities (or cause them to be closed by taking decisions in the opposite direction), and take risks with the aim of profit. Like an author who opens a book and engulfs his reader when they read the first sentences, entrepreneurs are leaders who will follow their qualified audience with a vision that is achievable and shares it. They are people who combine their resources and time while designing their future, take calculated risks, and choose their teammates meticulously. With the aim of increasing their quality of life day by day, they run to the big picture without stopping. Entrepreneurs, who do not neglect to benefit from technology and gaining knowledge, meticulously examine the research and publication reports made to analyze the market as well as their observations in order to realize their dreams and make their success sustainable (Kalfaoğlu, 2022).

Entrepreneurship is defined in Oxford English Dictionary in 1902 as "activity, behavior, or attitudes characteristic of an entrepreneur or entrepreneurs" (OED, 2023). Entrepreneurship has been dealt with in different dimensions later on and many definitions have been made. Although it is difficult to give a single definition of entrepreneurship, innovation and creativity are the most emphasized elements among these definitions (Çevik, 2006).

As with the definition of entrepreneurship, different definitions have been made for the entrepreneur by many authors. However, according to Aidis (2003), Schumpeter made the most important contribution to the definition of entrepreneurship with his book The Theory of Economic Development (1912). In his book, Schumpeter defined the entrepreneur as an innovative and leading individual. Thanks to imitative entrepreneurs who following the innovative leader, the economy is booming.

Entrepreneurship and the decision-making processes of entrepreneurs have gained significant attention in the economics literature. However, developments in behavioral economics necessitate a reevaluation of entrepreneurship's impact on economic and structural development. In this regard, Schumpeter's views contain a rich source (Santarelli & Pesciarelli, 1990).

According to Schumpeter (1947), the creative response in the business world also moves in parallel with entrepreneurship, which is the main driver of economic change in capitalist formations. The entrepreneur and the function of entrepreneurship can be defined as: "*doing new things or doing things in a new way that are already being done (innovation)*" (p.152).

The most important data in measuring economic performance and creating economic development is the increase in Gross Domestic Product (GDP) (Akcan & Metin, 2018). However, economic growth has a far-reaching impact on

many aspects of life (Akcan & Azazi, 2022). It can be argued that entrepreneurship bolsters economic growth through innovation and creativity. While the connections between entrepreneurship, creativity, innovation, and economic growth have not seen significant enrichment in economic theory since Schumpeter, psychology literature offers a more comprehensive perspective. In this regard, the psychology literature is more extensive, and there is a need to integrate psychological research with economic theory (Williams, 1983). Following Williams' insight, fields like behavioral economics, experimental economics, and neuroeconomics have emerged, allowing economists to explore human behavior, the human brain, and nervous structure through interdisciplinary approaches. However, the economics literature has dealt with the concept of rational human being intensively in this field and has conducted tests to falsify the rationality assumption. Macroeconomic issues such as economic growth, on the other hand, have been dealt with very limitedly.

However, for Schumpeter, the innovative and leading entrepreneur is too valuable to be confined solely to the realm of rationality or even to the debate about whether they are rational. This leads us to a critical question: How innovative or creative can a rational human be when freed from emotions? Innovative entrepreneurs are at the core of the innovation that drives economic growth. This question raises another question: How can we determine if Homo economicus possesses innovativeness? In the next parts of the study, the question of whether the human typology defined by the mainstream economics is an innovative individual will be tried to be explained by considering the structure of the human brain.

2. Structure of the Brain

The human nervous system, comprising nerve cells, subsidiary cells, and connections between these cells, constitutes one of the most complex biological structure. The central nervous system, responsible for control, resides in the brain (Canan & Sezen, 2018). The brain carries out this control function through billions of nerve cells, known as neurons (Pelvig et al., 2008). Neurons are the basic unit of work and the brain is shaped by the structure and function of neurons. There are billions (possibly up to a trillion) of neurons in the brain responsible for transmitting information to other nerve cells, muscle, and gland cells. Neuron consist of a nucleus and a cell body, with an axon extending into small axons. Synapses serve as communication points between neurons, while dendrites extend from the neuron's cell body to carry messages from neighboring neurons. Neurons transmit electrical impulses through their axons. Insulating myelin sheaths, on the other hand, increase the speed of this electrical conduction by covering the axon (Ariniello et al., 2002).

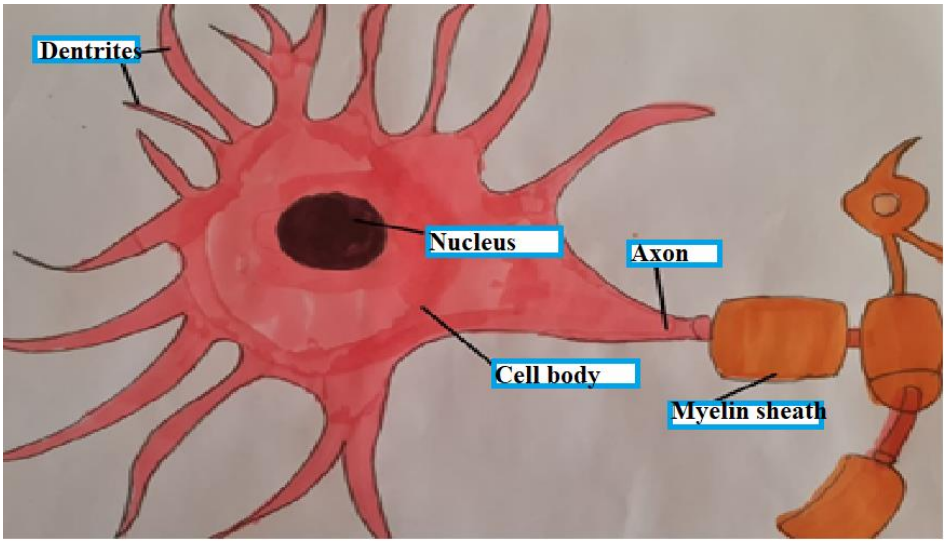

Figure 1. Structure of Neurons (Ariniello et al., 2002)

The brain consists of two hemispheres connected by a structure called the corpus callosum, facilitating communication between the two hemispheres. The hemispheres are covered by a layer known as the cerebral cortex, which envelops the entire brain with its distinct gray color. The cortex is divided into sections such as the occipital (occipital lobe), parietal (lateral lobe), temporal (temporal lobe), and frontal (frontal lobe) lobes. Below the cerebral cortex lie nuclear structures such as the hypothalamus, thalamus, and amygdala. Situated behind the brain stem is the cerebellum, which serves as a connection between the brain and the spinal cord. The brain is connected to the body's organs through axon connections, known as nerves (Uran, 2013). To comprehend this intricate brain structure, extensive research has been conducted, leading to the development of various models explaining the relationship between the brain and the human body.

3. Brain Models

Today, there are three brain models: the right and left brain model by Robert Ornstein and Roger Spreery, the triple brain model by Paul McLean, and the holistic brain model, which divides the brain into four regions, by Ned Herrmann (Onan & Akgül, 2012).

3.1. Right Brain-Left Brain Model

The separation of the right and left lobes in the brain's structure is of great importance for understanding its functioning. Roger W. Sperry, in his studies on the cerebral cortex of cats, revealed that the brain is divided into two different hemispheres, the right and left hemispheres. This work enabled Sperry to win the Nobel Prize (Boydak, 2004, p.1). According to Sperry (1975), the brain is divided into two by a fiber layer known as the corpus callosum, and the right brain and the left brain, which emerge as a result of this separation, have different capacities and mental characteristics. Investigations on the right and left brain separation continued with many different studies.

Studies on the hemispheres have revealed differences in their functions and abilities. In general, the left hemisphere is responsible for analytical thinking, while the right hemisphere is associated with intuitive thinking

(Laccino, 2014). When the right and left hemispheres of the brain are considered functionally, tasks such as creating numbers, words, lists, sequences and lines, together with skills involving logic and analysis, are the task of the left brain. While the right brain handles situations as a whole, it undertakes the tasks of perception of space and size, colors and rhythm, and also the right brain is the center of imagination (Buzan & Barry, 2018).

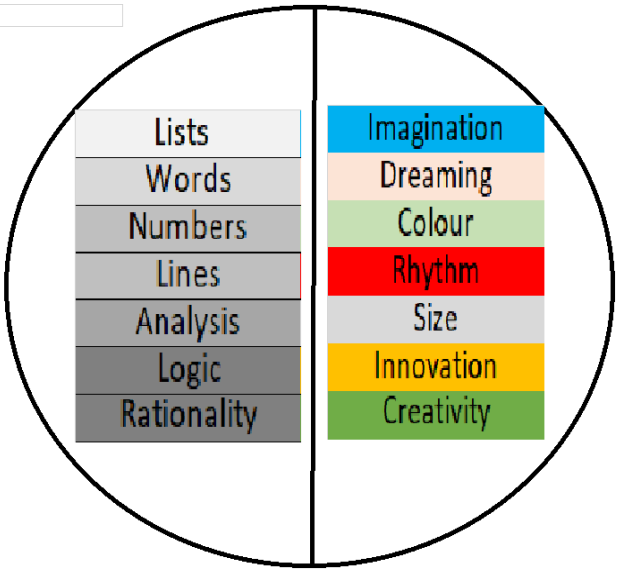

Figure 2. Mental functions of the right and left hemispheres of the brain (Buzan & Barry, 2018)

When considering the brain as two hemispheres, a relationship between the right brain and economic growth can be established. Factors such as patenting and innovation, which play a vital role in economic growth, are closely linked to the development and effective utilization of the right brain. The top of three countries in the patent applications are the United States, Japan and China (Kavaklı & Saygılı, 2019). When evaluating the production capacity of these three countries and their position in the world economy, the importance of creative intelligence and the right brain becomes evident. An examination of the utilization of the right brain reveals that while this rate is 5% worldwide, it significantly increases to to 60% and 80% in countries with high invention rates such as Japan, China and Korea (Karaman, 2015).

In the right-brain-left-brain distinction, an inference was made regarding economic rationality. According to Yılmaz (2020), it can be suggested that individuals who predominantly use the left lobe of the brain are more rational than those who predominantly use the right lobe of the brain.

3.2. Triune Brain Model

The Triune Brain theory, originally formulated by Paul MacLean, postulates a hierarchical progression in the development of the human brain, delineated into three distinct segments: the reptilian brain, the mammalian brain (specifically referred to as the palaeomammalian brain), and the cerebral cortex (Herrmann, 2003). This structure, known as the limbic system, includes the amygdala, hippocampus, hypothalamus, thalamus and pineal gland (Derrington & Goddard, 2007). The limbic system emerges as the third significant neural system in its development,

both in terms of its morphological and functional attributes, during early childhood. It possesses the remarkable capacity to shape and refine the physical, instinctual, and social aptitudes of the organism in response to its early experiential encounters. This adaptive prowess enables the limbic system to effectively modulate an individual's responses and behaviors, aligning them with the exigencies of their specific environmental context." (Livingston, 2013) The neocortex or upper brain (neomammalian brain) is the part that enables rational thinking and separates people from each other. It is divided into right and left brain. It provides mental activities such as thinking, planning and creativity. The upper brain consists of parts such as frontal, occipital, parietal and temporal (Derrington & Goddard, 2007).

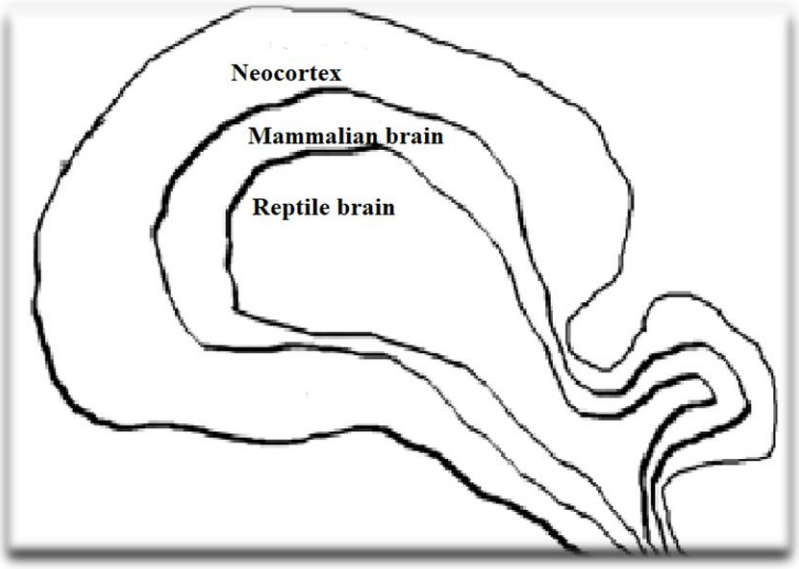

Figure 3. Triune Brain (Herrmann, 2003)

The limbic system exercises regulatory control over emotional states and fundamental cognitive processes that manifest in response to heightened states of arousal. The limbic system, also known as the intermediate brain, assumes responsibility for processes characterized by heightened emotional reactivity, such as anger, as well as the consolidation of acquired knowledge, as elucidated in the study by Canan (2023). According to views before Mac Lean, the neocortex part of the brain dominated the lower two parts. However, Mac Lean revealed that in the event of a threat, the reptilian brain comes into play and dominates the rational brain, but this phenomenon is questioned by neuroscientists (Derrington & Goddard, 2007).

Herrmann criticized the Right Brain-Left Brain Model put forward before him and thought that this model should be combined with the Triune Brain (Herrmann, 2003, p. 26).

3.3. Holistic Brain Model

The Whole Brain (Four-Quarter Model) was developed by Ned Herrmann as a more comprehensive model by combining the Right Brain-Left Brain Model and the Triune-Brain Model (Lumsdaine & Lumsdaine, 1995; Onan & Akgül, 2012). Herrmann developed the “Herrmann Brain Dominance Instrument” with more than 110,000

participants, which has strong validity and is used in 7 languages (Herrmann, 2003). With this tool, Herrmann divided the brain into four quadrants according to the dominant use of the participants.

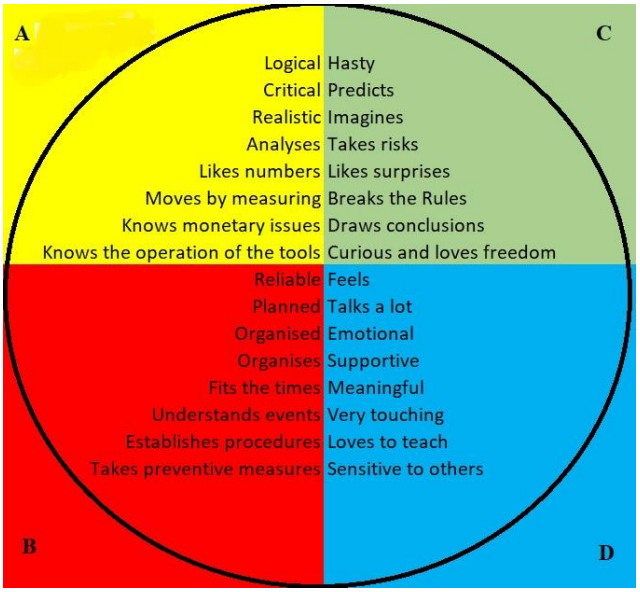

Figure 4. Four Quarter Model (Hermann, 2003)

Herrmann introduced the concept of "dominance" for individuals who use one part of their brain more intensely (Herrmann, 2003). For example, left-brain dominant people are logical, realistic and planned. Right-brain dominant people are risk-takers, dreamers, and innovators. Left-brain dominant users perceive information in numbers and words, while right-brain dominant learners learn with elements such as imagination, colors and shapes. (Avcı & Yagbasan, 2008). Per Hermann (2003, p. 40)'s framework, an individual's brain can be analyzed in relation to their dominant cognitive orientation within the context of professional endeavors. Illustrated in Figure 4 of the model, this analysis delineates specialized aptitudes associated with specific cerebral domains."For those who use the A quarter dominantly; "solo work, applying formulas, data analysis, combining objects, conflicting objects, solving problems, manipulating numbers, challenging, analyzing and diagnosing, explaining objects, explaining topics, logical operation",

For those who use the B quarter; "creating things, being in control, creating an orderly environment, maintaining the status quo, paperwork, queuing, planning, stasis, getting work done on time, paying attention to details, structured tasks, providing support, stewardship",

For those who use the C quarter dominantly; "forming groups that will work well together, expressing ideas, building relationships, learning, listening and speaking, working with people, persuading people, being part of a team, communication statements, helping people, explanatory writing, coaching, consulting",

For those who use the D quarter dominant; "Taking risks, generating solutions, providing vision, having diversity, bringing change, creating opportunities to experiment, selling ideas, developing new things, designing, having freedom of action, seeing the end in the beginning, excitement".

In this context, it is pertinent to reiterate the significance of the D quadrant within the model, as it aligns with individuals characterized by a proclivity for risk-taking, experimentation, change instigation, innovation, and entrepreneurial enthusiasm. Conversely, the B quadrant is diametrically opposed in its attributes, being characterized by a penchant for controlled, status quo maintenance, staticity, and meticulous attention to detail. It is imperative to underscore that the Herrmann Brain Dominance Tool serves as a tool for delineating an individual's cognitive predilections within the realm of thought, taking into account factors such as their educational background, hobbies, self-assessments, and overall lifestyle. Consequently, it offers insights into mental preferences while refraining from rendering judgments regarding innate abilities and competencies. It is pertinent to recognize that adeptly matching one's mental disposition with their chosen career path can significantly bolster motivation and enhance workplace performance. In contrast, the Herrmann Brain Dominance Tool primarily serves as a gauge of an individual's cognitive predispositions and their adaptability within the professional sphere. Figure 5, as presented by Herrmann in 2003, illustrates the distribution of occupational profiles across the four cerebral quadrants, offering a visual representation of their dominance. Looking at the occupational profiles, it can be posited that in Herrmann's holistic brain approach, it is the first good situation for people to choose a profession according to their brain dominance. On the other hand, it is asserted that brain dominance develops according to the working structure of the professions.

According to Kuznets (2015), the determination of career choices according to the element of merit is the determinant of modern economic growth. Merit is defined in the Dictionary of the Turkish Language Institution as “a person's suitability and suitability for employment” (TDK, 2023). From the provided definition, it is evident that the brain dominance profiles of prospective employees constitute a noteworthy determinant of their potential contributions within an organizational context. Given the profound impact of the recruitment of highly skilled individuals on economic growth, Herrmann's research assumes a broader significance extending beyond the confines of the corporate sector. Indeed, Herrmann's work not only holds value within the business realm but also carries implications for the broader field of economics. In the Right Brain-Left Brain Model and the Four Quarter Model, the right brain comes to the fore in features such as daydreaming, risk taking, innovation, creativity and entrepreneurship.

Comprehensive Literature Analysis

Literature investigations pertaining to the subject matter exhibit two distinct organizational approaches. Firstly, the discourse unfolds through an exploration framed within the paradigms of creativity and innovation, as expounded by the right-brain-left-brain model. Secondly, a distinct line of inquiry encompasses studies that delve into entrepreneurship or the realms of creativity/innovation, embracing perspectives rooted in the right-brain-left-brain model or adopting a more holistic-brain approach. Arguably the most salient facet within the paradigm of the right-brain-left-brain dichotomy, which has engendered a paradigm shift in the realm of human brain research, centers on the construct of creativity. According to Kane and Kane (1979), each side of the brain has different cognitive functions and the right side of the brain is creative. Fink et al. (2009) reported non-significant disparities between both cerebral hemispheres. Mihov et al. (2010) revealed that the right hemisphere is more creative with their meta-analytic analysis of left and right hemispheres on creativity. According to Gold and Ben-Artzi (2011)'s metaphors

and verbal creativity study for the right and left hemispheres, the right hemisphere also performs the task of the other hemisphere. Piaw (2014) revealed in a study that the right brain is more creative.

An examination of extant literature pertaining to the relationship between the right hemisphere of the brain and creativity reveals a prevalent assertion aligning the right hemisphere with a greater propensity for creative and innovative functions, in accordance with the tenets of the Right Brain-Left Brain Model. In the studies examined in the study and listed below, Right Brain-Left Brain and Whole Brain Models were discussed in terms of entrepreneurship and/or creativity.

In a research endeavor conducted by Huefner et al. (1996), an examination was undertaken to compare the Herrmann Brain Dominance assessment, the Myers-Briggs Type Indicator, the Entrepreneurial Attitude Orientation Scale, and the Entrepreneurship Coefficient Scales. The outcome of this investigation revealed that the Entrepreneurship Coefficient Scale emerged as the most effective discriminator among the assessed instruments, while the Entrepreneurial Attitude Orientation Scale occupied the position of the second-most discriminating measure. Furthermore, with regard to the domain of entrepreneurship, the D quadrant, situated in the upper-right segment of the Herrmann Brain Dominance Scale, emerged as the sole statistically significant group when contrasted with the remaining three quadrants. This observation closely aligns with the theoretical framework advanced by Herrmann (1988).

In the investigation conducted by Buergin (1998), the primary objective was to discern disparities in brain dominance patterns among Swiss entrepreneurs and managers, along with the consequent cognitive thinking styles that ensued. Employing the Herrmann Brain Dominance Tool as the principal assessment instrument, the study sought to elucidate the cognitive predispositions characterizing these distinct professional groups. As a result of the study, the right brain of the entrepreneurs is dominant compared to the managers. There was no significant difference in terms of limbic modes. Both groups preferred the cerebral mode, with entrepreneurs significantly favoring the D quadrant of the brain compared to managers. A positive correlation was found between the right hemisphere and achievement motivation.

Kirby (2004) aimed to evaluate the entrepreneurial tendencies of the participants in his study with 30 young people with Attention Deficit and Hyperactivity Disorder (ADHD). Durham University General Entrepreneurship Test was used in the study. As a result, it was found that young people with ADHD who participated in the study were more entrepreneurial and had a right-brain learning preference compared to other young people.

The Herrmann Brain Dominance Tool was used in a study conducted by Güney and Nurmakhamatuly (2007) with a total of 353 Kazakh and Turkish university students. The primary objective of the study is to examine entrepreneurship in the intercultural dimension. As a result of the study, it has been seen that Kazakh students are more controlled and balanced than Turkish students, and Turkish students come to the fore with their more reliable and creative personalities.

Demirel and Tikici (2010) undertook an investigation exploring the correlation between right-brain dominance and entrepreneurship within the demographic of university students. The study's findings indicated a propensity for

heightened right-brain activity in the cultivation of an entrepreneurial culture. Additionally, the research posited that, among the student cohort, the right hemisphere exhibited a greater degree of cognitive strength when compared to the left hemisphere. Demirel et al. (2011) examined the effect of multiple intelligence theory on entrepreneurship. Multiple intelligences with 212 SME owners were found to be effective on entrepreneurship. Furthermore, it was found in the study that right-brain characteristics were more effective on entrepreneurship than left-brain characteristics.

Kürtüncü et al. (2019) examined the effect between the dominant hemisphere of the brain and assertiveness and entrepreneurship in a study involving 1167 university students. As a result of the study, it was found that the brain dominant sphere affects entrepreneurship positively.

Concluding Remarks and Critical Analysis

If we were to analogize the economy to a structural edifice, entrepreneurs would aptly represent the foundational pillars thereof. It is conceivable that innovative and creative entrepreneurs assume pivotal roles within the economic growth paradigm, particularly in the context of value-added product and service generation. In the course of this investigation, an examination was undertaken to assess the cerebral attributes requisite for fostering innovative and creative entrepreneurship. When the brain is considered as hemispheres, it is remarkable that innovation/creativity takes its place among the functions of the right brain. Undoubtedly, patents, inventions and inventions are the product of creative thinking. When considered as such, the use of the right brain also affects economic growth through innovation. It becomes evident that the cultivation of right-brain attributes and their conscious recognition among entrepreneurs is imperative to stimulate economic growth. According to Filion and Dolabela (2007), entrepreneurship is possible with the development of the right part of the brain (creative and intuitive resources). This objective can be realized through the implementation of training programs aimed at nurturing visionary capacities and translating those visions into tangible reality. These programs should be systematically integrated into the educational framework, commencing from the primary education tier and extending throughout the educational continuum. It is noteworthy that imparting such training prior to the onset of adolescence holds particular merit in terms of optimizing the efficacy and impact of these pedagogical initiatives. According to Çalışkan and Dilmaç (2021), adolescence is a period in which personality changes are experienced and the effort put forward in terms of reaching future goals is valuable.

Furthermore, it is worth emphasizing that within the context of fostering and eliciting right-brain development in individuals during their formative years in primary school, the educators assume a paramount role. Regardless of the educational system or pedagogical approach employed, it is discernible that the foremost influential factor in shaping and advancing students' cognitive development is the pivotal role played by educators, as articulated by Traş and Arslan (2013). At this juncture, it becomes imperative to heighten the consciousness of educators operating within the domain of primary education concerning the significance of nurturing right-brain development and the proficient recognition of students who exhibit a predominant utilization of their right cerebral hemisphere. Right-brain dominant people, who can be said to be natural entrepreneurs, need to be supported in terms of adapting to difficult living conditions as well as identifying and training them. Individual therapy or group therapy management can also

contribute to their personality development in order to develop entrepreneurial individuals in terms of problem solving and struggling with difficult conditions (Traş & Aydın, 2019).

After primary education, the MBA program in the field of Creative and Cultural Entrepreneurship, developed by Bandung University of Technology with Goldsmiths University, can be presented as an example in terms of ensuring continuity with programs that develop creative and innovative thinking, especially in undergraduate and graduate education. This program focuses on developing the right brain with courses such as creativity, art and design. The courses aim to develop creative and innovative thinking to produce value-added products/services (Larso & Saphiranti, 2016).

According to Türkel and Dilmaç (2019), with the widespread use of the Internet with Web 2.0, the use of social media has overshadowed conventional media tools such as television and radio, and social media tools offer services such as communication, playing games and shopping..The potency of social media, an omnipresent force permeating various facets of contemporary existence, has become particularly pronounced in the wake of the widespread adoption of smartphones. It is noteworthy that this influential platform can be harnessed as a formidable tool for the cultivation of right-brain capabilities and aptitudes.

The outcomes of the investigation substantiate a discernible and substantial correlation between economic growth and the prominence of right-brain attributes. Entrepreneurs who use their right brain effectively are needed for economic growth. Right-brain and creativity/innovation education can be developed, as well as individuals with already developed right-brain should be encouraged to become entrepreneurs. Hence, in light of these considerations, it is advisable to identify innovative entrepreneurs through modalities such as the incorporation of right-brain training methodologies that bolster creative intelligence within educational curricula and assessment scales rooted in Herrmann's comprehensive brain model.

In the context of this perspective, a delineation of prospective actions may be enumerated as follows:• Right-brain-based trainings should be designed in every period of education life.

• Schools should be equipped with toys and laboratories that will develop the right brain.

• Trainers need to be trained for the training of the right back and the identification of the individuals who use their right brain dominantly.

• It is necessary to identify people who use their right brain dominantly in primary school and to support them to be successful entrepreneurs, innovative structures and personality developments.

• Right brain developing design and creativity trainings should be organized even after primary school age.

• One potential recommendation involves the development of social media initiatives, interactive games, and applications specifically designed to enhance right-brain cognitive faculties.

• In incentive and grant programs, it may be recommended to apply tests that analyze the brain's structure and dominance to candidate entrepreneurs, and as a result of these tests, it can be suggested that entrepreneurs who use their right brain be primarily supported.

• With models such as the angel investor model, innovative initiatives can be identified and financial support can be provided to business ideas.

The use of brain regions in different dominances is crucial for employment and employee productivity, and in future studies, the relationship between the structure of the brain and economic growth can be discussed in terms of employment. Furthermore, forthcoming research endeavors may contemplate investigations into the interrelationships among diverse theories of intelligence, personality typologies, and sensory representation systems (including visual, auditory, and kinesthetic modalities) in relation to their potential impact on the dynamics of economic growth.

Ethic

I affirm that the research adhered rigorously to the ethical guidelines stipulated by the institutional and national research committee, as well as aligning with the principles outlined in the 1964 Helsinki Declaration and its subsequent revisions, or analogous ethical benchmarks.

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