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Introducing a Novel Approach to Study the Construction and Function of Memory in Human Beings: The Meshk Theory

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Abstract

This study reviews the crucial role of memory in the human brain. For this purpose, previous investigations and researches about the construction and function of memory were studied. The mechanism of the memory function was reviewed, and crucial drivers for the working of the memory were indicated. Then an applied memory model that could serve as a framework to study the memory function was also introduced. Therefore, the memory unit was introduced as a basic information structure. Also, a structured platform for the memory unit was determined for encoding the information and data in the brain. Then a pattern of information coding was detected. Thus, a basic framework to study the memory function was conceived. The results of this thesis pave the way for the discovery of a basic algorithm to understand the memory function in the human. Also, this study introduces a simple way to overcome Alzheimer disease (AD). This way can be applied to research on the prevention and treatment of this disease.

Keywords: Meshk theory, triple drivers, memory model, memory unit, memory coding strand, music therapy, Alzheimer disease

1. Introduction

Memory is one of the greatest unsolved secrets encountered by human generation. There are a lot of questions about memory. The memory remains a mystery until now. A lot of scientists have studied memory, but there have been no certain results until now. Only recently has it been determined that memory is a faculty of the mind. They have discovered that information is encoded, stored, and retrieved in a region which is called “hippocampus” [8]. Also, they have found that memory is vital to experiences and related to the limbic system of the brain [8]. Models of memory provide abstract representations of how memory is believed to work [3]. There are several models that have been proposed over the years by various psychologists [3]. Controversy is involved as to whether several memory structures exist [3]. For decades, neuroscientists have attempted to unravel how the brain makes memories [22]. Atkinson-Shiffrin and working memory are the different kinds of memory models that have been available in the last decades.

The human brain is estimated to have approximately 86 billion neurons [12], and each neuron has tens of thousands of synapses, leading to over 100 trillion synaptic connections [2]. Concurrence monitoring of 100 trillion synaptic connections is an impossible work. On top of this astronomical complexity, one needs to map each connection or neuron to a given stimulus, yet possible numbers of stimuli that can be used are infinite given the complex, ever-changing nature of the world we live in [27]. This is one of the most difficult issues faced by neuroscientists. As such, the unifying mathematical principle upon which evolution constructs the brain's basic wiring and computational logic represents one of the topmost difficult and unsolved meta-problems in neuroscience [1, 9]. Because of that, it is required to introduce an innovative approach to solve this problem. Recently, Dr. Tsien and his colleagues introduced an approach about memory that is known to "thought experiment." They have done a lot of studies in the last decades about memory. It seems that this approach has an important contribution in the area of neuroscience. One useful concept in pursuing this line of reasoning is cell assembly, a term coined by Hebb [11] to describe the supposed computational building block or computational primitive in the brain. This notion has attracted keen interest, especially with emerging large-scale recording techniques [6, 13, 15, 16, 18, 19, 25]. Hebbian cell assembly was postulated to be comprised of a group of neurons with strong excitatory connections that are formed after learning [13, 26]. Dr. Tsien and his colleagues focus their research on the hippocampus, particularly a region called CA1, which is important to forming memories of events and places in both people and rodents [19, 24]. The hippocampus has four parts including CA1, CA2, CA3, and CA4, and each section can be divided into nine sections. The study results of scientists add to a growing body of work indicating that a linear flow of signals from one neuron to another is not enough to explain how the brain represents perceptions and memories [17]. Rather the coordinated activity of large populations of neurons is needed [19]. Human memory is a great performance organ. Also, the memory function is due to its structure. While the architecture of memory detects, it is possible to distinguish the memory function. This approach can be used to overcome neural diseases especially Alzheimer disease (AD) according to music. Alzheimer disease is a neurodegenerative disorder featuring gradually progressive cognitive and functional deficits as well as behavioral changes [4]. More than 30 million people in the world are suffering of Alzheimer disease (AD). It is a deadly disease that resulted in about 1.9 million deaths in 2015 and therefore is one of the most costly diseases. The previous investigation showed that music has an effect on treatment of AD. It is necessary to carry out a comprehensive study about music therapy of Alzheimer disease. It is a simple and low-cost way that takes less time for prevention and treatment of AD. Music is known as part of mathematics, and music composers work in the field of mathematic rules. In mathematics, a circle has 360° . So, all mathematical rules are in this field of degrees. Therefore, human memory works at 360° and connects to a complete loop. Barbad is one of the first ancient musicians in Kurdistan. He compiled 360 types of music that were made in 200 AC. Kurdistan is a strategic region that was separated to four parts between Iran, Iraq, Turkey, and Syria after World War 1. Kurd is a term that concerns people in Kurdistan that are related to the ancient Sumerians (10). Kurdistan is a historical place that had governments in the ancient periods. One of them is known as Sassanian. In this period, music was prevalent, and many people worked on mathematics, and so, music was built on the structure and function of the human brain. According to this approach, music shows the inherence of human memory. Hence, music can relieve and improve the nerves and memory. The last studies that have been done by a lot of scientist prove this claim. Some of these investigations led to the wonderful discovery. It is required to carry out a comprehensive study about human memory

for introducing a simple and applied way to overcome Alzheimer disease. The objectives of this study respond to the following questions:

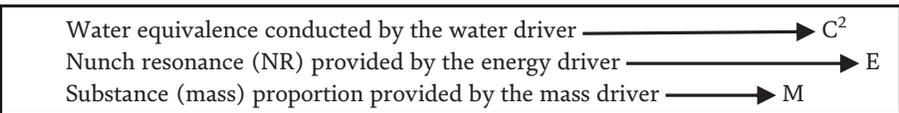
- What is human memory?
- What is the simple structure of memory in the human brain like?
- How does human memory work?
- More importantly, what is a simple way to overcome Alzheimer disease?

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2. Methods

2.1 Triple drivers

In Einstein's special theory of relativity, $E = mc^2$, energy and mass are equivalent and transmutable. It is possible to explain the relativity theory of Einstein for the brain. According to Meshk theory, the memory structure and function of the human brain depend on three main factors (**Figure 1**). The word Meshk is known in the Sumerian and Kurdish languages to the human brain. These drivers provide the inherence of human memory as shown below:



The human memory in the function circle is based on three basic drivers including water, energy, and substances. Water is a driver for creation and operation of memory. The quantum brain dynamic (QBD) theory claims that water comprises 70% of the brain and proposes that the electric dipoles of the water molecules constitute a quantum field [34, 35]. Therefore, human memory works in a general circle provided by water called "water equivalence (WE)." While memory neurons are working, WE is an important factor for coding and encoding memory information. The last studies have shown that conscious experience correlates not with the number of neurons firing but with the synchrony of that firing [38]. Ears are likely to be related to this process because the ear is connected to the brain's equilibrium process. For a long time, the oldest part of the brain was thought of as a "control

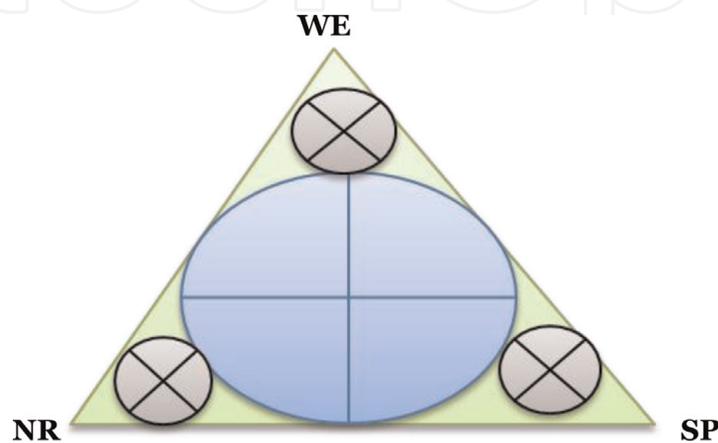


Figure 1. The triple drivers that provide the inherence of human brain, the gray circles, blue circle, and green triangular indicate the NR, SP, and WE, respectively.

room” for human motions [42]. Now there is evidence that the cerebellum also stores the temporal information about the music we are listening to, and then it recalls this information while reproducing the music [42]. Moreover, an amazing fact is that the cerebellum was discovered to be a center for emotions [42]. Also, the water equivalence of the brain can lead to a powerful electromagnetic (EM) field in the brain. The electromagnetic theories of consciousness propose that consciousness can be understood as an electromagnetic phenomenon [36]. Electromagnetic field theories of consciousness propose that consciousness results when a brain produces an electromagnetic field with specific characteristics [36, 37].

In the conscious electromagnetic information (CEMI) theory, McFadden proposes that the digital information from neurons is integrated to form a conscious electromagnetic information field in the brain [39]. Since the brain is a 300° Kelvin tissue strongly associated with its environment [44], it is possible that the noise and warm environment of the brain cause to transform the water crystals. This transformation, resulting in internal equivalence of the brain, leads to the operation of intrinsic memory. This process can form the basis of memory structure. Dr. Masaru Emoto and colleagues (1996) studied water crystals [31, 32]. They proposed that human consciousness has an effect on the molecular structure of water and therefore emotional energies and vibrations could change the physical structure of water [33]. Brain activities in human infants have shown evidence of existence of the intrinsic memory. The high ability to learn a language in infants is an important evidence that proves this claim. There is a fundamental potential in infants that enables them to advance learning and behaviors. This is a fundamental difference between human beings and others. There is a mechanism in the human brain in which “Nunch resonance (NR)” enables the brain to accelerate and increase reactions to stimuli from the environment. According to **Figure 2**, each nunchaku includes two parts that are linked together by a connection. A part of the nunchaku inputs the force and energy and then transmits it to the other part by a connection. Owing to the resonance in this process, the output force is much more than the input. It is what McFadden termed as “amplifying the microscopic quantum effects.” In the CEMI theory, the synchronous firing of neurons is argued to amplify the influence of the brain's electromagnetic field fluctuations to a much greater extent than would be possible with the unsynchronized firing of neurons [39]. Exciting recent research shows that nontrivial quantum effects are present in biological systems and not just in spite of, but sometimes because of, the interaction with the noisy and warm environment [51]. Furthermore, because the brain is a complex nonlinear system with high sensitivity to small fluctuations, it is likely that it can amplify microscopic quantum effects [51]. It is also possible that light photons derived from the eye are related to this process. In general relativity (GR) and the equivalence principle developed by Einstein, it is argued that black holes are regions of space where gravitational attraction is very strong, because even light cannot escape. It is possible that there are spots with a black energy attribute on the front lobe of the human brain. The mineral substances in the function circle of the human brain are provided by a process called “substance or mass proportion (SP).” It is likely that the heart and sense organs are important parts for this process. The concurrence of the triple drivers is required for encoding information in the memory. Triple driver compatibility is required to encoding



Figure 2.
A schematic of the nunchaku function.

information in memory. According to Einstein's special relativity theory, $E = mc^2$, energy and mass are equivalent and transmutable. In this equation, c^2 is the determinative factor, and so it can be concluded that WE is the main driver for recalling information in the brain.

2.2 Memory model

Most of the memory models presented in the past decades have been based on time. The terms of memory, including short-term, long-term, and working memory, are defined by time. In Einstein's special theory of relativity, $E = mc^2$, time and space are not invariable. According to the Meshk theory, space and time are variable and parts of the inherent memory. Therefore, memory in the human brain is indicated in a new model called "Manna model." In this new model, memory is divided into three parts fundamental, central, and peripheral. The base structure of memory in this model is shown in **Figure 3**. Fundamental memory is inherent intelligence. This can be called intrinsic memory and has existed since the advent of mankind. This memory is very cryptic and so unknown so far. The spatial and temporal information are parts of the memory nature. The ability of infants to swim and learn a language is clearly an example that confirms the nature of fundamental memory in human beings. All learning processes in the central memory of human are connected to fundamental memory that is called "recalling of the internal information." The environmental information includes visual, auditory, and sensory data. The eye, ear, and heart are the centers of receiving the visual, auditory, and sensory information from the environment and transmitting them to the brain (**Figure 2**). It is possible that sensitive organs send their signals to the heart and, after coordination, the information is sent from the heart to the brain. The peripheral memory is specialized to receive environmental information from the eye, ear, and heart and transmit them to the central memory. At the start, external information is transferred from the peripheral to the central memory. In the process of being transferred, some of the data is removed, and some remains. By coupling of blocks in the fundamental to the central memory, internal information is retrieved. The "coupling process" is a turning point in reminding of internal information from the fundamental memory. The water equivalence (WE) is an important factor for operating the coupling process. The coupling process can be the starting point for neural momentum in the brain neural circuit. Therefore, in human memory, it is necessary to receive information from the auditory, visual, and sensory systems for making memory coding unit. At the same time, the information in the fundamental and central memory is also binded as binary codes. The coupling process leads to the

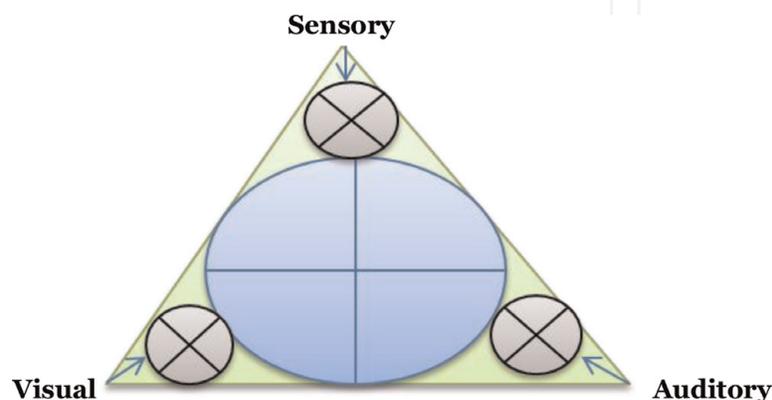


Figure 3.
The Manna model, the gray circles, blue circle, and green triangular indicate the peripheral, central, and the fundamental memories, respectively.

creation of this important structure. This is what Dr. Tsien and colleagues termed as “neural cliques.” They discovered that these overall network-level patterns are generated by distinct subsets of neural populations or neural cliques [19].

According to the theory of connectivity by Dr. Tsien, a clique is a group of neurons that respond similarly to a select event and thus operate collectively as a robust coding unit [14, 19–21, 23]. **Table 1** indicates each event as three blocks are active and the others are inactive. The investigators represented clique activity as a string of binary codes that revealed details of the event an animal experienced [19]. In the string fragments shown here, 1 means a particular clique is active, and 0 signifies inactivity [19]. The idea of quantum coherent waves in the neuronal network is derived from Frohlich [35]. He viewed these waves as a means by which order could be maintained in living systems and argued that the neuronal network could support the long-range correlation of dipoles [35]. Repeated stimulation in a continuous and rhythmic way is a critical factor in operating the coupling process. As more and more memory blocks are turned on and active, more processes of recalling the internal information are performed. Therefore, more information and data are extracted from the fundamental memory. In the human brain, there are millions of memory blocks that are not used during the lifetime. Thus, people have entire blocks in fundamental memory but only turn on some of the blocks in their lifetime (**Table 2**). The active blocks make up the central memory in the human brain. The recalling of internal information and data from the fundamental memory is different about people. This process is different from elementary to advanced levels. It is dependent on the quality and the quantity function of coupling process in the memory. In mathematics, the entire angle of a circle is 360 grades (360°). The human brain works in a 360° field and therefore in two mutual directions (**Figure 4**). The Manna alphabet framework is interestingly conformed to the algorithm of the human brain structure (**Table 3**). This alphabet could be the best basic format to receive and transmit data and information by the human. Manna is a term that concerns people to the south of Urmia Lake in Kurdistan [7, 29]. There are a lot of mysteries about the Manna that has not been discovered until now. The

A	1	1	0	0	1
B	1	1	0	1	0

Table 1.
The binary codes, (A) earthquake and (B) elevator drop.

Table 2.
The building blocks of fundamental memory in the human brain. Black blocks are the memory in use, and white blocks are inactive memory.

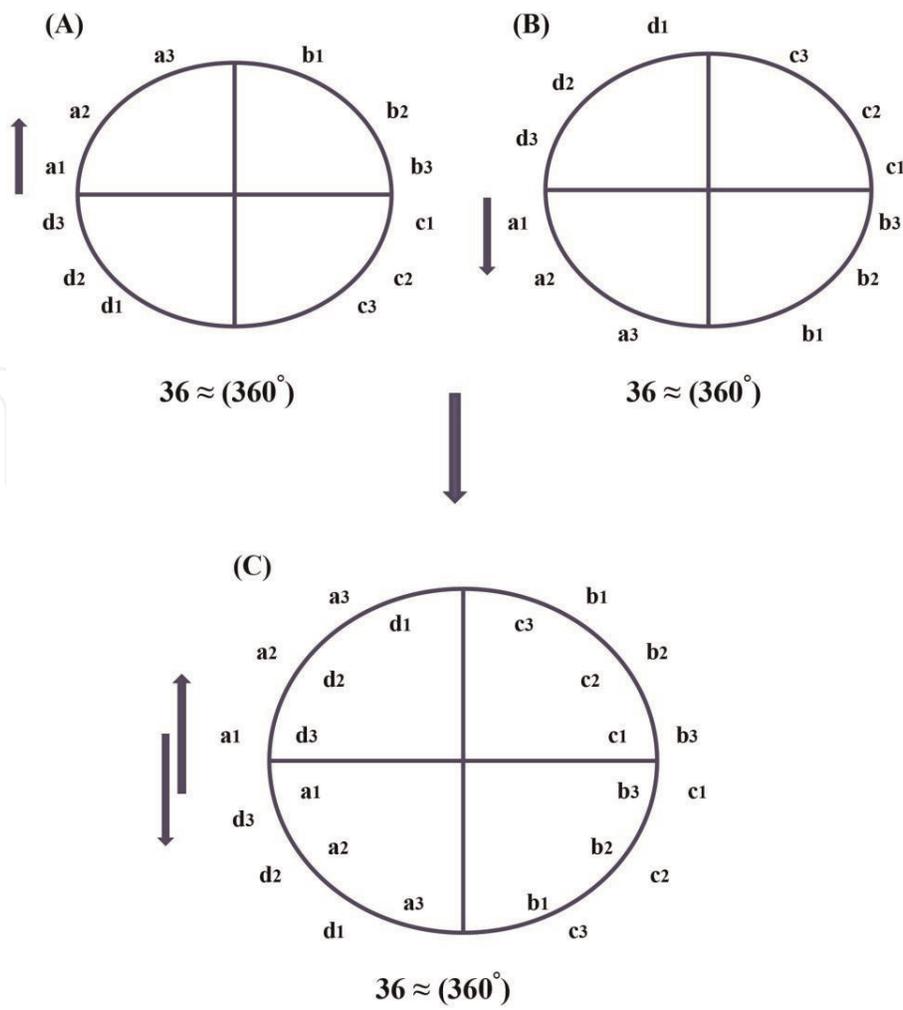


Figure 4.
 The circles that indicate the memory coding directions, (A) base direction of the memory coding, (B) complementary direction of the memory coding, and (C) entire directions of the memory coding.

1	2	3	4	5	6	7	8	9	
A	i	U	k ^a	k ^u	x ^a	g ^a	g ^u	c ^a	A (a1, a2, a3)
j ^a	j ⁱ	d ^a	d ⁱ	d ^u	t ^a	t ^u	Θ ^a	c ^a	B (b1, b2, b3)
n ^a	n ^u	p ^a	f ^a	b ^a	m ^a	m ⁱ	m ^u	y ^a	C (c1, c2, c3)
r ^a	r ⁱ	i ^a	v ^a	v ⁱ	s ^a	š ^a	z ^a	h ^a	D (d1, d2, d3)

Table 3.
 The structure of Manna alphabet between 600 and 800 BC.

only thing that has been distinguished is that the people of that age were blessed with great intelligence. They developed music, agriculture, animal husbandry, industry, medicine, and astronomy. According to ancient literature, Sumerians and Mannea had an advanced alphabet with 37 and 36 letters, respectively [10, 30]. The Mannea were an ancient ethnic group, and a rich trove of literature written by them exists [28, 5]. This literature and books covered various topics including music, agriculture, astronomy, medicine, industry, and more importantly water engineering. The Manna alphabet included four partitions with a specific algorithm, and each part had nine letters. This algorithm made a basic structure for humans to communicate and understand the relation between the people from the ancient period until now. This alphabet can be a suitable pattern for decoding memory architecture in humans.

3. Results

3.1 Memory unit

There is a need for a paradigm shift from behaviorist stimulus-response concepts toward notions of predictive coding in self-organizing recurrent networks with high-dimensional dynamics [45, 47]. Neuronal networks with nonlinear neurons and densely connected feedback loops can generate dynamics that is more complex, variable, and rich than expected [48–50]. Therefore, the two structures of the hippocampus located in the limbic system can operate in reciprocal connection to the coding of the information in the brain. According to the Meshk theory, the information and data received from the environment encode in a structure is called “memory unit.” Each memory unit is actually a perception unit in the human brain. It is necessary to operate one or a few perception units to figure out the problems and issues. According to the Manna model features described in the previous sections, each memory unit includes three parts: visual, auditory, and sensory. Therefore, each perception unit makes three functional codes (**Figure 5**). At the same time, the central and fundamental codes are binded together by coupling process to create the binary codes described in the previous section. For an individual event, three sections in the memory unit have to work, and each section has a functional code. It is likely to operate numbers of the memory units for an individual event. This is dependent on the quality and quantity of internal information that might be extracted from the fundamental memory. Locating consciousness in the brain’s electromagnetic (EM) field, rather than the neurons, has the advantage of neatly accounting for how information located in millions of neurons scattered through the brain can be unified into a single consciousness. In this way, EM field

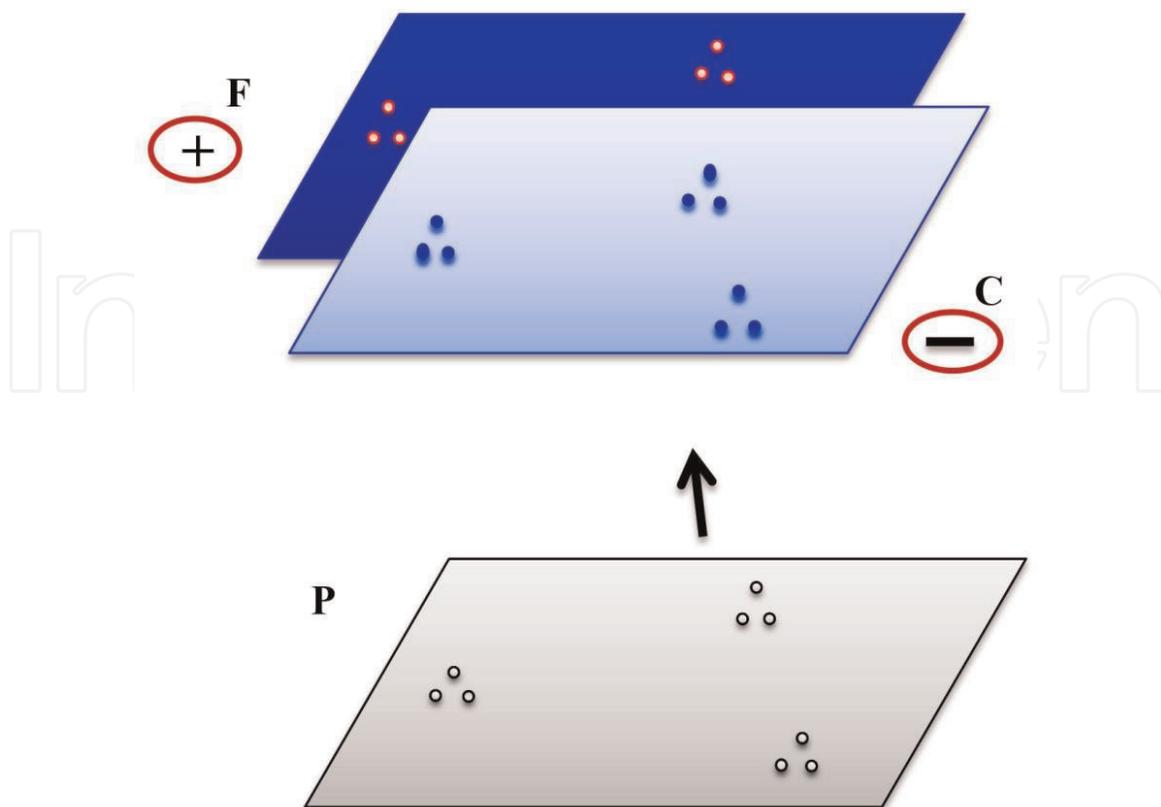


Figure 5.

The coupling of memory blocks in the human brain. Plates F, C, and P show the fundamental, central, and peripheral memories, respectively.

consciousness can be considered to be “joined-up information” [41]. This is an important part of the issue that could help scientist to solve the brain puzzle. When neurons fire together, their EM fields generate stronger EM field disturbances [40]. Therefore, synchronous neuron firing will tend to have a larger impact on the brain’s EM field (and thereby consciousness) than the firing of individual neurons [41]. The synchronous neuron firing is like a symphony orchestra or philharmonic orchestra with a lot of musical instruments. The harmony of playing music causes to create of a strong and impressive conclusion. Without each part of the symphony orchestra, the music is imperfect. The generation by synchronous firing is not the only important characteristic of conscious electromagnetic fields as in Pockett’s original theory; spatial pattern is the defining feature of a conscious field [36]. In a philharmonic orchestra, there is an accurate spatial and temporal pattern that is well organized. It can lead to creating of a memorable artistic masterpiece. In Meshk’s theory, spatial and temporal patterns are part of the intrinsic memory features. The CA1 region of the hippocampus receives inputs from many brain regions and sensory systems, and this feature most likely influences what type of information a given clique encodes [22].

3.2 Memory coding strand

The nervous system can be seen as a nested hierarchy of nonlinear complex networks of molecules, cells, microcircuits, and brain regions [46, 51]. The Manna alphabet has a simple structure for understanding the brain. It is an appropriate programming system for the human brain and could be the first one designed by humans. In this way, the alphabet conforms to the structure of information coding in human memory. Therefore, in the coding process, signals received by the brain from the environment translate into special characters. These characters are arranged based on the external information received from the environment. A recorder strand of information is divided into four parts, and each part includes a memory unit (three memory codes) (**Figure 6**). The two strands of memory, akin to strands of deoxyribonucleic acid (DNA), run in reciprocal connection and are thus parallel. The two strands of memory are coupled together for making a crucial structure. The base strand is made in the fundamental memory, and the couple one is in the central memory. These two strands make memory coding strand that enables the brain to advance learning and behaviors in humans. In this structure, information processing is done in a simple way by the human brain. Therefore, it could possibly be a fast way to distinguish problems and issues. **Figure 7** shows the overall architecture and human memory function in the Manna model. According to this approach, the reminder of the internal information process is carried out in five general stages; A and B have potential levels, and D and E are active levels of

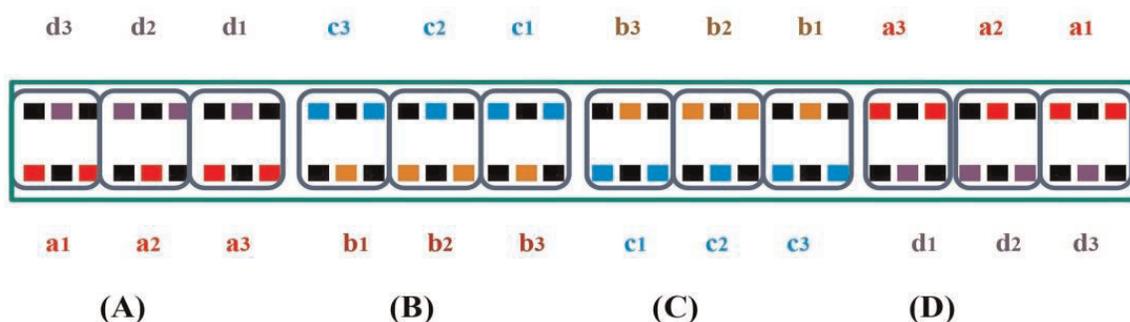


Figure 6.
 The pattern of human memory coding. A, B, C, and D are the memory units.

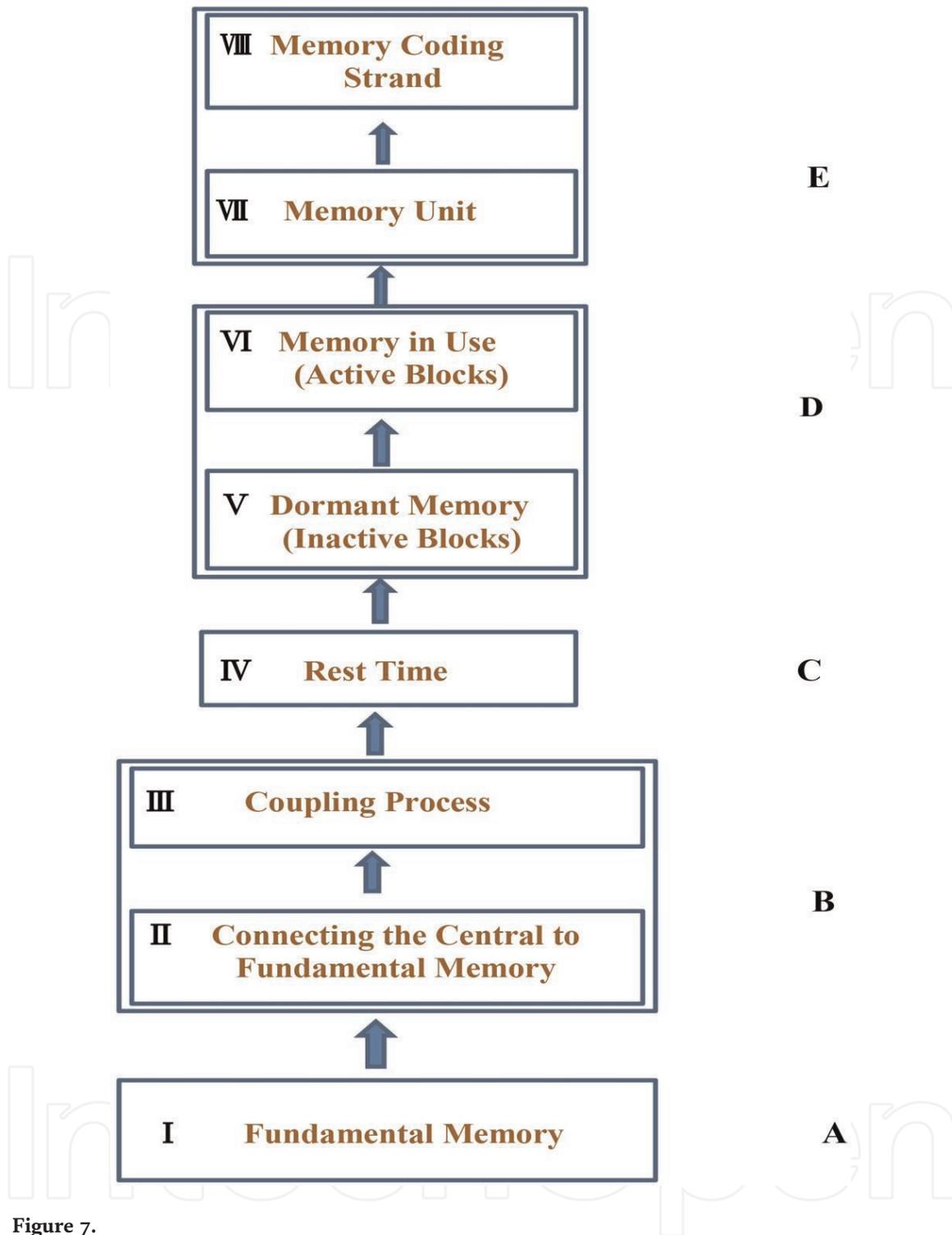


Figure 7.
The functional levels of Manna model.

the memory. In general, in detail of this model, eight levels of human memory function have been deciphered. Also, the basic algorithm for the memory of the human is an exponential function. This function is transcendental and indicates the features of human memory coding. The function is as follows:

$$N = e^i - 1 \quad (1)$$

where N is the number of memory units connected in different possible ways; e is the Napier's constant; i is the information they are receiving; and 1 is just part of the math that enables you to account for all possibilities.

4. Conclusion

The fundamental memory in animals is alternatively an ability that is known to instinct. In comparison to the fundamental memory in human, the animal instinct is primitive. It means that animal species have inherent intelligence, but the quality and quantity function of coding the information is different from the human. While the fundamental memory function is known, most problems and ambiguities about memory including short-term, long-term, working memory, and learning process are being answered. For instance, in the Manna model, learning is an activity that is described as a reminder of the internal information from intrinsic memory to central memory. It is said that all of the information and data are in the atmosphere and we have to discover them, but it is likely that internal information is in the fundamental memory. While the learning process is a reminder of information from the fundamental memory, it is required to make a connection between the fundamental and central memory. This connection is made by the coupling process. This process creates memory units and, therefore, leads to the formation of a memory coding strand. Indeed, in the Manna model, the memory unit is a unit of reminder information. In this model, the coupling process is a turning point in the neural circuit and can be the basis of the memory function. Also, like to the structure of Deoxyribonucleic acid (DNA), memory is formed to a spiral train structure. According to general relativity of Einstein, the observed gravitational attraction between masse results from the warping of space and time by those masses. Human memory is made of U shape components that convoluted together. The curvature in the U shape components intensively increases efficiency in the structure and function of memory. The two strands of memory are coupled together for making an applied and unique architecture. In human beings, this architecture is working for advance learning and behaviors. The Manna model is a simple and applied memory model that clearly explains the construction and function of memory. This model provides a functional framework to distinguish the memory function and therefore discover a basic algorithm for memory in the human brain. Consequently, using an applied and simple model, scientists can find a simple solution to overcome the brain and mind disorders, especially for Alzheimer disease (AD).

One of the important solutions to Alzheimer disease is the music therapy that scientists are investigating about. The music utilizes a large variety of basic brain functions; it is closely tied to emotion and seems to be advantageous to survival in line with Darwinian natural selection [43]. It is sometimes claimed that swimming is the best exercise one can do since it requires one to work nearly every group of muscles [43]. The music can be thought of as the brain's analog to swimming [43]. It's a most basic and passive form; it exercises timing functions, matches patterns, and makes predictions [43]. Like swimming as the best exercise to recover and retrieve body muscles, music has the ability to retrieve and remind the brain's internal information. It is necessary to design a technique for music programming in specific time periods. This technique enforces the brain to manage the fundamental memory for the recall of information without using drugs and surgeries. According to the Meshk's theory, a simple technique dubbed as "special music programming" is organized to retrieve memory and mind. This technique is made up of two sections, including harmonic music composes and repetitive courses. Synchronicity of body muscle movement is a basic principle in swimming. Similarly for a particular person, the music harmony and scheduling of repetition time in this technique are key factors that have been ignored in previous research on music therapy of the mind. It is possible to dub these important principles as spatial and temporal equivalence (for a particular person). The repetition of harmonic music in

the certain time periods is a turning point in stimulating the mind for recalling information in the Alzheimer disease. This simple technique is divided into 72 sections (36 pairs) each section having special composes and time. Each pair can be performed in a day (morning and one in the evening). Each period is 40 days, because the day after 9 days of the program, there is 1 day to rest the mind. Therefore, there are nine repetition periods in the year. In general, the program includes 324 working days and 36 resting days in the year. This simple technique depends on the architecture and functions of human memory and thus is remarkable to retrieve memory in Alzheimer patients. Also, it is applied to prevent the disease for people in different ages. The Mozart and Beethoven symphonies can be applied in this way, because these symphonies are compatible with the structure and function of human memory. The Kurdish and Iranian traditional music that was named Dastgah, including Mahur, Homayun, Nava, Segah, Cahargah, Rast-Panjgah, and Sur, can be very appealing. According to the Meshk theory, this adaptation is logical and it is not casual. The influence of music and symphonies on the mind has been investigated in the past decades, but is not organized in repeating certain courses (for a special person). That is why previous investigations on the music therapy of the mind have not succeeded and have remained as a cryptic problem up to now. Crucial points of this study can be applied in research about the music therapy of the mind and other investigations.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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