Exploration

On the Determinants in the Formation of Human Consciousness: A Simple Theory of Difficult Meanings

George G. Tumanishvili*

Ilia State University, Georgia & Masaryk University, Czech Republic

ABSTRACT

In this work, the author presents a theory in which an indivisible, multidimensional bit of information is the smallest entity - the smallest constituent part of the Universe. The author also describes determinants in the formation of human consciousness (Infself in action).

Keywords: Infself, self, consciousness, IMBit, information, quantum, quantum mechanics, universe, origin.

Through theoretical modelling, the text aims to explain and substantiate what determines human self – infself existence; what infself in action or consciousness is and how it was created.

Consciousness is a concept-phenomenon which doesn't have any straightforward definition in the world of science. There is no clear and simple approach towards it, as well as a universal formula to specify its essence. Today, real (observable-measurable) construction of consciousness along with its composition and specific location is also unknown to scientists.

Consciousness - infself's present state - Infself in action implies a flow of impulses (streaming) during which perception, imagination, thought and memory are coming to life; those are an interaction between neurones which creates the associative neural network.

Infself is information that exists in a particular interval of time and comes out as an electro-impulses and biochemical interaction between neurones. According to this, and to the definitions given above, living organisms with a brain and developed neural connections can have infself. Hence, not only humans have infself and infself in action but other animals too. Origin of infself is linked to the evolution of living organisms - formation of the brain, neural connections in particular and entire neural network.

Consciousness is an ambiguous term. It can be used for describing not only the general state of mind but its specific contents too. We need to be in a conscious state to realise some particular information.

While the subjective experience of consciousness, we have the knowledge of inner and outer events. In everyday speech, they use that term when speaking of awakened state. Normal, waking state of consciousness involves our perception, thoughts, feelings, ideas and wishes in a particular moment given; in other words, it implies mental activity which we concentrate on. We

*Correspondence: George G. Tumanishvili, Ilia State University, Georgia. E-mail: georgetumanishvili@gmail.com

realize the action itself and the fact of doing that action. The feeling of self is the result of the experience we get from observing ourselves from "inner" position.

In the literature, there are mainly three different levels of consciousness defined:

1. Basic level – consciousness of inner and outer worlds;
2. Second level – reflection and perception of our consciousness; and
3. The highest level – consciousness of oneself as a conscious individual capable of thought.

The highest level of consciousness is the level of self-consciousness, self-perception, realizing / cognition (knowing) that events which are felt personally are autobiographical by nature.

A large number of neural connections in the neural network, the complexity of neural chain-sentences, the electro-biochemical capacity of neural connections and the number/complexity of active neural chain-sentences result in, so called, the intellectual content of infself in action. Hence, the lower neural connection number is (or the simpler neural chain-sentences are) the lower infself intellectual capacity and self-perception are.

The depth and capacity of self-perception are directly linked to the electro-biochemical and informational capacity of the neural sentences that are active in a particular point of time.

The evolution of living organisms (both natural and artificial) has resulted in all the diversity of the living world we have today. The evolution of the brain is also linked to the DNA evolution. That, for its part, is related to a number of issues like climate changes on earth, the growth of the brain capacity, the formation of the mirror neurones, creation/improvement of the communication tools, the ways of adapting outer world to our personal needs and derivation/perfection of other highly intellectual processes.

When it comes to self-perception, its quality and capacity matter. That is to say, the capacity, depth and essence of self-perception are individual and different. Capacity and content of infself in action among different people vary. As mentioned above, the capacity of infself in action is directly linked to features and complexities of neural network meaning that the capacity and content of infself in action vary depending on age, different experiences or informational content.

If as an abstract theoretical example, we imagine the embryo conceived in an artificial womb having no audio-emotional connection with the outer world and no interaction with humans after the delivery too; if such a baby would live in a separated room without any mirroring surfaces around and surrounded by very few things having poor visual appearance and almost no use. Despite having received chromosome sets from the parents meaning that baby's body and autoimmune processes are developing more or less according to the genetic code in the DNA, the capacity of formation of infself within time wouldn't be equal to the time needed (relatively equivalent) for people existing in different conditions. In other words, contents and capacity of infself and infself in action varies in case of every particular person and person but also other living organisms.

As mentioned above, self-perception and consciousness require a minimum capacity of infself in action in a particular interval of time. The issues related to the normal and/or altered states of mind are also linked to the capacity mentioned. In the case of a newborn baby, a sleeping person or a person in a coma we're witnessing different electro-biochemical and respectively different informational states of infself in action.

In 2013, there has been a theory suggested through which the capacity of various informational flows, the ones at the cellular level among them, was calculated and it was equal to 10^9-10^{10} bits/seconds/neurones per self-perception. The calculation has been done in conditions when human brain consists of about 10^{11}-10^{12} neurones and the speed of perception of visual information is 3 bits/secs/neurones (Anderson et al., 2005).

The same work suggests three levels/stages of consciousness. According to the authors, there must be consciousness on cellular, organism and universal levels. The authors have presumed the component of choice and decision at above-mentioned levels to be a proof of their suggestion.

Despite the word "elementary", in physics elementary particles are not really simple thing for they belong to universal sphere (Einstein and Infeld, 1938; Weinberg, 1995) (Kafatos and Nadeau, 2000).

Animals that have a brain and neural connections also have infself but with the relevant contents and capacity as it is enabled by neural chain-sentences or electro-biochemical connection in the neural network in every particular case.

No matter how many theoretical bases the formation of human infself has, all of them imply and cannot deny evolutionary development; considering this, we should assume that human infself varied in the past, varies today and will vary in the future. It is important to find out about causes of formation of infself, as such and if other organic or inorganic forms can have it.

We can say that contemporary physics is divided into two main parts – Newton's physics and Newton's mechanics; Naturally, Descartes, Galileo Galilei and Johannes Kepler made their contribution to it. For more than two hundred years, classical physics used to explain the nature of occurrences, time, space, energy and substance as well as their interaction with each other. Eventually, it became clear that classical physics could not fully explain various phenomena; this caused the need for new studies and emergence of quantum mechanics. For its part, quantum mechanics has enabled us to learn about DNA structure and some aspects of its functioning, also to find about the colour composition of stars and stability of atoms (Tarlacı, 2010; Cohen-Tannoudji, 2006). Primary quantum ideas in physics were established by Max Planck in 1900 while working on thermal radiation problem.

For many years now, and in many cases even today, a human brain is often described with terms known to classical physics which makes infself studies impossible. Alfred Lotka (1880-1949) was the first to suppose that cognitive processes in the brain may obey to the laws of quantum mechanics (Lotka, 1925). Many theories about quantum nature of consciousness, memory and intuition have been emerged since. Moreover, independent branch of science has been emerged known as neuroquantology. In 1977, neuroscientist John Eccles presumed that the rules of quantum mechanics may apply in the space between neurones and interaction between neurones might be done through quantum tunneling (Popper and Eccles, 1977). He also tried to explain

motor activities/movements with quantum tunneling, so-called, quantum jumps. According to the first law of thermodynamics, during transition from one condition to another the change of internal energy of the system is equal to the sum of the work done by the external forces and the amount of heat supplied to the system, which, according to the law of conservation of energy, can be formulated in the following way: the total energy of an isolated system remains constant - the energy can neither be created nor disappear. In a closed system, it can only transform from one form to another. Eccles suggested energy could be "borrowed" from the quantum vacuum (Beck, 2008).

In 1989, in his work The Emperor's New Mind (Penrose, 1989), Roger Penrose posited that consciousness results from the contraction of the brain cells during quantum-mechanical operations. (Tarlacı, 2010). The theory, known as 'The spin-mediated quantum consciousness'', was developed by Huping Hu and Maoxin Wu in 2002 (Hu and Wu, 2001). According to the theory, certain aspects of neural functioning were brought to the subatomic level. The theory is still the subject of lively discussion among neuroscientists/physicists.

Up to now, there is no integrated, agreed theory regarding the issue to be discussed, which would make allow to explain every level of human consciousness / the brain function both from physiological/biochemical and neuro-electrical and quantum point of view. Scientists still have many questions and no answers regarding various phenomena in quantum mechanics including wave nature of particles, observer effect, quantum tunneling etc.

There is no coordinated approaches and knowledge of the objectively existed dimensions in contemporary science. In a three-dimensional world, each point is indicated by three coordinates (roughly - length, width, height). Time is often considered to be the fourth conditional dimension. Time is a specific coordinate; it is possible to move along x, y, and z coordinates in both directions, but along time t coordinate it is possible only to move forward. The hypothesis that the world must have more than three dimensions appeared a long time ago as there is no enough room in three-dimensional reality for the depth and complexity of ongoing processes in the world. Initially, the hypothesis was suggested by a German mathematician Kaluza in 1919. He presumed that the world is five-dimensional (including time as a dimension). Considering this approach, certain physic phenomena became easier to describe. The idea of extra dimensions was brought back through the String Theory at the end of the 20^{th} century. New suggestions appeared regarding the 10-dimensional world. Later, number ten was changed into eleven (Aspinwall et al. 2017).

According to the String Theory, electrons and quarks within the atom are not zero-dimensional objects but one-dimensional strings. Following an earlier model of string theory, boson string was only associated with bosons but this view has been developed into Superstring Theory which posits a connection (supersymmetry) between bosons and fermions. Apart from familiar four spacetime dimensions, String Theory also requires the existence of several unobservable extra dimensions.

The theory has been originated from (1969) the dual resonance model. Since then the term "string theory" has been spread among the groups connected to superstring theory ("string theory" became an umbrella term among the groups related to superstring theory). Five major string theories had emerged. The main difference between them was the number of dimensions,

where strings and their features were formed. (Bousso and Polchinski 2004). But all these theories were correct. In 90ies so-called M-theory was emerged unifying all previous superstring theories (Becker, Becker and Schwarz 2006). According to it, strings are the actual one-dimensional parts of two-dimensional membranes in 11-dimensional space (Witten, 2005).

Theory of supersymmetry is based on an idea that any distant interaction is due to the exchange of particles (photons, gravitons, gluons) transferring relevant interaction among other particles (Ferrara, 1987). Within standard model, quarks function as bricks and bosons act as mediums through which the quarks are connected. Theory of supersymmetry goes even further and claims that quarks and leptons (atoms) themselves are not fundamental, but they also consist of even heavier and experimentally undiscovered material structures which are compounded with even stronger particles with super energy than quarks and bosons in the composition of hadrons (proton, neutron).

In 2010, during the examination of data from electroencephalograms the suggestion was made that human consciousness requires 5-8 dimensions for functioning (Gardiner, Overall and Marc 2010) and that consciousness is linked to the quantum gravitation (Penrose, 1989).

Despite a large number of dimensions in the world, there are same rules for the communication between objects within one dimension and a variety of applying these rules may only depend on size and speed of the objects. Today, informational dimension, through which infself in operating, is so far one of the experimentally unobserved dimensions. It is an indivisible constituent of objectively existing dimensions. In other words, in spite of a large number of objectively existing dimensions, an indivisible constituent of any smallest elementary particle or wave in any dimension in the world bears an indivisible unit of information.

In the world, which we live in, there are laws of classical physics and laws of quantum mechanics at the same time/ They apply to various quantities in various dimensions connected to each other. If we imagine simultaneously existing various dimensions which may not interact directly with each other (meaning that a wave-particle in one dimension cannot have an impact known in classical physics on a wave-particle-entity in another dimension), wave-particles in every available dimension exist simultaneously in some sort of essence composed of an endless number of units of information. This essence has a capacity of the capacious world since every indivisible entity of every dimension in the world contains it as information.

Indivisible units of information (in this case we can't apply familiar classical bit or/and quantum bit-qubit, which is quantum equivalent to a classical bit describing two-state quantum system). Classical bit, which is the main unit of information and used to enter and store data on computers, has two possible states; these states are normally called 0 and 1 (also true or false). Quantum bit is quite similar to a classical bit, but many of their features differ significantly. In any case of qubit measurement, the result can be 0 or 1. The difference is that the state of a classical bit is always 0 or 1 while the state of a qubit can be a superposition of these two states. It is important that we can store one classical bit through one quantum bit though quantum bit can store more information than the classical one. Within the simple theory of difficult meanings, we can use IM-bit (Indivisible multidimensional Bit). IM-bit is not homogeneous and there can be different types of it. This doesn't mean that one IM-bit has bigger or smaller capacity than the other. It cannot contain anything else except indivisible unit of information. It is impossible to

express this unit of information in the binary system as its meaning transcends the possibility of describing an event with binary code and requires a more sophisticated tool which can describe IMBit, its location and connection with other IMBits.

IMBit can have various informational capacity and meaning in various dimensions; though it's just a dimensional layer of IMBit composition and does not give an opportunity to divide it into constituent parts.

It is important that there is zero distance between IMBits meaning that despite the fact of occurring quantum polarization and quantum tunneling (according to quantum mechanics (quantum field theory)), there is no objective vacuum on the level of all dimensions, but vacuum in one dimension is just one of the layers of another dimension and that is what creates the whole picture of the universe.

It is important to consider that IMBit's features include ability of both weak and strong interaction, gravitation and electromagnetism. It has its initial potential which develops through communication with other IMBits. In different dimensions, IMBit characteristics unfold in different ways. Today, it is not available to examine its features in above-mentioned dimensions as research in this direction haven't conducted yet.

Through joining IMBits create constructions which reveal differently in various dimensions. Some of them are observable as they are found in dimensions familiar to us and some of them aren't because of the absence of relevant tools and irrelevance of technological and energy conditions.

According to the present model, the universe is a closed system with an endless capacity which has never been created. Big Bang is one of the events that happened in the universe and gave birth to relatively familiar (to us) universe, but not universe on the whole. The model implies that real universe is much larger than the universe created through the Big Bang. For better and easier understanding of the text, it is essential to define the meaning of the word "universe" as it can depend on this or that particular context. The difference in meanings is based on a capacity of the content of the word, hence, it can be used both in broad and narrow senses. In the broad sense of the word, the universe involves other universes in the narrow sense of the word and one of the examples of those are the universe relatively familiar to us. And in a broad sense of the word, the universe is the entirety of everything existing, which, according to the present model, transcends the capacity of the world created through Big Bang and includes the universes emerged through this or some other events.

As a living organism, a human being is guided by various subjective assumptions/criteria in the process of knowing the universe, based on one's age, knowledge, experience, superstitions, etc. One of the most important facts in the process of knowing is that, according to available scientific knowledge, a human being is actually the only living organism which creates his/her own self-conception through chronological perception-memory-comprehension and determines the relationship between this conception and outer world. Based on observation and gained knowledge/experience, including the observation of a cyclical pattern of life of any organic form, a human being concludes that any organic form is being created, it lives and dies. A human being has the same approach towards any event for it begins, develops and then ends. It is unusual for a human being to assume and judge by categories which have neither beginning nor

the end for, on some extent, these categories contradict the knowledge and experience that a human being is empirically gaining. Though it doesn't mean that these categories are unfamiliar for human beings.

According to the presented model, the universe has neither beginning nor the end. It was never created so its existence will never end. It is an endless, closed system the smallest constituent of which is IMBit.

Characteristics of IMBits cause interaction between them (as a rough parallel we can take simplification in Maths where 10 includes all numbers, but its expression consists only of one and zero. Same happens with any other number – every following number includes numbers that are less). IMBit features include communication with other IMBits, adoption-merger, division and simplification, also replication while making specific combinations. Precisely these characteristics of IMBits have caused the emergence of living organisms in the universe. Specific combinations of IMBits lie at the root of human thinking process and neural connections. Human infself also consists of these combinations.

Certain combinations of IMBits have the ability of self-perception that is not directly linked to the form of these IMBits in the spatial dimension. So, self-perception is one of the features of IMBits which might be occurring in highly developed organisms as biochemical and electrical processes in the spatial dimension. Notwithstanding their material appearance, IMBit combinations have self-perception and characteristic feature/ability to make a choice that is seen during communication with other IMBits. During interaction weak and strong communication processes relatively familiar to us, gravitation and electromagnetism are operating; They are used by IMBit to interact with other IMBits relying on its initial potential at its choice.

Interaction is made by IMBits towards those quantities and dimensions, which are impossible to observe using present technological capacity. It also requires large energy costs expending of which is possible only if alternative energy sources are found. Rules, according to which IMBits interact with each other, require improvement of the present knowledge in particle physics, also practical verification of theories presented.

Conclusion

It is impossible to conduct full research on infself through the tools and measures presently available in classical physics, neurosciences and biochemistry as, according to the model presented in this work, infself affects quantities in which above-mentioned rules are not effective.

Infself in action consists of combinations/flows of IMBits, which are functioning in presently undiscovered, dimensions unknown to us.

According to STDM (Simple Theory of Difficult meanings), the universe has neither beginning nor the end; it was never created and its existence will never end. It is a closed endless system the smallest constituent of which is IMBit.

IMBit may have various capacities and meanings in various dimensions; though it's just a dimensional layer of IMBit composition rather than the opportunity to divide it into constituent parts.

Certain combinations of IMBits have the ability of self-perception that is not directly linked to the form of these IMBits in the spatial dimension. Self-perception is one of the features of IMBits occurring in highly developed organisms as biochemical and electrical processes in the spatial dimension.

Notwithstanding their material appearance, IMBit combinations have self-perception and characteristic feature/ability to make a choice that is seen during communication with other IMBits. During interaction weak and strong interactions relatively familiar to us, gravitation and electromagnetism are operating; They are used by IMBit to interact with other IMBits relying on its initial potential through its choice.

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