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Breakthrough in the Human Decision Making Based on an Unconscious Origin of Free Will

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Abstract:

This paper deals with a breakthrough in the concept of free will in the human decision making. It is assumed that the consciousness and unconsciousness show the same mind processes in the human brain. The decision making initiates unconsciously in the human brain, and, eventually, becomes a conscious decision. So the free will is unconsciously prepared in the human brain. Then I conjecture that what is called the conscious human brain is just the enlightening of some parts of the unconscious human brain.

Keywords: free will, decision making, unconsciousness, anticipation, human brain, mind-brain.

1. Introduction

In a pioneered work, Benjamin Libet (Libet et al, 1983) found a brain signal, the so-called "readiness-potential" that occurred a fraction of a second before a conscious decision. His experiments opened a fundamental debate on the mind-brain problem. If the decisions are prepared, unconsciously, by the brain, then the feeling of free is just an illusion. So, this is the unconscious brain that makes the decision, not the conscious mind of a person. It was a long controversy about whether free decisions are anticipated by the brain activity.

More recently, a team of scientists from the group of John-Dylan Haynes (Soon et al, 2008) has showed in brain scanning images how the brain might unconsciously prepare decisions. They found that a decision making could be encoded in brain activity of prefrontal and parietal cortex up to 10 seconds before it becomes a conscious decision making.

Patrick Haggard (2008) reviewed Human volition as a neuroscience of will. "Volition consists of a series of decisions regarding whether to act, what action to perform and when to perform it (Haggard, 2008)". Voluntary action is controlled by networks of brain areas, identified by the pre-supplementary motor area, the anterior prefrontal cortex, and the parietal cortex. "These areas generate information for forthcoming actions, and also cause the distinctive conscious experience of intending to act and then controlling one's own actions (Haggard, 2008)".

This short paper deals with a breakthrough to this mind-brain problem, and is organised as follows. Next section 2 deals with the Libet theory of free veto. Then, section 3 presents the triune brain theory of MacLean. Afterward, section 4 deals with the intelligence of the unconscious brain. Finally, section 5 deals with the breakthrough to the mind-brain problem.

2. The Libet Theory of Free Veto

Benjamin Libet (2004) studied, experimentally, how the human conscious awareness emerges in the brain. His experiments reveal a substantial delay, the "mind time", before any awareness affects how we view the human mental activities. If unconscious processes precede any conscious awareness, this means that unconscious processes initiate the conscious experiences. Freely voluntary acts are initiated unconsciously before an awareness of wanting to act. Indeed, Benjamin Libet measured the response time between the moment the brain of a patient was stimulated and the time the patient became consciously aware of the stimulus. He found there was a consistent half-second delay between the unconscious reaction of the patient and their conscious awareness of the stimulus. Moreover, he continued his work with even more experiments to refine his theories of mind, brain and consciousness. Those experiments also involved using electrodes to measure the response times of the brain, and he found, for example, that when a volunteer was instructed to move a finger, the brain unconsciously initiated the movement even before the volunteer was aware that the finger had begun moving. This seemed to indicate that "free will" might not exist in humans at all. But Benjamin Libet disagreed, because his experiments showed that if his subjects were told not to move a finger, or to stop moving it, their conscious will would maintain complete control. The conscious will could block performance of the act and veto it. These discoveries have profound implications for the nature of free will. So, after the results of Benjamin Libet, the free will only consists in the possibility to say NO, what is a veto. In consequence, the brain in an unconscious way creates and launches the future event before the knowledge of this event reaches the conscious part of the brain. At that moment, the conscious brain can accept or refuse this event. This means that in these experiments, there is no place for the conscious brain to create and launch future event.

So, the unconscious brain anticipates the future decision of the conscious brain, but the conscious brain can block this decision.

Recently, I gave the mathematical demonstration of hyperincursive free will, which shows a similar veto mechanism, which is an unpredictable hyperincursive anticipation (Dubois, 2008).

Next section deals with the evolutionary triune brain theory of MacLean that gives complementary explanations about brain function.

3. The Triune Brain Theory of MacLean

Paul D. MacLean (1990) proposed that the human brain consists to three brains in one, given by the reptilian complex, the limbic system, and the neo-cortex. In his evolutionary triune brain theory, he explains brain function through the evolution of existing structures of the human brain.

The reptilian complex, existing since 400 million years, controls normal involuntary behaviour that the conscious mind does not, such as the cardiac and respiratory functions. The reptilian complex is found in all vertebrates and is the most primitive structure of a brain during the species evolution. It is pre-programmed and has only a short-term memory.

The limbic system, existing since 65 million years, which was first introduced by MacLean in 1952, is similar to the brain of the more primitive mammals and is the source of emotions and behaviour. It operates by influencing the autonomic nervous system and acts as a filter to select information to record in his long-term memory. This limbic filter excites the cortex depending on the filter itself linked to the emotional feelings. It is highly interconnected with the nucleus

accumbens, the pleasure center of the brain, which plays a role in sexual arousal and the heavy derived from certain recreational drugs. It is involved in reward, placebo effect, pleasure, laughter, addiction, fear and aggression. The emotions triggered by stimuli acting on the limbic system are not under the control of the cortex. The limbic system is tightly connected to the prefrontal cortex including the orbitofrontal cortex that is required for decision making. The limbic brain has some autonomy from the cortex, in blocking any responsiveness of cortical areas, and in anaesthetizing the unpleasant feelings that do not reach the cortex but may stimulate certain areas of the cortex. This is important to note that the communication is thus unidirectional from the limbic system to the cortex, but the logical right hemisphere of the cortex may block the communication from the limbic system.

The neo-cortex, also known as the cerebral cortex, existing more recently since 3.6 million years, resembles the brain of more recent mammals in that it controls more highly evolved mental capacity such as reason and speech. It is involved in higher functions such as sensory perception, generation of motor commands, spatial reasoning, and, in humans, mind, language, conscious thought and anticipation of acts.

This is important to know the structure of the brain, because this can explain some anomalies in the way of reasoning and free volition of the conscious mind. For example, the decision making to stop any addiction to products, like alcohol, and drugs, like medications, mainly depends of the limbic system, and thus is not controlled by way of rational reasoning of the neo-cortex. Indeed, the limbic system is the central unconscious evaluator of the information entering the brain. The orbitofrontal cortex is the conscious rational complement of the unconsciously working limbic system. The orbitofrontal cortex unconsciously receives the emotional limbic stimulations, but consciously makes them rational for the real world conditions by way of reasoning. So this is clear that the intelligence deals essentially with the unconscious brain.

Next section deals with the conscious and unconscious intelligence of the brain.

4. The Intelligence of the Unconscious Brain

In my book (Dubois, 1990), a section is devoted to the question: Is the consciousness important for the development of intelligence? The evolution of the life and species was performed by the Darwinian natural selection. No conscious intelligent entity was at the origin of the creation of conscious intelligent species, as humans. During the evolution, the biological primitive living entities evolved firstly to an intelligence endowed by unconsciousness.

The unconscious brain might be defined as that part of the mind which gives rise to a collection of mental phenomena that manifest in a person mind but which the person is not aware of at the time of their occurrence. These phenomena include unconscious feelings, thoughts and habits, unconscious automatic skills and reaction, and unnoticed perceptions. The unconscious brain can be seen as the source of night dreams and automatic thoughts. The long-term memories are encoded in unconscious repository, which may become accessible to consciousness at some later time. Unconscious knowledge is scripted in the brain, for example, all the things that are learned and executed without conscious thinking. An example of the intelligence of the unconscious brain deals with phenomena where one fails to solve a given problem and then later one has a flash that provides a solution. There is a dialogue between the conscious and the unconscious brain. The conscious brain is often seen as the domain of the mind but it exists

within sensory inputs to and action outputs from the body. Amongst the conscious awareness of the body, let us cite the five main senses, sight, hearing, taste, smell, touch. Many of the scientific discoveries in the mind-brain problem come from experimental studies of defects in the state of consciousness. In a first case, some damage within the brain giving problems such as blind-sight, which causes a patient to be fully able to interact with an object in the visual field, yet being totally unaware of its presence. The patient has no conscious awareness of the object but behaves as though can see it. A second case resulted from a patient who was completely blind in the left visual field as a result of brain surgery. Although he could not see any objects on the left of the visual field, he was able to reach them correctly when asked to do so. In a third case, some patient suffers severely from epileptic seizure. An operation that splits the two brain hemispheres can attenuate the symptoms. This is the Split Brain Experiments, after the Nobel Laureate Roger Sperry. In such patients, one half of the brain processes information presented to one half of the visual field. Information learned using one half of the brain alone is not useable by the other half. It is as if the patient has never seen or learned the information. However, the half of the brain that did see or learn the task is fully aware. Finally, let us give the example of an unconscious automatism given by the alien hand syndrome, where a person experiences his hand moves as uncontrolled by himself, although the movements can display a complex purposive act.

Next section gives the breakthrough to this mind-brain problem.

5. Breakthrough to the Mind-Brain Problem

Libet (2006) proposed, after his experiments, that mental awareness can be delayed by up to 0.5 second, and therefore, he concluded that processes that are unconscious must precede it. He then proposed, by extrapolation that all mental events are initiated and developed unconsciously. He thus analysed the mind-brain interaction. If there is an interaction, then the mind and brain are independent variables the mind represents subjective experience and is therefore a non-physical phenomenon. This fact led Libet to the need for a field theory, that he termed the Cerebral Mental Field (CMF). So, this proposition of Libet is similar to dualism that is a set of views about the relationship between mind and matter, which begins with the claim that mental phenomena are non-physical. The theory of dualism, attributed to René Descartes (1641), holds that the mind is a non-physical substance. Descartes was the first to identify the mind with consciousness and to distinguish this from the brain, which was the seat of intelligence.

In this paper, I conjecture that there is no such dualism, because the mind-brain system is an indivisible oneness. There is no mind-to-brain causation, nor brain-to-mind causation. Any mind change function corresponds to a physical trace in the brain, in the form of executable scripts, coded by low-level and high-level languages. An executable script is a program that executes a sequence of coded instructions. The word "program" comes from "pro-gram" meaning "to write before", and means a plan for the programming of a mechanism, or a sequence of coded instructions that can be inserted into a mechanism, or a sequence of coded instructions, as genes or behavioural responses, that is part of an organism.

Recall that all the cells in the body, and the neurons in the brain, are programmed by the genetic code, DNA, in a low-level language with four signs. Bazan (2007) proposed that the unconsciousness be structured like a language based on the Pierce's indexical, iconic, and symbolic signs. My conjecture goes beyond the proposition of Bazan, because she proposed only one language for the unconsciousness with three signs.

The breakthrough in this paper deals with a complete programmed brain, with different executable scripts in low-level and high-level languages. The execution of these scripts by the brain corresponds to the mind. Mind is the seat of intelligence given by experienced conscious and unconscious processes as combinations of thought, perception, memory, emotion, will and imagination. There are several types of executable scripts. For example, some scripts are pre-programmed by the DNA, some scripts are self-programmed by learning or by rational rules. These programs are executable scripts coded in the physical brain. These scripts are based on biological low-level and high-level languages. There are translating scripts that can be called interpreters that translate a script to another script. There are different types of scripts, some scripts are written in neural low-level languages, and there are interpreter scripts that translate a script to another script in another language. The comprehension of the meaning of a script can only be made in translating this script, with an interpreter, and the subsequent production of an equivalent script, likewise called a translation, that communicates the same message in another language (Kull, 1998). The script that is translated is called the source script, and the language that it is translated into is called the target language. The product may be called the target script. For example, we suggest that an unconscious script becomes a translated conscious script by an interpreter. In conscious mind, the scripts are written in high-level languages coded in the neural brain. The natural languages, like French, English, that Human learns, are high-level languages. The fact to be conscious is a physical property of the brain, because this is the result of the execution of a program represented by an executable script coded in the neural brain. The fact that an unconscious free will can become a conscious free will, is just the translation of the unconscious script to a conscious script in another language that the conscious mind understands.

6. Conclusion

The breakthrough presented in this short paper deals with the conjecture that the mind-brain problem can be understood with the assumption that the brain is entirely programmed with executable scripts in low-level and high-level languages.

The execution of these scripts by the brain corresponds to the mind.

Any unconscious script, coded in a low-level language in the neural brain, can be translated to a conscious script in a high-level language understandable by the conscious mind.

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