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# The Neuro-Psychology of Learning and Fetal Programming along with a panacea for all types of learning disorders

Pragati Mishra[1], Dr. Nitnem Singh Sodhi[2]
[1]*Independent Educational Researcher, Practicing as a Trainee Psychologist with Dr. Nitnem Singh Sodhi*
[2]*Independent Multidisciplinary Researcher and Practicing Neuro-Psychologist at various hospitals in Lucknow, U.P., India.*

***Abstract:** This research paper explains the neurology and psychology of the mechanism of learning process and fetal programming. It elaborates the further technicalities of The Unimind Metamodel and The Unibrain theory. This research paper also provides a panacea for all types of learning disorders.*

## I. INTRODUCTION

Learning can be defined as the process of a subjectively permanent change in the structure of brain/mind. As per The Unimind Metamodel [1], the brain/mind is divided into three segments, namely

*1)* Object/entities
*2)* Associations
*3)* Algorithms

These three are a functional division of the neural circuits within the actual brain. [2]
Thus, the subjective permanent change referred to above shall occur with in either or multiple of the three mentioned segments.

## II. NEUROLOGY OF LEARNING PROCESS

Neurologically, the learning is synonymous with 'neuro-plasticity', referring to the brain's ability to change (its neural circuits/pathways) as a result of experience; making the learning process an inherent function of the mind/brain. The structure of human brain is developed and determined according to the (sensory) experiences and their psychological interpretations, of that individual human. The brain has billions of neural circuits and pathways, each of which represents an experience of that individual. Overtime when an experience is repeated (something being experienced repeatedly), it makes the corresponding neural pathways/circuits to become stronger – and this very process is what we term as learning on the neurological level. Once such circuits/pathways become strong enough due to repeated experiencing, they become autonomous and human can 'imitate' those experiences subconsciously i.e. without thinking about them. For example – driving, writing, brushing, eating, typing etc. by those who are well experienced in doing such tasks.

## III. FUNDAMENTALS OF LEARNING PROCESS

All life forms on earth are subject to various mechanisms under the process of evolution, such as natural selection, sexual selection, social selection, etc. – and the prerequisite to go through the evolution process is the ability to 'learn' – which verily the same was stated by Charles Darwin as 'the ability to adapt to one's environment'. This ability to adapt to one's environment, which enables all life forms to evolve, is verily the learning process.
When Charles Darwin said that evolution refers to adapting to one's environment, he simply referred to the ability to learn – we are biologically programmed/evolved to learn for the purpose of survival & reproduction – it would not be an exaggeration to claim that all life forms are but neuro-biological machines programmed by nature to learn to survive and reproduce. (in coherence with the Unibrain Theory [2])
Learning is can therefore be logically considered to be a form of "imitation" (with reference to its synonymity with neuro-plasticity and neural pathways/circuits representing experiences as explained above) – and the decision of what to imitate or what not to imitate is guided by the pain-reward mechanisms of brain.

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## IV. PAIN-REWARD MECHANISMS OF LEARNING PROCESS

The biological purpose of all life forms is survival & reproduction – and this inherent urge to survive & reproduce is the fundamental purpose which guides the learning process and has caused the faculty of learning to evolve in a wide variety of species. On the neurological level, this entrenched aim of survival and reproduction manifests in brain as the reward mechanisms and pain mechanisms.

Reward mechanisms are those neural regions of brain which in essence functions to release certain neurotransmitters/hormones in the brain that makes us feel happy, whenever there is the subjective perception/feeling of increased probability of survival and/or reproduction.

Pain is similarly the mechanism used by the nervous system wherein it produces a negative feeling (via neurotransmitters/hormones) as a warning of a perceived danger to one's survival and/or reproduction.

Today's neuroscience understands well that the learning process (or any other process in brain) is possible/mediated only by the synchronic communication between individual neurons through release of neurotransmitters, and interestingly enough, all those neurotransmitters which enables the neurons to communicate, like serotonin, dopamine, endorphins etc. are the same neurotransmitters which makes the individual feel happy. Therefore, it would be apt to state that the subjective states of happiness and other positive emotions on neurological level are the states of heightened information processing in brain, and pain/negative emotions being the opposite thereof. In the most fundamental level, the brain is inherently programmed to process only those pieces of information which are relevant to its survival and reproduction.

Therefore, the reward mechanisms of brain are the direct mediator which enables the learning process on a neuropsychological level. As in the mechanisms of pain, during the experience of pain, the reward mechanism reduces the release of those happy neurotransmitters (and increase release of stress hormones) which has an apparent inhibitory effect on the learning process. On the functional level, this programs the mind/brain to learn to avoid those negative/painful imitations.

## V. DETAILED MECHANISM OF LEARNING AS PER THE UNIMIND METAMODEL & THE UNIBRAIN THEORY

The process of learning can also be described as per the Unimind Metamodel [1] as follows :

Processes/algorithms/objects/associations/etc. referred to hereafter are not abstract concepts but refer to actual corresponding neural circuits/pathways in the biological brain. (as per the Unibrain Theory [2])

*1)* During when our brain/mind interacts with actual substantive reality through our sensory organs (eyes, ears, nose, skin & tongue) the sum total information perceived by our brain/mind/senses complex goes through attention/filtration process which is guided as per the 'relevance' of arbitrarily perceived pieces of information from whole sensory data input. It calls upon the background (subconscious) procession by algorithm (neural-circuits) of meaning identification to identify demarcated pieces of information from the sensory input stream, depending upon their 'relevance'. (corresponding brain region – amygdala-hippocampus complex).

*2)* The degree of the 'relevance' of each individual identifiable piece of information is decided on the basis of its associations with running processes. Meaning identification process is running in our brain/mind continuously, which assign/provide 'meaning' to each object perceived by our brain from the input by sensory organs. Whenever our brain/mind receives any sensory input in form of sound through ears, or visuals through eyes, or any input from any other sensory organ in corresponding forms, the brain/mind starts identifying individual objects and patterns from that information and on the basis of its relation with previously perceived or stored data (memory), and this awareness of having past knowledge of something is what provides 'meaning' to that something. In case of a newly perceived object, the brain/mind creates new object along with associations with old objects that be present in that particular moment of actual reality or present in the thinking process, during that particular time of perceiving that new object. (corresponding brain region – amygdala-hippocampus complex).

*3)* After identifying individual objects (pieces of information perceived by the senses) from surroundings (sensory input), the brain/mind next recognizes or constructs/assumes the pattern(s) in that information. The meaning identification process assigns each of those pieces with the (neural encoded) list of all the associations that piece has with existing neural circuits, and then and sends all this to the pattern recognition process. This pattern recognition process on the subtlest level, enables the brain/mind to predict/calculate for subsequent and successive sensory information in relation to any specific piece of information actually input by senses. On a technical level, whenever there are multiple identifiable objects in input sensory information, then pattern recognition process is sent all those objects (individual pieces of sensory information), by the meaning identification process, along with all their relevance (associations) (neural encoded) and then the pattern recognition process either finds or constructs/assumes a pattern in those objects. (corresponding brain region – neocortex).

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*4)* Pattern simply refers to intermittent repetition.

*5)* If no pattern is found and there is neither enough information/relevance to construct/assume any pattern, the abstract overload on brain/mind as an inability to percieve a pattern is what causes discomfort/anger/irritation, and this pattern recognition process is the cause of Cognitive Biases of all types, as the brain/mind is inherently programmed to try to assign meaningful sequence/chronology to everything. This verily predisposes the mind towards appreciation of music. (corresponding brain region – neocortex).

*6)* Learning process in regards to any given piece of information is complete when that information becomes 'memory'. Memory creation is an important aspect of cognition. In this process the brain/mind creates multidimensional objects for every situation, which is constituted of the individual objects as perceived by senses in that situation, along their relevance/associations with any other object already stored in past memory and the patterns among therein. Whenever there is change in the perceived number of objects or patterns in the situation, our brain/mind creates another object for that situation, and it also changes/updates its associations with other objects. (corresponding brain region – hippocampus & limbic system).

*7)* Memory can be classified as Short-term memory (referring to comparatively less relevance/associations with presently running brain circuits) & Long-term memory (referring to comparatively more relevance/associations with presently running brain circuits)

*8)* All processes in our brain/mind work not only with the input of information perceived actually through sensory organs, but also input from other processes running in brain - Especially the process of recalling/remembering/imagination, which produces fictitious streams of sensory information which it can provide to other processes in place of real information from sensory organs. Whenever any object/entity/experience is needed to be "recalled" by another process, the process of recalling/remembering/imagination produces a stream of fictitious sensory information representing such object/entity/experience and provides it into the needed/calling process. On demand from another process, it can also create such objects/entities/situations which were never perceived before, from the objects etc. which are already stored in the brain/mind (as a permutation/combination of already stored objects, subject to pattern recognition process and meaning identification process). Thus, it enables/construes the faculty of imagination/visualization/etc. (corresponding brain region – limbic-neocortex complex).

## VI. FETAL PROGRAMMING - NEURO-PSYCHOLOGICAL ASPECTS OF FETAL DEVELOPMENT

As the Unimind Metamodel and the Unibrain Theory proves that psychology and neurology are the two aspects of the same mind-brain complex, we hereby outline the framework of how the psychology & neurology of a fetus is programmed within the womb.

The development of the human fetus brain can be divided into three dimensions with reference to the triune brain model :

*A.* Reptilian region of brain
*B.* Limbic region of brain
*C.* Neo-Cortex region of brain

*1)* In the beginning of pregnancy, brain within fetus starts from the form of being a "neural tube", which during around the third week of embryonic/fetal development, develops three vesicles which will eventually develop into the aforementioned three regions of brain/neurology with a corresponding dimension of mind/psychology, during the course of gestation.

*2)* It keeps growing neurons and forms into significantly complex circuit(s) by the beginning of 2nd trimester which will then be further programmed (i.e. more neurons being arranged into complex circuits) according to epigenetic factors. Thus, the 2nd and the 3rd trimester of pregnancy are the most important time periods for influencing a human's brain development.

*3)* Hormones by definition are the chemical messengers within the body – and with reference to the fetus, the hormones along with other constituents of the blood of mother, which can cross into the placenta, serves as the markers/indicators guiding the epigenetic manifestations within the fetus. In other words, the biological state i.e. the hormones and other constituents of the blood of the pregnant mother directly affects the neuro-psychological development of her fetus, as that blood is direct cause of epigenetic changes in the fetus.

*4)* In simper words, the biological state of mother (the hormones and other constituents of the blood) informs the fetus about the external surroundings which the mother is perceiving, which in turn manifests the epigenetic factors which includes the structure of brain and neuro-psychological development.

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*5)* The biological state of the mother (i.e., the hormones and other constituents of the blood) is controlled by multiple internal and external factors, but the most significant, direct and controllable contributor is her psychological state and her dietary intake.

*6)* For example, if the mother subjectively feels stressed during pregnancy for prolonged continuous durations, the increased release of stress hormones like adrenaline/cortisol and increased blood glucose will inform the fetus to expect stress in its future surroundings and thus the neurological structures correlating to impulsive behaviors i.e. the reptilian regions of brain will develop more prominently, and another example being that if the mother is subjectively feeling happy and relaxed during pregnancy for prolonged continuous durations, the hormones like serotonin/dopamine/endorphins/etc. will inform the fetus to expect a safe environment, thus allowing the Limbic and Neo-Cortex regions of brain to develop more prominently.

*7)* Further developments will be published by authors in subsequent research papers.

## VII. COGNISHEILD – A PANACEA FOR ALL TYPES OF LEARNING DISORDERS

All types of learning disorders can be categorized into two basis of origins –

*1)* Learning disorders of psychological origins (Psychological Learning Disorders) – These occur when the existing thought process or existing thoughts interferes in the imitation process or the pain-reward mechanisms of mind/brain.

*2)* Learning disorders of neurological origins (Psychiatric Learning Disorders) – These occur due to functional errors of the neural structure/circuit/pathways.

For all types of psychological learning disorders, the COGNISHIELD technique effectively works as a treatment, as well as in case of psychiatric learning disorders, it works effectively as a management technique. [3] In the former case, the technique provides absolute control over the thinking process, even enabling the subject to shut-down their thinking process at will, so that learning/imitation can occur effectively and the present thoughts don't interfere in the pain-reward mechanisms, wherein in the latter case, it provides control over the faculty of attention/filtration process, which is the direct mediator of subjective experiencing correlating to formation and changes of/in the neural circuits/pathways in brain, as mentioned above, thus working as a management technique for effective learning/imitation process. [3]

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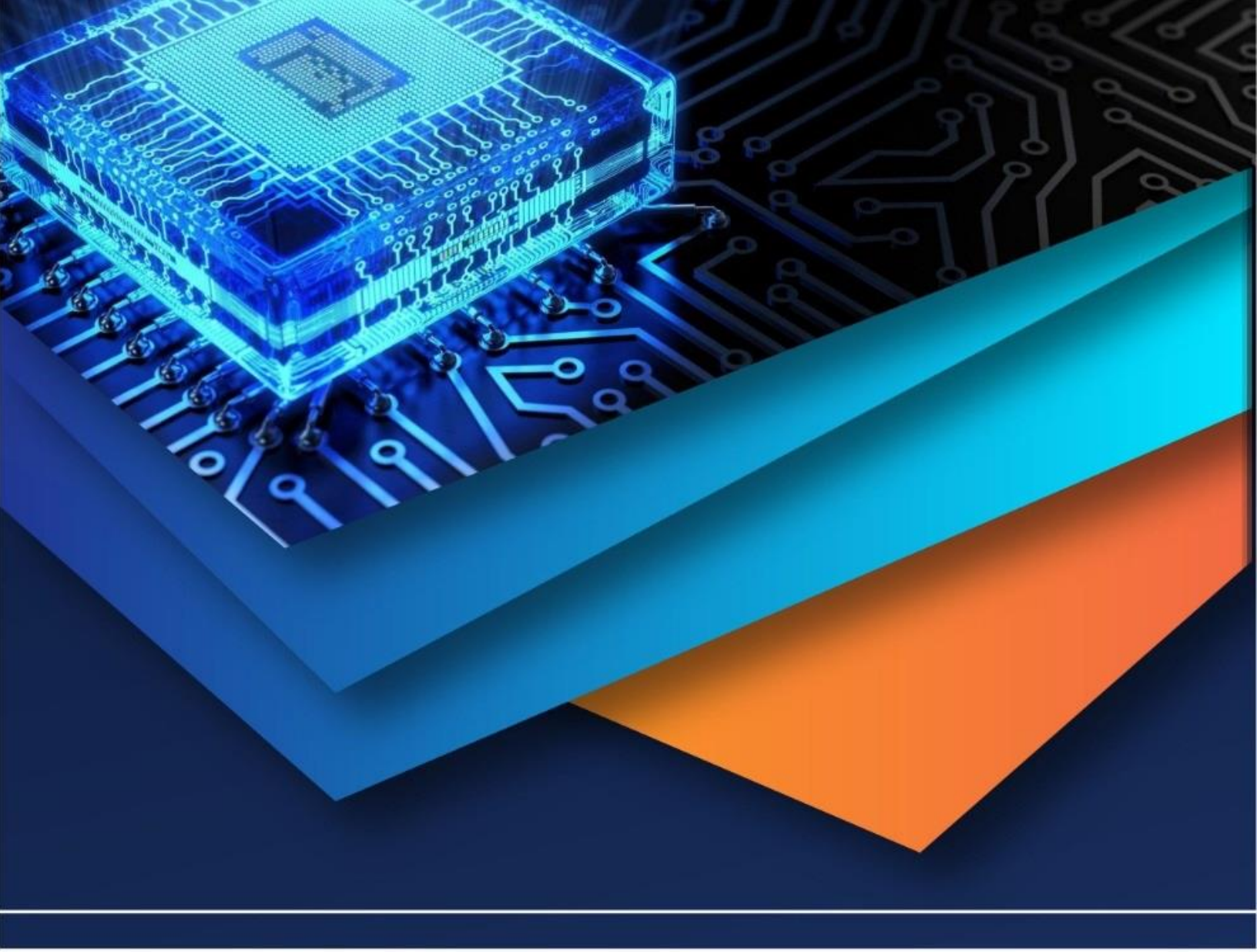

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