Brain response of behavior

Psychology, Behaviorism

Thecommunicationprocess of neurons in the brain is a complex electrochemical process from one neuron to the next in a series of chemical reaction to pass the message (Charles, 2002). However, the message to be passed precedes the process of communication involved. The message to be communicated to the brain neurons originates from the senses of sight, touch, taste, smell and sound.

The neuron’s dendrites usually receive a chemical message from the neighboring neuron which generates or triggers off a chemical reaction to form nerve impulse.

The generated nerve impulse or action potential travels down the neuron tube referred to as axon through the terminal button at the end of that neuron. At this end, the message carried is passed to the next adjacent neuron through a synapse. However, the synapse has a gap called synaptic cleft that message neurotransmitters should diffuse through to the next nerve cell’s dendrites. The electrical message to be diffused through synaptic cleft is contained in synaptic vesicles with several neurotransmitters.

The neurotransmitters on the presynaptic neuron or neuron that has the message to diffuse through synaptic cleft to the postsynaptic neuron or on the receiving neuron must be in appropriate key and fit structures (Charles, 2002, p. 63). This is necessary to enhance successful neurotransmitters binding after diffusion. Once the neurotransmitters are diffused through the synaptic cleft, they bind to the dendrites of postsynaptic neuron and release the chemical message that triggers off or stimulates neuron chemical changes.

Thereafter, the process repeats as the previous one for this neuron until it moves message to the next nerve cell and communication enhanced. It is a point of worth to note that, once message diffuses through the synaptic cleft to the postsynaptic neuron, there are several neurons that shall receive the message but only specific neuron that is compatible to the message is shall successfully receive and pass it by to the next neuron.

For example, if there is need for body temperature control, the neurons that are specialized in body temperature control messaging only shall facilitate communication to the brain; and after interpretation by the brain the same neurons shall carry message to the hypothalamus. Then hypothalamus gland shall release hormones to increase liver activities, constriction or vasodilatation of blood vessel, follicle hair behavior and personal behavior to respond to cold by warming or wearing heavy clothes or hot weather by wearing light clothing (Albert, 2002).

Neurotransmitters and their effect on behavior The observable behavior is a result of brain interpretation and stimulated action course. However, it should be noted that the brain ability to influence behavior is highly dependant on neurotransmitters contained in the synaptic vesicle. The neurotransmitters have the capacity to influence the message being passed and the outcome in terms of behavior exhibited. In this regard, neurotransmitters are chemical agent in the neurons that are responsible for facilitating message movement from one neuron to the adjacent one through axon (Charles, 2002).

To this effect, neurotransmitters are either excitatory which allows communication or inhibitory that hinders information passage depending on

the nature of message being passed on. But effects of neurotransmitters whether inhibitory or excitatory are different depending on the nature or receptor. Some common examples of neurotransmitters are: Acetylcholine which is an excitatory neurotransmitter dealing with the muscle tissues especially the heart muscles to facilitate blood pumping mechanism.

Epinephrine is concerned with energy provision for urgent confrontation such as immediate flight or fight by producing glucose as a ready energy to an individual. Another neurotransmitter is the Serotonin which is concerned with person’s mood and insufficient leads to mood disorders such asdepressionandanxietydisorders. Oxytocin is concerned with maternal related behaviors such as mammary glands, sperm production and ovary release in sexual related behaviors. On contrary to excitatory neurotransmitters, Dopamine is an example of exhibitory neurotransmitter that inhibits action potential in motor neuron.

Abnormal quantity of Dopamine results to Parkinson’s disease and substance addition (Charles, 2002; Albert, 2002). Part II: major regions of the brain and their functions on behavior The brain is a complex structure that is divided into specialized parts or regions that perform specialized function. The importance of specialization and brain parts division is not only in brain processing information and generating responses, but the specific impact on behavior of an individual generated by each specialized part. In this regard, the brain has three main regions: cerebral cortex, limbic system and the brain stem (Charles, 2002).

The brain stem is the most primitive part of the brain that is located at the joint where the spinal cord enters the brain (Charles, 2002). This part of the

brain contains such sub-parts as reticular activity system, medulla and the Pons. The main function of this part of the brain is for autonomic functions deemed as necessary for survival such ashealth, food, shelter and security seeking behaviors. For instance, when a person falls ill, the brain stem triggers off the course of action to seek medication or health care, thus such an individual shall move towards the hospital premises than to any other direction of food or security.

The cerebral cortex is brain region that is on outer part that covers the brain (Charles, 2002). By virtue of covering the brain, the cerebral cortex is considered as the largest part of the brain. The behavioral function of the cerebral cortex involves higher cognitive processes such as memory process that enhances language, thought and learning. Therefore, behaviors such as performance inacademicwork, ability to retain and remember, verbal fluency and speech development are controlled and generated by the cerebral cortex.

Limbic system (Charles, 2002) is the third region of the brain with structures such as hippocampus, thalamus, amygdale and hypothalamus. This part of the brain is responsible for emotional related behaviors of individuals such asmotivation, memory functions, and physiological functions. For instance, amygdale is responsible for behaviors such as anger, fear and aggression. The hippocampus sub-structure involves the functions of memory such as information coding and processing into short term and long termmemories. Hypothalamus is responsible for emotional behaviors such as hunger, sexual feelings, thirsty and reproduction behaviors.