

Does Learning Change the Structure of the Brain?

Does Learning Change the Structure of the Brain?

Introduction

Neuroplasticity, also known as neuronal plasticity refers to the ability of the nervous system to change, adapting and shaping the structural and functional level along neuronal development and when subjected to further experiments. This unique feature makes neuronal circuits that are compliant and underlies the formation of memory and learning and adaptation to traumatic injury and throughout adult life events. The individual is used to do a certain thing every day, but now want to do differently because it is bringing you problems or is no longer pleasing (Boyke et.al, 2008).

Anyway, before it was satisfactory, but now want to make their own decisions, reviewing behavioral patterns before preset, change your choices. Thus, the way is to use the area of the brain that flexibility is governed by the frontal lobe. The relation between the function of the nervous system and the human behavior are the object of study of neuropsychology which has the purpose of relating the cognitive psychology to neuroscience, revealing the Physiopathology of the disturbance and facing the treatment strategy rationally. Learning is defined as a change in the behavior as a result of practice or previous experience. Also it can be seen as a change in the behavior made possible for the plasticity of neural cognitive processes. Because learning is constituted by neural processes is Necessary to consider neuropsychology as a tool of study to understand these processes (McEwen et.al, 2005).

Research Questions

1. How does learning impact on human brain structure?
2. What are the learning procedures that impact human brain?

Literature Review

The human brain is a complex system that establishes relationships with the world around him through significant factors such as the specificity of the neuronal pathways that lead from the periphery to the cortex information from the outside world; and the specificity of neurons, which determine motor, sensory, auditory, optical, olfactory, etc. areas, establishing accurate and rich functional interrelationships that are extremely important for learning. The process of learning requires a certain level of activation and attention, monitoring and selection of information. Activation, through surveillance, connects with the attention towards the ability to focus the activity. Are key elements of all neuropsychological, essential for maintaining cognitive activities activity, inhibiting the effect of many neurons that do not affect the situation.

Learning results from the reception and the exchange of information between the environment and the different nerve centers. Thus, the learning starts with a stimulus arising physico-chemical nature of the environment which is converted into nerve impulses by the sense organs. Pay attention, understand, accept, and hold, transfer and acting are some of the main components of learning. Thus, the information captured is subjected to continuous processing and preparation, which works on increasingly complex and deep levels, from the extraction of sensory characteristics, the interpretation of meaning until, finally, the issue of the response. Considering human learning as information processing, we see that the “core” processes are modifications and combinations that occur in cognitive structures. In fact, the learner is designed

as an intelligent and flexible manipulator who seeks information and tries to organize it fully pays it, store it and retrieve it when needed, and actively adjusted to the cognitive structures that have internally (Raichle et.al, 1994).

Many learning procedures are based precisely on a frame of reference that includes the classical notion of psychomotor, implicit knowledge that the subject has of his own body, static and in motion, and its relation with the external objects. The development of somatognosia normally takes place after the use of many body components: thus, for example, a five year old child has a remarkable capacity manipulative however their digital gnosis appears quite immature. In general, the neuropsychological tests that follow the guidance presented some differences with those typically used in educational psychology. Neuropsychology exploits specific features of mind which correspond, in turn, clearly identified and the areas of the brain circuits. But in reality, the difference in approach that proposes neuropsychology does not rely much on the type of test used, but rather the recognition of clinical syndromes characterized and tables on the anatomical and functional bases of the brain. In the teaching-learning process, the overall assessment of psychological functions must take into account all brain mechanism, in its successive levels of evolution. Thus, the neuropsychological evaluation is the only way to evaluate a particular function, since only when it is put to the test (by specific tests), we can observe their integrity or commitment (Zull et.al, 2002).

Understanding the intellectual Functioning of the child, the learning process, as well as its disturbances, the neuropsychology can qualify professionals such as doctors, psychologists, therapists and psycho pedagogues of language, to make possible a more effective therapeutical intervention. It is understood as the study of neuropsychology disorders of higher functions produced by brain disorders, specifically investigating the disturbances of behavior acquired, by

which every man has relations adapted to the environment. Only a little over one hundred years is what happened to know the functioning of the cerebral cortex, through the study of spontaneous localized lesions and partial resection of the brain, which have demonstrated that the various hemispheric parties do not have the same function and that there is a similar brain organization in all three individuals.

Conclusion

Neuropsychology understand the participation of the brain as a whole, in which areas are interdependent and interrelated, working like an orchestra, which depends on the integration of its components to perform a concert. This is called functional system. Thus, it is known that, from knowledge of the normal development and functioning of the brain, it can be understood brain disorders, such as cognitive and behavioral disorders resulting from injury, disease or abnormal brain development. Sometimes, the terms learning and knowledge are used interchangeably, however, is through the learning process that takes knowledge, however, the resulting knowledge of the process can not be confused with learning. In some manuals psychology of learning, learning is defined as “a change in behavior resulting from practice or previous experience” Learning is a continuous process, which operates on all data that reach a threshold of significance, depending essentially on memory and attention.

The ability to store data on cerebral specialization for later use allows, through memory, encode and decode information; There are various types of memory (sensory, short-term or working, and long-term) that can work not only sequentially, but in parallel, basically dependent synaptic plasticity. Lets you focus attention dependent conscious activities of systems and

anatomical and functional subsystems, working as networks in parallel, allowing simultaneous and interactive performance on cognitive tasks (Fields et.al, 2008).

References

Boyke, J., Driemeyer, J., Gaser, C., Büchel, C., & May, A. (2008). Training-induced brain structure changes in the elderly. *The Journal of neuroscience*, 28(28), 7031-7035.

Fields, R. D. (2008). White matter in learning, cognition and psychiatric disorders. *Trends in neurosciences*, 31(7), 361-370.

McEwen, B. S. (2005). Glucocorticoids, depression, and mood disorders: structural remodeling in the brain. *Metabolism*, 54(5), 20-23.

Raichle, M. E., Fiez, J. A., Videen, T. O., MacLeod, A. M. K., Pardo, J. V., Fox, P. T., & Petersen, S. E. (1994). Practice-related changes in human brain functional anatomy during nonmotor learning. *Cerebral cortex*, 4(1), 8-26.

Zull, J. E. (2002). *The art of changing the brain: Enriching teaching by exploring the biology of learning*. Stylus Publishing, LLC.