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Self Reflection - Cognitive Neuroscience

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Abstract: *Neuroscience deals with the study of nervous system whereas cognitive neuroscience is the branch of neuroscience and it focus on the neural connections of the brain with it's behaviour. Parts of the brain play an important role in this field. The methods include experimental procedures from psychophysics, cognitive psychology, functional neuro imaging, electro physiology, cognitive genomics and behavioural genetics. Studies of patients with cognitive deficits due to brain lesions constitute an important aspect of cognitive neuroscience. The damage in the brain changes the neural circuits and causes it to malfunctioning during basic cognitive processes such as memory or learning. By comparing the neural circuits of the damaged brain we can conclude the affected cognitive processes.*
Keywords: *Self-reflection, functional MRI, language, gene, sensory experience.*

I. Introduction

The human brain is estimated to contain ten billion to one hundred billion individual nerve cells or neurons. Each neurons have many connections to other neurons. The analogy between human mind and computer is a high level of abstraction. The data stored in a computer is similar to human memory formation. The structural view of a mind is a passive agent with mental elements combining according to mechanistic laws.

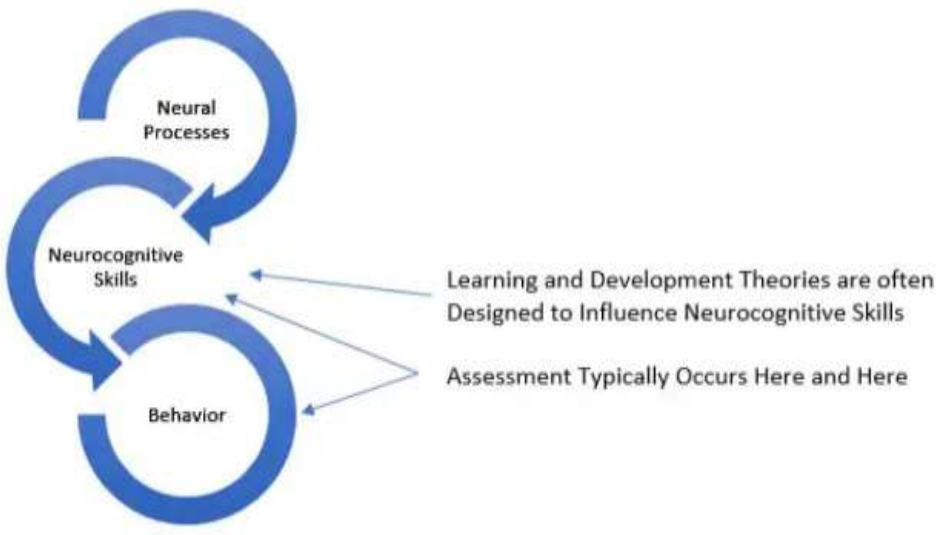
II. Methodology

Self Reflection

Humans can reflect on themselves as a person and they have a neural representation of their own body. Reflection is a cognitive skill that can measure structural changes in brain and the functions related to the changed portion of the brain. Evidence can be made by

- Measured changes in the brain structure and function.
- Self report of a first person.
- Observed behaviour.

The basic characterization of reflection is a neurocognitive skill that is necessary for executive function. Executive function consists of many outcomes to influence our educational system such as paying attention, reflection, the ability to regulate emotional reactivity, perspective taking, inhibitory control, working memory, adopting and using certain rules (habits), and cognitive flexibility. The process of measuring reflection is that what is seen in the imaging can be aligned with the real time function.



The experiment is repeated until the observed structural change is correlated with the observed functional change that can be verified by the data.In order to cultivate awareness of what we are learning, how we are learning it, and how what we are learning may be meaningful or not. We begin to legitimize the reflections as valid first-person, self-report data.

- Positron Emission Tomography (PET) scans to measure the accumulation of beta-amyloid in the brain.
- Functional Magnetic Resonance Imaging (fMRI) to measure activity in the brain during memory task.
- An electroencephalographic (EEG) machine to measure brain waves during sleep.
- Satistical models to analyze the data.

It's the equivalent of retrieving files from the computer's hard drive, rather than the temporary storage of a USB device.

Language

Language is the foremost tool of human thought and culture.Virtually all humans, regardless of their intellectual abilities, learn to speak. Language system involve large interconnected networks that are in constant contact with long-term memory stores and abstract conceptual representations. Current imaging techniques are investigating the relationship between these large scale neural networks in the brain.

Functional MRI

fMRI is used to examine CMS/insula function during a self-reflection task. Participants judged by the personality trait sentences about self and about an acquaintance. The reflection period was initialized by a cue and followed by photographs of the respective persons (perception of pictures of oneself or the other person).

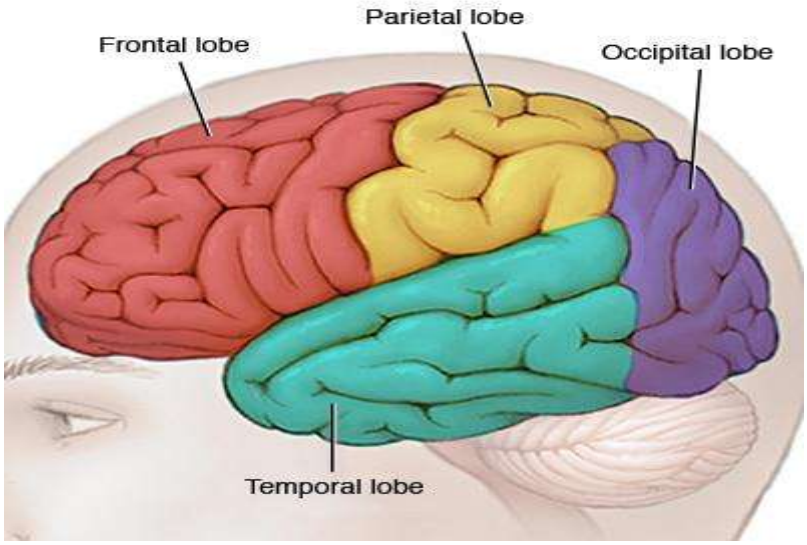
Gene

The therapy consists in injecting into the hippocampus - a region of the brain essential to memory processing - a gene which causes the production of a protein blocked in patients with Alzheimer's, the “Crtc1” (CREB regulated transcription coactivator-1). The protein restored through gene therapy gives way to the signals needed to activate the genes involved in long-term memory consolidation.

Sensory Experience

The thalamus passes most sensory information on to the cerebral cortex after helping to prioritize it; and the hypothalamus is the control center for appetites, defensive and reproductive behaviors, and sleep-wakefulness.

Each side of our brain contains four lobes. The frontal lobe is important for cognitive functions and control of voluntary movement or activity. The parietal lobe processes information about temperature, taste, touch and movement, while the occipital lobe is primarily responsible for vision. The temporal lobe processes memories, integrating them with sensations of taste, sound, sight and touch.



III. Conclusion

Self representation is not only interesting from a philosophical or scientific point of view but may also have practical implications in psychiatry, for example, in understanding disturbed self-related functions

occurring during depression The aspects of self-referential processing and underlying brain mechanisms are similar in clinical and subclinical (high PP) forms of psychosis, suggesting that these may be associated with vulnerability to psychosis. The results are obtained without the behavioural response supporting the reliability of the methods used.

References

[1]. *www.sciencedaily.com*
[2]. ***https://blogs.illionis.edu***
[3]. ***www.oxfordhandbooks.com***
[4]. ***www.mayoclinic.org***
[5]. ***www.ncbi.nlm.nih.gov***