

The concept behind neural plasticity psychology essay



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Have you ever wondered what Neural Plasticity is? Do you know the concept behind Neural Plasticity? To achieve your full understanding on what neural plasticity is and its concepts; the information below will help you discover what this is by defining neural plasticity and as well as giving examples on neural plasticity. You will find out that neural plasticity can be experienced in many different parts of the brain such as in the motor cortex, the auditory cortex, and in the visual cortex. Neural plasticity depends on the experiences one encounters because each experience stimulates the brain in different places. The areas I will focus on in this assignment are the background of neural plasticity, examples on how neural plasticity is used, and the actual concept of neural plasticity. Come with me on the journey through neural plasticity!

To fully understand what neural plasticity is, I must break down the words into two parts and define them for you. Neural – relating to nerves or the nervous system, Plasticity – the capacity to change as a result of usage, practice, and experience. Fuse those two words together and you will now have neural plasticity – the ability of the brain to change throughout the process of learning and experience. Before the mid 1960's came around, psychologist concluded that neural circuits in a fully mature brain and nervous system was completely developed in which the brain can not produce new neurons. What the critics didn't know was that they are about to be dramatically shocked because their hypothesis will be proven wrong through neurogenesis and neural plasticity.

The brain we once thought we knew turns out to be completely altered than the brain once discovered in the late 1800's and 1900's by Santiago Ramon

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y Cajal, Camillo Golgi, and Wilhelm Waldeyer. Santiago Ramon y Cajal was a Spanish Neuroanatomist, born in Petilla, Navarra, close to the Pyrenees Mountains. Ramon y Cajal studied medicine, teaches anatomy, history, and also teaches pathological anatomy. Ramon y Cajal made numerous contributions to the study of neural plasticity. He was the first to propose the ideas of the changing of neurons, the organization of the brains networks, and the neurons functions through new experiences in life.

The brain has the ability to change as a result to usage, exercise, and experience. The concept of neural plasticity is proven by an American research psychologist by the name of Mark Richard Rosenzweig according to the “ Essentials of Psychology”. Rosenzweig found out in animal studies on neural plasticity that the brain sustains developing anatomically by adapting and transforming itself into its adolescences based on life challenges and changed the assumed wisdom that the brain reached full capability in the childhood stages of early life. Mark Rosenzweig created an amazing park for rats so he could observe the significant effects in a developed habitation on neural development. He had half of the rats live together in a cage full of obstacles to have fun with. The other half of the rats lived in solitary confinement without any ladders to climb on or toys to expand their mind with. Rosenzweig found out incredible information that changed the world’s view on neural plasticity. He discovered that the rats that resided in the enriched environment increased cerebral cortex volumes and developed heavier, broader brains. He also found out that the rats in the enriched environment cultivated more dendrites and synapse in their brains than the ones in solitary confinement. Visual stimulated rats increased 20 percent

more synaptic connections per neuron in the visual cortex. Also, the rats that were running between obstacles formed new synaptic connections in the cerebellum, the structure mainly dealing with balance and motor cortex coordination. Rosenzweig's final conclusion on the experiment in 1996 was, by encountering new experiences; it increased the growth of new synaptic connections and shapes the brain's neural architecture. Neural plasticity is remarkable information for human development and adaptation.

Another interesting discovery that explains neural plasticity is the study on Albert Einstein's brain. Einstein had an average sized brain like any other human being but there was an important aspect that caught researcher's attention. The visuospatial and mathematical region of Einstein's brain showed 15 percent larger than normal! Do you think you know why this happened? This happened because Albert Einstein constantly used and challenged the visuospatial and mathematical side of his "average sized" brain. "Practice may not always make perfect, but it's likely to create an impression on your brain", states Dr. Azar in 1996. I am a true believer of these words. I believe that you obtain the ability to do anything you want in life, but it is all up to what "you" decide on in life. Neural plasticity boils down to your mindset towards your life and how you perceive learning experiences. You're either the rat that resided in the enriched side of the cage or the rat in solitary confinement, but this is where you have the opportunity to challenge, exercise, and expand your brain to perform "Neural Plasticity".

In conclusion, neural plasticity is the ability to develop an individual's learning process. This statement provides proof that no matter what environment one

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is in; there is always going to be an ability to change through their experiences which improves the growth of the brain. Basically, the concepts of neural plasticity states that the more experiences a person encounters, the greater chances one has on improving their dendrites and synapse. Neural plasticity is found in many different regions of the brain such as in the auditory, motor, and visual cortexes. The information I've provided proves that without experiences there is no ability to improve your brain because one isn't improving if one doesn't go through experiences in life. Thank you for taking this exciting journey through NEURAL PLASTICITY!

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