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Neuroplasticity - Rewiring brain through training and development

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Introduction

The objective of this paper is to find out why training always takes a back seat every time there is a crisis or problem in any organization whereas training is the only way to handle the crisis or the conflict in any situation, e.g, fire brigadiers, policemen, army officials, pilots, airhostesses, and many other who are well trained and their brains are wired in a way to heal with any situation. Quoting the recent example where one of the leading airlines had to shut down due to heavy losses, the first division to be closed was Training and Development as a part of cost cutting effect. Whereas it is proved that trained people often handle the situation in much better and professional way as compared to the untrained ones. Training leads to development of brain and it increases their capacity & ability to do any task in an efficient way as compared to untrained ones and this is known as Neuroplasticity.

Understanding Neuroplasticity

Neuroplasticity – or brain plasticity – is the ability of the brain to modify its connections or re-wire itself. Without this ability, any brain, not just the human brain, would be unable to develop from infancy through to adulthood

Neuroplasticity refers to the brain's ability to adapt. Or, as Dr. Campbell puts it:

"It refers to the physiological changes in the brain that happen as the result of our interactions with our environment. From the time the brain begins to develop in utero until the day we die, the connections among the cells in our brains reorganize in response to our changing needs. This dynamic process allows us to learn from and adapt to different experiences" – Celeste Campbell (n.d.).

Our brains are actually phenomenal and work in a truly extraordinary manner; unlike computers, our brains are also built on certain specifications and receive

periodic updates, knowingly or unknowingly. It creates various pathways and fall dormant, new ways are created or discarded, depending on our experiences and observations.

When we learn something new, our brain generate new neurons and a connection is established between our neurons. Our brains automatically start to rewire to adapt to the new circumstances. Though this happens on daily basis, it is something that we can encourage and stimulate for our growth and development.

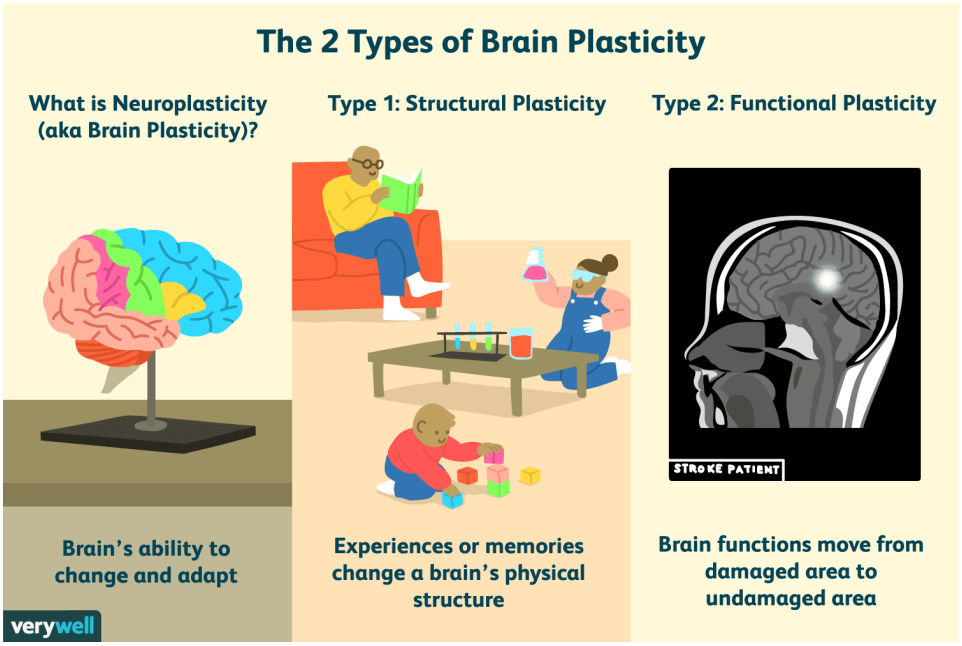

Figure 1

The term "neuroplasticity" was first used by Polish neuroscientist Jerzy Konorski in 1948 to describe observed changes in neuronal structure (neurons are the cells that make up our brains), although it wasn't widely used until the 1960s.

However, the idea goes back even farther (Demarin, Morović, & Béne, 2014)—the "father of neuroscience," Santiago Ramón y Cajal, talked about "neuronal plasticity" in the early 1900s (Fuchs & Flügge, 2014). He recognized that, in

contrast to current belief at that time, brains could indeed change after a person had reached adulthood.

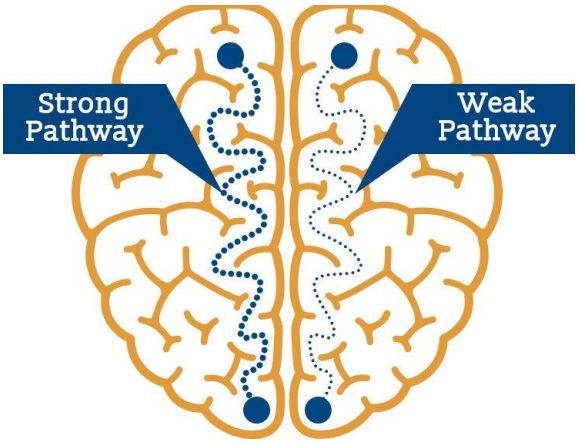

Figure 3

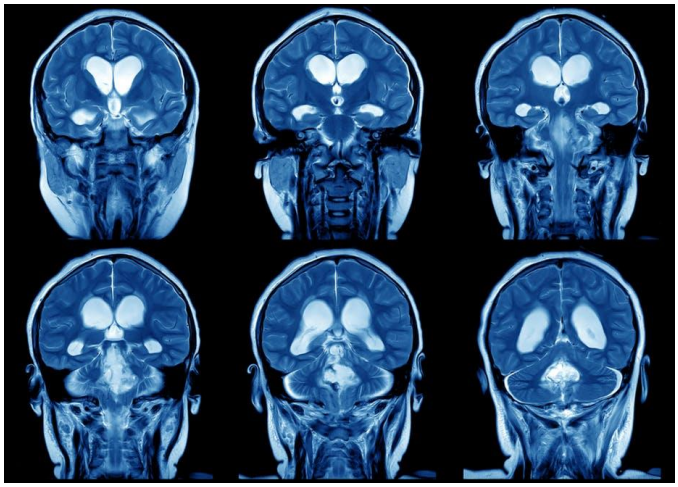

Figure 2

These images clearly show how our brain grows and develop every moment by different learning and through varied experiences. Moreover, anything that doesn't grow dies out and doesn't lead to further growth. It's a tendency of nature that anything which is not in progress and in not use over a period of time, nature considers it as non functional. It starts degenerating the organ and gradually it stops responding further.

Our brain needs growth and continuous learning to grow, just like a knife needs sharpening periodically to sharpen its cutting edge else it looses its cutting capacity and becomes blunt. It is not considered as usable anymore. Same is with sharpening of our brains specially with the adults and with golden age.

It is a myth that brain stops growing with the approach of "Golden age". Growth is a continuous process until death. Continuous training and tuning helps in development and growth of brains but also regenerate the dead cells and neurons in any age. If we continue to learn new activities, skills or languages even as

adults, it increases our ability to adapt to new changes and accept new challenges. These challenges are easily accepted by a trained brain. This increased ability requires the brain to have a mechanism available to remember so that knowledge is retained over time for future recall.

Literature Review

According to Rick Hanson, Ph.D. – ***Buddha's Brain: The Practical Neuroscience of Happiness, Love, and Wisdom*** *"...we can actually use the mind to change the brain . The simple truth is that how we focus our attention, how we intentionally direct the flow of energy and information through our neural circuits, can directly alter the brain's activity and its structure. The key is to know the steps toward using our awareness in ways that promote well-being."*

According to a study conducted on jugglers by **Emma J. Harding, Elizabeth S. Paul and Michael Mendl from Centre for Behavioural Biology, Department of Clinical Veterinary Science, University of Bristol.**
The experiment was conducted on two groups of jugglers. Both groups were inexperienced in juggling at the time of their first brain scan. Both groups were given 3 months to learn a classic three-ball cascade juggling routine. They were then given to practice 4 ball cascade juggling routing. It was observed on the change of grey matter of brain on those who practiced and those who were didn't. It was observed that the grey matter of the brains of the jugglers showed a significant change whereas the grey matter of the non jugglers did not show any change in the scan which is evident that training has a great impact on the brain and it makes it work better.

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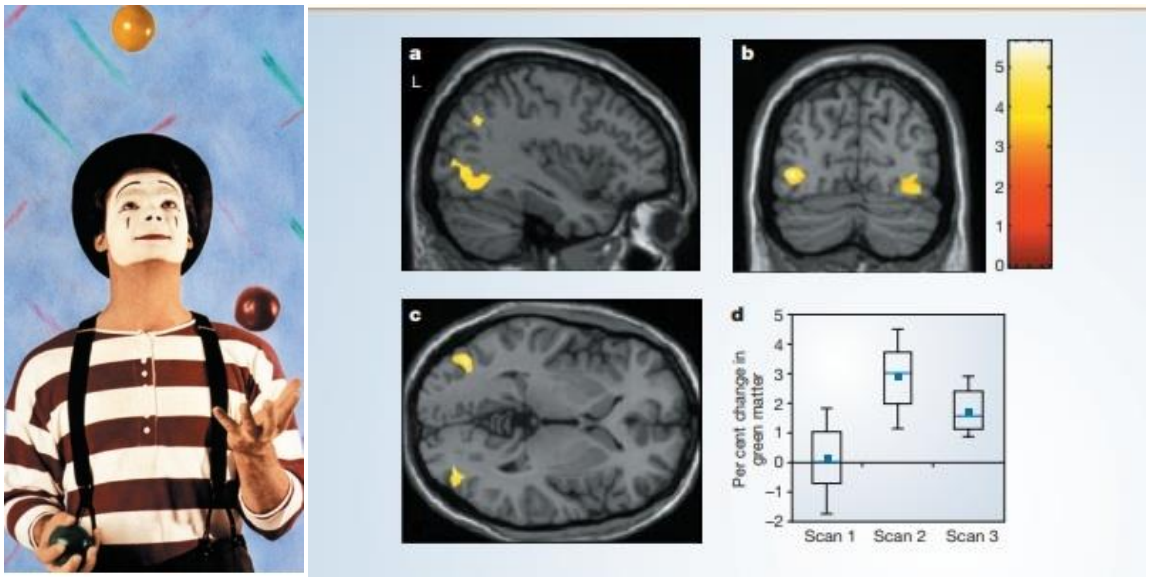

Cognitive skills influencing brain wiring

This scan was a great evidence to understand the correlation between Trainning and neuroplasticity. Our cognitive skills are the foundation skills that our brain uses to think, act, read, learn, remember, reason and focus. Cognitive skills play a great role in processing the entire information. To develop them our brain needs continuous growth and rewiring. There have been times when the long gap in the training numbs the sharpness of the brain and the functioning gets affected. It is proved that whether humans or animals performance comes better if they undergo a specified training.

Most important factor if we see here, cognitive skills plays a very important role in processing any new information, which means no matter what information we receive, grasping, understanding and retaining or even bringing it to use is impacted if any of or learning and cognitive skills is weak. It is very much impacted by poor neuroplasticity.

If we take a look at the statistics of need of training and development in western countries we will find that even the professionals in Western countries are seeking

ways to enhance their cognitive skills as they have realized the importance of Neoroplasticity in daily life.

Experiments have been done not only on adults but also on infants and kids to assess their motor skills and the way their brain functions. In the study it was found the kids who were trained well to go to washroom, washing hands, eat themselves and self discipline performed well as adults and grew as independent individuals as compared to those who did not get any type of training or grooming. Those kids still were bedwetting, wanted to be fed by parents, disorganized in handling their stuff etc.

This shows that training is absolutely essential for every age group, humans and even animals to make the brain work better and to instill better growth of neurons.

Now if we take examples of adults we can see that the trained individuals performing in much better way that the untrained ones in every field. Knowledge and training becomes obsolete very fast these days. One has to keep updating himself with updated technology and trends to stand in the competition.

The question again comes here is then why does training and development is still taking a backseat in Indian scenario in most of the organizations specially in cities with B or B+ level ? Where we can see the great difference in the two employees, one who has come from a trained background and the one who is still an untrained one. It is still taken as *"Icing on the cake"* rather than *"Need of the hour"*

Future Implications

Links

https://positivepsychology.com/neuroplasticity/

http://dbm.neuro.uni-jena.de/pdf-files/Draganski-Nature.pdf

https://thebestbrainpossible.com/your-life-shapes-your-brain/

https://theconversation.com/what-is-brain-plasticity-and-why-is-it-so-important-55967

https://www.learningrx.com/what-is-brain-training-/what-are-cognitive-skills-/