

Creating Necessity for Neurogenesis through Play and Positive Activities

All the brain health topics that I have written about are to some degree a treatise on how to work on cognitive resilience, as well as creating a neurobiological sense of necessity to motivate neuroplasticity. But working on one's cognition and brain health does not have to be all work and no play. In fact, engaging in physical and playful activities, indulging your curiosities, and allowing yourself to have new experiences can be some of the most effective ways to inspire brain neuronal growth (Psychology Today, 2023). That is how children learn, so why can't we?

Neuroplasticity is the brain's ability to grow, adjust, and adapt to the external environment and internal brain trauma by changing neuronal connections and generation of new neurons (Psychology Today, 2023). Neuroplasticity is demonstrated primarily during early childhood when the individual learns how to interact with the external environment while using their senses and body. There is a significant increase in synaptic connectivity and neurogenesis after birth and during early childhood while learning to interact with the environment, with significant neuron pruning of unused synapses and neurons that are not used after the initial connections are made (Pinel, 2009), or found necessary.

It was assumed by many psychological and neurological researchers up until the 1990's that the brain was unable to change and did not engage in neurogenesis, or creation of new neurons, after childhood (Pinel, 2009; Psychology Today, 2023). Researchers assumed that after this significant pruning and myelination of learned repeated senses and behaviors that an individual's neuronal connections could not be changed in adulthood. However, due to the adherence to the principles of the scientific method in practice and philosophy, studies over the last 40 years have confirmed that the brain has the capacity to adjust connections between neurons, or continue to learn, as well as generate new neurons in adulthood. Current research has found that most of the neurogenesis occurs in the hippocampus and olfactory bulbs (Pinel, 2009). The hippocampus's primary function is learning and memory, which would make sense why this area of the brain continues to create new neurons.

There is a catch though. The brain and or the neurons need to have a sense of necessity to generate new connections and maintain the connections you have. The neurons require neurotrophic signals to maintain neuronal connection, grow new connections, and to grow new neurons (Psychology Today, 2023). Without neurotrophic signals, the neuron will engage in a genetically programmed cell death called apoptosis. Basically, you use it, or you lose it. The brain will gradually prune away unused nerves through the neurobiological assumption that they are unneeded.

Now much of the research and focus on neuroplasticity has been on the brain's ability to adapt and grow new connections and or regain abilities after a traumatic brain injury. For example, surrounding regions of stroke damage in the brain have been found to create new neuronal connections for the damaged regions to regain some of the lost functions of the damaged brain tissue (Psychology Today, 2023).

However, trauma does not have to be the necessity that inspires your brain to engage in neurogenesis and or create new connections between neurons. Just practicing routines or repeating behaviors will signal the maintenance of already established neurons. Many people have assumed that once they have learned something that they no longer need to practice or maintain those learned skills;

however, recent research on the effects of stress and lack of neurotrophins due to depression and negative thoughts have been linked to loss of synaptic connections and neuronal pruning, which may increase the potential for degenerative brain disorders later in life (Psychology Today, 2023).

So, why not create a sense of necessity for the brain to create new neurons and maintain memories and abilities through being active? Some of the best methods for maintaining neuroplasticity are; playing, engaging in positive social interaction, engaging in new activities, being in enriching and stimulating environments, practicing positive or personally rewarding activities, engaging in cognitive and mindful mental activities, and developing a sense of purpose (Psychology Today, 2023).

You can have fun, make your brain feel like it must create new neurons, and improve your overall brain and cognitive health. So, what fun are you going to challenge your brain with today?

Pinel, J. (2009). *Biopsychology*. Pearson.

Psychology Today. (2023, July 31). *Neuroplasticity*.
<https://www.psychologytoday.com/us/basics/neuroplasticity?>