

Editorial

Victory Over Stress: The Power of Brain Plasticity

Anuluxshy Balasubramaniyam^{1*}

¹Faculty of Engineering and Science, University of Greenwich, Medway Campus, Chatham Maritime, Kent, ME4 4TB, United Kingdom

*Corresponding author: Dr. Anuluxshy Balasubramaniyam, Faculty of Engineering and Science, University of Greenwich, Medway Campus, Chatham Maritime, Kent, ME4 4TB, United Kingdom, Email: A.Balasubramaniyam@greenwich.ac.uk or anu2november@gmail.com .

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Abstract

The amygdala which is located in the medial temporal lobe of human brain functions as the integrative centre of the alarm circuits of our body. It receives information on the environmental insults from the hippocampus via a faster route and from the prefrontal cortex via a slower route. Since hippocampus is involved in processing sets of stimuli, i.e., the contexts of a situation, the faster pathway provokes particular memories and makes us susceptible to have strong emotions. On the other hand, the slower route via the prefrontal cortex allows us to be rational, since the prefrontal cortex sub-serves our highest order cognitive abilities. Stress promotes structural changes in the brain, the prefrontal cortex in particular, shrinking the capacity of our brain for higher functions. Adopting changes in our lifestyle helps ward off the detrimental effects of stress exposures and restore our brain to its full capacity, since our brain is malleable throughout life.

Introduction

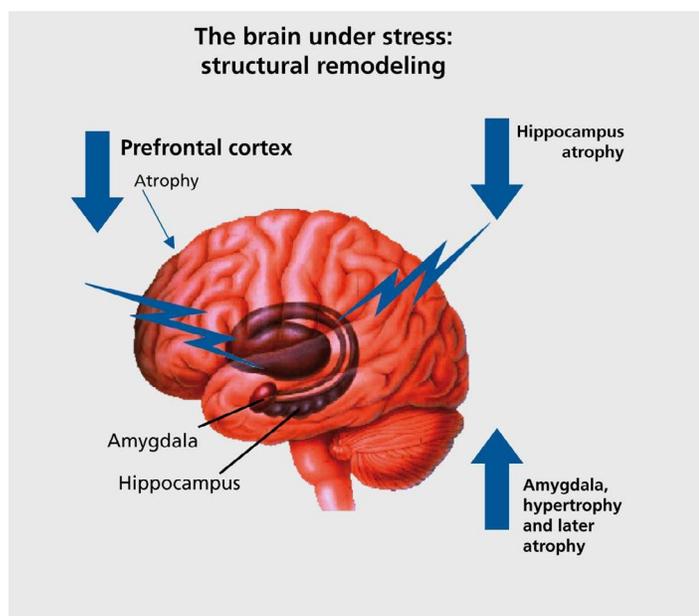
If anyone asks me what I truly want to be, I would say: I would like to be the sweet, free being whose smile spread to her eyes and who sang and danced freely, that I have once been, and lost to a pre-schooling incident, when a familiar, friendly head-teacher threatened to beat me. After this distressing event, I started to wear a rather timid, too quiet personality that I had worn throughout my schooling, in particular. If I relate this story to my younger cousins, they would laugh and say: 'You're the kind of person that gets butt hurt'. May be they are right, but neuroscientists would argue that the nature and wiring of human brain are the real culprits.

Our body's alarm circuits are grouped together in the amy-

dala, an almond-shaped set of neurones, located deep in the brain's medial temporal lobe. Whilst the amygdala decodes emotions and modulates autonomic responses associated with fear and fear conditioning, its close connection, the hippocampus, in addition to storing and retrieving explicit memories, specializes in processing sets of stimuli, i.e., the contexts of a situation. Together, these two are responsible for our strong emotions triggered by particular memories and anxiety provoked by the entire context associated with a traumatic event.

So, are we to be held hostage to any trauma we encounter in life? Absolutely not; information on our environmental insults reaches the amygdala through another longer, slower, but precise route via the medial prefrontal cortex, the most

evolved brain region, sub-serving our highest order cognitive abilities. This superior prefrontal cortex gives us the ability to confront our fear and make the waves of anxiety disappear, allowing us to choose the right course of action rationally.



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From an evolutionary standpoint, this wiring with the amygdala as the integrative centre makes absolute sense. The immediate need is to escape a danger and the need to distinguish an illusionary threat from a real one comes second.

Does this mean that everything could be picture perfect? Not entirely. We are living in a world that is not short of a wide range of environmental insults, in other words, stress, and the prefrontal cortex, our wise counsellor, is hugely sensitive to the adverse effects of stress. It has been demonstrated that even quite mild, acute, uncontrollable stress can result in rapid, dramatic loss of prefrontal cognitive abilities whereas chronic stress can cause structural changes in prefrontal dendrites, which consequently affect how the brain functions [1]. So are we left without any options but let these inevitable stressors disfigure our overly sensitive prefrontal cortex and shrink the capacity for our higher cognitive abilities? Of course not; a few changes we adopt in our lifestyle will not only help us overcome stress in our day to day life, but will restore our whole brain modified by the detrimental effects of past stress exposures to its original superiority, owing to the plasticity of our brain.

The habits listed below which is by no means an exhaustive list have the power to turn one into a confident, calm, empathetic human being prone to achieve great things by decreasing the level of cortisol, the stress hormone, which at elevated levels makes our brain predisposed to be in a constant state of fight or flight [2], with a lesser capacity for higher functions. They

could also work by increasing the levels of dopamine, a neurotransmitter that helps regulate movement and emotional responses, which not only enables us to see reward but also to take action to move toward them and, oxytocin, a hormone and neurotransmitter contributing to relaxation, trust and psychological stability. There are other biological molecules too that take part in stress-signalling pathways in our body.

- Adopt a body posture of confidence even when you don't feel confident [3].
- Smile even when you don't feel like it [4].
- Have sufficient sleep
- Do regular physical activity
- Deep breathe
- Meditate (Practising Loving Kindness Meditation helps more) [2]
- Foster a feeling of genuine connectivity with family, friends, etc.
- Have a pet, dog in particular
- Laugh and be light-hearted
- Listen to music
- Be surrounded by positive thinking people
- Take appreciation and approval in and leave insults out (but not constructive criticism)
- Have faith/ hope
- Be in harmony with your conscience

These little steps may look simple but some of them are not so easy to exercise at every circumstance until one becomes accustomed to them. Still they are worthy to pursue as they do have the potential to protect our precious brain from the detrimental effects of stress exposures and will take us a long way towards peace and success. Sticking to this to-do list has magically taken me to the brim of success and saved me from spells of distress. On the other hand, I had nearly fallen on the other end of the spectrum of victory by doing the exact opposite on the list. So, I know they work.

The good news is we can start practising these habits at any age for our brain is malleable throughout life. As far as 'finding my true self back' is concerned, well, it does need solid determination and perseverance, but it is entirely possible.

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