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Perspective

How Forming and Breaking Habits Changes the Brain

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Over the years there have been several arguments on whether the brain changes in shape, size, functionality or content. It is only recently that scientific research has proved that the brain does change based on our thoughts, emotions, behaviors and experiences. This concept is termed as neuroplasticity. Our brains form neural connections based on what we do constantly. Our repeated mental states, responses and behaviors become neural traits.

We are able to form or break habits because of the brain's plasticity. We often engage in activities, either physically or mentally, because we derive some sort of pleasure out of them. When this occurs, dopamine, the feel-good hormone, which is also essential for neuroplasticity is released. Dopamine is a major component in the neural circuitry that produces rewarding feelings which reinforce habits.

The first time someone does something, be it eating, gambling, using recreational drugs, looking at sexual photos or videos or even engaging in intercourse, dopamine is released. This causes one to seek out the activity again thus dopamine is released in small amounts before the activity causing a dopamine surge which in turn motivates one to engage in the action. Neurons fire at the beginning and end of an activity and dopamine is released during the activity thus a new neural pathway is formed in the brain and since the brain always takes the path of least resistance, the pathway is strengthened and solidified and as a result a habit is formed.

Assuming that the habit formed is a negative or undesirable behavior, how do we break it? And what does changing the behavior do to the brain?

Breaking habits is easier said than done. It requires a lot of focus and dedication. The most used neural pathways become well-worn and with time run automatically. Fortunately, as you practice new behaviors and work on creating new neural pathways, the old ones are weakened. Working on forming new habits requires a lot of conscious mind direction. For instance, if you constantly focus on quitting smoking as a stress reliever and find alternatives such as talking about your problems, setting achievable goals, reducing the number of cigarettes you smoke in a day, going for a walk when you feel the urge to smoke, envisioning your success and reviewing your goals daily, you rewire your new habit of stress relief. Changing older habits is a lot of work and if you don't fully put your mind to focus on the change, the existing routines will continue to run automatically.

Repetition, enough rest, constant practice of positive thinking, emotions and visualization contribute to change of habits and in turn neuroplasticity as the brain is rewired to accommodate the new forming habits. Another great way to change habits is through meditation. Researchers have proved that meditation activates the prefrontal cortex in the brain which helps our bodies shift from stress response to relaxation response. When you are stressed, because of our survival instincts, the brain takes the path with the least resistance consequently strengthening the old neural pathways making it harder to break habits. Therefore meditation makes it easy to focus and practice new habits thus solidifying new neural pathways.

Now that we have stopped focusing on the old neural pathways and they have weakened, what happens to them? The brain gets rid of them to create space for new neural pathways through a process known as Synaptic Pruning. The less used neural pathways are marked by protein C1q and once the microglial cells detect the mark, they bond with the protein and destroy the synapse. This all takes place when we are asleep. The brain cells shrink up to 60% which is an example of neuroplasticity. Our minds, through our conscious thoughts, play a major role in what happens in our brain. We should therefore be keen on what we focus on in order to feed the intended neural pathways.

The interrelation between psychology and brain behavior is wide and formation and breaking of behaviors is just a fraction of it. Even though breaking habits seems hard and time consuming, it is very possible. The brain is powerful but so are our minds. We are very capable of having full control of our thoughts, emotions and behaviors if we focus completely and trust that we can do it. It is remarkable knowing that our brains can change in so many ways but what makes it more thrilling is knowing that we have the ability to control how it changes.

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