

Your Brain On Meditation

By Kristi Lee Schatz for Medium
11 February 2019

The latest research in neuroscience and epigenetics depicts a fascinating tale of how our experiences and environments create our reality and alter our biology. The stories we play in our minds create neurological loops that keep us seeing reality through the lens of the past. Our emotional connection and perception of an experience creates a concoction of neurochemicals that flood our cells with information about how to respond to a situation physiologically.

When you shift your emotional relationship and narrative of the story, you change which chemical messengers are delivered to your cells and thus engage in a biological reprogramming process. Changing your story reshapes your brain's neurological structure because you are actively choosing to be in the present moment, rather than lost in an old way of seeing the world.

The following excerpt is from "[*Power of the Mind in Health and Healing*](#)" by [Keith Holden MD](#). Holden is a physician who is board certified in Internal Medicine and trained in Functional Medicine. He has graciously contributed his research findings and insights to help explain some of the science that supports the mind-body connection. If you're interested in exploring more about the scientific research and Holden's unique perspective on health and healing, then check out his book. He is an extraordinary human being who takes personal responsibility to a whole new level.

MIND-BODY GENOMICS

Mind-body genomics is the study of how your mind influences your genes to turn on and off. This field of study is in its infancy, but early research is producing some amazing results. By practicing mindfulness and meditation, you learn to regulate your thoughts. By regulating your thoughts, you can trigger your relaxation response. The relaxation response causes genes to turn on and off that optimize your health. A study co-authored by Dr. Herbert Benson in 2013 shows how this happens.[\[i\]](#)

Dr. Benson is a medical doctor and one of the founding fathers of mind-body medicine. He coined the term "relaxation response" almost forty years ago. He says the relaxation response is the opposite of the stress response, and is induced by any mind-body practice that produces relaxation. Dr. Benson set out to study if the relaxation response turned genes on and off. Participants in this study included inexperienced and experienced practitioners of the relaxation response.

Both groups completed eight weekly training sessions. In these training sessions, they learned a relaxation technique, diaphragmatic breathing, body scanning, mantra repetition, and mindfulness meditation. They also listened to a 20-minute audio track guiding them through the same sequence at home once a day. Researchers analyzed gene expression in participants at the beginning and at the end of the study and here is what they found.

The relaxation response turns on genes involved in the production of energy by mitochondria, which are the batteries of the cell. The relaxation response suppresses inflammation and turns on genes that dampen oxidative stress. This is analogous to reducing body rust. The relaxation response turns on genes increasing insulin production, which has the potential to result in better blood sugar regulation. The relaxation response also has an anti-aging effect, in that it preserves the ends of your chromosomes called telomeres. Not surprisingly, all these beneficial effects were more pronounced in the experienced practitioners.

MEDITATION IS ANTI-INFLAMMATORY

Science shows that mindfulness and meditation turn genes on and off to reduce inflammation. Because excessive inflammation causes disease, a reduction in excessive inflammation translates into health benefits. A study published in 2014 shows that the anti-inflammatory effect of mindfulness happens quite rapidly.[\[ii\]](#) In this study, a group of expert meditators underwent eight hours of intensive mindfulness.

Researchers performed a gene analysis comparing the expert meditators to a control group who underwent eight hours of quiet non-meditative activities. What they found was that an intensive day of mindfulness in expert meditators is a powerful anti-inflammatory. It triggered the same gene pathway as the anti-inflammatory drug Celebrex, but without the side effects.

The body creates inflammation through several genetic pathways. One involves a cell protein called nuclear factor kappa B (NFkB). Multiple studies show that mindfulness meditation reduces inflammation by turning off NFkB.[\[iii\]](#),[\[iv\]](#),[\[v\]](#),[\[vi\]](#)

By using mindfulness and meditation to reduce stressful thoughts, you trigger a relaxation response. This relaxation response has a positive influence on how your genes turn on and off, or how they express. So by learning to manipulate your thoughts, you indirectly affect how your genes express. It turns out you can also manipulate your thoughts to grow new neuronal pathways in your brain. Some call this self-directed neuroplasticity.

SELF-DIRECTED NEUROPLASTICITY

Neuroplasticity is your brain's ability to physically change and adapt. We used to think that neuroplasticity only occurred in early childhood. We now know that the adult brain is capable of creating new neuronal pathways. Your environment and your actions influence your brain's ability to create new neuronal pathways. This requires a sustained change in your pattern of neural activity. For your brain to create new neuronal pathways, you need to do something in a repetitive manner to create long-lasting changes.

An example of neuroplasticity is what occurs when someone undergoes rehabilitation after a stroke. Rehabilitation to recover neurologic function forces the brain to create new neuronal pathways. These new pathways take over function for the areas of the brain injured by the stroke.

Self-directed neuroplasticity is the ability to create new neuronal connections in your brain through regular mindfulness and meditation. Here's an example. In 2005, researchers imaged the brains of experienced meditators. They found that long-term meditation produces neuroplastic effects. It thickens areas of the brain associated with attention, interoception, and sensory processing. [\[vii\]](#) Interoception is your awareness of your body's internal regulation.

These findings were more pronounced in older long-term meditators. It suggests that meditation may help prevent age-related brain atrophy, a common condition in the elderly. A more recent study published in 2015 reinforced this finding. It showed less age-related brain atrophy in long-term meditators compared to those who don't meditate. [\[viii\]](#)

Regular meditation is a form of self-directed neuroplasticity. You can use your mind to make positive long-lasting changes in the neuronal pathways of your brain. When you meditate on a regular basis, you get better at holding your attention in the present moment. This may translate into improved focus and less stress. You get better at processing sensory information. This may translate into you becoming more intuitive. You also become more self-aware. This may translate into better self-regulation of your autonomic nervous system. Regular meditation may even help prevent age-related brain atrophy, which has the potential to protect against memory loss and improve brain function as you age.

– end of quote from [*"Power of the Mind in Health and Healing"*](#)

That's pretty epic! When we choose to rework our inner landscape and focus our attention on purpose, we break the bond of neurons habitually firing together and alter the plasticity of our brains. It also alters which neurotransmitters are released and forges new neural pathways.

Actively rewiring our brains for more efficient processing requires us to first acknowledge this as a possibility. Breaking old habits can feel daunting, but just knowing that our little daily actions amount to great changes in our physiology and psychology can make all the difference.

Taking personal responsibility is about owning how much power you actually have over the quality of your responses, relationships, stories, and health. This principle is about cultivating self-awareness of your autopilot reactions without judgment and choosing moment to moment to feel your feelings and own them rather than project them.

Taking responsibility for your life is often associated with activities like properly managing your finances, honoring your commitments, and pulling your weight around the house and on the job. While these are very important, so is the quality of your experiences and inner life. The latter is rarely a topic of discussion in mainstream Western society or the public health and education system, yet it's critical to our success as humans.

What if you learned at an early age that your inner world determined the quality of your experiences and could be a catalyst for gene expression in your body? Would you be more mindful of ensuring you're taking daily steps to clear the noise from your mind? Would you make an effort to stay in the present moment to avoid autopilot syndrome? Would you be more inclined to use visualization techniques to change the pictures in your mind? Would you teach your children these principles in a comprehensible manner so they fully understand how their minds impact their overall physical health and quality of life? I'm fairly certain that if we all understood just how connected our minds and bodies are we would be more adamant about making those changes we've been putting off.

Whether we like it or not, the majority of our life is likely controlled by habitual responses with minimal conscious awareness. Many of these response patterns are extremely adaptive, like walking, eating and driving. They require little conscious attention because the process is committed to memory. That's great! However, in the same way we learned how to feed ourselves, we also learned how to respond emotionally to stressful situations, how to communicate our feelings to others, and how to behave appropriately in social situations.

Consider this: When someone upsets you, do you think about it, or does it just happen? When you get triggered, your mental, emotional, and behavioral response is likely an automatic reaction and not a conscious choice. The reality is that life does not happen to us, it just happens and we respond. The quality of our response is ultimately up to us.

By nature, we are creatures of habit who develop adaptive responses to survive. This highly successful survival function allows us to convert our experiences of the world into perceptions that determine the best way to respond to different situations. These response patterns are committed to our memory bank for easy retrieval, and we rely on them to get us through life. When we encounter a situation that resembles something we've experienced before, our autopilot system retrieves the file and presses play (oversimplified metaphor, of course). Sometimes the response encoded on the tape seems perfect for the situation, and other times it causes more harm than good.

However, it's important to know that the only thing that actually exists is the here and now. That means no tape from a past experience is ever going to be the perfect response to the present moment because each new moment is a unique moment.

These learned responses begin to develop during childhood as we observe the behavior of others and through our own trial and error. If we learned to view a situation as a threat, we will create a memory to avoid similar situations in the future. If we are unable to avoid repetitive exposure to the threat (i.e. physical or emotional abuse as a child) we will in turn develop adaptive coping mechanisms that helps us best survive the situation. Unfortunately, sometimes these learned responses can lead to fear of expressing our feelings, shame, emotional repression, or even disruptive outbursts when threatened. These repetitive reactions become habit, influencing our responses and how we handle stressful situations mentally, emotionally, and physically. These patterns make up our personality profile and influence all areas of our lives. But is that who we really are?

Living on autopilot means responding without self-awareness and falling victim to the logic of our own mind. Mindfulness-based practices help us regain control over our autopilot function by literally retraining our brain to become fully present in the moment, making us more aware of our automatic reaction. This pause gives us the ability to make a conscious choice to stop the response and just observe.

In general, our autopilot system is not a bad mechanism. It's necessary for survival and basic functioning. The issue arises when we self-identify with this system as the only mode to relate to the world, especially human interactions.

This is where personal responsibility over the quality of your inner world comes into play. Are you taking the necessary steps to ensure you are responding from the present moment? Are you actively training your brain to know how to pause? Does your mind race out of control with worrying thoughts but you choose to do nothing about it? Can you express yourself freely, or do you feel restrained in self-expression because of the stories you tell yourself? Are you spending all of your energy rehashing past stories and projecting onto others?

Where you choose to place your attention determines the quality of your experience. If you have an unsettling feeling and choose to make a story about why that is bad, you will feel bad. If you have an unsettling feeling and you're simply curious without judgment, allowing the feeling to be OK, and focus your attention on loving the part of yourself in pain, you will feel love. It's simply a shift in perception.

I can't even begin to describe the countless times my autopilot system failed me, especially in relationship with others. I would allow my rambling mind to focus on itself, planning what it might say next, yet failing to really hear the person in front of me. I would internalize criticism and use it as evidence to validate that I wasn't good enough. I wasn't doing any of this intentionally; it was an automatic response from a part of myself that didn't feel good enough. It was only when I learned to pause and be present that I was able to make a conscious choice to respond differently.

SELF-SABOTAGE

We are all masters of sabotage from time to time. Our core beliefs and old habits are so engrained in our psychology and physiology that we unconsciously create issues to validate the need to hold onto our current perception. We are more committed to maintaining the status quo than having a new experience, even if the status quo means hateful self-talk and relationship drama. We have become biologically addicted to our current way of being and need to keep creating drama to get the same rush of chemicals to feel "normal."

If you've bought into the perception that you are not worthy, good enough, or lovable you will build a barrier to anything that challenges that core belief. Experiences will be filtered through this lens, keeping you in a vicious cycle of only seeing yourself and the world in one way.

It's fascinating to ponder the reality that our perceptions might be the only thing limiting us from blossoming into our full potential. Perceptions come in many shades, like tinted glasses that trick our minds into believing the world is a certain color. For me, fear-based perceptions shade my reality with a sense of darkness, resembling the shadows that linger in my unconscious. If I am committed to my attachment that the world is dark, then darkness is all I will see. Holding onto fear not only alters our perception of reality, it also draws a line in the sand for what we are capable of achieving.

Try opening yourself up to receive love. Accept the compliment instead of deflecting it. Raise your hand to ask the question even if your mind is telling you that you're stupid. Have a new experience that challenges your current way of being and watch how you grow. We are all a work in progress and stretching ourselves can sometimes be clumsy, like a child learning to walk. We don't judge a child for falling or wobbling when he's

taking his first steps, so why would you judge yourself or anyone else? Baby steps add up and will eventually become enough evidence that change is possible.

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