

MY
MYNDPROJECT
OUTSIDE YOUR MIND WHERE IS THE PROBLEM?

EVOLVE YOUR BRAIN



WHAT'S IN IT FOR ME?

Discover the incredible power of your brain, and use it to change your life.

For most of medical history, humans misunderstood their own brains.

It was thought that the brain, like the stomach or lungs, stayed pretty much the same once it had formed. But modern neuroscience has probed the mysteries of the brain to the point where the exact opposite is now understood to be true. As the thinking organ, the brain isn't just shaped by nature – your genetics – but also by how you nurture it. In other words, how you use your brain influences its structure and functioning.

But if you've ever wondered why it was so difficult to change your habits around something even when you really, really wanted to, you know that the awesome power of the brain has a downside. The more you strengthen some areas, through bad habits or recurring thoughts, the more the brain will try to stick to them – and play electrochemical tug-of-war to get you to go along.

Given the outsize role your brain plays in your perception of reality, understanding how and why it works can unlock a host of possibilities to use it wisely and well. So if you've never thought about what you're thinking with, read on.



YOUR BRAIN AND YOU

Take a moment, and picture what you did this morning. Maybe even close your eyes to help you summon up the details.

Whether you slowly shuffled to make your morning brew, or sprang from bed full of energy and ready to take on the day, your brain did a lot just revving itself up into an active state. Perhaps your morning included making breakfast, grooming yourself, and getting dressed. Did you plan out your day, check emails, or chat with family?

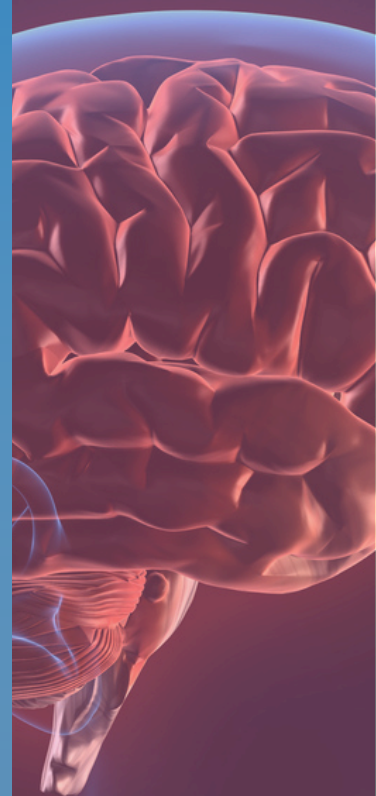
Let's break that all down, and consider how many remarkable things your brain is doing in the first hour of the day.

Moving from sleep into waking consciousness is a complex electrochemical process. To stand up and move, your brain processes sensory input from your environment and sends signals for muscle movement. Your visual cortex processes your journey to the bathroom even if your eyes are barely open, and your memory of previous mornings helps your brain anticipate what comes next.

You didn't even have to think about breathing or blinking or swallowing. You didn't focus on keeping your heart beating, your body temperature steady, or your blood circulating either. And things get even more complex when food or drink hits your system, and a flurry of chemicals called neurotransmitters are released, causing a cascade of effects from raising your blood sugar to kicking off digestion.

If you thought about the day ahead, you activated even more areas of the brain – ones that handle reasoning and decision-making. Adept at predicting the future from past experience, these areas help you make good long-term decisions. After all, you might not feel like going to work or paying bills today, but you've learned that not doing so can come with serious consequences.

If you woke up with challenges like pain, trauma, addiction, or mental illness, you know all too well how the brain shapes the way you experience the world. But does that make your biology or history your destiny? Not necessarily, because the brain is also incredibly adaptable.



THE MATTER OF THE MIND

Taking a closer look at the brain begins to unravel how all this activity is possible. If you could zoom in on a small piece of brain tissue the size of a grain of sand, you'd see it contained about a hundred thousand neurons, or nervous system cells. Your whole brain has over a hundred billion of these cells.

Resembling tiny trees, each separate neuron is adept at gathering information through its branches and passing it along to the next cell at incredible speeds. Electrical nerve signals travel at 250 miles per hour and jump the gaps between individual cells like a spark in a spark plug.

The neurons in the brain, numerous as they are, squish themselves into folds in the outer brain to maximize space in the skull. Neurons outside the brain can stretch up to a meter long, snaking down the spinal column and throughout the body. This is your nervous system – the interconnected web of cells that sense everything from pain to heat to when your bladder is full. They also regulate things you don't have to notice, like your heart beating, your lungs breathing, and your gut digesting.

The human brain is pretty unique too. It's six times larger than other mammals' brains relative to body size. Interestingly, dolphins have a similar brain size relative to their mass, but their brains haven't evolved much for 20 million years. Human brains took an enormous evolutionary leap forward just 25,000 years ago.

The human brain's evolution is written in its structures. Like other animals, we have a brain stem at the top of the spinal column that controls basic life functions. Just above is the cerebellum, which controls your coordination and navigation through the environment. It's the most active part of the brain, and it plays a big role in your emotions. It also has more neurons packed into it than any other part. If you've ever heard the term reptile brain, it's because this oldest part of the brain exists in reptiles as well.

The midbrain appeared at least 150 million years ago and is sometimes called the limbic or mammalian brain because it's present in all mammals. This is where your autonomic nervous system is located – the part that regulates things you don't consciously control. Wrapped around the reptile brain, the midbrain contains many structures you might have heard of: the thalamus and hypothalamus, pineal and pituitary glands, as well as the amygdala, hippocampus, and basal ganglia.

It controls many of the systems we take for granted, like regulating hormone levels, blood pressure, and heart rate. Making up about one-fifth of the total brain size, it's responsible for impulses like fight-or-flight, food-seeking, and sex drive. It's sometimes called the chemical brain because of its outsize role in communicating through neurotransmitters – which we'll discuss more in the next chapter.

The neocortex was the last brain area to appear – around one hundred million years ago – and continued to evolve until about 25 million years ago. The neocortex handles the most complex and sophisticated of human brain functions: what we call “consciousness.” This part of the brain is aware of itself, makes choices, and predicts outcomes. It's the part of your brain that learns, imagines, and philosophizes.

Moving from the base of the skull outward traces biological evolution for hundreds of millions of years. And while they seem separate, they're in a never-ending electrochemical conversation you call “reality.”



IT'S ALL CONNECTED

So human brains developed in three increasingly sophisticated parts over the course of hundreds of millions of years, yet function as a single organ. How? Chemistry.

Along with electrical signals, chemicals known as neurotransmitters carry information through the brain. You've probably heard about serotonin or dopamine – two chemicals that play a big role in mood. But there are many others, and it's these chemicals that conduct the neurological symphony that is your perception of life.

There are two fundamentally different types of neurotransmitters. The first are excitatory, because they prime neurons in the system to allow signals to travel more quickly. The most important of these is glutamate, which binds to the neurons along the gaps between cells, and lets signals jump faster across the network.

The other type is called inhibitory, because they suppress activity along the neural pathways and slow things down. The most important of these is called GABA, which stands for gamma-aminobutyric acid. When it's present, nerve cells are less likely to pass signals along. This is an important "off-switch" neurotransmitter – just imagine if your nerve cells never stopped firing!

In fact, your autonomic nervous system, located in the midbrain, has similar on-and-off switches. The sympathetic nervous system is the one that activates during fight-or-flight responses. To help you survive, it releases adrenaline to quicken your heartbeat, increase lung capacity, and dilate your pupils to see more. It moves blood from the organs into the muscles in seconds, so you can attack or escape.

When the danger has passed, your parasympathetic nervous system kicks in and releases neurotransmitters to calm things back down. This is your rest-and-digest state; your heart rate and breathing slow, and your blood moves back into the organs so they can carry on with growth and repair. It's that lovely feeling after a big, satisfying meal when you feel sleepy.

In modern life, though, environmental stresses usually aren't momentary. When there's no clear signal that the danger has passed, the fight-or-flight response sometimes doesn't switch off. When it stays on, you may find yourself unable to rest, digest, or repair. The brilliant survival system from millions of years ago isn't great for long-term stress management, and the effects can be pretty severe.

But all of this information about your brain can help you work with it, not against it – which is exactly what we'll tackle next.

THE EVOLVED BRAIN KEEPS EVOLVING

As modern science has accelerated our understanding of the brain's remarkable abilities and evolution, one thing has become extremely clear: the brain changes and adapts with use, not the other way around. In other words, the brain's structure is shaped by how you use it. Science has dubbed this neuroplasticity.

To understand how it works, imagine you could look at brains using an MRI, or magnetic resonance imaging, while they were active

If you looked at the brain of a juggler while they were juggling, you'd see that their brain areas for spatial awareness, visual motion tracking, balance, and fine motor control were all extremely active. These areas of the brain would also be larger than those of a non-juggler. Years of practice have shaped the juggler's brain to be primed for juggling.

Watching a seasoned tennis player, you'd see spatial awareness and hand-eye coordination areas light up like a fireworks display. Observe the mind of a programmer, and you'd see pattern recognition and logic circuits aglow as they coded.

And it isn't just healthy brains that change either. Care for stroke patients has shifted radically in recent decades to challenge the brain during recovery – and thus create new neural networks that can substitute for damaged ones. The challenged brain rewires and repairs much faster and more fully than an unchallenged one, which is why early intervention makes such a difference in outcomes.

The brain changes under more ordinary circumstances too. Anything you do a lot, from daily habits to recurring thoughts, all have an impact on the physical structures of your brain and the working of your nervous system.

For instance, meditation – even for a short period of time – can influence the parasympathetic nervous system to kick in, which lets your brain know it's OK to rest and repair. If you're someone who experiences chronic stress, incorporating this awareness into your nightly routine can train your brain to let the parasympathetic system take over when you switch off your screens, turn down the lights, and lower the room temperature about an hour before bed.

To spark new pathways in your brain, you have to push beyond the discomfort of breaking old habits and patterns. Anyone who's tried to give up caffeine, smoking, or sugar can tell you about the high-stakes chemical game the brain plays on you when you try to stop. When the brain goes through dopamine withdrawal from a lack of sugar or nicotine, for instance, the whole body suffers. It's the extreme end of discomfort. But to overcome addiction, knowing it's a temporary effect can help empower the will to push through.

And learning to play an instrument, speak a foreign language, or tackle a new sport is challenging in a good way – it's the very thing the brain interprets as a signal to grow. In fact, an awareness of the brain and its neuroplasticity can empower a lot of changes, as we'll see in the last chapter.



CHANGE YOURSELF, AND YOUR BRAIN FOLLOWS

Real brain changes are going on inside of you right now as you read this MYNDSET. Your visual and language centers are processing these words, and your brain is organizing the information it's taking in and testing it against older information. You've stored some in your memory too – if your brain decided it was important information to store. In other words, just reading with a curious mind has made your brain change.

Bringing your full awareness to this process can be a powerful tool for overcoming personal challenges and living the life you want. For instance, awareness that the brain will grow new pathways as you learn something means that, even when the process is frustrating, it'll get better with practice.

That's because the brain's incredible efficiency means it's trying to exert as little effort as possible to maintain your activities. A practiced driver can drive miles and not remember doing it. Your brain wants to use past experience to predict future outcomes – even when doing so isn't what you want.

So now is the moment to understand that you, as a self-aware being, are capable of making the choice to shape your brain in ways you want. You can actually use your brain to outsmart itself by choosing to evolve it consciously – just like a good parent helps a child grow by challenging them and encouraging them while they master new things.

You already know how this change goes. It starts with discomfort, which begins when the brain tries to maintain its old habits and not exert the energy to form new ones. You can acknowledge this fact, and still not give in. Finding healthier brain rewards, from exercise or meditation, retrains the brain to crave these instead of fast food or mindless scrolling. Learning new things, and committing them to memory through practice, is the key to keeping the brain challenged, healthy, and active.

And when your brain and nervous system are functioning in peak condition, so are you. The healing benefits from more time to repair and recover are myriad, and the changes compound too. As your brain shapes around the challenges you set before it, the more it craves new challenges and growth.



FINAL

SUMMARY

The human brain isn't fixed or static; it's a constantly adapting marvel of complex evolution. With structure shaped both through genetics and use, this neuroplasticity can be harnessed to help push through the discomfort of changing behaviors, thought patterns, or habits. It can also greatly influence your health. Challenges help your brain thrive, which in turn encourages your nervous system to rest and repair – resulting in a healthier, happier you.

