

A dramatic photograph of a space shuttle launching at night. The shuttle is silhouetted against a bright, glowing plume of fire and smoke that billows upwards and outwards. The scene is set against a dark sky. In the foreground, the launch pad's service structure is visible, partially obscured by the massive cloud of exhaust. The overall mood is one of power and achievement.

BOOST YOUR MEMORY,

Focus and Performance
by Better Understanding
Your Brain

Boost Your Memory, Focus and Performance by Better Understanding Your Brain

Psychology is a fascinating subject for anyone who wants to learn more about themselves, about the way the world works and about how to have successful interactions with other people. Psychology is fascinating in this way because it provides us with effective models for understanding our thought processes and even what makes us human.

Psychology is used in this way to help us gain more insight as to the way our brains work and even to help treat and avoid mental illness.

But it can also be a fascinating tool for actually *enhancing* our capabilities. Once you understand how your brain works, then you can look for ways to get more out of it or even *upgrade* it. In this report, we'll be taking a look at some of the different strategies that psychology reveals to us that can be used to hack the way our brains work and to get more out of them.

And if you can do that, then you can be happier, more productive, more focussed and even *smarter*.

So, let's start with a little history lesson...

A Brief History of Your Brain

The study of psychology really began with Sigmund Freud and psychodynamic theory. Of course there was interest in the subject before then, but Freud pretty much brought us the first approach to therapy, the first 'talking cures' and the first attempt to really dissect why we think and behave the way we do.

Psychodynamic theory was highly popular and influential at the time but it has since fallen out of vogue. The central concept was that we have unconscious thoughts (not 'subconscious', which is a misnomer) and motives. We might do something for reasons that we are unaware of.

These unconscious thoughts often came from suppressed (hidden) aspects of our personality like the Id, or from buried traumas deep in our past. The purpose of psychoanalysis was to talk through

these issues and to help patients come to terms with every aspect of their personality, to prevent them coming out in destructive ways (i.e. creating psychoses).

The problem was that Freud linked almost every issue back to sex. Not only that, but there was no real evidence for the existence of 'suppressed' memories or desires. The biggest sin of all is that psychodynamics are completely unfalsifiable. They can't be disproven, meaning they can't be subjected to the scientific method.

So, perhaps in a backlash to this, we got behaviorism. Behaviorism looked at the subjective human experience as being an entirely learned one, accomplished through conditioning. Conditioning and reinforcement meant that the brain would learn to associate two things if they consistently occurred together. So, if you consistently experienced being punched every time someone gave you a grape, you'd learn to cringe at the sight of grapes.

The most famous experiment demonstrating how classical conditioning could work, was Pavlov's dog experiment. Here, he managed to train dogs to drool at the sound of a bell.

So how might complex human behavior arise from such a basic premise? It would occur through layering these different experiences on top of each other. As infants, we might reach blindly and find that something gets passed to us. In doing so, we learn to associate reaching with reward and learn the basis for communication. Further interactions with caregivers and others might help us to develop more complex patterns of behavior and communication.

Likewise, we could learn to walk simply by repeatedly stumbling and falling. We thereby learn to fear certain sensations and to gravitate toward others.

Behaviorists admitted that a particularly traumatic single event could much more rapidly increase this learning process. So, a phobia might be learned either by repeat reinforcement to create an association between a stimulus and a negative consequence, or it might be learned through one traumatic event. But the fact remains that it was *learned* and the behaviorist approach to treating this condition would be to help the patient 'unlearn' that link through 're-association' or 'disassociation'.

Behaviorism is an appealing theory because it is simple (satisfying the rules of 'Occam's Razor') and because it provides tangible results that are easy to repeat.

But there is a fair bit missing. Behaviorism boils *all* of the human experience to simple learned behaviors, learned through nothing but repetition. This suggests that there is nothing more to a

human than the ability to simply *rote learn* skills and behaviors. That our awareness is an illusion or a mere emergent property. And that our personalities are completely malleable.

Most of us would object and say that we have *some* kind of internal experience. And behaviorism would need something to that effect if it was going to explain why someone might have a phobia of a snake without ever seeing a snake, or how factors like our memories or context would impact on our behavior.

Enter cognitive psychology, or to use its full title, cognitive behavioral psychology. This school of thought takes behaviorism and then it layers on top a 'cognitive' element – an inner experience. In other words, it explains that our thoughts and that our emotions can actually end up influencing our perception of events and also creating new associations of their own.

So, if you continually tell yourself you are going to get laughed at if you try speaking in public, then you can actually cause yourself to learn to fear public speaking... even without actually having a bad experience of any kind!

CBT might approach a phobia by using reassociation methods then, but it would also look at the cognitive element – by looking at how someone might think about a stimulus or a situation (using mindfulness) and then teaching them to deconstruct those beliefs and to assume more constructive and helpful narratives. This can also be useful for addressing things like depression, low confidence and more.

CBT is incredibly powerful because it has been shown to get tangible results without even requiring one-to-one meetings between a therapist and a patient. They can accomplish wonders themselves simply by following written instructions!



THE BIOLOGICAL ELEMENT

The Biological Element

Alongside all of this development was increasing understanding of the human brain and how it operated in a physical sense.

With Darwin's theory of evolution came an evolutionary perspective on psychology – the understanding that all behavior must have evolved and must therefore be adaptive to our survival. This is very apparent when it comes to our motivation and our desire for food, sex and shelter but even more complex behaviors can be seen as directly aiding our survival or being a by-product of an adaptive trait.

If you've read the full book then you will know by now about neurons and neurotransmitters. The connectome (web of neurons) and brain plasticity can be seen as perfect physical representations of behaviorism in action. Neurons that fire together, wire together. So when Pavlov repeatedly rang that bell while serving up food, the dogs learned to associate the bell with food because they created new neuronal connections.

And we can even explain how some interactions might more rapidly lead to those connections forming – because highly traumatic, exciting or subjectively important events will trigger the release of neurotransmitters such as dopamine, norepinephrine and cortisol and these strengthen new connections and increase their likelihood of forming in the first place.

We can also explain how you might learn by watching (called vicarious reinforcement) – thanks to the role of 'mirror neurons' which fire when we see something else happening.

But what is the biological basis of cognitive psychology? What is actually happening in the brain when you visualize? Or when you ruminate?

The fascinating thing that we now know, is that you actually cause areas of your brain to light up *as though* you were engaging in that activity. If you visualize going running, then your brain lights up as though you *are* running. Thus you can actually trigger reinforcement *through* your ruminations and your thoughts. You can thereby learn and even alter your personality, simply by changing the course and the nature of your thoughts. And therein lies our power to heal ourselves and to hack our brains for even greater cognition.

An even more exciting theory that explains this further is something called 'embodied cognition'. Embodied cognition effectively explains how we think, how we understand language and what makes us human.

So, let's imagine you're reading something in English. Of course, you understand this text, but what does it *mean* to understand text? What does it mean to interpret information?

Psychologists once explained this away by making the assumption that language or thought would be translated into some kind of 'base' code for the brain, some kind of innate language that the

brain understood. They gave this the name *mentalese*, but made no attempt to explain what this might look like or how it might work.

Embodied cognition however suggests that this essentially amounts to visualization. So, when you read something, you light up areas in your brain to *experience* what is being said. So, if you read a story, you picture the characters. If someone explains a concept to you, then you use your experience of the world to build a representation of it – by simulating that thing happening in your mind's eye.

Even something abstract like math is only possible for us to understand because we have interacted with the world around us and because we have experience of counting objects, of visualizing quantities. In fact, some people with synaesthesia will even see visual representations of numbers *as* they perform the math. And it should come as no surprise that the maths areas of our brain are situated closely to those associated with movement and spatial awareness.

This further explains how the world informs our psychology and how our psychology informs the plasticity of our brains. We understand things by visualizing them and experiencing them – even the things that people are saying to us and this then *causes* plasticity and *causes* classical conditioning. That's why someone who keeps insulting you can eventually damage your confidence and why visualizing your golf swing can improve your game.



STRENGTHENING YOUR WORKING MEMORY

Strengthening Your Working Memory

If you have read the full book, then you will know how this relates to working memory. Working memory was once described by psychologists Baddeley and Hitch as being a kind of 'store' for information that you were about to utilize. It was once explained as being a kind of holding pen for numbers, names and other information you needed to hand.

We now know that it boils down to an ability to create an internal representation of information inside your brain, by *activating* specific parts of your brain. In the full book, we have explained how

you can enhance this by improving brain energy – using supplements like creatine in order to help yourself focus on a concept.

But you can also improve working memory simply by practicing it. Meditation is one fantastic tool for doing this because it ultimately challenges you to focus on emptying your mind. To choose a mantra and to focus *purely* on that. Or alternatively to try simply emptying the mind all together and to resist the temptation to be distracted by other thoughts.

If you can do that, then you can also focus more on the activation in your brain corresponding to your internalized thoughts. You can focus more easily on the numbers you're trying to juggle or on the names you're remembering.

And if you can improve this ability, then you can improve nearly every aspect of your cognition because you will be able to hold more concepts in your mind as you engage in conversation – becoming wittier, cleverer and improving your memory. Likewise, you will be able to better visualize where everyone is on the pitch while playing sports, or you'll be able to imagine your location on a map, which you can successfully internalize and focus on. If you are interested in brain training for improved cognition, then *nothing* will beat meditation for this reason.

But other ways to boost working memory include learning more to strengthen your neural plasticity, as engaging specifically in activities that utilize the working memory – such as playing chess which requires you to store in your memory the positions of all the pieces on the board. Playing computer games, believe it or not, can also be a highly effective form of brain training.

And you can also simply practice using your visualization and in this way, you can enhance its usefulness in real world settings. For instance, if you would like to improve your abilities when it comes to navigation, then you can do this by visualizing routes you take regularly in your head. What turns do you need to take to get to X destination for instance?

CHANGING MENTAL STATES

Changing Mental States

The usefulness of CBT in a therapeutic setting is similar to the lessons preached by the stoics. The idea is that while you can't control the events that happen to you, you can certainly control your *reactions* to those events and thereby choose how you want to interpret them and feel about them.

Some people are highly anxious personalities and this often comes from their inability to focus on anything other than the worst outcome. They find it hard to picture positive outcomes and instead will picture the worst thing that could happen to them at any point. When they are called into the office, they visualize being shouted at and they visualize losing their jobs.

Remember, when you picture this or tell yourself this is going to happen, you actually affect the body and the mind in just the same way as if it actually *already* happened. So as far as you are concerned, you already *are* being shouted at and you already *are* in trouble.

And this triggers the 'fight or flight' state – the highly alert stress state that prepares us for battle and prepares us for fleeing.

In fight or flight, the body produces more adrenaline and more cortisol. This is combined with dopamine, norepinephrine and other neurotransmitters that trigger alertness, focus and fear. The muscles contract, the heartrate speeds up and blood is rushed to the brain. We get tunnel vision, our veins constrict and our breathing increases. Blood is diverted *away* from less critical functions like digestion and like the immune system.

In the short term, all of this is highly useful. In the short term, these changes allow you to perform better in a fight, or during sport.

But when you're giving a speech, having tunnel vision does *not* help. When you're focussing on work, worrying about what is going to happen later on doesn't help.

And if this aroused state is allowed to continue indefinitely, then it becomes 'chronic stress' and that can lead to serious health problems. Conversely, when we are relaxed, our brains become more creative but we can also struggle to focus to the same degree. This is how the brain is supposed to use neurotransmitters and hormones to alter its state – to ensure that you are in the right mental zone for whatever challenge you currently face.

Unfortunately, visualization, rumination and more can sometimes put us in the wrong mental state for the situation at hand – and especially when you consider that our brains evolved in very different circumstances.

So one of the keys to unlocking greater happiness *and* greater performance is to use CBT and similar techniques like visualization in order to put yourself into the right mental state for whatever the given situation is or whatever you want to accomplish.

In other words, if you are highly stressed and you need to deliver a great speech, then you need to stop focussing on how it might go wrong – which will only work you up much further – and instead focus on convincing yourself of things that can help it to go *right*.

One CBT technique you can use to help you do this is called ‘cognitive restructuring’, or more specifically an aspect of cognitive restructuring called ‘thought challenging’. The idea is to look at the beliefs that are informing your predictions and your simulations and to challenge them.

Perhaps you think that if you stutter in front of the crowd, then they are going to laugh at you and tease you. Maybe you think you’ll be instantly fired?

But now let’s look at the reality. If you stutter or can’t think of your next line, then you will simply wait. You will simply wait until you can think of the right next line and then begin talking again more slowly. And you probably know deep down that you’re not going to get booed off the stage, or get laughed at. After all, everyone knows how hard it is to deliver a speech and most people are thus very sympathetic to it. More likely, people will politely wait for you to finish.

Teach yourself this and genuinely believe it and you can thereby prevent yourself from being stressed during a speech. The same goes for interviews or meetings. If you can stay calm, then you can avoid narrow tunnel vision and you can stay focussed.

Likewise, you can also use a similar technique to the opposite end – to ramp yourself up, to increase focus and to remind yourself *why* something is important and why you need to wake up and focus.

Using CBT to change your mental state can allow you to achieve the right mental state at the right time and with practice, perhaps it can even allow you to achieve the coveted flow state...

There is much more to learn when it comes to unlocking the full potential of your brain. We’ve only touched on one small aspect without looking at brain plasticity, accelerated learning, focus and concentration or nootropics. There are countless things you can do to get more from your brain and in the full book, we’ll dive much deeper and help you to get a smarter mind, and a better life!