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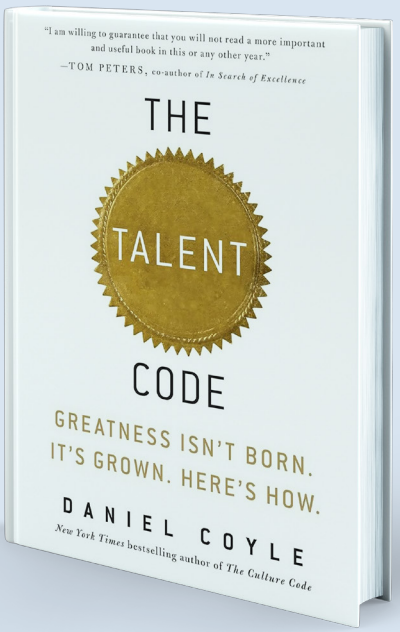


## The Talent Code

**Greatness Isn't Born. It's Grown. Here's How.**

*By Daniel Coyle*

Daniel Coyle is the *Sunday Times* bestselling author of several acclaimed books, including *The Culture Code*, The *Talent Code*, *The Little Book of Talent*, and *Lance Armstrong: Tour de Force*. He lives with his wife and four children in Homer, Alaska, and Cleveland Heights, Ohio.

*A Book Review by Soundview*

# Cracking the Code of Talent

Why is it that in certain places and at certain times, a hotbed of talent will spring up seemingly out of nowhere? Why is it that some coaches and mentors are able to elicit greatness from their players and mentees? How exactly does practice work? What type of practice is most effective for success? These are all questions that Daniel Coyle sets out to answer in his book, ***The Talent Code: Greatness Isn't Born. It's Grown. Here's How***. Coyle's book first establishes the role myelin plays in successful practice, and then he gives detailed analysis of different successful coaches and learners in an effort to help his reader understand and achieve greatness.

## What Myelin Does

Coyle explains that myelin is responsible for all learning. Myelin is "a neural insulator." It works like rubber insulation around a copper wire because it wraps itself around nerve fibers in much the same way that rubber insulation wraps around a copper wire. The effect is that the signal is both "stronger and faster" because it stops the leaking of electrical impulses. The more a person effectively fires their circuits, the more myelin is wrapped around their neural circuits. Every human being can grow myelin, and myelin is at work in all sorts of skills that people can learn. We cannot feel this happening, however. We can only see the effects as our skills begin to improve. Skill, according to Coyle, "is a cellular insulation that wraps neural circuits and that grows in response to certain signals." Practice is the mechanism by which these skills increase. As Coyle states, "The idea that all skills grow by the same cellular mechanism seems strange and surprising because the skills are so dazzlingly varied. But then again, all of this planet's variety is built from shared, adaptive mechanisms; evolution could have it no other way."

Not all practice is created equal. Coyle highlights a mediocre clarinet player he calls Clarissa. In a video of her practicing, she vacillates between the practice of a genius and the practice of someone barely competent in her craft. In her moments of genius, she performs multiple skills including fixing mistakes, comparing herself against an ideal, and rehearsing in her mind. This is the way experts practice. In her moments of weakness,

she merely moves through the steps, creating what barely sounds like music. The difference in moments of growth and moments of stagnation is the result of the different ways she practices. Coyle explains that a highly effective process of practice is what helped create hotbeads of talent throughout history. It is behind the Bronte sisters, the success of baseball players from the Dominican Republic as well as the proliferation of literary talent in Shakespearean England. The good news is that it can be learned.

## How Myelin Works

Coyle expected to see something amazing and innovative happening when he visited modern talent hotbeds. He believed he would find "world-class speed, power, and grace." At times this is what he saw, but at other times, he witnessed slow struggle. From this he learned that it is small failures that ultimately lead to progress. It is not words like willpower, concentration, or focus that explain the prowess of exceptional performers because these words do not capture the difficulty these performers go through in practice. It is also too simplistic to use the nurture versus nature paradigm to explain greatness. Rather what separates the greats from the rest is deep practice, and this type of practice requires moments of struggle that sometimes last only a microsecond, but this microsecond of trouble facilitates the deep learning they are engaging in. Coyle writes that "deep practice is built on a paradox: struggling in certain targeted ways – operating at the edges of your ability, where you make mistakes – makes you smarter."

These types of difficult experiences allow for trial and error, and because of this, obstacles turn out to be helpful. For this to be effective, scaffolding must be in place which is essential if people are to learn efficiently. This scaffolding asks people to practice just beyond what they are capable of, and it is important because larger challenges do not provide the same benefits of these smaller, quicker challenges. People generally try to avoid difficulties, but small trials are actually the defining factor of deep learning.

Coyle, like many people, once believed that learning was a product of neurons and their synapses, and there is truth to this; however, myelin plays a large role in the process of learning. Coyle bases his understanding on three facts.

1. Every human movement, thought, or feeling is a precisely timed electric signal traveling through a chain of neurons – a circuit of nerve fibers."
2. "Signal strength, speed, and accuracy" are increased as myelin wraps itself around these nerve fibers.
3. Myelin will optimize a circuit in proportion to the number of times a circuit is fired. Our movements become "stronger, faster, and more fluent" the more we perform them.

When people train, they signal the myelinization of wires. With a lot of training, the wires become strong and fast. Skill can be seen as the myelin insulation that is wrapped around neural circuits. During deep practice, neural circuits are fired and optimized. This is true whether a musician is learning to play the piano or an air core pilot is learning to fly a plane. Myelin also explains why practicing with mistakes is more effective than repeating easy tasks "because the best way to build a good circuit is to fire it, attend to mistakes, then fire it again, over and over. Struggle is not an option: it's a biological requirement." This entire process takes time and energy, and that is why passion is important. Passion is what prompts people to continue practicing through difficulties.

The author gives two further insights into brain science. The first is that "all actions are really the result of electrical impulses sent along chains of nerve fibers." We receive input and then we respond with output. It is the circuit that controls everything we do, and fast circuits mean fast movements.

The second insight into the human brain is that we become less aware of our skill circuits the more we practice them. This means that skills become automated and are performed by the unconscious mind. This is why tasks that at one point may have seemed difficult can start to feel effortless. This was important to our ancestors throughout human history because they were better able to focus on life threatening situations when other tasks could be performed without conscious thought.

For a long time, the role of myelin was overlooked. Since the early 2000s, however, researchers have discovered that myelin acts as a sort of super highway in the brain, greatly increasing information processing. Not only that, but it can regulate the speed at which nerves are activated. It is through deep practice that myelin covers the nerves. This practice must be repeated, so it is not lost. Despite the fact that there are many different types of skills people can learn from reading to shooting a basketball, there is only one type of myelin that serves all of these skills. Additionally, myelin can only be lost through age or disease. People continue to produce myelin throughout life; however, its production is most efficient in the early years which is why it is easier to learn new skills when young and harder as people progress through life.

As Anders Ericsson has demonstrated, memory can be improved. Prior to Ericsson's work, scientists believed that nobody could remember more than seven digits. This was a fixed limit. Ericsson was able to prove, however, that some people could memorize many times that amount. In fact, one person was able to memorize 100 digits. This proved that there is no universal limit to memory. Ericsson began to promote his idea that "every expert in every field is the result of around 10,000 hours of committed practice." This must be deliberate practice that consists of technique work followed by feedback. It must focus intently on finding weaknesses. This deliberate practice that Ericsson speaks of is the same as the deep practice Coyle promotes. Coyle admits, however, that it is more complicated than Ericsson's work alludes to: 10,000 hours of any type of practice will not always lead to world class skill.

## Talent Hotbeds

Coyle turns his attention then to people who excel in groups, including the Brontës, the Z-boys and the greats of the Renais-

> *People are more motivated to continue practicing when their efforts rather than their outcomes are most praised."*

sance. The Brontës were three sisters who, among the three of them, created such literary greats as *Wuthering Heights* and *The Tenant of Wildfell Hall.* Some used to claim that the sisters' greatness appeared out of nowhere and that they were far removed from English society. This is not entirely true, however. The Brontes lived in a place of both politics and of commerce. Additionally, their home environment provided plenty of intellectual stimulation as it was full "with books, current magazines, and toys, overseen by a benign, tolerant father." The sisters wrote books when they were young, but these books did not demonstrate innate genius. The sisters were mainly copying the characters and voices of well known authors of the day. Still, they wrote frequently, and it was this deep practice that Coyle believes is responsible for their greatness. Their writing skill was developed through all of the hours they spent imitating great writers and in a childhood that was full of this deep practice. The sisters enjoyed writing, and they pursued this together. Each cared about the writing their sisters were producing. As Coyle states, the Brontes, "fired and honed millions upon millions of circuits, tangled and untangled thousands of authorial knots, and created hundreds of works that were utter artistic failures except for two redeeming facts: each one made them happy, and each one quietly earned them a bit of skill." This skill consisted of insulated neural circuits that grew. At its publication, critics loved *Wuthering Heights* and called it original, but as Coyle points out, it was not original. It was based upon all of those years of writing the girls produced when they were young.

Coyle states that "geniuses are not scattered uniformly through time in space… To the contrary, they tend to appear in clusters." Coyle then goes on to write about moments of great achievement, including those in Athens, Florence, and London. Florence's Renaissance is the most well documented of the three. While there are many explanations for the Renaissance including the prosperity of the time, as well as the peace, freedom and social mobility residents experienced, Coyle believes that it is shortsighted to attribute the greatness of the Renaissance to just these factors. He writes that "myelin doesn't care about prosperity, peace, or paradigms." Rather, Coyle believes that the craft guilds that were in place in Florence at the time were a big part of what prompted the Renaissance. In guilds, apprentices worked under a master and learned their craft through them. "In short, apprentices spent thousands of hours solving problems, trying and failing, and trying again, within the confines of a world built on the systemic production of excellence." This is what Coyle believes led to the greatness of the time.

Coyle then moves on to the nature versus nurture debates. He believes that seeing success through this paradigm falls short when speaking of genius. Genes do provide blueprints, but writing an instruction book for behavior is incredibly difficult because complex human beings encounter countless different situations in life. Instead of writing an instruction book for behavior, Coyle states that our genes "contain instructions to build our circuitry with preset urges, proclivities, instincts. Genes construct our brain so that when we encounter certain stimuli… a factory loaded neural program kicks into gear, using emotions to guide our behavior in a useful direction." It would be biologically expensive for human beings to create circuits for skills that they will never need to use. For example, skills such as creating software would not have been helpful in the 19th century. The brain responds to this problem with a different design strategy whereby circuits that are used most frequently get the most broadband while those that are fired least get less. These installers work hardest during youth because it is then that people adapt to their environment. Because of this, people believe that the skills they have acquired are gifts, but the real gift is the broadband installer because this is what insulated the needed circuits in the first place.

## Rules of Deep Practice

Coyle writes about what he calls the holy shit effect which is the response people have when they encounter greatness For example, a person may be astonished to see a chess player who is able to memorize a board quickly. Coyle attributes this skill, however, to grouping. Another example of grouping is when people see the individual letters for a word and are used to seeing the letters together. Because they have seen this grouping before, they are easily able to decipher the word. This is how chess players react when they see chess boards they have encountered many times before – they can memorize quite quickly. If a computer, however, makes a random configuration not based on the logic that the player expects, it becomes much more difficult for players to memorize the board. The paradigm is gone. Physical skills are built in the same way. An example of this is when a gymnast is able to combine movements seamlessly that they have practiced individually in the past.

There are three steps to chunking. First a person needs to see the whole. Then they need to take apart the whole and divide it into parts. Finally, they must slow things down and practice these individual parts. This is the same regardless of the skill a person is trying to master.

If chunking is the first rule of deep practice, repetition is the second. The author writes, "There is, biologically speaking, no substitute for attentive repetition. Nothing you can do—talking, thinking, reading, imagining—is more effective in building skill than executing the action, firing the impulse down the nerve fiber, fixing errors, honing the circuit." There are caveats to this rule, however. Not all practice is the same. Deep practice requires peo-

ple to be practicing on the edge of their abilities. Second, people can only complete so much deep practice, about 3 to 5 hours, in a single day. Coyle also notes that people need to feel their mistakes as they make them. Successful practice requires those practicing to reach for something, to fail, and then to reach again.

## Ignition

Coyle then turns to the motivation that is required to prompt this deep learning. He likens this motivation to an ignition. He notes that many people believe they love what they do because of something innate within them, but it is more complicated than that. Oftentimes, motivation can come from preconceived ideas. For example, Coyle notes a study that followed children learning an instrument. They discovered that the single greatest factor that determined how long a child would continue to play the instrument was how long they believed they would play before they even started. For example, if before a child even had their first practice they believed that they would continue to play throughout life, they were more likely to continue on with their practice once they began. It is the children's preconceived ideas about themselves, not passion, that most affected their outcomes. A lot of times, these ideas involve identity. For example, a child who associates himself with musicians will be more likely to continue on the work of becoming a musician.

Hotbeds are often embedded in places that lack many comforts. People who are ignited are ignited in part because they see a better future. This gives people the motivation to do the deep practice necessary to succeed at high levels. It is not enough, however, for these cues to merely ignite motivation. There has to be a continual supply of signals that keep this motivation going, so it does not fade out. One way to foster this motivation is in the words coaches and mentors use. People are more motivated to continue practicing when their efforts rather than their outcomes are most praised. This praise is most effective when it acknowledges the difficulties a person went through in order to get where they are.

## Master Coaching

Coyle then turns to coaching talent, and he lists four virtues of great coaches. The first virtue is referred to as the matrix. He states that "years of work go into myelinating a master coach's circuitry, which is a mysterious amalgam of technical knowledge, strategy, experience, and practiced instinct ready to be put to instant use to locate and understand where the students are and where they need to go." The second virtue is perceptiveness. Master coaches try to deeply understand those they coach so they can better help their students move forward. Coyle calls his third virtue the GPS Reflex. By this he means that good coaches have a sense of urgency to the direction they give. The fourth and final virtue is theatrical honesty. Coyle writes that "many of the coaches I met radiated a subtle theatrical air." They are tuned in with those they work with, and they, themselves, are moral standards.

Coyle ends his book with a discussion about how these insights into myelin are applicable to skills of every kind. Coyle's book opens by describing how myelin works and then delves into numerous case studies involving different types of coaches and different types of teachers including sports coaches, charter school founders, and even a skateboarding team. He goes back in time to the Renaissance to explain how hotbeds of talent were created, providing insight for today about how hotbeds are still developed in the same way. His myriad detailed examples make the book imminently readable while also giving readers blueprints for success.