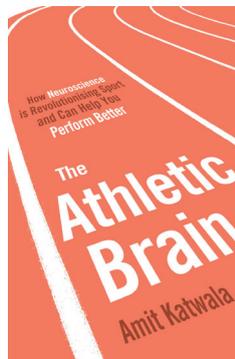




**THE ATHLETIC BRAIN:** HOW NEUROSCIENCE IS REVOLUTIONISING  
SPORT AND CAN HELP YOU PERFORM BETTER



## THE BOOK

**The Athletic Brain**

How Neuroscience is Revolutionising Sport and Can Help You Perform Better

by Amit Katwala



## INTRODUCTION

We all know that top-level athletes can perform feats that seem extraordinary to everyone else but is it their body or their brain that does the bulk of the work?

It turns out that the brain plays a huge part in any athlete's success. And not necessarily because this organ is different to start with... but because sport can actually change the way your brain works.

Along with changing your physical appearance and strength, sports can reshape your brain. After thousands of hours of practice, athletes have advanced skills in spatial awareness and reactivity... and they're able to respond and react in ways that don't seem human.

In *The Athletic Brain*, Amit Katwala explains how this takes place and more importantly, how you can create your own 'shortcuts' to improve your athletic performance.

A must-read for aspiring sportspeople or anyone with an interest in how our brains work, *The Athletic Brain* is an investigation into the power of the mind and its ability to change.



## 5 BEST QUOTES

**"It is not possible for the limited capacity of our working memory to consciously handle all the variables required to bowl accurately at speed, or hit a tennis return, or pull off an overhead kick. But when the processes become so automatic that we don't even have to think about them, we can do things that at first seemed impossible, and we can do them in the face of all kinds of distractions."**

**"Sport is a deceptively difficult thing for the brain to do. The simplest of movements requires precise calculations of the speed and trajectory of objects, and of our own position in space. 'There is more computational power in picking up a chess piece and moving it than there is in deciding the chess move'..."**

**"In sport, mirror neurons and neural plasticity explain how athletes are able to learn new skills and how they learn to anticipate the actions of their opponents."**



## 5 BEST QUOTES

“Efficiency and richness of training are thought to be two of the reasons why Brazil has produced so many great footballers over the years. Futsal, a favoured variant of the game played on a small pitch with a small, heavy ball, gives players many more touches than they’d get in a traditional game – six times as many according to one study.”

“Vision can be trained. The software can, in some cases, improve the hardware.”



## 7 BIG IDEAS

### 1. EXERCISE

Exercise actually helps to grow new neurons. Science has found that exercise creates a surge in a protein called brain-derived neurotrophic factor (BDNF). This makes neurons grow faster and helps your brain to develop. The fact that exercise does this is why it can be so good to exercise before you study.

Exercise can make you better at learning and remembering new skills!

### 2. THE 10,000 HOUR RULE

It has been well established for some time now that the amount of practice that needs to be put in to become an expert in any discipline is 10,000 hours. Obviously, this gives a strong advantage to those who start out early and sharpen their skills from a young age. All the same, anyone who puts in the effort required has a good chance of mastering whatever skill they choose.

Can the 10,000 hour rule be beaten? According to Katwala, yes. There are a few different ways around beating the rule and one of the best is ‘skill transference’. Katwala presents the cases of practising the video game Gran Turismo for hours and hours and thus negating the need for a huge amount of on-track practice to become a race car driver. Likewise, someone who has trained from an early age as a gymnast will be able to transfer their skills to aerial snowboarding with far less practise than many other snowboarders.

The other basic trick if you want to be good at something sooner is simply to train super efficiently. Try to practice the most essential routines as often as possible.

You can also use tools like apps and sport software. In many instances, you can access the same technology that is used by elite athletics to improve your own results.



## 7 BIG IDEAS

### 3. VISUALISATION

Believe it or not, simple visualisation can make a huge difference in how you perform on the field or in other areas of your life.

Many professional players will visualise different aspects of their game before every event, from how they might score a goal to how they will pass and move.

Visualisation triggers something called mirror neurons in your brain. These neurons act in the exact same way when you watch someone else perform a task or simply visualise it yourself as when you perform the task in question. This means that visualising your performance readies your mind and body for performing the same performance when the time comes.

The next time you find yourself daydreaming about scoring the perfect goal, don't worry... it's part of your training!

### 4. FLOW

It has many different names but 'flow' is that special time when you are so deeply into whatever it is that you are doing that time seems to stop and nothing else matters.

Flow, or the Zone, comes from just the right combination of focus, challenge, and skill. If it is too hard you will not find the flow, neither if it is too easy.

Katwala recommends chasing flow by always pushing your skill level a little further and eliminating distractions. Find that rhythm that is just advanced enough in a quiet, distraction-free environment and the flow should come.

### 5. CHOKING

Choking is the nightmare of any competitor. It is that moment when everything falls apart, when you fail to perform the most simple tasks and you lose at what should have been an easy win. Choking is a complex and multifaceted subject that includes analysis paralysis, the 'yips' (muscle spasms), and even uncalled for aggression. It has many causes and almost as many solutions.

One of the safest ways to combat choking is to accustom yourself to performing under pressure as often as possible. That will get your brain used to filtering out extraneous noise and focusing on the task at hand.



## 7 BIG IDEAS

Oddly, distraction can also be a great way out of choking. Katwala describes how the left hemisphere can interfere with your right hemisphere's workings, putting you off your game. By keeping the left hemisphere distracted by squeezing a ball in your right hand or shouting a word at just the right moment, you allow instinct to take over and can leave choking behind.

## 6. LIMITS

For centuries it was believed that the limit to human performance was the human body. However, that has turned out to not be true at all. The fact that athletes often push themselves past states of exhaustion shows that it is the brain that limits what we can do.

Most often, when an everyday Joe goes for a jog and stops because he has had enough, he is not truly at his limit — no matter how he feels. If you can go for a run, feel like you have reached your absolute limit but then slow down and walk, you still have reserves left. This is not to disparage anyone who might slow down now and then! The brain is a powerful force and if it tells you to slow down you should usually listen.

However, it is good to know that you don't have to. There is almost always more you can give.

## 7. CONCUSSIONS

Concussions are a serious and dangerous part of more sports than you might think. Katwala devotes a whole chapter of *The Athletic Brain* to concussions and the dangers they pose. As has been widely broadcast in the media over the past half-decade or so, it is being found more and more that former NFL stars suffered from a condition called chronic traumatic encephalopathy (CTE), a condition that results in severely lowered quality of life and often leads to suicide.

This condition is continuing to be found in athletes of many disciplines. Even soccer is not exempt. It is vital for the sake of the health of athletes that the culture of 'toughing it out' and going back on the field after a concussion needs to change.

While improvements in testing and safety equipment are of huge benefit, it is ultimately the culture that will help bring the concussion and CTE epidemic down to a minimum and keep our athletes safe in the future.

**3 ACTION STEPS****1. UNDERSTAND THE ROLE YOUR BRAIN PLAYS**

It used to be believed that everyone's physical limits were set by their body. As it turns out, this is not the case. It is your brain that chooses how far you can go.

Once you understand the importance of your brain in sports and any other areas where you wish to excel, you will be able to take the next steps.

**2. TRAIN LIKE THE PROS**

No one is more highly motivated to succeed in sports than those on a professional level.

Therefore their training standards are the best and most cutting edge. If you want to be just as successful, take a close look at what the pros are doing in your field and work towards emulating them.

**3. FIND THE BEST TRAINING TOOLS**

The experts utilise high tech gadgets and many are available to you as apps or commercial products. These tools can be so helpful to boost your training. You can even be smart and find ways to create these tools or methods yourself without forking out big bucks on fancy technology.

**1 KEY TAKEAWAY**

The key takeaway of *The Athletic Brain* is that the brain has more influence over sporting prowess than the body. While physical attributes such as keen eyesight and high oxygen retention play an important role, without the mental factor athletes could never reach their peaks.

The mental factor of your performance can and should be nourished and trained. Athletes who train mentally can acquire an advantage over the competition, whether they are professional or amateur.

By staying across the latest in neuroscience, all aspiring athletes can find an extra edge to overtake the competition. Never overlook the power of the brain in high level performance, even in physical fields.



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