Psykinetics: The New Science of the Golf Swing

Psy-kin-etics (n) the interaction of mental states and physical movement

Timothy Harkness, Sports Psychologist
tharkness@mweb.co.za +27 82 9697 255

Golf, like any other field of human endeavour, is characterised by revolution. If you are a modern player, your clubs, your balls, your training, probably even your swing, are revolutionarily different from those of your predecessors.

Walk down the line at the practice range of a major tournament nowadays, and the players look like they came out of a rugby team, and their equipment looks like it came from outer space.

But what about the mental revolution? The best efforts of Dr Bob Rotella and James Gallway notwithstanding, are you any better prepared mentally for your round than your father was when he played the game a generation ago? The modern pros hit the ball further than Jack Nicklaus or Gary Player would ever have dreamed of, but are they any tougher mentally?
I don’t think so. Even as a sports psychologist for the last 10 years, I can say until now, the mental revolution in golf has been a damp squib, a non-starter. That’s not to say sports psychology is a waste of time. It isn’t. I’ve taught a lot of golfers to use mental techniques that Jack Nicklaus used, and it makes them play a lot better. It’s just that there hasn’t been a dramatic advance in this generation like there has in the other areas of golf.

One reason for this is that sports psychology grew out of a field called cognitive psychology, which means literally, “the psychology of thinking”. The problem is that brain imaging studies show that when you hit your best shots, you’re not thinking at all. You are using parts of your brain that are not involved in consciousness. In some ways, cognitive psychology is barking up the wrong tree.

But there are three new scientific fields that do cast light on the mental processes involved in hitting a golf ball. These are evolutionary psychology, psychophysiology, and sensory discrimination. Together these make up psykinetics, the new science of the golf swing, and hold onto your hats folks, because the mental revolution is upon us.

**Evolutionary psychology** says when human beings get into conflict, they respond aggressively, submissively, or assertively. Each of these emotions come with its own physical, sensory and neurological settings - like Boston’s 1976 hit says, emotions are more than a feeling. Emotions affect which muscles, brain regions, senses and hormones we turn on or off. Without even thinking about it, as we move from emotion to emotion, we also move through different mental and physical states. Sometimes these mental and physical states are appropriate to the situation, and sometimes they are not.

**Psychophysiology** is the field that describes the connection between the mind and the body. Human emotions always manifest physically – in the unconscious but predictable activation and deactivation of certain muscles in the face and body. In fact, part of the *experience* of emotion is the physical feedback we get from muscle states. Anger wouldn’t feel the same without the tight feeling you get when you contract your forehead muscles in a frown, and happiness wouldn’t feel the same without the stretching feeling you get when you smile.

**Sensory discrimination** is our ability to use our senses to gather and use information about our internal and external worlds. For example, we use vision to tell us where things are, touch to give us information about objects we are manipulating, and balance and proprioception to tell us where our bodies are.
Why are you reading this in a golf magazine? Here we go …

Human beings move in a variety of ways. One of these involves rotating the shoulders above the hips, then driving forward off one leg before releasing the power from the shoulders and extremities. This creates a lever system out of the joints, and uses muscle groups in sequence to generate very high levels of power. This archetypal rotational movement is used by human beings to throw, punch, strike with an object, and kick.

My partner John Dickson and I call it the 1, 2, 3 movement, where 1 is the loading of the core, 2 is the initial release of power from the core, and 3 is the release of power into the extremities (Fig 1 and 2).

The modern golf swing involves taking the club back and rotating the shoulders around the hips until they are tight and loaded with energy. The swing starts with an explosive drive off the right leg, which pushes the hips forwards and coils the spine still further, creating an elastic energy which is then released into the shoulders, arms, and finally through the wrists into the club, and through the club head into the ball (Fig 3).
Fig 3, Correct swing sequence

Fig 4, Pull swing sequence

Fig 5, Push swing sequence
A few years ago John and I started to realise that people hit the ball left primarily because of a failure to do 1 or 2 (Fig 4 & 6). When a golfer doesn’t load his core sufficiently, or doesn’t release power from his core sufficiently, his hips lag behind his shoulders in the downswing, which drags his swing plane or his club head to the left (Fig 7) causing pulls and hooks.

John and I also realised that people hit the ball right because of a failure to do 3 (Fig 5 & 6). When there is too much tension in the shoulders or arms, the wave of power from the core and spine cannot flow into the extremities. This drags the swing plane to the right (Fig 7), and makes the club-head late to the ball, causing pushes and blocks.

Fig 6: Pull (failure to implement 2), Push (failure to implement 3), Good shot
Figure 7, Correct, pull and push swing planes

This is where the evolutionary psychology and psychophysiology come in to make things exciting …

Remember, when I’m under pressure or in conflict, my evolutionary psychology gives me three choices; submission, aggression, or assertiveness.

On the golf course, submission is when I lack confidence or commitment to a shot, don’t try hard enough, don’t believe I can make it, or quit on it. Aggression is when I try too hard, when I feel I have to make the shot, or when I force it. And assertiveness is when I believe I can make the shot, and I decide to “just do it”.

When we go into these different mental states, we involuntarily and subtly assume the corresponding physical position. This is body language. The body language of submission is a broken or disengaged core with soft hands, aggression is tensed muscles in the shoulders and forearms, and assertiveness is an engaged core with relaxed extremities (Fig 8).
Evolutionary psychology and psychophysiology explain why we hit some shots left or right of our intended targets. When we become aggressive we tense up in our shoulders and forearms, causing pushes and blocks, and when we become submissive we weaken our cores, causing pulls and hooks.

One of the biggest tips I can give to golfers is ‘protect your body!’ What I mean is that when you get under pressure, that pressure attacks your body, changes your muscle settings, and messes up your swing.

Once I was watching Tiger practice his putting, and when his caddy threw him the ball he caught it with lovely soft hands. When I saw him putting on the course in the competition and his caddy threw him the ball, he caught it with exactly the same soft relaxed hands – he was protecting his body.
There are only two controllable reasons for bad shots in golf - bad swings and bad connections. Bad swings are caused by poor psychophysiology, and bad connections are caused by poor sensory discrimination.

**Sensory discrimination** refers to our ability to use our senses to gather and use information about the world. We’ve actually got nine senses, not five - sight, hearing, taste, touch, smell, balance, proprioception, visceral, and timing/rhythm.

Proprioception is my sense of where my body is in space. If you can close your eyes and clap your hands, that’s proprioception. Your visceral sense is your sense of your insides - a full stomach or butterflies. Timing/rhythm is your ability to predict when the next event in a sequence will occur - for example, tapping your foot in time to a music beat, or closing your hand at the moment a ball arrives in it.

Senses can get turned up and down. For example, when you listen carefully, you turn your sense of hearing up and hear sounds that you hadn’t noticed before.

When you are under pressure the *wrong* senses for the golf swing (hearing, visceral) may get turned on, and the *right* senses (balance, proprioception, touch, timing, vision) might get turned off. When you are not under pressure (for example on the driving range), all the senses that you need are turned on, and all the senses that you don’t need are turned off. And you connect the ball fine. But under pressure, this situation can start to reverse itself … and this explains the second category of bad shots.

Because if vision is turned off, you don’t know exactly where the *ball* is, and if touch and proprioception are turned off you don’t know exactly where the *club-head* is … and this is when you get bad connections.

It is important to think positively, but pressure doesn’t just affect your thoughts, it affects your body and your senses also, and it’s these two that make the difference between good and bad shots. Another big tip I can give to golfers is ‘prepare for the shot!’ Tiger’s pre-shot routine is designed to get his body and his senses into the right arrangement for hitting a golf ball. It has the following steps:
1. Tiger checks his body is in the *assertive* setting (relaxed shoulders, arms, wrists and hands, strong, activated core).

2. Tiger only does a practice swing *after* he has corrected his psychophysiology, because if you practice swing with wrong muscle activation your swing feels wrong.

3. In the practice swing, Tiger feels the *timing* of his hips (2) and club-head (3). He turns *vision* on by targeting a blade of grass in the swing, and coinciding the *timing* of his power release with that specific target.

4. After the practice swing, Tiger stands still, and moves the club-head very slightly to turn on *proprioception* and *touch*, and rocks backwards and forwards on his heels, to turn up *balance*.

5. Now he’s all switched on and all he has to do is go and hit the ball.

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Tiger Woods about to implement pre-shot routine
Psykinetics is a system that trains golfers to achieve the perfect physical and mental state for hitting a golf ball.

Just like your body, your brain has different parts that do different things. Neuroimaging pioneers like Brad Hatfield in the US and Claudio Babiloni from Italy are helping us understand what the brain does during a golf swing.

![Anatomy of the human brain](image)

Fig 9: Anatomy of the human brain

Some of the relevant parts are:
- The cerebellum, which controls balance and coordination, and needs to be turned **on**
- The putamen, which stores muscle memory, and needs to be turned **on**
- The premotor cortex and sensorimotor cortex, which control motor planning and execution of movement, and need to be turned **on**
- Wernicke’s area and Broca’s area, which are involved in language and speech production and during a golf shot need to be turned **off**
- The orbital-frontal cortex, which is responsible for negative thinking, and needs to be turned **off**
- The occipital cortex which controls vision, and needs to be turned **on**

When these brain regions are activated correctly, the golfer will have all the right senses turned on, and all the wrong ones turned off. Babiloni showed in a recent research article that sensorimotor cortex activation during a putt predicted the result better than technique! So if your brain is turned on, the putt is going in the hole.

Psykinetic training uses a neuroimaging technique called electroencephalography (EEG). EEG is a technique that has been used by medical doctors for years, and is beginning to be used in sports psychology. It works on the principle that when your brain works, it
emits small electrical frequencies. The harder it works, the higher the frequency it emits. By attaching sensors to the scalp, we can monitor which parts of the brain are more active than others.

Because we know what brain regions you should be using (and not using) to hit a putt, we can use EEG to train you to get into the right mental state to hit a putt.

But the body needs to be turned on also. By using sensors to monitor muscle tension, skin conductivity, and the link between heart rate and breathing, we can tell when you are in the right psychophysiological state – and also train you to achieve this state at will.

In training you are wired to a computer with highly specialised BioInfiniti® software that interprets the neurological and physical data. In one drill, when you get into the right physical state a green light goes on and a tone sounds, and when you get into the right mental state another green light goes on and another tone sounds. When both green lights are on, that’s when you are ready to hit the shot; you’re in the psykinetic zone.

![BioInfiniti® software training screen](image)

There’s nothing that special about the tone itself, it’s no heavenly chorus, but it signifies one of the biggest ‘Aha!’ moments you will ever experience as a golfer.

Think of the first time you saw yourself on video, and finally understood your swing, and what it was supposed to look like. Biofeedback is that times ten. You suddenly realises what proper readiness feels like. You can experiment with different approaches until suddenly you realise how to turn both lights on at the same time and it’s ‘Aha! That’s where I need to be to play a golf shot.’

Psykinetic training happens in a fairly simple routine.

The first stage is learning to achieve the psykinetic zone in the office. You have to experience it for yourself, and discover how to turn the green lights on.
What I find is many golfers can produce the zone quite easily, but it’s very fragile. So you might be in the zone, but there is a slight distraction and you slip out and struggle to get it back. Also, golfers don’t always recognise when they are in the zone or not – and so often play shots before they are actually ready.

The second stage of training is to make your psykinetic zone more resistant to pressure – because as a competitive golfer, the ability to produce the zone under pressure, and on demand is as important as a good swing.

The third stage of psykinetic training is to get onto the practice green or driving range, and use biofeedback to train yourself to stay in the zone all the way through a shot.

I find golfers fall into three categories. The first category is the carefree/feel golfer. These golfers do get into the zone, but only in the last second or so before the putt. If they get their timing slightly wrong, or rush the shot, they hit the ball before they are in the zone, and miss the putt.

The second category are the serious/mechanical golfers, and they also get into the zone, but have a tendency to slip out of it again just before they play the shot, because they start to worry about the result.

The third category of golfer is the type who is disposed to anxiety, and in some ways, they are the most interesting. These golfers tend to get into the mental zone, but only get into the physical zone after the ball is struck. The reason for this is that they only relax after they have hit the shot. Interestingly, they relax regardless of whether it was a good shot or not – they’re just glad it’s over. These golfers tend to rush their preparation because they want to get the anxiety of the shot over and done with.

When we’re working with golfers, sometimes we find that they hole putts when they are not in the zone – it is possible hit good shots with the green lights off. But what we also find is that it’s very rare to hit a bad shot when the green lights are on.

Psykinetic training allows golfers to discover when they are in and out of the zone, and teaches them to increase the duration and strength of their zones so they can cut down on errors and hit better shots.

The final stage of training is to play a full round while monitoring your zone. By combining this with video analysis, we can tell which situations or shots cause you to slip in and out of the zone, and we can train you to overcome this.

The end result is when even faced with your toughest shot or situation, you can stay in the zone, and give yourself your best chance. There are a lot of things you can’t control on the golf course, but with the technological revolution of psykinetic training, one thing you can now control is your zone.