Data….. How do we collect it, interpret it and apply it to understand swing patterns?

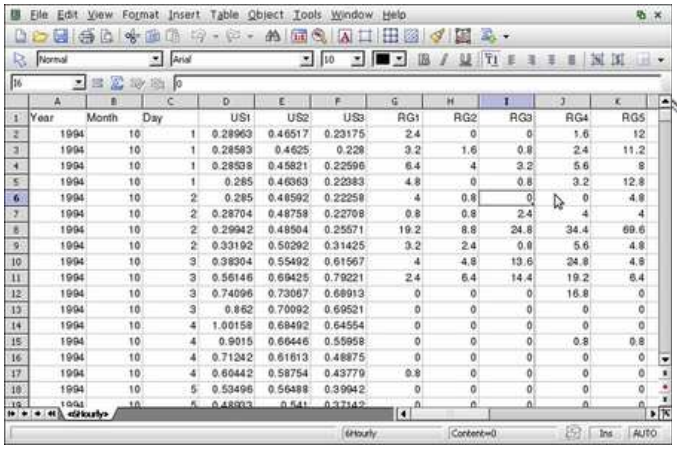
In the world we currently live in, information is pretty much accessible at the click of button, practically anywhere and at any time. It is this information that has helped coaches make better judgement calls than ever before and allowed for a completely new way of developing the athlete. It was fascinating to listen to the interview given by Team Sky cycling coach Shane Sutton just after Sir Bradley Wiggins won the time trial in the recent Tour of Britain. Sutton stated that he couldn't wait to see the numbers that Bradley had produced to win the trial in an astonishing time as he was eager to see what levels and outputs Wiggins had fashioned. I, like most curious enthusiasts was keen to hear what he had achieved, however I had to rein my enthusiasm and remind myself that it's not the numbers that are important, it's what's behind them that counts most.

In the world of 3D and biomechanics, players and coaches wait with a combination of excitement and trepidation as data it presented. The word I am often presented with when working with players is "I want to see the facts". Well, one could argue there are no such things as facts, there are purely opinions, for example ten people could read the same set of data and come up with ten different conclusions.

Thankfully, golf now has many wonderful devices these days that capture all manner of data on player's performance, whether it be 3D motion capture systems, ball/club radars, GPS systems, force plates etc… So with all this information available, before we can start to work through the numbers to put them into an intervention order which I will discuss shortly, we have to ask ourselves some important questions:

1. How credible and reliable is the data? I often get asked how important is this, to which my reply is it depends on how good you want to be? If you want to be good then I would say this is critical!
2. What is the accuracy of the information? Is the accuracy of the system been independently tested and is this information readily available from the manufacturer?
3. How accurate and consistent was the calibration of the system used. It's pointless informing the coach and player that they are doing something when they are clearly not, due to an error in calibration.
4. What environment was the data captured in? If a comparison is being made to a previous session, if it was done in an completely different environment then can this be classed as accurate?
5. How is the data being used? Is it being used to confirm the users believes and help quantify the coaches' values or is it being used completely objectively and without agenda? For example, in food labelling manufacturers will claim food is 90% fat free, however another way of reading the label is it's 10% fat. To different people these mean different things.
6. What is the data being compared against? Are there normative values, sport specific ranges, does it allow for individuality or outliers?
7. Arguably the most important, how is the data collected, interpreted and then acted on?
8. Data it not stats. Data is simply information. Statistics are numbers that are subjected to analysis. For those familiar with stats packages such as SPSS then you will know that when stats are presented, often more questions than answers are produced.
9. Remember, there are stats, stats and lies
10. Personally, for me this is the important part of data collection and usage. How do we turn data into feels, emotions and solutions?

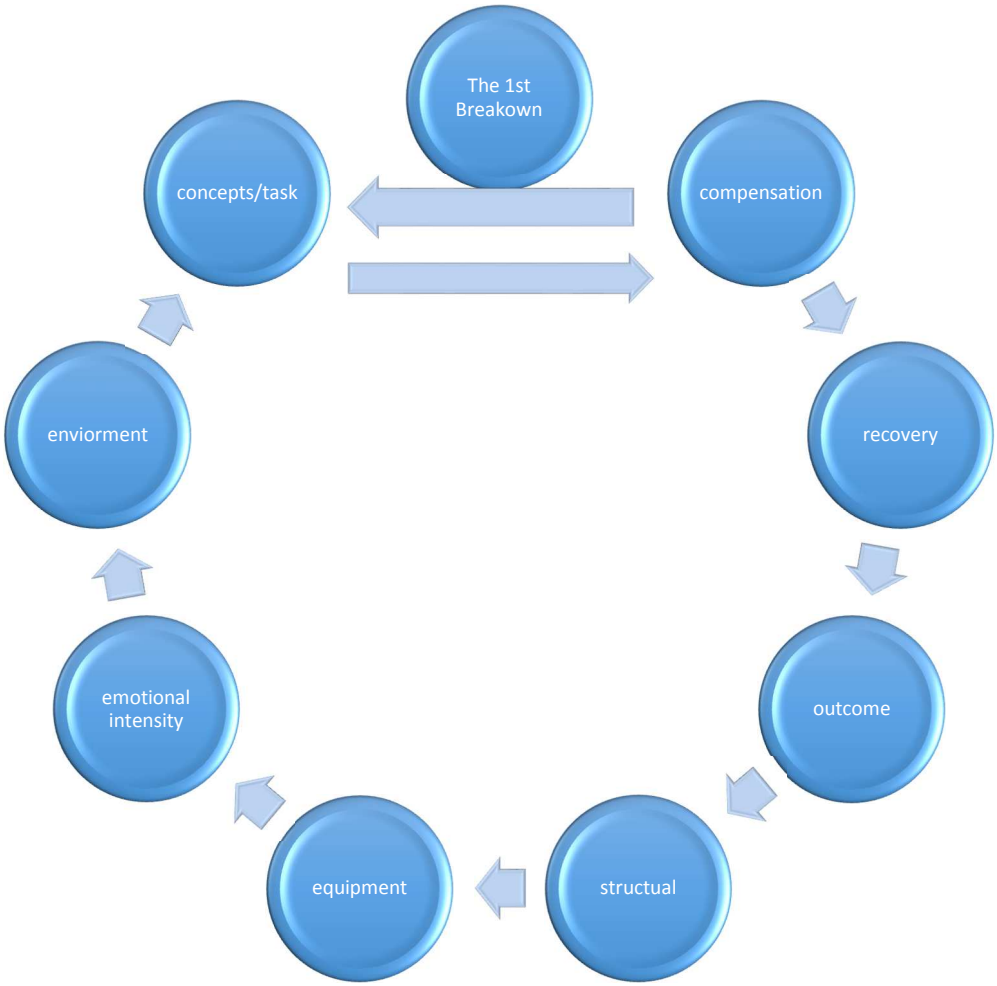
There are many more factors that need to be considered when collecting and using data on golfers and the early conclusion is that you have to dig much deeper into the numbers and start to compile patterns and correlations to understanding the root cause of the problem and to isolate any abnormalities. What makes this more of a challenge is we need to do all of this often with the player looking at us fervently awaiting our findings and rightly so. After all that is what they are correctly paying for!



Ok, which one shall we look at first?

So, assuming all is good and we have accurately, objectively and subjectively in many occasions made our judgement calls on what the data is telling us, how do we now deliver this in order to solve the problem? After all, that's what coaches are, problem solvers! For those that have seen me work, you may know that I have an intervention cycle that I work towards that is where is the first breakdown, what are the compensations and what are the subsequent recovery moves? So for the purpose of this article, let's focus on what breaks down first within the golfers swing and what are the common influences and consequences attached to this breakage. I believe that you should always start and work from the first breakdown. This way we may start to understand the data better.

Now, we'll never truly know why golfers do what we do (that's why credible data etc is so vital) therefore balanced, educated judgement calls help allow us to make better decisions. Below is a cycle of influences that typically impact on the breakdown, you will note that it is a circle and this is important as when presented with the list of possible influences, which one do we deal with first? Is there a start and end or is it in some ways a self-perpetuating cycle? My view is, everything effects everything therefore understanding data correctly and having the ability to drill deep and not just "read what it said on the tin" is crucial.



Let's start at the top and work clockwise, for no reason apart from it will hopefully make it easier to follow.

Compensations – Compensations are what the golfer does to effectively move around the problem. A little like the way water flows, it will follow the easiest route around any blockage. Therefore, is the data we are looking at compensatory data? What is it compensating for? What is the underlying to the compensation?

Recovery – I have mentioned in previous articles how the neurological system (the brains GPS) knows where impact is, especially in skilled players, therefore it will make accurate, quick adaptations when it knows the club is lost, hence getting it back on track and more often than not in the appropriate impact position for the task in front of them. Is the data showing the recovery move, which more often than not is actually making the swing work. Therefore would it be wise to change this without looking at what the player is attempting to recover from?

Outcome – Is the data outcome data? So do we know what process the golfer went through in order to achieve this outcome?

Structural – Is there an underlying physical reason as to why the golfer is moving in the way they do? This said, is the data a reaction to a physical imbalance that invariably leads to injury and or swing compensations. Additionally, is the body structure adapting to swing dysfunction so which one do you address first, structure or swing pattern?

Equipment – Is the golfer reacting in their swing to make incorrectly fitted equipment work, as often seen in younger adolescent golfers? Surely this will influence the data? Was data captured on a teenage player in January for example, then when retested they have grown substantially however they are still using the same equipment. One would be wise to assume then the data will change!

Emotional – Psychologists such as Dr Noel Blundell will inform you that one of the biggest differences on human performance is emotional intensity. Dr Blundell explains how the level your emotional intensity is running at is the key influence in performance change, therefore if we test golfers on separate days, with completely differing emotional levels, then one could make a fairly confident guess this will impact on the data?

Environment – Testing a golfer in warm, sunny, calm conditions in July compared to indoors or on a cold, windswept driving range, whilst wearing several layers in January you would assume will impact on the data?

Concepts – In my experience, misconceptions are still the biggest influence on why golfers move in the way they do. So before we embark on any training program, is this something we need to address as if they are misinterpreting what they are attempting to do, then this will invariably impact on what they do. In the words of Einstein, the only thing that effects my learning is my education. The challenge with many golfers is that they are very reactive athletes, typically reacting to feel or flight. It's not uncommon that their concepts to change in session based around changes in feel or shot patterns.

Another consideration is do golfers function and move different from mats, grass, range, indoor studio and golf course? I have just started capturing and collecting 3D swing data on the golf course and the early indications are there are some extremely interesting patterns existing. Once enough data collected, I will present this at a later date.

In summary, collecting data on golfers is vital as it has helped enhance the development of golfers to new levels. Arguably, I think there are three important times to collect data:

1. When the player is playing their best golf. Essentially cloning them and capturing the DNA of what they do when they perform their best. This way, as/if and when their form drifts then you have the benchmark of where they were when they performed their best. I think this is also important as golfers typically react to feel or flight, so having evidence on when they move and strike their best will help reduce the 'searching' mentality some players exhibit when they lose their way
2. When the players is hitting their typical bad shot and when they have their bad feels. What's changing within their patterns as this helps identify the first breakdown and why it breaks
3. When the player is injured. What moves are they making that is causing the overload.

Things that we can see now were not possible ten years ago and continuously pushing the boundaries and using technology to help make better judgements is an exciting and in many ways limitless process, after all we don't know what we don't know. However, when looking at data next, where applicable refer to the points mentioned as the top of this discussion as it may help you see the numbers in a different light. As the famous story goes, a company calls out an engineer to fix one of their employees' computers as it has a fault. The engineer looks at the

computer and askes the employee what the problem is etc.. The employee replies that they have tried numerous techniques and tried everything possible for the past hour trying to get it to work. The engineer looks at it and after five seconds presses one button and to the astonishment of the employee it works immediately. After saying their thanks and goodbyes, the engineer sends an invoice for £100 to the company. On receiving the invoice, the company are horrified at the expense and contacted the engineer to explain the reason for amount of the invoice as all the engineer did was push one button, to which the engineer replied I know, however it's knowing which button to press!

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