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Much has recently been written in popular golf magazines (Plummer & Bennett, 2007a, 2007b, 2007c), about the “new tour swing” advocated by Mike Bennett and Andy Plummer (B&P). It certainly is a “hot” topic in the United States and I can imagine that it (as well as Plummer & Bennett) are receiving plenty of publicity in other parts of the world. I am convinced that these two coaches are providing their players with the necessary support and input to help them become successful: they must be doing something right or they would not be popular! While I am not trying to shoot down these two men and I have no personal axe to grind with them, I do get frustrated when coaches advocate movement patterns and swing mechanics that are not true! In this short article I will address the key principles and foundations of the Stack & Tilt method and provide evidence to either support or refute the propositions.

Here is a list (taken from the various articles that have appeared in the popular golf magazines this year):

the most efficient swing is one in which the golfer stays centered over the ball during the backswing, while keeping his weight on the front foot

This claim hardly makes sense and is nonsense! Firstly, no measure of efficiency is ever provided (remember that efficiency is defined as the ratio of work done:energy expended). Secondly, what does “centered over the ball” actually mean? Lastly, no golfer (let alone tour players!) keeps his or her weight on the front foot! Everyone transfers weight during the backswing! If there was no weight on the backswing, then it would be impossible to push with the back foot (it would have nothing to push against and therefore no force could be applied to it!).

there is no effort to transfer weight

In order to move the body, work must be done and therefore, energy must be expended. Thus, there is effort (work) required to transfer weight.

at setup, there should be 60% of the bodyweight on the front foot

This statement could well be true!

the centres (the centre of the shoulders and the centre of the hips) should lie in a vertical plane (as viewed from front on) and should remain vertical throughout the backswing and downswing

In Figure 1, I have drawn these “centres” at three points (address, top of the backswing and impact) for the swing of Aaron Baddeley. You can see clearly that they do not remain vertical (green line) throughout the swing. The data from hundreds of tour players are consistent with the pictures that I have chosen to show of Baddeley, though there is variation. In fact, most tour players have a slight tilt of the pelvis, upper torso and spine to the right (right side lower than left) at setup and at impact. I have published the range of values for these three tilts (Neal, 2004) and they are 0-3° (pelvis), 7-13° (upper torso) and 0-10° (spine). The spine value is the difference between the tilt of the upper torso and pelvis.

the spine needs to tilt to the left (toward the target) on the backswing (so that the weight remains “centered”) the right leg straightens during this backswing movement and the left shoulder moves down

During the backswing, the back knee (right knee for right hand golfers) may extend slightly but it never straightens completely. Thus, at the top of the backswing there is still some flexion in this knee. It is interesting to note that because the pelvis is being rotated in an oblique plane (i.e., it is angled at between 20 and 30° to the horizontal), the back hip joint is higher than the front one, with a tilt to the left (e.g., left hip lower than right for right hand players) of approximately 10-15°.

at the top of the backswing, the percentage of weight on the front foot has increased

Since, according to P&B, there is approximately 60% of the bodyweight on the front foot at address then there must be something greater than that (e.g., 70 – 80%?) at the top of the backswing. The data from Langdown (2007) among others, show that this statement is false. In fact, the exact opposite occurs as the load on the back foot increases with a concomitant decrease on the front foot. It is also pertinent to designate the demarcation from backswing to downswing. It is our belief that there is no single point that is the “top of the backswing”. Rather, there is a transition phase as first the body (starting with the lower body) and then the club reverse their direction of movement. This method seems to make sense biomechanically since there is a sequence of movement from proximal-to-distal that is used by the human body to maximize the speed of the distal (club) segment.

the entire body starts the downswing together and more weight is transferred to the left foot (the left knee is now straightening and the right knee is flexing)

Part of this statement is true in that weight is transferred to the left leg and the left knee straightens. It is interesting to note that this statement is in direct conflict with their statements that there is no weight transfer during the golf swing! The phrase that the entire body starts the downswing together is fallacious. Neal et al. (in press) have documented that highly skilled players have a distinct proximal to distal sequence and timing pattern during the downswing. This sequence allows energy that is generated by the large muscles of the legs and torso to be transferred to the small body segments at the end of the kinematic chain.

The hips have limited turning capacity when they're tilted, so they have to come out of their tilt to keep accelerating. The move that releases the hips is a springing up of the lower body, where the butt muscles push the hips upward and toward the target. The player has to feel as if he's jumping up as the club comes down

Let's firstly assume that P&B are referring to the pelvis and not the hip joints. If that is the case, then there is no evidence to support their contention that the pelvis has limited turning capacity when it is tilted. Their comment that the hips have to “come out of their tilt to keep accelerating” is the opposite of kinematic data collected at the Titleist Performance Institute. In fact they maintain that if the pelvis bends under (i.e., early extension of the spine), the pelvis is decelerated! (Rose & Phillips, 2006).

The body is leaning on the front side, the club comes down steeply and would crash into the ground unless the swing shallows out. The pelvic thrust takes some of the steepness out of the swing.

In the 3D world, we refer to thrust as AP motion of the pelvis. I do not understand what they mean with this statement.

During the follow-through, the torso flexes forward and the butt tucks under the back. The spine tilts away from the target for the first time and has a C-shape appearance.

This statement makes no sense at all! The classic C-shape appearance comes about with extension of both the lumbar and thoracic spines. Tucking the butt under is normally described as posterior pelvic tilt by the physiotherapists and creates flexion of the lumbar spine.

Here is an interesting comment taken from the Golf Digest article

Some people say our Stack & Tilt Swing is a reverse pivot because the weight doesn't shift to the right on the backswing. But why would you shift to the right when you know you have to be left at impact? Not even the pros are good enough to do that and get back to the ball on a consistent basis.

The data from Langdown (2007) clearly show that there is substantial weight transfer during the golf swing and that professional golfers are very consistent in transferring their weight. In fact, Jacobsen et al. (2005) in a study of NCAA golfers showed that those golfers with the highest skill level (as measured by their golf scores) had the most consistent patterns of weight transfer during the swing.

References

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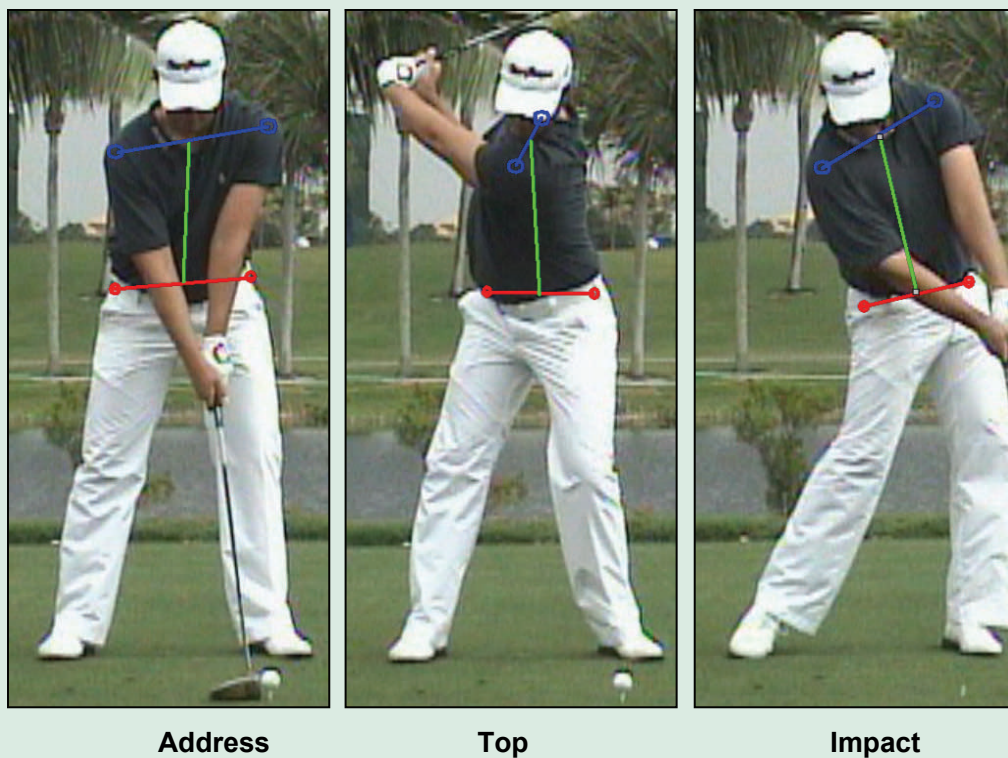


Figure 1. This figure is extracted from video taken during a practice day at the WGC event in Miami (Mar-2007). It is hard to imagine that the load (weight) on the left leg remains constant during the entire swing, particularly in the impact frame! (Note: I drew dots at the anatomical landmarks of the hip (blue) and shoulder (red) joints and then drew a green line between the centre of the hips and shoulders, as stated by Plummer & Bennett).