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**Golf swing technician Jim Christine:**  
**Bridging the gap between the science of the golf swing and the art of golf coaching**  
**A Commentary**

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**Introduction**

In an insightful interview, esteemed golf coach Jim Christine talks directly about his use of a “*clock analogy*” - a metaphorical clockface on the ground representing horizontal launch angle with 12 o’clock as the line to the target - “*to get over that idea of the starting direction of the ball, and therefore the line of the path of the swing*” (p. 13). He provides the example of asking players to “*to keep the ball within one o’clock on the clubface*” (p. 14) and, in discussing the application of the coaching method, references the control and shape of ball flight, environmental constraints (trees and out-of-bounds) and wanting players “*to think about swinging the club in the right direction*” (p. 20). Jim Christine’s application of the clock analogy coaching tool, and his description of it, draws attention to the *effect* of the player’s movement (club, clubface, ball flight) rather than the internal mechanics of the swing itself. Directing attention in this way has empirical and theoretical backing. Attempts to experimentally manipulate attention through instruction and verbal feedback to the effects of the movement (external focus of attention) rather than to the movement itself (internal focus of attention) have generally led to superior performance outcomes (Wulf, 2013). The benefits of an external focus are explained by the *constrained action hypothesis* (Wulf et al., 2001). In the context of the golf swing, the constrained action hypothesis suggests that directing attention internally to the mechanics of the movement is likely to cause players to attempt to consciously control parts of their golf swing. This can have a constraining effect on how the movement is organised, and ultimately, the effectiveness and/or consistency of the outcome. Alternatively, directing attention externally to the effect of the swing “*allows the motor system to self-organise more naturally*” (Wulf et al., 2001, p. 1144) and benefits performance. The purpose of this commentary is to provide support for Jim Christine’s *clock analogy* coaching tool by presenting empirical research, pertinent to golf, on the

relationship between external focus of attention instruction and performance, with specific focus on research that has considered the underpinning concept of self-organisation.

### **The generally positive performance effect of external focus of attention instructions**

Practice of a golf-pitch with reference to a single instruction to focus on the pendulum-like motion of the club (an external focus) resulted in superior shot accuracy for a group new to golf than for those who were instructed to focus on the swinging motion of the arms (an internal focus) (Wulf et al., 1999; Wulf & Su, 2007). The performance advantage associated with drawing attention to the movement effect (the motion of the club) has also been shown for low handicap players (Bell & Hardy, 2009; Perkins-Ceccato et al., 2003; Wulf & Su, 2007). Extending this work, Bell and Hardy (2009) found that skilled golfers (mean handicap of 5.51) further benefited from a focus on ball flight compared to the more proximal movement effect of the position of the clubface through the swing. This was true when pitching in low- and heightened-anxiety performance conditions and supports the proposal put forward by Wulf and Su (2007) that attention should be drawn further away from the movement (ball flight rather than club face) as task proficiency increases. However, this may be conditional on the task. Kearney (2015) found that the putting of participants with no competitive golf experience also benefited from instructions to focus on ball path when compared to instructions to focus on the motion of the putter (proximal external) or focus on the mechanics of the swing (movement of the arms or shoulders). Moreover, when asked, participants generally preferred focusing on the ball path than either the motion of the putter or an internal focus. In this case, when participants were instructed to focus on the motion of the putter their performance was no better than when they were directed to focus internally (see also Poolton et al., 2006).

Jim Christine's applied example draws attention to the swing path of the *clubface*, and he expresses a want for players to think about *swinging the club*, both relatively proximal external focus instructions. It would be interesting to know if Christine directs attention to more distal effects of the swing, such as ball flight or landing areas, when working with low handicap players or when working on the less-complex, but equally important, parts of the game, such as green-side pitching and putting. The experimental research on focus of attention instruction suggests that if the appropriate external focal point can be found,

positive performance outcomes and learning gains will result, possibly because the body is allowed to solve the problem without interference from conscious processes (McNevin et al., 2003).

### **External focus of attention instruction allows the body to better organise**

Empirical focus of attention studies of far-aiming tasks (dart throws, basketball shots) and golf-specific tasks have suggested that the benefits of external focus of attention instruction are associated with the action not being constrained by the performer focusing on the movement; that is, the motor system is afforded the opportunity to self-organise (e.g., An et al., 2013; Hitchcock & Sherwood, 2018; Lohse et al., 2010; 2014; Zachary et al., 2005). Specific to golf, An et al. (2013) found that a group of players relatively new to golf that were instructed to “push against the left side of the ground” (p. 5) as they hit the ball (an external focus) generated higher maximum shoulder, pelvis and wrist velocities, and subsequently further ball carry, than a group of players instructed to transfer their weight to the left foot as they hit the ball (an internal focus). It is assumed that in order to generate and coordinate the velocities that return a longer ball carry, the swing would have to be better organised. Superior organisation of the motor system has also been inferred by studies that have found relatively lower surface EMG of both the biceps and triceps brachii in basketball free-throws (Zachary et al., 2005) and dart throws (Hitchcock & Sherwood, 2018; Lohse et al., 2010) following the provision of external focus of attention instructions. Heighted EMG activity of the prime movers of the basketball or dart likely reflects ineffective and uneconomical co-contractions, that is, a less well-organised motor system (Marchant et al., 2011). As a more direct test of organisation, Lohse et al. (2014) measured the accuracy of dart throws, the trial-by-trial variability of critical features of the throwing action (e.g., angle and angular velocity of the shoulder/elbow/wrist), and the co-relationship between these critical features. Proximal (dart flight) and distal (board) external focus instructions produced more accurate throws with greater trial-by-trial variability of critical features than produced by internal focus instructions (focus on the hand’s release of the dart or the motion of the arm). Importantly, external focus instructions resulted in stronger correlations between critical features suggesting a functional relationship, in which a deviation in one critical feature would be compensated by another feature in order to stabilise key performance variables at the vital moment of dart release (Lohse et al., 2014).

In short, an external focus of attention instruction allowed the body to better organise. Moreover, building functional variability within the motor system may better equip a player to deal with perturbations (noise) that can occur during movement execution, such as that caused by wind or the tug of long grass. In sum, one of Christine's favoured coaching tools for how to coach the golf swing may result in performance and learning benefits because it allows the body to organise movement better than it would if conscious control was either requested or triggered by an internally focused coaching instruction.

## **Conclusion**

In his application of the clock analogy, Jim Christine appears to deliberately direct player's attention to the effect of the golf swing as opposed to the monitoring and control of the movements underlying the swing. His practice informed theory of how to coach aligns with empirically informed practical recommendations from the focus of attention literature. Scientific tests of the theory explaining the benefits of external focus of attention instructions find evidence for favourable movement characteristics, such as higher movement velocities, greater movement efficiency and functional variability, suggestive of the superior organisation of movement. The challenge for coaches who want to follow Christine's lead is to identify the feature of the movement effect that works best for the player and for the part of the game that is being worked on.

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