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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

Liam D Thomas, Chris Low and Jamie M Poolton

Carnegie School of Sport, Leeds Beckett University

Introduction

In the interview presented by Simon Jenkins, Jim Christine discusses the application of the Laws, Principles and Preferences model of the golf swing. Based on the work of Wiren,¹ the concept of Laws, Principles and Preferences (see Table 1) provides a framework from which golf coaches can develop a ‘method’ of instruction to facilitate skill acquisition by conducting a systematic diagnosis of swing errors, upon which to then focus intervention. The framework remains a threshold concept within the Professional Golf Association (PGA) of Great Britain and Northern Ireland’s coach development curriculum and is likely to be interpreted and adapted by coaches in accordance with their inclinations and experiences.² The purpose of this commentary is to highlight the need to test the validity of the Laws, Principles and Preferences model as a coaching tool to diagnose errors and prescribe targeted intervention.

Research on application of laws, principles and preferences model

Empirical research into golf coaches’ application of the Laws, Principles and Preferences teaching model, is limited and mixed. Without direct reference to the framework, Smith³ observed and interviewed PGA golf coaches to collect their thoughts on the aspects of the golf swing that are characteristic of a ‘top-level’ player. Three key features emerged, namely, *ball flight*, *club motion* and *body motion*, and descriptors included the relatively abstract concepts of accuracy, powerfulness, repeatability, controllability, and simplicity; but how each related to a desirable outcome (ball flight) was not considered.

Morrison² interviewed 18 professional PGA golf coaches to understand the steps coaches typically take to analyze the golf swing of an ‘established player’. All but one coach referred to making swing changes that directly influenced the ball flight. Following initial observation of the ball flight, 14 of the coaches described how their attention then shifted to the impact between club and ball. Together the group referred to each of the ball flight laws to varying degrees. Following diagnosis of the error, all coaches then considered the feature (or principle) of the golf swing they would work on to remedy the error; but direct associations between critical features of swing technique (*Principles*) and ball impact and flight characteristics (*Laws*) were not described.² It seems that Morrison’s sample of coaches adhered to some of the principles of the Laws, Principles and Preferences teaching model, but it is unclear which aspect of the golf swing technique (*Principle*) was considered critical to achieving the desired impact factors (*Laws*) and final ball flight. Moreover, while most coaches subscribed to the idea that there is not a ‘blueprint’ or model golf swing, Morrison² did suggest that this was conditional on the skill level or physical capabilities of

the learner - application of a model golf swing was considered useful when coaching beginners or those flexible enough to get into the positions required by the model swing.

Technical faults vs. intra- and inter-variability

The idea of “the way” to perform a sport skill has been propagated by science and research alike.⁴ In the context of golf, the premise is that an optimal, invariant movement pattern would result in consistent ball impact characteristics and successful shot outcomes.⁵ In conjunction, biomechanical research has sought to clarify key technical performance indicators by calculating and comparing group mean data and by testing for relationships between a technique variable and some outcome or performance measure (e.g., clubhead velocity and shot distance). For example, Tinmark⁶ examined if full and partial swing shots (*length of arc*) were organised in a proximal to distance manner (*timing*); Fedorick⁷ investigated differences in wrist (*position*) kinematics and Wheat⁸ the alignment of the upper body (*aim*) at address, top of the backswing and at impact. In so doing, such approaches mask inter-and intra- individual variability,⁹ which has been identified as an inherent feature of the golf swing, even within high-skilled performers.¹⁰⁻¹² Therefore, a ‘technique blueprint’ approach is considered by some to be unreliable in identifying the aspects of a technique that are associated with better performance,¹³ and by others as a constraint on critical thinking about effective technique.¹⁴ Indeed, there is an increasingly convincing argument that inconsistency or variability within some features of the golf swing is not a problem but a functional advantage¹⁵ and reflects the range of possible movement patterns available,⁹ which allows the motor system to readily adapt to perturbation and ever changing constraints, such as shot distance, intended ball flight, lie of the ball and weather conditions amongst others. However, that is not to suggest that movement patterns are categorically different between individuals as they will consist of shared features (*Principles*) that distinguish a particular technique (e.g., a golf swing).¹⁶ Likewise, individual movement patterns will contain characteristics that define their unique movement style (*Preferences*).¹⁷ It seems reasonable to suggest that a coaching model which forms the basis for swing error diagnosis and intervention would need to account for the inherent variability both within and between individuals in response to changes in constraints. A challenge faced by both the practitioner and researcher, then, is the capability to distinguish between what might be considered a technical fault as opposed to “*functional adaptations* [intra-variability] *or stylistic idiosyncrasies* [inter-variability]”.¹³

Conclusion

Wiren¹ recognises that the Principles reflect “fundamental considerations in the swing which have a direct bearing on a player’s application of the Laws” (p. 5) and that a coach should “select or group certain elements on which to focus” (p. 10). However, current biomechanical descriptions of the golf swing are without reference to how the principles of the golf swing interact to bring about the desired impact characteristics (*Laws*) for an intended shot type. In our opinion, the next iteration of the Laws, Principles and Preferences teaching model will need to be shaped by empirical validation of the principles of the golf swing, which accounts for inter- and intra-variability and consultation with professional golf coaches to understand what application of the teaching model actually looks like in practice.

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