Optimizing golf skill learning

This month’s coaching article is written by guest writers, Gabriele Wulf from the University of Nevada, Las Vegas, PGA Master Professional Steven Orr, Guillaume Chauvel from the Université Paris Est Créteil, and Rebecca Lewthwaite from the Rancho Los Amigos National Rehabilitation Center and University of Southern California. They recently wrote a book chapter in the excellent ‘Routledge International Handbook of Golf Science’ and we’ve asked them to summarise their findings in this article and suggest how they might apply to your own coaching practice.

In recent years, research related to motor skill learning has provided important new insights into which instructional methods are effective. In particular, three factors have been identified as critical for optimizing those conditions, and they are central to the OPTIMAL (Optimizing Performance Through Intrinsic Motivation and Attention for Learning) theory of motor learning published by Drs. Gabriele Wulf and Rebecca Lewthwaite in 2016.

Those three factors are:
- **Confidence** (or enhanced expectations for performance)
- **Autonomy support**
- **An external focus of attention**

Golf-specific studies have underscored the importance of each factor, and below are examples of how coaches may incorporate those factors in their work with athletes.

**Confidence**

Being confident in one’s ability to perform well is critical for optimal performance. Thus, providing golfers with a heightened sense of confidence is key to effective performance and long-term changes in performance (i.e., learning). Expectations for performance can be enhanced in various ways. For example, feedback highlighting good aspects of performance and (occasionally) ignoring poor executions results in higher confidence levels and faster learning than the opposite. Furthermore, setting criteria that purportedly indicate good performance, but that can be reached relatively easily, can raise athletes’ confidence and facilitate learning. In one study, novice golfers performed a putting task where the target was surrounded by two concentric circles. One group was instructed that putting within the larger circle would constitute “good” putts, whereas another group was informed that balls ending up in the smaller circles would be considered “good.” The group for whom the larger circle was identified putted with greater accuracy than the other group (smaller circle). Importantly, on another day, with the circles removed, the former group still showed...
superior putting. Thus, making learners feel successful during practice resulted in enhanced performance and learning. Creating measurable opportunities to observe progress can boost confidence: “How many putts out of 10 do you think you can put in the hole?” High performance expectations prepare the golfer for successful movement at cognitive, motivational, neurophysiological, and neuromuscular levels. Confidence also serves as a buffer against distracting thoughts or worries about capabilities.

When setting challenges that involve accuracy, for example in short game or putting, coaches will often use markers to define the target zone for a pupil. Coaches should consider adjusting task difficulty so learners experience success. Furthermore, with the number of new participants in golf dropping, and one of the reasons cited being the perceived difficulty of the game, the value of lowering this barrier to entry cannot be overstated. Confidence is also critical for golfers practicing for, or warming up before, a competition. Setting simple and attainable goals during the warm-up, for example, can serve to boost confidence. Also, after a successful putt, not putting again from the same location, or ending the warm-up with a successful shot, can help players enhance their confidence for performance in a tournament.

- **Autonomy support**
  Conditions that support individuals’ need for autonomy, or sense of control over their own actions, increase their performance, learning, and motivation. For instance, giving learners the opportunity to request feedback, decide when to watch a demonstration, or choose the number of practice trials, enhances learning. Even minor and seemingly insignificant choices, such as choosing order of practice tasks, have the same benefit. Also, the type of instructional language has been found to have an impact on motor learning. In one study, instructions that gave the learners a sense of choice (“You may want to try …”) led to superior learning relative to “controlling” instructions that offered little option for how to execute the skill. In a golf-specific study, allowing novice golfers to choose the colour of golf balls led to more effective learning of a putting task than not giving them that choice. An additional advantage of giving learners choices is that it increases their motivation to practice – which might have additional indirect benefits for learning.

  Having choices results in enhanced processing of task errors, reduced nervousness or worries about performance, and confidence boosts. Coaches have many opportunities to support pupils’ need for autonomy. For example, a coach can allow the pupil to choose which target to aim at, in which order to work on the agreed tasks for the coaching session, which section of the practice area to hit from, or which club to use. When offering augmented feedback (typically feedback on results or performance), common tools used by coaches are video replay and launch monitors. Coaches can let pupils decide which shots to look at.

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COACHING OPINION

- **External focus of attention**

A golfer’s focus of attention, or concentration, is another critical factor. Numerous studies have shown that adopting an external focus – or concentrating on the intended movement effect or outcome – is more effective than an internal focus on body movements. An external focus might be one that is directed at the motion of the golf club, a target, the force exerted against the ground, or even a sticker attached to the body (e.g., chest). Compared with an internal focus (e.g., arms, shoulders, hips), an external focus enhances overall performance, including movement accuracy, consistency, distance, maximum force, and automaticity.

In several golf studies, external focus instructions produced greater accuracy in hitting a target relative to internal focus instructions for both novices and experts. At a higher skill level, concentrating on a more distant or distal movement effect, such as the intended ball trajectory or the target, has been shown to be more effective than an external focus that is closer to the body (e.g., club head). Advantages persist under pressure. Interestingly, movement form often changes immediately with an appropriate external focus. For example, in novice golfers, instructions to push against the ground (external) resulted in a greater shoulder-hip angle during the downswing than did instructions to shift the weight to the front foot (internal). Carry distance was increased as well. Thus, a single external focus instruction enhanced both movement form and outcome.

One of the challenges a coach may face in implementing coaching cues that encourage an appropriate external focus is developing the understanding and creativity to devise relevant tasks and metaphors. For example, a coach might feel that a faulty hip or shoulder action may be the primary contributor to poor movement form, and it may seem easier to simply ask the pupil to focus on that. However, focusing on the movement of the club or on hitting a certain part of the golf ball may be an alternative cue that will facilitate the change in hip movement required. External swing thoughts such as “hit a high draw,” “land it pin high,” or “start it on the tree on the left,” allows the player to maintain the technical aspects during the swing (e.g., try to keep the club head moving down the target line after impact) without disrupting automaticity.

CONCLUSIONS

The importance of each factor – confidence (or enhanced expectations), autonomy support, and an external focus of attention – for enhancing performance and learning has been demonstrated in numerous studies, including golf-related studies. While each of these factors plays an important role in and of itself, recent findings show that they have additive effects. That is, the presence of all three factors leads to the most effective outcomes. Golf coaches can easily take advantage of these effects. They require little more than small changes in the way they give instructions or feedback – and, of course, some creativity. The resulting movement success may even create a virtuous cycle with overall positive consequences for learning, motivation, and participation in the game of golf.

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If you have a question for the authors, please send it to gabriele.wulf@unlv.edu

If you are curious to read a more detailed explanation of this author’s findings, or any of the other subjects within the Routledge International Handbook of Golf Science, why not purchase a copy from either the Routledge or Amazon websites.