



The usefulness of externally-directed instructions for teaching technique and tactics.

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ABSTRACT

This article outlines research findings that demonstrate the superior benefits to motor-skill learning of using externally as opposed to internally directed instructions. This is illustrated with examples and then some implications and suggestions for coaching practice are made.

Key words: Technique, Instructions, Feedback, Attentional focus.

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INTRODUCTION

Among coaches, there are a variety of different styles and methods of improving players (see Crespo & Miley, 2005 for a description of a variety of these). Styles are based on coaches' own individual experiences of playing, teaching and coach education. While there is a strong scientific consensus on many of the most effective coaching styles and techniques, sport science research can only point the way and seldom offers definitive answers on the most singularly effective methods in every aspect of training. In other words, there is no one way that defeats all others. This is of course also true due to the vast array of ages and abilities that are encountered by coaches in their everyday work- different people require tailored approaches to help them reach their potential.

There is however one area of skill acquisition research that has offered consistently positive results in its effectiveness as an instructional tool for a broad range of abilities. It has not been specifically addressed in any detail in this publication and despite having never encountered it on a coach education curriculum, it has many useful applications for a coach. The technique in question is the directing of a learner's attention to an external point of focus as opposed to an internal one. For instance, when trying to change the path of a player's swing, the coach is faced with many possible choices, one of them being to direct the player's attention to the movement of the

arm (an internal point of focus), or to the movement of the racket (an external point of focus).

THE CONSTRAINED-ACTION HYPOTHESIS

Research into the direction of a player's attention during skill-learning has shown that an external point of focus is generally more beneficial than an internal point of focus (Wulf & Prinz, 2001). This result has been repeatedly found in many laboratory studies by Gabriele Wulf and her colleagues, as well as in field research in tennis (Maddox et al., 1999) and golf (Wulf et al., 1999). The theory behind this effect is the constrained-action hypothesis, which states that an internal point of focus disrupts the flow of movements that function more efficiently without the self-conscious attention promoted by an instruction to manipulate a specific part of the body.

Many coaches may already be familiar with this principle, as it is commensurate with the philosophy of Gallwey (1974) and the "inner" game of tennis. It will also ring true with anecdotal evidence of "paralysis by analysis" and experiences many will have had of how "thinking too much" can disrupt smooth execution. Incidentally, while excessive augmented (verbal) feedback has been found to degrade the learning process for motor skills, this pattern seems to hold only when the feedback is internally directed. Externally directed feedback has not been shown to negatively affect learning in larger volumes (Wulf & Shea, 2004). Much research suggests that complex movements

are largely self-organised in novices as well as experts (Davids, Button & Bennett, 2008), and that these can be harmed by too much conscious attention. There is now also physiological evidence of this phenomenon from muscular electromyography (EMG) data from research that found basketball players' arm muscles to work more smoothly in executing a free-throw when their attention was directed externally as opposed to internally (Zachry et al., 2005). The externally focused players threw more accurately and with less EMG activity in their biceps and triceps, indicating more efficient movement.

Further to the apparent benefits of an external point of focus when compared to an internal one, learning also seems to be affected by the proximity to the body of the point of focus itself. In tennis, a player's movements have direct effects on the environment, most notably on the racket and the ball. It can be said that the effects on the racket are more proximal (closer) to the player's body, while the effects on the ball and its ensuing movement are more distal (further away). In a laboratory balancing task, McNevin et al. (2003) consistently found that the further away from the body their participants' point of focus, the more beneficial it was to their learning. More importantly, this finding was replicated in a study of learning a backhand drive in tennis (Maddox et al., 1999). In this experiment, players' learning was enhanced when their attention was directed to the intended effect of their movements on the ball, when compared to the effect of their movements on the racket. In the case of tennis at least, it seems that using instructions that direct learners' attention to their body are generally less beneficial than directing attention to the racket, which is in turn less beneficial than directing attention to the intended effect on the ball.

PROPOSALS

This principle has some obvious implications for coaching and instruction. When teaching a novice a basic groundstroke swing, many coaches will be familiar with directing a player's attention to the finishing position of the elbow and perhaps a turning of the wrist. In applying the theory described above, coaches are encouraged to think of where the racket (external) will finish after a desired swing instead of the elbow (internal), or how the wrist (internal) manipulates the racket-face (external). For instance, instructions that emphasise an external focus on a forehand drive might include; "Finish with the racket around your shoulder"; "Point the butt of the racket forwards at the end of the stroke" and "Finish the stroke with the racket strings facing the side-fence". Better still, depending on the intended tactical outcome, the coach can start by directing the player's attention to desired effects on the ball itself. Starting basic instructions with the words, "Make the ball..." will effectively direct a player's attention to the intended ball control and keep the learning at an optimal level. After some initial attempts, this will also inform the coach as to whether it is necessary to direct the player's attention to their racket

because of a technical limitation that will not allow the player to achieve the desired ball control and subsequent tactical goal. A similar effect might be achieved with an instruction to a player to transfer their bodyweight. Instead of directing attention to the foot on to which weight should be transferred, a coach could use the directional instruction of "toward the net" for example when encouraging a player to get her weight on to a specific foot.



There are many further possibilities for taking standard technical goals for players and turning the typical, internally directed instruction into an externally directed one. One inspired coach who wanted to help his young players with opening the outside hip in preparation for a groundstroke used eye-shaped stickers and stuck them to his players' knees. The instruction to his players to then make the "eye" look in a certain direction when positioned behind the ball helped them open the appropriate hip effectively before their shots, perhaps due to the way he took a very internally- focused technical goal and innovatively made it more external to facilitate learning. This sort of strategy is effective with young players and could be adapted easily to any part of the body. Even without the aid of stickers, an imaginary eye or arrow could easily be used to guide players' movements as a skill-focused imagery exercise for increased learning. The mental picture of something outside the body that is affected by movement could be said to act as an external point of focus and keep players from disrupting smooth movement execution.

CONCLUSION

The message of this article is not that internally directed instructions to focus on moving specific parts of the body are redundant. There is always a place for a simple instruction of this nature as an opportunity to improve technique, especially when dealing with players who want specific technical information and learn best with instructions on how to use their

limbs and body. The message is to experiment with externally directed instructions as a starting point for teaching movement skills. The philosophy behind keeping an external point of focus is part of a broader "top-down" approach to coaching in sport that is reflected in games-based coaching styles, constraints-led approaches to skill acquisition (Davids et al., 2008), implicit learning (Masters, 2000) and perceptual-cognitive frameworks like decision training (Vickers et al., 1999). Underlying these approaches is a de-emphasis on the role of explicit verbal instructions as a means of teaching, especially when communication is directed toward the manipulation of specific body parts. These styles are well-supported by research evidence on their effectiveness and signpost the move away from the older school of "bottom-up" coaching where one-size-fits-all techniques were micro-managed through high volumes of verbal instructions in tactically redundant and repetitive basket-drills.

The external focus of attention effect when performing a skill is one of the most robust phenomena in skill acquisition research and it is intended that the reader gain some insight into why something coaches are likely already doing works well for their players. Also it is hoped that some new ideas are inspired so that the reader can optimise his or her learning environment by adapting instructions where possible.

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