A Novel Training Tool for Batters to 'Watch the Ball'

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The mantra to 'watch the ball' is one of the most fundamental and often-heard instructions in the game, but are coaches actually able to coach it? This presentation will address a series of studies which have examined the role of vision in cricket batting, and in particular how good vision must be for successful batting, and the role of implicit visual skills in the development of expertise in batting. As a result of these studies, a novel training tool will be proposed to implicitly enhance the concentration of skilled cricket batters.

Vision is clearly important for the performance of hitting skills like those demonstrated by elite cricket batters. This has lead to the natural assumption that excellent cricket batters may have some form of 'above-normal' vision, and that any action taken to improve their visual skills would result in direct improvements in batting performance. This assumption has been challenged by studies of sporting expertise which typically advocate vision to be a poor predictor of sporting success. Rather than relying on superior visual skills, these studies suggest that excellent cricket batting is more likely to be underpinned by highly developed perceptual-cognitive, psychological, and motor skills. This viewpoint is supported by the relatively common occurrence of anecdotal stories of sportspeople, including cricketers, who have been highly successful performers despite displaying patently poor levels of vision. To examine this discordance in the role of vision in cricket batting, a series of studies were performed to examine how good vision must be for optimal batting performance.

The vision of grade level cricket batters was blurred using contact lenses (four increasing levels: plano, +1.00, +2.00, +3.00; see Figure 1) in each of two experimental phases. In the first phase batters faced a bowling-machine and live bowlers to examine the effect of blur on batting performance. It was revealed that the highest level of blur (+3.00) was required to produce a significant decrease in batting performance when facing the bowling-machine at medium-paced ball-velocities (105-115 kph; Mann, Ho, De Souza, Watson, & Taylor, 2007). This finding indicated that somewhat surprisingly, vision was required to be blurred to the level of legal blindness before there was a significant decrease in batting performance.

Figure 1. Four increasing levels of blur experienced by batters

A viable interpretation of the inability of blur to decrease batting performance may have, in part, been that facing a bowling-machine was a highly predictable task; however a similar effect of blur was found when facing live bowlers of comparable ball-velocity. Once again, the highest level of blur (+3.00) was required before there was any measurable decrease in performance when facing medium-paced bowlers. Only when batters faced faster-paced ball-velocities (120-130 kph) did a lower level of blur (+2.00) affect performance (Mann, Abernethy, & Farrow, in press-a). Even when batters were tested in a situation simulating the batting conditions experienced at the higher levels of competition, the +1.00 level of blur was concluded to have no measurable effect on batting performance.

The second phase of testing sought to investigate anticipation: a perceptual skill established to be an important component of expertise in many interceptive sports such as cricket batting. Skilled batters are able to predict ball-flight characteristics such as the type of swing or spin of the delivery prior to ball-release by the bowler (Müller, Abernethy, & Farrow, 2006; Renshaw & Fairweather, 2000). We sought to examine whether skilled grade-level batters could predict the line of the delivery prior to ball-release, and in particular whether this was an explicit skill which could be verbalised, or that is was a more implicit one that was embedded in movement. Skilled batters observed balls being bowled towards them and attempted to predict the line of those deliveries when decisions were made based only on the visual information available prior to ball-release. With vision occluded at the moment of ball-release, batters predicted the direction of the ball either (i) verbally, (ii) by moving their foot towards the ball, (iii) by playing a 'shadowed' shot, or (iv) by attempting to hit the ball. It was shown that batters were unable to verbally predict the anticipated direction of the ball; performance in this task was no better than levels achievable by chance guessing. When producing a predictive movement, skilled batters were, in some cases, able to predict the line of the delivery prior to ball-release. Only when attempting to hit the ball did the batters reach their maximal performance in predicting the line of the delivery prior to ball-release (Mann, Abernethy, & Farrow, 2010). These findings demonstrate that, although when trying to hit the ball, skilled batters are able to predict ball-direction based on the movements of the bowler, they do not appear to have the explicit knowledge of how they do so. This provides some evidence to suggest that the ability to predict line is an implicit skill which has developed over many years of batting practice. It is clear that not all elements of batting expertise can be verbalised; in this case skilled batters were able to perform a skill, but they did not appear to have the declarative knowledge to replicate this when explaining the outcome. The implication for coaching is that first, skilled batters cannot explicitly verbalise or explain some of the skills that they demonstrate on a daily basis. Second, these findings highlight that practice design must simulate real-life conditions as closely as possible, otherwise these more implicit skills may not develop; in particular, these findings highlight that a bowling machine will be detrimental in seeking to develop these implicit anticipatory skills.

The vision of skilled batters was manipulated by the same four levels of blur used in the first phase of testing (plano, +1.00, +2.00, +3.00) to examine the level of vision required for the successful anticipation of ball-flight characteristics based on pre ball-flight information. Skilled batters predicted the line of deliveries based on the vision of live bowlers occluded at the moment of ball-release in each of two different response conditions: (i) a coupled condition where batters attempted to hit the ball, and (ii) an uncoupled condition where batters verbally predicted the direction of the ball. Coupled anticipation demonstrated velocity-dependent resilience to blur; +3.00 and +2.00 levels of blur were required for respective decreases in the anticipation of medium- and fast-paced ball-velocities (Mann, Abernethy, & Farrow, in press-b), replicating the resilience to blur found in the first phase of testing. Remarkably, the results for the uncoupled anticipation suggest that blur may actually enhance anticipation according to the movement velocity of the bowler. It has been proposed that visual blur may 'filter out' information of high-detail which has the potential to distract the observer from the visual information (of lower detail) that is most useful for the detection of movement. Further work is required to test this rather speculative suggestion.

Collectively, these results lead to the conclusion that clear vision is not necessarily required for the performance of a task like cricket batting, even when the demanding spatio-temporal task simulates the conditions experienced at the higher levels of competition. Although clear vision may be an advantage for related tasks such as detecting grip of the bowler's hand prior to ball-release, or in identifying the position of the seam in ball-flight, on this basis of these findings it should not be so surprising that players have reached elite levels of performance despite possessing below-normal levels of vision. The findings also suggest that the training of 'supra-normal' levels of vision is unlikely to result in improvements in performance.

Rather than blur acting as an impediment for cricket batting, it has been proposed that visual blur in some cases may provide a relative advantage as a potential tool to be used in the training environment. A number of batters who took part in this series of testing expressed an anecdotal preference for batting with a low level of visual blur, particularly when using the +1.00 lenses. On further investigation it was found that some batters felt that they - with the introduction of blur - were more active in visually searching for the ball out of the bowler's hand. It has been proposed that visual blur may prove to be a useful tool to be used in training to modify visual attention. Many batters when out of form tend to focus internally (particularly on their kinematic body movements) rather than focussing externally on the ball and bowler; this internal focus of attention is thought to decrease performance in skilled athletes (Beilock, Carr, MacMahon, & Starkes, 2002). Visual blur in the form of spectacles or contact lenses may prove to be a useful tool as an intervention, in particular for those batters experiencing a 'form slump', by implicitly forcing batters to focus externally on the ball, and allowing what are well-learned batting movements to 'flow' in a more natural manner. This presentation will address in which conditions this training tool is most likely to be useful and how coaches can go about applying it in the daily training environment.

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