

# Watch the ball?

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## INTRODUCTION

Brabenec and Stojan (2006) underlined that coaches and players have been paying attention in training or during the learning process exclusively to the visible elements of the stroke: backswing, forward swing and follow through and that examination of the impact moment has however received comparatively less research attention.

In this context, the purpose of this study was to examine head and gaze behaviour during the hitting phase, i.e. to explore the old adage "keep your eye on the ball!" probably the most used instruction ever given in tennis.



*Federer's backhand at impact*

## METHOD

In order to explore the head and gaze behaviour of elite players, photos at – and just after – the impact moment was analysed and compared to less-skilled top players on the professional tour.

Past study of Stein and Slatt (1981) who looked at photos of all the major professionals demonstrated that top players' eyes invariably do not follow the ball and highlighted that tracking the ball as close as possible to the impact zone is not feasible or desirable for most people.

Since, it is often assumed that, at the very best, everyone can keep their eyes on the ball until the moment that the ball actually strikes the racquet.



*Nadal's gaze and head control*

However, recent observations of Roger Federer and Rafael Nadal call into question their conclusion. More specifically, the idea motivating this study is that great players, i.e. those at the top of the professional rankings (as defined by Brabenec and Stojan, 1997), seem to achieve a control of their gaze and head movement during the hitting phase.

## RESULTS

A considerable amount of hitting sequences photos (several hundred for each player) reveals that elite players not only seem to follow the ball longer than other players but also possess a characteristic posture of the upper body: At impact, their head and eyes are turned in the direction of the hitting zone.



*Backhand after impact*

Additionally, what contrasts with previous studies is that Federer and Nadal not only keep their eye on the

ball up to the moment of impact, but **after impact** their head remain still and in the direction of the contact zone. This 'fixation' of the contact zone is the trademark of elite players.

The most noteworthy finding was that elite players was able to maintain a fairly consistent control: a consistency also illustrated on the women's tour by Steffi Graf who kept her eyes on the ball on every shot with significant fixation stage after impact.

## TOP PLAYERS COMPARISON

The comparison of hitting sequences shows that top players differ greatly in their gaze behaviour. Indeed, there is a profound disparity in their head and gaze behaviour as compared to previous elite players (see Arnaud Clément for example). The vast majority of photos show players hitting with their eyes focused ahead of the ball in the *fog zone* – term introduced by Stein and Slatt (1981).

Moreover, players were often seen to lift their eyes and pull their head up before the ball even reaches the racket. They turn their head as if they want to immediately follow the beginning of the ball trajectory or the movement of their opponent (Brechtbuhl *et al.*, 2005). It is evident for the forehand side where top-ranked players differ greatly from those of lower rank.



*Arnaud Clément*

Despite this comparison reveals that a majority of professional players appear to not keep their eye on the

ball or only intermittently, any players have been noted to make specific control on their best stroke (often their backhand), i.e. associated to better centering and accuracy (see Lleyton Hewitt).

A common idea is that there is very little difference in the stroke capabilities of the top players (Taylor, 2000) and therefore the only difference lies in their mental strength. However, the above observations show that at the professional level, all the players are not equally talented in terms of technical skill especially with regard to gaze control.



Lleyton Hewitt

Past studies in racket sports have already reported that experts watch the ball differently. They differ from novices in eye fixation patterns and perceptual strategies (Murray, 1999), analyse relatively little information but focus only on the most pertinent information (La Rue and Ripoll, 2004), and show faster information processing and decision times (Day, 1980). But, what is particularly interesting and departs from previous studies, is that great players watch the ball and position their head differently, especially after impact. Thus, great players don't just hit the ball better, they do it differently.

## CONCLUSION

In tennis, top players are expected to maintain visual contact with the ball as they complete the hitting action but that was not consistent with the observations. In particular, what emerges in this study is that the top players are not as individual in the way they deal with the gaze control in tennis as they are in the way they stroke the ball. More precisely, among top players, only few high-level performers follow a typical

fixation of the contact zone. It is significantly illustrated in the modern game by the amazing consistency of Roger Federer and Rafael Nadal.

So, is gaze control a decisive characteristic of great players? At this time, observations of elite players only suggest that gaze control, especially fixation could be partly what gives them higher accuracy especially through better centering. More broadly, Federer and Nadal demonstrate that it is possible and even beneficial to play tennis with the eyes not always focused on the ball. Therefore, watching the ball throughout its entire flight is not the visual strategy used by elite players. In a sense, it confirms the hypothesis of Ford et al. (2002) about the possibility and benefits of focusing on the contact zone during the stroke execution.

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