

Investigation of the Open Stance and Square Stance Forehand Drives

Bahamonde, R.¹ & Knudson, D.²
 Indiana University Purdue University Indianapolis ¹
 California State University, Chico ²

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INTRODUCTION

Forehand Drives:

• Changes in tennis racquets, including increased stiffness and decreased racquet weight, have influenced various techniques used in play. The increased power of groundstrokes and serves, partially due to these equipment modifications, has fueled the trend of athletes adopting more open stance (than square stance) forehands. Unfortunately, the open stance forehand may not utilize the optimal series of body movements to produce the most effective and safest tennis technique, which may lead to overstress on players' upper bodies.

• Although there is a great deal of controversy regarding which stance is better, very little scientific information is available which would answer this question. Therefore, this study aimed to investigate differences between the two stances with a focus on the upper extremity components of the two techniques.

PURPOSE

- The purpose of this project was to look at the differences in the open and square stance forehand swings and differences in performances of these techniques from players of different skill levels.
- Participants for this study were 15 tennis players, with approximately half of the players qualifying as professionals (8 male certified teaching pros) and the other half being intermediate players (2 males and 6 females with NTPR scores ranging from 3.5 to 4.5). The participants were analyzed performing the open and square stance forehand drives using high speed film and computer technology.



RESULTS

- The square stance generated faster racquet speed than the open stance.
 - This result was observed in both groups with a difference of 4% for the pros and 9% for the intermediate players resulting between the two techniques.
- The racquet speeds of the intermediate players were 20% and 23% lower than the professionals in the open and square stance, respectively.
- The paths of the racquet through the swings was similar for both groups of players as far as racquet height was concerned, but there were differences between the groups in the way their racquets moved horizontally.
 - More specifically, the pros' upper arm was more forward in relation to their trunk at ball contact than the intermediate players.
- The professionals had a more accurate racquet path in the square stance than the open stance, with the reverse being true for the intermediates.
- For the pros, the open stance created a 60% reduction in time that the ball could be successfully contacted on the racquet.
- All players were able to produce greater trunk rotation in the square stance than the open stance, with professionals generating more trunk rotation than the intermediates with both techniques.
- The same major groups of muscles were used to perform both forehand techniques.
- However, the square stance generated larger muscle action than the open stance.



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COACHING IMPLICATIONS

- The results of the study support the idea that the square stance is superior to the open stance in terms of generating more power.
- Although the footwork is different across stances, the motions and muscular actions of the upper body are very similar during the two forward swings.
- The footwork in the open stance provides little transfer of momentum in the forward direction and possibly a lesser amount of angular momentum.
- This will reduce the player's ability to produce greater trunk and shoulder rotation, resulting in the development of less muscle activity and slower joint and racquet speeds.
- In contrast, the square stance allows players to transfer the momentum generated during the weight shift and possible generate more angular momentum.
- The greater angular momentum would result in greater muscular contractions and faster joint and racquet speeds.
- Another observed benefit of the square stance is that it provides players with more time to move their racquets into the appropriate striking position than the open stance.
- While the square stance appears to be superior to the open stance, one must keep in mind that these results may be more applicable to players of higher ability (e.g., intermediate players were able to perform more accurate racquet paths through their forehand swings using the open stance).
 - Choose the technique that is more appropriate to your individual players.

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