# DEVELOPING ANTICIPATION SKILLS OF JUNIOR TENNIS PLAYERS

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## INTRODUCTION

Anticipation skills are fundamental to successful performance in fast ball sports such as tennis. The ability to anticipate is presumed to be due to an enhanced ability to notify and process information arising from the opponent's postural orientation prior the ball racket contact (Smeeton et al. 2005). For example players' trunk (shoulders, hips and legs), the stance and the path of the racket vary in different strokes and thus give relevant information related to stroke outcome.

The purpose of this study was to determine whether the anticipation skills of junior tennis players could be improved through on-court and video simulation training and appropriate instruction.

## METHODS

A total of 24 junior tennis players participated to this study. Players were divided into two groups, G1 (n=17, age 14.7±2.9 years) and G2 (n=7, age 13.6±2.4 years).

### Training

Subjects participated in their normal tennis training sessions approximately two times per week. In addition G1 received video simulation training in four (30 min) sessions over a 3-week time period in the laboratory conditions.

Each video simulation training session consisted of 20 forehand strokes which were all shown twice. During the first presentation the subjects were required to react to a stroke that was occluded at ball-racket contact. After each response their attention was directed with appropriate instruction to the informative areas of that specific stroke execution. Then the same trial was repeated showing also the outcome of the stroke.

### Pre- and posttest

Subjects were tested both in laboratory and field conditions. In both tests an opponent was playing return forehand strokes into four different areas on court (left, right, front and back) (figure 1). Both test conditions included six practice and 30 test trials in which stroke type and ball end locations were randomized.

*Figure 1. An example of a test trial in which an opponent is hitting a drop shot to the front court.*

In the laboratory setup subjects sat 4 m from a projection screen. They were instructed to react as quickly and accurately as possible in response to near life-size images of tennis forehand strokes. The reaction was made by pressing a keyboard button after which they notified the direction of the stroke.

In the field test subjects were required to physically respond on-court to actual forehand strokes by moving to the right direction. Their responses were filmed from the front and the opponent from the right hand side using two video cameras (50 Hz). The synchronization of the video clips and the analysis of the decision time in response to the ball-racket contact were analyzed using Dartfish-software.

Decision time (ms) and accuracy (%) were measured before and after the training period in both test conditions. T-test was used to detect changes from pre- to posttest and the differences between the groups.

## RESULTS

A significant reduction in decision times from pre- to posttest was found for both groups and test conditions (figure 2).

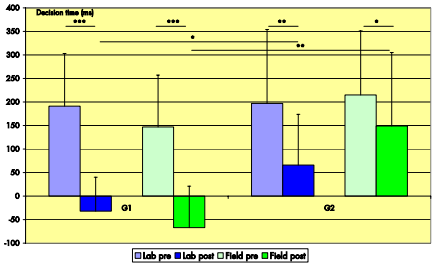


*Figure 2. Means and SDs of decision time for both groups in pre- and posttests (* p<0.05, ** p<0.01 and *** p<0.001).*

In the laboratory posttests G1 had significantly faster decision times when compared to G2. Similarly a significant difference was found in the field posttest between the groups. (Figure 2)

The only significant change in response accuracy was found in G1 in the laboratory pre- to posttest. No other significant differences were observed either inside or between the groups in response accuracy. (Figure 3)

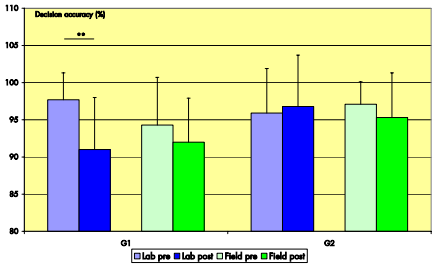


*Figure 3. Means and SDs of decision accuracy for both groups in pre- and posttests (** p<0.01).*

## CONCLUSIONS

Both groups improved their decision times in the laboratory and field test conditions. Video simulation training was found to be more effective when compared to normal tennis training only. The difference was especially big in the field test conditions. Nevertheless also the response accuracy of G1 decreased in the laboratory test which could imply that in some test trials players were "guessing" the outcome of the shot before sufficient amount of information was available.

To conclude, players learned to extract meaningful information from the postural orientation of the opponent and thus were able to develop their anticipation skills. It can be suggested that even fairly brief periods of video simulation training and appropriate instruction lead to meaningful improvements in decision times and also substantially facilitate players´ on-court performance.

## REFERENCES

Smeeton, N. et al. 2005. Journal of Experimental Psychology, 11(2), 98-110.

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