

# The Influence of Video-based Perceptual Training on Tactical Decision Making in Soccer



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## Introduction

In sport-games, skilled performers often have to make accurate and efficient sport-specific decisions in a very short time (Williams, Davids & Williams, 1999). Numerous studies have dealt with the question if and in which way video-based training can positively influence visual perception in different sports (e.g., Farrow, Chivers, Hardingham & Sachse, 1998; Williams, Ward & Chapman, 2003). In addition, other studies have shown that implementing exogenous stimulus for guiding visual attention in video-based trainings leads to improvements in visual information processing (for Badminton, see Hagemann, Strauß & Cañal-Bruland, under review).

## Purpose

The aim of the study was to examine to what extent video-based training, characterized by visual manipulating the focus of attention, improves both reaction time and response accuracy in tactical decision making in soccer ("3 against 2" - situation). Furthermore, this study investigates whether the implementation of exogenous stimulus (using a "red transparent patch") for guiding attention in video-based perceptual training has a positive impact on tactical decision making.

## Methods

62 male junior soccer players (mean age 14.32,  $SD = 1.10$ ) were subdivided into four groups, three training groups and one control group. Training group I completed a video-based training program (210 video situations plus the corresponding 210 feedback clips in three training sessions), that was characterized by the above mentioned exogenous stimulus. Training group II had to train with the same videos, but without "red transparent patches". Training group III trained the equal tactical variants to the same extent as the two video-based training groups practically on the field. The control group did not receive any training.



Figure 1. Four frames of a sequence from the video-based training program of training group I.

The experimental scenario consisted of test (pre-/ post-/ retention- ,containing each 51 randomized videos) and training programs with video sequences (working with the temporal occlusion technique), that showed a typical "three against two" situation. These video-based test and training programs required of the participants to look at the situations presented, in this study we worked with variants of four different group-tactical situations (filmed from three different perspectives), and to make the tactically correct decision as quickly as possible. The participants had to choose from three action options. The average data of the data sets that were determined concerning the dependent variables (reaction time and response accuracy) were separately analyzed in an analysis of variance (ANOVA).

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## Results

Results showed that training group I (with exogenous stimulus) reacted in the post- ( $F(1,27) = 53.50, p < .001, \eta^2 = .67$ ) and in the retention-test ( $F(1,27) = 21.59, p < .001, \eta^2 = .44$ ) significantly faster than the practical training group III and the control group. The participants of training group I reacted on the average more than 0.6 seconds faster than those of the control and training group III. Statistically here is no difference in response accuracy between these groups. In addition, it can be found that both forms of video-based perceptual training (training groups I & II) lead to significant improvements in both reaction time and response accuracy. The interaction, however, misses the level of statistical significance. Nonetheless, in the post-test after the training periods, the difference in reaction time is of more than 80 ms.

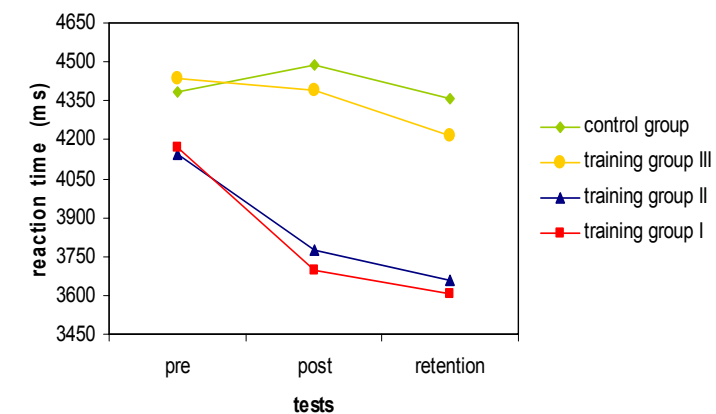


Figure 2. Different reaction times of the four groups over the three tests.

## Conclusions

In comparison to practical tactical training, video-based tactical training in soccer leads to an improvement in reaction time and therefore also to better tactical decision making skills. Both forms of training result in the players' making more frequently accurate tactical decisions. Consequently, it can be followed that video-based training on tactical decision making shows absolutely positive effects. Thus, from that consideration should be concluded that, in the future, video-based tactical trainings can complement the practical training of junior soccer players in very efficient ways. In addition, the manipulation of visual attention by implementing exogenous stimulus seems to lead to even faster reaction times. So, even in solving tactical situations in sport settings, the use of visual peripheral stimuli for guiding attention seems to be absolutely promising. Future investigation must show whether video-based perceptual training can positively influence tactical decision making in different sports that are characterized by dynamic and complex "open skill" situations.

## References

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