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## Knowing Goalkeeper’s Movements in a Penalty Increases Success Rate and Reduces Kicker’s Decision Time

*ScienceDaily* (Dec. 9, 2009) — A study shows that knowing the anticipatory movements of a goalkeeper before kicking the penalty reduces the decision time and increases the success rate when choosing the direction of the shot in football (soccer). The results, extracted from the second paper by researcher F. Javier Núñez Sánchez from the University Pablo Olavide (UPO), which he wrote for his thesis, have recently been published in the scientific journal *Perceptual and Motor Skills*.

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This research, developed by the group for Analysis of Human Movement, lead by Professor Antonio Oña of the University of Granada, has analysed the elements that interact during a penalty shootouts, including the movements and the response and reaction of the goalkeeper and the speed of the decision of the kicker when deciding the direction of the shot. According to their results, by studying the position of the goalkeeper in the instant immediately before the shot may significantly increase the probabilities of selecting a successful direction for the shot and reduces, in turn, the time of this decision process.

In the first phase, the researcher studied the movements of the

goalkeeper during a penalty shootout. Among the findings, published in the International *Journal of Sport Psychology* in 2005, he stresses that all the goalkeepers begin their final movement instants before the player kicks that ball because, otherwise, they would not manage to reach it. These signals were named "movement pre-indexes," and help us know, in the exact moment when the player takes his last step before shooting, if the goalkeeper will jump towards his right or left before hitting the ball.

Once the aspects regarding the goalkeeper have been detected, a second phase of the study analysed the ability of the football player to decide if to hit the ball towards the right or left, in this short space of time. They also observed if it was effective or not to show the movement pre-indexes to increase success. They used a sample of 20 individuals for this study. These were later divided into four sub-groups (two control groups and two experimental groups), depending on whether the players were experts or inexperienced, i.e. those who occasionally play football and for leisure. The participants underwent two tests using a life-size projection of the goalkeepers and where the players had to simulate their penalty shot.

### The professionals and the inexperienced

In the results obtained in the first test they did not find significant results between the experienced players and the inexperienced ones. However, different results were obtained after the test. After the initial test, the experimental groups watched a video that clearly explained the goalkeeper's movement pre-indexes. "During the informative film we explained where to focus, noting that when the kicker takes the last step before the penalty, he should direct the shot towards the area where the goalkeeper has the most extended knee, since he will shift towards the opposite side," states Javier Núñez.

In this sense, the decision time of the expert players in the experimental group passed from 275 to 189 milliseconds. By contrast, this decrease was barely significant in the control groups that did not receive the information on the movement pre-indexes.

As regards to the glances, the researchers registered in both tests, by means of an eye tracking system, the point in which

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test their glances were, more or less, equally distributed. After viewing the explanations over 95% of the glances of the experimental groups were concentrated on area 3. Specifically, it is in this area, that the researchers, best observe where the goalkeeper extends his knee.

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