

## FACTOR INFLUENCING PENALTY KICK SUCCESS IN ELITE SOCCER

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### **Introduction**

Penalty kicks are an important source of scoring goals in soccer and, therefore, research into the factors associated with successfully converting penalty opportunities into goals is justified. The purpose of the current investigation was to investigate the effect different factors had on the proportion of penalty kicks that were scored by players of the highest professional soccer leagues in England, Germany, Italy and Spain.

### **Methods**

Video recordings of 286 penalties taken during soccer matches in the top professional leagues in England, Germany, Italy and Spain in 2009-10 were analysed in the current investigation. The goal was divided in six 4' high x 6' wide zones. Chi square goodness of fit tests were used to analyse penalty taker and goalkeeper action. A series of chi square tests of independence was used to compare the 217 (75.9%) of penalties that resulted in a goal with the remaining 69 that were unsuccessful.

### **Results & Discussion**

Penalty kicks were distributed significantly differently to an expected uniform distribution ( $p < 0.001$ ) with 36.7% placed in the left-bottom zone and 30.1% placed in the right-bottom zone. Placement of the kick had no significant influence on outcome ( $p = 0.231$ ). There were 175 (61.2%) of the penalties taken in the second half which was significantly greater than the expected 50% ( $p < 0.001$ ). However, time at which the penalty was taken had no significant influence on outcome ( $p = 0.434$ ). None of footedness of the penalty taker ( $p = 0.734$ ), goal keeper action ( $p = 0.856$ ) or score in the match ( $p = 0.176$ ) had a significant influence on outcome. There were 134 of the penalties that were taken by players who had taken a previous penalty with 32 (23.9%) of these being placed in the same zone as the previous penalty. However, whether the penalty taker placed the penalty in the same zone as the previous penalty or not had no influence on the outcome ( $p = 0.649$ ). When placement of the penalty and goal keeper action were considered together, the 58 out of 110 (52.7%) penalties scored when the keeper moved to the correct zone was a significantly lower proportion than the 159 out of 176 (90.3%) when he did not ( $p < 0.001$ ).

### **Conclusion**

When a goal keeper is able to anticipate where a penalty taker places the penalty, the chance of a goal being conceded is significantly reduced. Therefore, goal keepers should try and improve their ability to anticipate penalty placement. Sports science support may have an important role to play in such preparation.