

Psychological testing may predict success in football

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(Medical Xpress) -- Measuring what are known as 'executive functions', which reflect the cognitive ability to deal with sudden problems, may make it possible to predict how good an elite football player will become in the future. This has been shown by a new study from Karolinska Institutet. Scientists believe for the first time that they have found the scientific key to what has previously been described as 'game intelligence' in successful football players.

It has long been known that physical ability and ball sense are not enough to become really good at football. A third vital component has often been mentioned: game intelligence, which is the ability to 'read' the play, to be always in the right place at the right time, and steal goals. Many people have regarded game intelligence to be almost a magical ability, something that is impossible to measure.

The scientists at Karolinska Institutet, however, claim that game intelligence is hardly mystical, and that it can be understood from a scientific perspective. It is, rather, an example of something that cognitive scientists call executive functions, which encompass the ability to be immediately creative, to be able to see new solutions to problems, to change tactics rapidly and to revise previous behaviour that has proved not to work.

"Our brains have specific systems that process information in just this manner, and we have validated methods within cognitive research to measure how well the executive functions work in an individual," says

Dr Predrag Petrovic at the Department of Clinical Neuroscience.

Predrag Petrovic and his colleagues report in one study, to be published in the on-line scientific journal *PLoS ONE*, tests of certain executive functions in football players in Allsvenskan (the highest Swedish league) and in Division 1 (the league under Allsvenskan), a total of 57 elite footballers. The scientists found that football players in both groups performed much better in tests of executive functions than the general population. And they found that players in Allsvenskan achieved much better results in these tests than players in Division 1.

The study then compared the test results with the performance of the players on the pitch. The scientists followed several of the football players for some years and recorded the number of goals and the number of assists each player made. In this way, each player was awarded points related to his or hers performance on the pitch. A clear correlation appeared between the results of the tests of executive functions and the number of points obtained on the football pitch (when corrected for such factors as a player's position and age).

It was thus shown that the best players had also performed best on the tests of executive functions. These results are unique, since they are based on scientifically standardised tests. Previously, researchers have used either specific tests from which it has not been possible to generalise the results, or studied specifically how heading the ball can cause cognitive abilities to deteriorate.

"We can imagine a situation in which cognitive tests of this type become a tool to develop new, successful football players. We need to study whether it is also possible to improve the executive functions through training, such that the improvement is expressed on the pitch. But there is probably a hereditary component, and a component that can be developed by training," says Torbjörn Vestberg, psychologist and a

member of the research group that carried out the study.

More information: Vestberg T, Gustafson R, Maurex L, Ingvar M, Petrovic P (2012) Executive Functions Predict the Success of Top-Soccer Players. *PLoS ONE* 7(4): e34731. [doi:10.1371/journal.pone.0034731](https://doi.org/10.1371/journal.pone.0034731)

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