

High intensity in football: is it correlated with technical events outcome?

Submission Type: Original investigation

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STUDY DESIGN (IJSPP IN PRESS)

Hypothesis: to verify whether high intensity(*) is correlated with the subsequent success of the technical tactical event (**)

* speed sprints ($v > 20$ km/h)

acceleration/deceleration sprints ($a > < \pm 3$ m/s/s)

Metabolic Power sprints ($MP > 55$ W/Kg)

** shots on target, dribbling, crosses, forward passes, interception and tackles.

MATERIALS AND METHODS

610 professional players were participated (age 26.8 ± 7 , height 182 ± 5 cm, weight 76 ± 7 Kg). In total, 50 games of Italian “SERIE A” season 2013-2014 were analyzed with semi-automatic match analysis system by K-Sport (Montelabbate, PU, Italy). Each event done by players during the 50 matches was selected and the software counted the different kinds of “sprints”, going back till 5 seconds before.

RESULTS

Odds ratio :quantify how strongly the presence or absence of property A is associated with the presence or absence of property B in a given population. **OR**=n successful cases / not successful cases

probability of obtaining the observed sample results (or a more extreme result) when the null hypothesis is actually true . If P tends to 0, strong correlation between the variables.

Table 1.
Logistic Regression Predicting Who Will Shot on target

Variable	β	SE	Odds ratio	P
Velocity	0.02	0.10	1.02	0.85
Acceleration	0.40	0.08	1.49	0.00
Deceleration	0.09	0.09	1.01	0.31
Power	0.07	0.08	1.07	0.36
Constant	0.67	0.08	0.51	0.00

The beta (B) regression coefficient is computed to allow you to make such comparisons and to assess the strength of the relationship between each predictor variable to the criterion variable

Table 2.
Logistic Regression Predicting Who Will do Dribbling

Variable	β	SE	Odds ratio	P
Velocity	-1.63	0.23	0.20	0.00
Acceleration	0.17	0.14	1.19	0.22
Deceleration	0.92	0.17	2.50	0.00
Power	0.26	0.13	1.30	0.05
Constant	-0.30	0.09	0.74	0.00

standard deviation of the sampling distribution. "standard error" is also used in the phrase standard error of the regression to mean the ordinary least squares estimate of the standard deviation of the underlying errors

Table 3.
Logistic Regression Predicting Who Will do Interception

Variable	β	SE	Odds ratio	P
Velocity	0.384	0.099	1.467	0.000
Acceleration	-0.31	0.077	0.969	0.684
Deceleration	0.166	0.072	1.180	0.022
Power	-0.474	0.078	0.622	0.000
Constant	-0.613	0.039	0.542	0.000

Table 4.
Logistic Regression Predicting Who Will do Pass

Variable	β	SE	Odds ratio	P
Velocity	-0.169	0.054	0.845	0.002
Acceleration	-0.162	0.042	0.850	0.000
Deceleration	-0.256	0.040	0.774	0.000
Power	0.157	0.038	1.170	0.000
Constant	0.697	0.021	2.009	0.000

Table 5.
Logistic Regression Predicting Who Will do tackles

Variable	β	SE	Odds ratio	P
Velocity	0.393	0.148	1.482	0.008
Acceleration	0.237	0.095	1.268	0.013
Deceleration	-0.295	0.099	0.745	0.003
Power	-0.213	0.095	0.808	0.025
Constant	-0.609	0.054	0.544	0.000

Table 6.
Logistic Regression Predicting Who Will do cross

Variable	β	SE	Odds ratio	P
Velocity	0.035	0.112	1.035	0.757
Acceleration	-0.320	0.090	0.726	0.000
Deceleration	0.269	0.100	1.309	0.007
Power	0.209	0.076	1.232	0.006
Constant	0.791	0.097	2.205	0.000

RESULTS

Chi square test (used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories) showed that the Hypothesis H0 (**correlation between football high intensity and technical events**) is not confirmed by X^2 value for all the parameters whether considered together.

Logistic regression showed an important relation between:

- HIA (high intensity acceleration) and shots
- HID (deceleration) and dribbling

- No other important results are to underline

DISCUSSION

Focus should be addressed to the global vision of the football performance: the technical event is entered in a tactical situation that required some physical tasks and not the opposite!!!!

The results suggest that *shots and dribbling* cannot have success without high intensity before: accelerations for the firsts and deceleration for the seconds should be always researched.

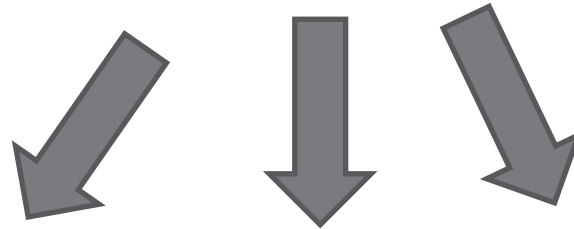
***Dribbling* deserves subsequent studies to clarify the difference between elite and sub elite and provide information for the right selection of talent about this parameter, in which the ability to decelerate, accelerate and rich high speed with the ball meet the technical abilities and seems to take great relevance.**

***Forward passes and crosses* are often detached from forms of confrontation and depending much more from reading that the player makes in the individual and specific situations and this may think in the high level: the ability to think quickly, to be able to recognize the means of situations, anticipate and fit to the tactical changing of the game seems to be the paramount key that discriminate elite from sub-elite players.**

***Interceptions and tackles*, as individual defensive tactical and technical parameters, move the attention to another aspect that seems to be crucial: the *intervention timing*. Thus the intensity of each of these skills is decided by the single tactic situation: spaces, number of opponents, team strategy seem to be factors that the player needs to analyze and sort instant by instant.**

PRACTICAL APPLICATIONS

ELITE FOOTBALL is not



PHYSICAL

TACTICAL

TECHNICAL

But should be

PHYSICAL



TACTICAL



TECHNICAL

COGNITIVE

In a global vision always changing

STUDY LIMITATIONS AND FUTURE DEVELOPMENT

- It should be expanded to all the 20 movements players in each instant to know whether the high intensity can have an importance far from the ball zone.
- Positional analysis should be considered to know deeper the performance connected with the technical requests in each tactical situation
- To know how the score can influence the high intensity in the game each 15'
- Demonstrate as variability in football game is great ; this could be a prove that player needs to read and adapt instant by instant to the situation that the play offers.

CONCLUSIONS

The findings of this study suggest that football finds the right compromise between **power-speed** and **accuracy** in the pursuit of the **technical success** in the changing **tactical situations** of the competition.



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- Bachelor's Degree "Motoric and Sport Sciences", University of Rome Tor Vergata Votation: 103/110
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- Master's Degree in "Theory and Techniques of the Athletic Preparation at Football" University of Pisa and Verona, in collaboration with the FIGC votation: "excellent"
- Doctorate Degree in "Advanced Technology in Rehabilitation Medicine and Sport" University of Rome Tor Vergata close to the end, Thesis Dissertation on June 2015
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