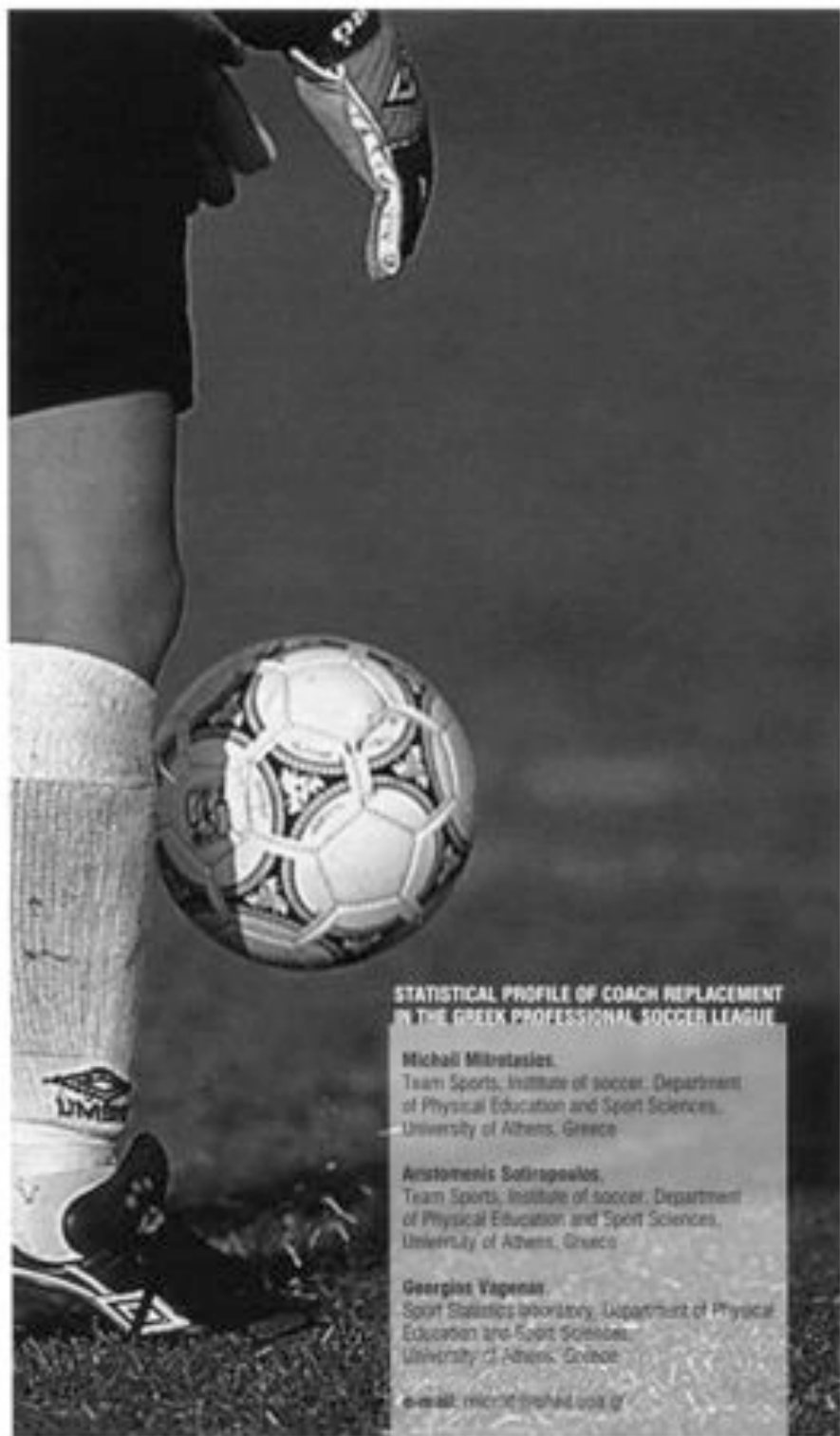


# Statistical profile of coach replacement in the Greek professional soccer league



## STATISTICAL PROFILE OF COACH REPLACEMENT IN THE GREEK PROFESSIONAL SOCCER LEAGUE

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## Abstract

The purpose of the present study was to statistically investigate the profile of coach replacement in the Greek professional soccer League. A total of 162 coach substitutes for the three major leagues (145 teams) during the 2000-01, 2001-02 and 2002-03 championships were recorded and analyzed. The data comprised of variables related to the frequency of substitute, the performance of the coach on equal number of games and the ranking position of the team. Non-parametric and multivariate statistics were used. The results demonstrated that 70.34% of the soccer teams replace their coach during the three researched championship seasons and the frequency of replacement is significantly increased in the lower divisions ( $p < 0.05$ ). An overall significant increase in ranking position of the team was found for the four consecutive games after coach replacement ( $p < 0.001$ ), on the contrary the comparison between the performance of these teams on the rest of the games before and after the replacement fluctuated at the same levels without significant differences. The ranking position was improved in only 41.4% of the teams after the replacement. Overall, the study confirmed short term positive influence of coach replacement on the team ranking position, while no evidence is provided in support of any middle or long term influence.

**Keywords:** Soccer, coach replacement, team performance, rating statistics.

## Introduction

The relation between coach replacement and the performance of the team as far as professional sports are concerned has been a subject of scientific research for decades. Grusky (1963) analyzed American Baseball teams and ascertained that the performance of the team is negatively related to the number of coach changes that have taken place. This means that the low performance teams had more frequent coach replacements than the teams with higher levels of performance. This negative relation was later confirmed by Loy (1970) and Theberge & Loy (1976) in Baseball, by Eitzen & Yetman (1972) in Basketball and by Brinkmann (1979) in football. Brinkmann (1979) showed that this negative relation exists only for coach replacements that take place during the regular competitive season. On the contrary, when replacement takes place in the pre-competition season the relation is positive; the success of the team could be attributed not only to the new coach but to other factors as well, such as the number and the quality of newly-acquired players and the new structure of the team.

According to Gamson & Scotch (1964) the relationship between frequency of coach replacement and team success is characterized by three different interpretations. First, a positive effect on the performance of the team is achieved due to new ideas and perhaps a new style of coaching. Second, a negative effect may exist due to the possibility that the performance of a team in a crisis does not improve after coach replacement, but becomes even worse. Third, lack of any significant change in the performance of the team between the former and the new coach. Gamson & Scotch (1964) and Gabler (1975) found that coach replacements usually occur in periods of decline in the performance of the team (i.e. after a series of defeats) and in most cases team performance gets better two or three games after the replacement. Gabler (1975) trying to explain these results attributed the performance improvement mainly to the psychological motives and expectations

of the players.

Singer & Wagner (1979), Breuer & Singer (1996), Audas et al (1997) and Salomo & Teichmann (2002) compared the performance of teams which changed their coach to that of control teams that didn't make any coach replacement during the same soccer championship. These researches pointed to the conclusion that neither in the long nor in the short term significant differences between the two cases exist. Despite this, many teams dismiss their coach long before the first round is over. This is quite evident in the Greek professional soccer League in which one or two unexpected defeats are enough to emerge coach dismissal. During the 2002-2003 football season 50% of the teams of the first division changed their coach, while just two of the coaches of the second division managed to keep their position until the end of the championship (Tsakiris, 2003).

Due to the lack of relative scientific information concerning in particular the Greek reality, the present study was designed and conducted on the basis of archived data to re-examine and statistically analyze this complex phenomenon. Therefore, the aim of this study was to statistically document the profile and the effect of coach replacements on team performance in the Greek professional soccer Leagues.

## Methods

### Subjects

The raw data was collected from archived material related to the changes of coaches that took place in the 1st, 2nd and 3rd division of the Greek soccer Leagues during the seasons of 2000-01, 2001-02 and 2002-03. Only the changes of coaches in which the former as well as the new coach was leading the team in the corresponding period for at least four games were analyzed. This restriction was put in order to exclude the possible effects of coaches that were leading the team from one to three games (two "home" games and one "away" game or two "away" games and one "home" game). With a minimal of four games (two "home" games and two "away" games) the "home vs. away game" factor is almost balanced to the same degree for all coaches.

The dependent variables included the number of coaches that have worked in each team in the corresponding period, the championship game in which the replacement of coach has taken place, the number of games each coach has led the team to before and after the change, the collected points, the coefficient of performance of every coach in the same number of games (games 1 up to 4 and 5 up to 10), the total number of games before and after the change, and the ranking position of the team before the first coach replacement and at the end of the soccer season. The performance coefficient is to the ratio of the total number of collected points to the number of games held for every coach. In the researched football seasons the following system of points was applied: defeat = 0 points, draw = 1 point and win = 3 points.

### Statistical analysis

The data were analyzed using the SPSS 11 (Bühl & Zöfel, 2000). Descriptive statistics were used to describe variables of the phenomenon. The various comparisons of the frequency distributions for selected variables were carried-out using chi-square ( $\chi^2$ ) statistics. Non-parametric comparisons by Wilcoxon tests were conducted for the variables with skewed distributions. Simple and multivariate analyses of variance for the variables with approximate normality verified by the

Kolmogorov – Smirnov test were used to maximize the efficiency and power of the statistical comparisons.

## Results

### Frequency of Coach Replacement

The results demonstrated that a considerably large percentage of the teams change coaches in every soccer season (figure 1). From the 145 teams of the 1st, 2nd and 3rd division, the 102 (70.34%) replaced their coach in the three soccer seasons (2000-01, 2001-02 and 2002-03). Only 43 teams (29.66%) finished the championship with the coach they began with. No significant differences between the soccer seasons were found ( $\chi^2 = 0.359$ ,  $p = 0.836$ ), which seems to indicate that the phenomenon is constant within consecutive years.

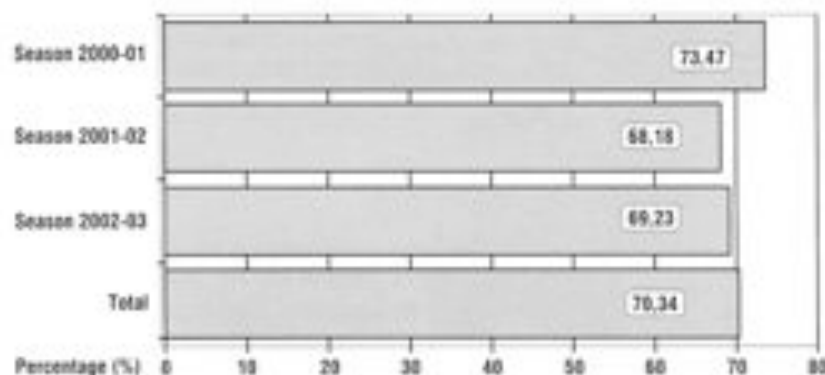


Figure 1. Coach Replacements per soccer season (%)

The comparison of the frequency distributions of coach replacement per division (figure 2) indicated that the number of coach dismissals increases significantly from the 1st to the 3rd division ( $\chi^2 = 6.507$ ,  $p = 0.039$ ). In other words, the teams of the 3rd division dismiss their coaches much more often than the teams of the higher divisions.

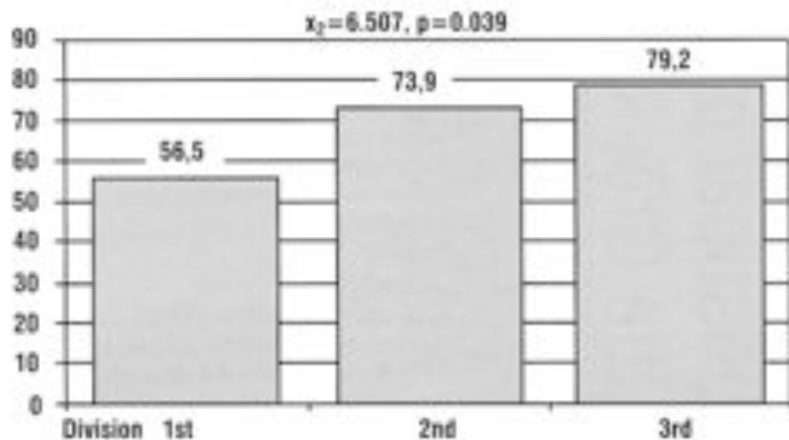


Figure 2. Coach Replacement per division

Most of the teams of the 2nd and 3rd division that changed their coach used more than two coaches during the same soccer season (58.8% and 64.3%, respectively), whereas in the 1st division most of the teams (57.7%) remained to one change. It is also important to mention that, some teams (18.2%) used more than five coaches during the same soccer season.

By examining the period of time of the football season in which the first replacement of coach usually takes place, it was ascertained that a 76.5% of the teams made the first change of coach in the first round, while a 23.5% in the second round. The majority of these coaches (52.9%) that started at the beginning of the championship had already lost their position in the first eight games. A comparison between the divisions in that respect did not show any statistically significant difference ( $\chi^2 = 0.986$ ,  $p = 0.611$ ).

#### Performance of the team after the replacement of the coach

As most of the teams change their coaches with the expectation to reach a better performance, it was examined if these teams actually improved their ranking position after the coach replacement. The results (table 1) showed that only 41.4% of the teams gained a better position after the replacement of the coach, whereas a 58.6% had the same (27.1%) or a lower (31.5%) position. The same picture, without any significant differences, was shown by the teams of the three divisions ( $\chi^2 = 1.216$ ,  $p = 0.875$ ).

Table 1. Ranking position of the teams after coach replacement

Divisions		Tri-categorical classification of ranking position after coach replacement			Number of teams that changed coach
		-1	0	1	
1st Division	f	10	9	16	35
	%f	28.6%	25.7%	45.7%	100%
2nd Division	f	17	13	24	54
	%f	31.5%	24.1%	44.4%	100%
3rd Division	f	24	22	27	73
	%f	32.9%	30.1%	37.0%	100%
Total	f	51	44	67	162
	%f	31.5%	27.1%	41.4%	100%

Tri-categorical classification of ranking performance after coach replacement:  
-1 = deterioration (lower position), 0 = same ranking before-after,  
1 = improvement (higher position)

**Table 2. Descriptive statistics of the dependent variables**

Variables	N	X	SD	Mo	Mo
Games - Before	162	9.59	5.95	7.5	4
Games - After	162	11.76	6.23	11	4
Coefficient of points in coaching in all games-Before	162	1.11	0.55	1.2	1
Coefficient of points in coaching in all games-After	162	1.23	0.60	1.25	1
Coefficient of points in coaching in four games-Before	162	0.94	0.61	1	1
Coefficient of points in coaching in four games-After	162	1.32	0.78	1.25	1.5
Coefficient of points in coaching the team in all the games after the four games-Before	63	1.27	0.66	1.25	1.33
Coefficient of points in coaching the team in all the games after the four games - After	63	1.21	0.66	1.3	2
Coefficient of points in coaching the team from the fifth to the tenth game - Before	46	1.27	0.60	1.16	1.5
Coefficient of points in coaching the team from the fifth to the tenth game - After	46	1.30	0.76	1.24	2.16
Ranking position of the team - "Before" the coach replacement	162	10.72	4.29	11	14
Ranking position of the team - "After" the coach replacement	162	10.33	4.56	11	14

The comparison of the performance of the teams before and after the coach replacement showed that there is an overall significant improvement. Combining the results in tables 2 and 3, it is shown that the new coaches achieved better results than their former colleagues; the comparison being based on all games that led their team ( $p=0.007$ ), on the four games right after the replacement ( $p=0.000$ ), and on the basis of the ranking position of the team ( $p=0.026$ ).

**Table 3. Non-parametric comparisons between "before" and "after" coach replacement for each dependent variable**

Comparisons of Dependent Samples	Coach Replacement (N)	Wilcoxon Z-values	p
Games before - Games after	162	- 2.857	0.004
Coefficient of points in coaching in all the games: Before - After	162	2.686	0.007
Coefficient of points in coaching in four games: Before- After	162	- 5.645	0.000
Coefficient of points in coaching of the team in all the rest games after the four games: Before (game 5 - rest all before) - After (game 5 - rest all after)	63	- 0.241	0.810
Coefficient of points in coaching of the team from the fifth to the tenth game: Before (game 5-10 before) - After (game 5-10 after)	46	- 0.357	0.721
Ranking position of the team on the point list: Before - After	162	- 2.229	0.026

A series of four new variables were computed and checked for gross normality (table 4). Their simultaneous analysis via MANOVA has shown that a significant differentiation does exist with regard to the effect of coach replacement on the performance of the team "before" and "after" it (Wilks'  $\Lambda=0.759$ ,  $F=12.560$ ,  $p=0.000$ ). In three of these variables the multivariate significance was confirmed by corresponding univariate significance with the exception of total ranking position ( $p=0.090$ ).

**Table 4. Multivariate comparison (MANOVA) between "before" & "after" coach replacement for the four selected dependent variables**

Variables	Coach Replacement (N)	df	F	p
Difference in number of games before - after	162	1/161	8.428	0.004
Difference of points in coaching in four games before - after	162	1/1613	5.948	0.000
Difference of points in coaching in all the games before - after	162	1/161	6.684	0.011
Difference of ranking position before - after	162	1/161	2.907	0.090

The per-game performance of the teams for 10 games "before" and "after" coach replacement is depicted in figure 3. It is clear that in the four games "before" (B4-B1) a decline in the performance of the team is observed, while in the four games after the replacement (A1-A4) a significant improvement is observed ( $p=0.000$ , table 3).

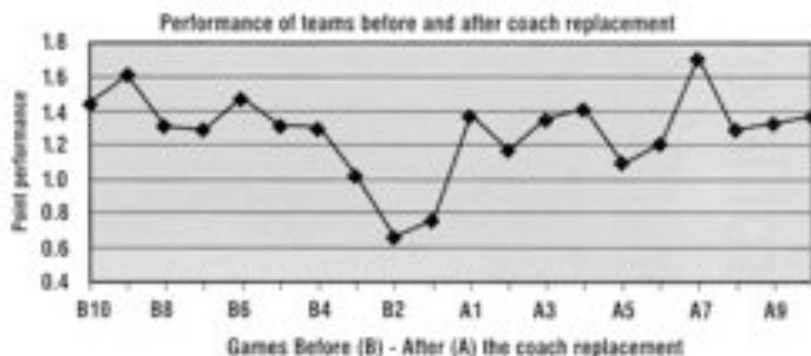


Figure 3. Diagram of the per-game performance of the teams for 10 games "before" and "after" the replacement

The results of the analysis of variance (table 5) show that the picture in the three divisions presents no significant differences ( $F = 0.122$ ,  $p = 0.885$ ). On the other hand, if we exclude the four games "before" and "after" replacement and compare the performance of the teams (a) for all the rest of the games and (b) for only six games after the four games (B5 - B10 vs. A5 - A10), then by combining data from tables 2 and 3 we ascertain that no significant difference exists ( $Z=-0.241$ ,  $p=0.810$  &  $Z=-0.357$ ,  $p=0.721$ , respectively). The Bonferroni

correction showed that there are no significant differences in that respect for these two variables between the three professional divisions ( $F=0.321$ ,  $p=0.726$ ;  $F=0.665$ ,  $p=0.520$ , respectively).

**Table 5. Descriptive statistics and ANOVA results for the differences between the three professional divisions in six selected dependent variables**

Variable	Descriptive statistic				Comparison between the three divisions		
	DIVISION	N	X	SD	F-Test (ANOVA)	df	p
Difference in number of games before - after	1st	35	2.57	7.03	0.245	2/161	0.783
	2nd	54	2.69	8.78			
	3rd	73	1.59	11.00			
	Total	162	2.17	9.50			
Difference of points in coaching in four games before - after	1st	35	0.44	0.84	0.122	2/161	0.885
	2nd	54	0.37	0.77			
	3rd	73	0.36	0.84			
	Total	162	0.38	0.81			
Difference of points in coaching in all the games before - after	1st	35	0.17	0.56	0.212	2/161	0.809
	2nd	54	0.14	0.57			
	3rd	73	0.09	0.68			
	Total	162	0.13	0.62			
Ranking position before - after	1st	35	-0.66	2.44	0.227	2/161	0.797
	2nd	54	-0.37	2.82			
	3rd	73	-0.26	3.09			
	Total	162	-0.38	2.86			
Difference of points in coaching in all the games after the four games before - after	1st	17	-0.18	0.59	0.321	2/62	0.726
	2nd	19	-0.02	0.89			
	3rd	27	-0.01	0.63			
	Total	63	-0.06	0.70			
Difference of points in coaching from the fifth to the tenth game before - after	1st	16	-0.10	0.56	0.665	2/45	0.520
	2nd	14	-0.03	1.09			
	3rd	16	0.19	0.51			
	Total	46	0.02	0.74			

## Discussion

The results demonstrated that most of the teams (70.34%) of the three Greek professional soccer Leagues (1st, 2nd and 3rd divisions) led to the replacement of the coach. In addition to that a significant tendency of improvement of this situation between the three successive soccer seasons was not statistically confirmed. The comparison of the frequency of coach replacement per category (figure 2) showed that the lower the division the more the number of teams that dismiss their coaches and the more these teams acquire the tendency to change more than two coaches in a football season (also see Tsakiris, 2001, 2002, 2003). Thus, it was ascertained that coach replacements in the higher divisions are less frequent compared to the lower categories.



The results of this research point out that the first round and, more precisely, the first 7-8 games of the championship constitute the most crucial period of time in which most replacements of coaches take place. This demonstrates the anguish of the team officials who by watching the non-realization of the initial aims or the danger of downgrading of the team, react immediately with the replacement of the coach hoping, in that way, to the improvement of the performance of the team (Küpperfahrenberg, 2004; Middendorp, 2004; Vath, 1994). The analysis, however, showed that just a 41.4% of the teams that changed coach improved their ranking position in the point list at the end of the championship. A more pessimistic picture also appears in the teams that found themselves in the downgrading zone before the first replacement. From the teams that adopted this attitude, only 33.3% managed to avoid downgrading. Our data shows that a replacement of coach during the championship does not constitute a remedy for a certain improvement in the ranking position of the team (McTeer et al., 1995). On the contrary, the risk is very big for, according to the results, the possibilities of a decline in the performance of the team. This conclusive position had also been expressed by Breuer & Singer (1996) who studied the changes of football coaches in Germany.

Further analysis of our data indicated that the teams which changed their coach succeeded the smallest collection of points in the last four games before the change. As a consequence, the unsuccessful results are one of the major reasons that lead the team administration officials to replace their coach (Gabler, 1975; Gamson & Scotch, 1964; Mitrotasios, 2004). This usually creates conflicts with the administration, the members and the fans of the team, especially when the team's expectations were not accomplished (Bette, 1984; Brack, 2001). It is worth clarifying that causes such as financial problems disagreements between coach and administration members etc., that also lead to the dismissal of coach, were not taken into consideration in the present research.

With regards to the points collected by the coaches in the games that led the team before and after the replacement a significant recovery in the ranking position of the team in the four games right after the replacement was observed. This result did not differentiate significantly between the three professional football divisions. However, considering that in the middle of the period the "potential" of the team remains about the same, any physical and technical weaknesses of the players are very difficult to improve in such a short period. In addition on the basis of the fact that changes in the method and the game system requires a long period of time in order to be consolidated, we can theorize that the observed, immediate improvement of the performance of the team is mostly attributed to other factors (Audas et al., 1997; Salomo & Teichmann, 2002). For example, during the first football games the new coach aims at raising the morale of the players, at making them regain their confidence and at strengthening their playing readiness for the win (Singer & Wagner, 1979; Breuer & Singer, 1996). In our results this improvement of ranking position was not verified in the games following the fourth game after coach replacement to the end of the season. This means that if the new coach does not succeed right after the change, then the performance of the team in comparison to that before the change will probably be at the same level or at a lower one.

In conclusion, the frequency of coach replacement in the Greek professional soccer League is quite high with a significant increase in the lower division. Coach

replacements take place after a decline in the team performance in four successive games, as confirmed by previous research (Breuer & Singer, 1996; Gabler, 1975; Gamson & Scotch, 1964; Salomo & Teichmann, 2002). The coach replacement seems to have a positive influence on the performance of the team only in short terms, certainly within the four games following replacement, but not in long terms. Regarding the implications of these findings Coach and Football associations may consider them when dealing with issues related to: a) increasing the degree of coach professionalism, b) improving issues that concern their contracts, c) developing a new moral code and colleague solidarity among coaches, and d) quality training of coaches with ultimate aim of soccer improvement.

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