

Relative age effect in european professional football. Analysis by position

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ABSTRACT

Salinero, J.J., Pérez, B. Burillo, P. & Lesma, M.L. (2013). Relative age effect in european professional football. Analysis by position. *J. Hum. Sport Exerc.*, 8(4), pp.966-973. The relative age effect (RAE) in sport consists in the lower presence of athletes born in the months furthest from the cut off date established by the competitive system, which normally coincides with the last months of the year. The purpose of this study is to assess if there is an RAE in European professional football, where the current cut off age for training in the different categories is based on the calendar year; and its analysis by position on the playing field. The analysis has included all the footballers playing in the league championships in the United Kingdom, Italy, Germany, France and Spain (N= 2763). The results of our study confirm an RAE in professional football in Italy, France and Spain. When differentiated by playing position there is a different RAE incidence in the five championships analyzed. **Key words:** RELATIVE AGE, SOCCER, EUROPE, PLAYING POSITION.

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INTRODUCTION

It was in 1985 that R. Barnsley, Thompson and P. Barnsley discovered this phenomenon after studying the Canadian hockey leagues. They found that there was a type of golden rule which was evident in almost all the elite teams in this sport and in this country: 40% of the players had been born in the first quarter of the year.

This “relative age effect” (RAE) has also been found in football. Barnsley, Thompson & Legault (1992) studied the age of under 20 and under 17 players who participated in the 1990 World Football Cup. Dudink (1994) studied the first division of the English football league Musch & Hay (1999) found a strong RAE in professional football in Germany, Japan, Brazil and Australia. Musch & Grondin (2001), compiled the results of 57 studies by 35 different authors on 11 different sports, and found common patterns with regard to RAE.

Helsen et al. (2000) found that the change of the cut off date from the month of August to January caused a decrease in the selection of players from the second half of the year in favour of the first. In a few years this produced a different distribution of the birth dates of players by quarter, and the proportion of those born in the fourth quarter of the year almost disappeared. Similarly, Helsen et al. (1998) discovered that those footballers who were born in the last months of the year left the sport at an early age as a result of not being selected.

However, at an early age, the chronological difference among athletes implies physical differences which may be determinant in the selection process. García-Álvarez & Salvadores (2005) found differences of more than 10cm in height and 10kg in weight among athletes of 14 years of age who had been born in the same calendar year. Equally, a study carried out in France with young elite players found significant differences according to the quarter, favouring those born nearest to the cut off date, in height, weight, peak torque quadriceps, maximal anaerobic power, and estimated VO₂max (Carling et al., 2009). In a study carried out with 281 hockey players of 14 and 15 years of age, it was found that the selected athletes were taller and heavier and was born in the first half of the year (Sherar et al., 2007). In another study with young footballers, differences in height were found in terms of the quarter in which they were born once the effect of biological maturity had been taken into account (Hirose, 2009).

This is why the problem of the RAE originates in adolescents where physical differences are more patent. Thus, the RAE has been revealed in young footballers from different countries like the United States of America (Vincent & Glamser, 2006), Brazil (Rogel et al., 2007), France (Carling et al., 2009), Spain (Perez Jiménez & Pain, 2008), and Belgium (Helsen et al., 2005). In this line of thought, Cobley et al. (2009) indicate that sports contexts involving adolescent males (aged 15-18 years), at the representative (i.e. regional and national) level in highly popular sports appear most at risk for RAE inequalities.

However, really talented players can manage to stand out in any case, as indicated by Ford, Webster & Williams (2008), who studied 180 athletes who were given awards for their sports successes and concluded that there was no RAE in them, but that when technical or tactical skills are equal, a greater physical capacity can be determinant.

The players who are turned down, perhaps due to their lesser physical capacity because of their lower chronological age, may abandon sports practice in which case possible talents can be lost. In this regard it is worth mentioning the information presented by García-Álvarez & Salvadores (2005) that more than 60%

of children born in the second half of the year abandon football before they are 17 due to problems which derive from the RAE.

This selection process mediated by the RAE at early ages produces a greater presence of players who were born in the first months of the year in the younger categories of this sport which will inevitably be reflected in professional football.

It is reasonable to think that these physical differences would be more important, for the selection of players, according to the field position of the player, as physical differences have been confirmed mainly in the goal keepers and the defenders (Gil et al., 2007; Reilly et al., 2000) and that therefore the RAE would be greater in these positions. However, several studies conclude that there are no differences in the presence of the RAE among the different playing positions in young footballers (Gutierrez et al., 2010).

The purpose of the present study was to confirm the presence of the RAE in professional football in the main European competitions and to analyse the influence of the playing position on this effect.

MATERIAL AND METHODS

Participants

All the players in five European leagues during the 2009-2010 season were studied with regard to their date of birth, making a total of 2763 footballers (Table 1).

Table 1. Participants studied in each of the five leagues

| | N |
|----------------|------|
| United Kingdom | 589 |
| Italy | 603 |
| Germany | 515 |
| France | 574 |
| Spain | 482 |
| | 2763 |

Procedures

The information on the date of birth and the playing position was obtained from the web pages of the different teams participating in the five leagues studied.

Analysis

The statistical package SPSS v.18 for Windows was used for the statistical analysis. Frequencies were obtained for quarters, calculating the chi square statistic to contrast the homogeneity of the distribution among the four quarters.

RESULTS

In all cases the first quarter was over represented in comparison with the other three. Significant differences were established with a homogeneous distribution in Calcio, Ligue D1 and the BBVA Liga ($P < 0.001$), where there was a gradual decrease of footballers born in the different quarters according to how far they were from the cut off date. In the English and German leagues there were also a larger number of players who were born in the first months of the year, but the difference was not significant.

Table 2. Chi square and significance of each of the leagues studied

| | Chi-Square | P |
|----------------|------------|------|
| United Kingdom | 6.986 | 0.72 |
| Italy | 24.244 | .000 |
| Germany | 4.138 | .247 |
| France | 28.578 | .000 |
| Spain | 28.480 | .000 |

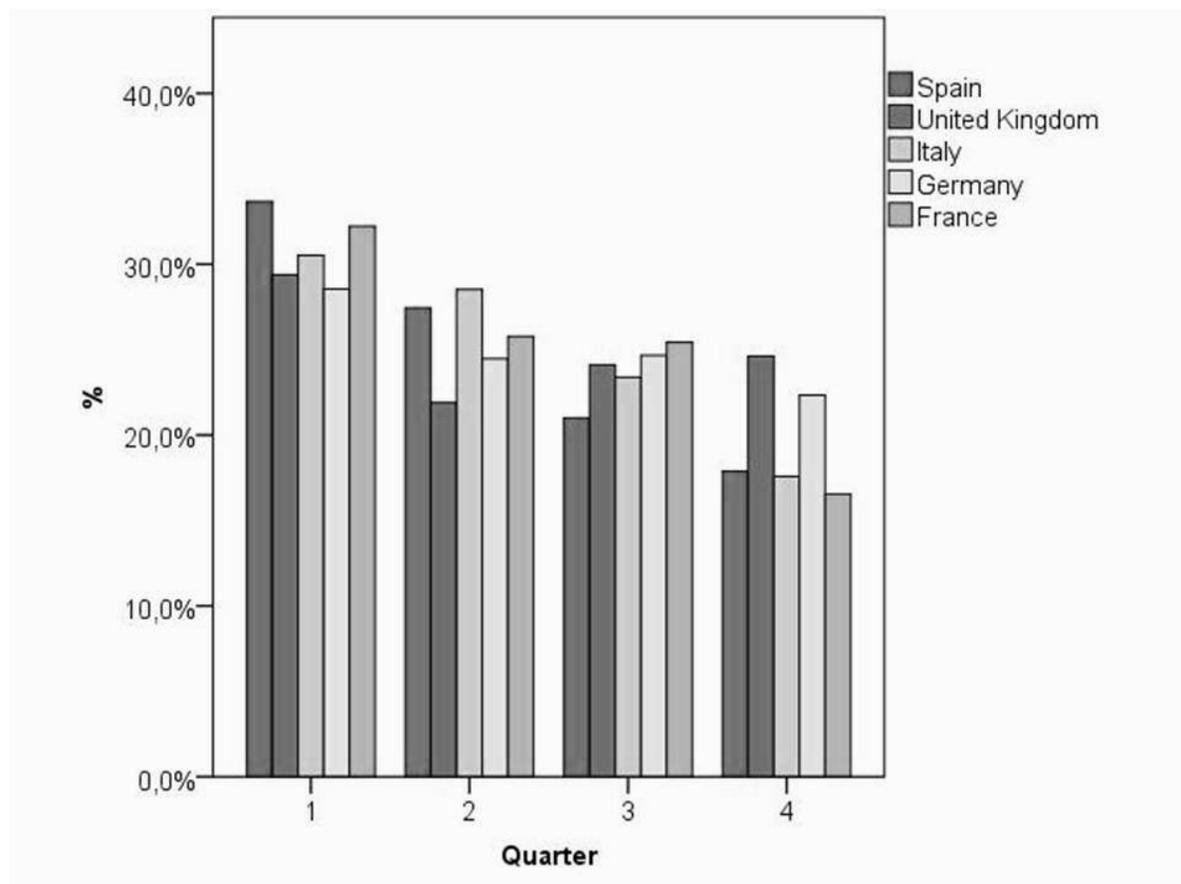


Figure 1. Distribution of players in the different leagues born in the four quarters

Analysis by position

The position which showed the greatest RAE in more competitions was that of the midfielders, in all the leagues studied except the Premier league where it was the only position which was not affected by the RAE. In the case of the Bundesliga, the opposite effect occurred, as the position of midfielder was the only one which showed the RAE. The next position most influenced by RAE in European competitions was that of the defenders, and was present in England, Italy and Spain. In the case of the forwards, the presence of the RAE was only significant in the Premier league. Both the Spanish and Italian competitions coincided in presenting significant differences in defenders and midfielders.

Table 3. Distribution of players in the different leagues born in the four quarters by playing position

| | | Quarter (% of players) | | | | |
|----------------|------------|------------------------|------|------|------|------|
| | | 1 | 2 | 3 | 4 | P |
| United Kingdom | Defender | 31,8 | 14,9 | 29,2 | 24,1 | .005 |
| | Forward | 36,4 | 16,1 | 22,9 | 24,6 | .017 |
| | Midfielder | 26,7 | 24,3 | 22,8 | 26,2 | .850 |
| | Goalkeeper | 18,6 | 44,3 | 15,7 | 21,4 | .002 |
| Italy | Defender | 28,9 | 31 | 21,9 | 18,2 | .046 |
| | Forward | 28,6 | 21,4 | 31,7 | 18,3 | .118 |
| | Midfielder | 31,8 | 30,8 | 21 | 16,4 | .002 |
| | Goalkeeper | 34,2 | 27,6 | 19,7 | 18,4 | .176 |
| Germany | Defender | 26,6 | 23,4 | 26 | 24 | .932 |
| | Forward | 26,5 | 27,4 | 19,5 | 26,5 | .600 |
| | Midfielder | 33,7 | 22,1 | 25,3 | 18,9 | .027 |
| | Goalkeeper | 20,7 | 29,3 | 29,3 | 20,7 | .632 |
| France | Defender | 24,5 | 31,5 | 23,4 | 20,7 | .192 |
| | Forward | 29,2 | 25,4 | 24,6 | 20,8 | .598 |
| | Midfielder | 39,4 | 20,2 | 29,3 | 11,1 | .000 |
| | Goalkeeper | 38,7 | 27,4 | 21 | 12,9 | .032 |
| Spain | Defender | 42 | 22,2 | 19,1 | 16,7 | .000 |
| | Forward | 30,4 | 25 | 25 | 19,6 | .537 |
| | Midfielder | 29,1 | 31,9 | 22 | 17 | .019 |
| | Goalkeeper | 28,9 | 33,3 | 15,6 | 22,2 | .352 |

DISCUSSION

The RAE was confirmed in three of the five competitions studied. These results coincide with those reported for the Spanish league (Gutierrez et al., 2010; Lesma et al., 2011). In the case of Germany, a possible explanation could be that up until the year 1996, the cut off date was 1st August instead of January, so that there may still be an effect from the players selected in their early stages with this cut off date. However, in previous studies in that country the RAE has been confirmed when the analysis was carried out by five-year period instead of just one season (Cobley et al., 2008). In England the federation was one of the first to make the cut off date coincide with the calendar year (Dudink, 1994), and a significant RAE was revealed in all positions except midfield.

While in the country analysis RAE was not shown in Germany and England, when looking at differences by playing position, all the countries studied showed obvious evidence of an RAE in some positions, which confirms a situation in which mistakes are made when selecting talents in the five countries studied. The selection is influenced by physical appearance, which is due to greater physical development because of the relative age difference in the lower categories, and thus possible sports talents may be discarded.

Therefore the analysis by position demonstrated that this aspect played an important role in the incidence of the RAE. This influence also varied depending on the different competitions studied, presumably because of the type of play, which is characteristic in each league. These results contradict previous studies of young footballers, which did not find significant differences depending on the playing position (Gutierrez et al., 2010).

The physical differences with regard to height found in the different playing positions in favour of the goal keepers and the defenders and where the midfielders were the shortest (Gil et al., 2007; Hencken & White, 2006; Reilly et al., 2000; Shephard, 1999), would lead to the consideration that the positions of goal keeper and defender were the most likely to be influenced by the RAE. However, the position where the RAE was most prevalent was precisely that of the midfielders. It is curious that in the Premier league the RAE was present in all the positions except in the midfielders, whereas the opposite was true in the rest of the championships. In contrast, in this competition we found the RAE in the forwards, which was not the case in the rest of the championships. It is likely that the characteristics of this competition, where high balls are very important, would make it logical to pick tall players for the forwards a feature, which would be less important for the midfielders.

CONCLUSIONS

In conclusion, it has been shown that the RAE was present in the five leagues studied to a greater or lesser extent, coinciding with the results of other authors that this effect is evident at the international level. It has been observed that the relative age gains greater importance in those cases where the players occupy defender and midfield positions on the playing field, where it probably means an advantage to have certain physical characteristics. In our opinion, given the social and also financial implications this effect seems to have, it might be interesting, as a future line of research, on the one hand to assess the socioeconomic impact of the RAE in professional football and, on the other, to make a comparative study with control groups for the different proposals made by the authors in relation to talent spotting and selection.

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