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Research article

The Relative Age Effect in the Two Professional Men's Football Leagues in Spain

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Abstract
The age difference among individuals of the same group is known as Relative Age. Relative Age Effect refers to the consequences derived from it, such as delayed physical, cognitive and mental development of children born later in the year. The aim of this study was to observe the Relative Age Effect by analyzing players' dates of birth throughout three seasons in the two professional football competitions in Spain based on the game positions and the teams´ classification at the end of the season. The sample was made up of players (n=4097) from both professional competitions ($n_{LaLiga\ Santander}$=1864), and ($n_{LaLiga\ Smartbank}$=2233). The data were collected from two public-access football statistics websites. The cut-off date was established on January 1, the year was divided into four quartiles (Q1: January-March, Q2: April-June, Q3: July-September and Q4: October-December). Results confirmed significant differences on dates of births' distribution ($p<0.05$) for the competitions ─ *LaLiga Santander* and *LaLiga Smartbank* ─ during three seasons, as well as for player position, with a larger effect observed for goalkeepers and defenders. Significant difference was also observed depending on classification. Results show a clear decreasing percentage of those born in quartile 4 in relation to those born in quartile 1, it can be concluded that the Relative Age Effect phenomenon is present in the Spanish professional football which may lead to an inappropriate talent selection technique in football, with recruitment oriented to the short term, to immediate results, and possibly caused by the early start of the player selection process.

Key words: Birth quartile, talent identification, development, Soccer.

Introduction

In areas such as sports and education, subjects are grouped by age, which, in most countries coincides with the beginning of the calendar year. The objective of this type of grouping is to achieve homogeneous sets of individuals with equal opportunities. However, when considering this type of grouping more thoroughly, inequalities can be found that are related to the month of an individual's birth. This approach to grouping can generate gaps of up to a year for individuals who have about the same level of maturation. Consider, for example, the individual born in the first days of January when compared to another who was born in the last days of December (Helsen et al., 2005). This chronological age difference between subjects in the same age group is known as relative age and its consequences as the Relative Age Effect (RAE) (Campbell, 2013).

Within sports, age difference has great relevance for younger participants. At early ages, a great diversity of anthropometric and physical measurements can be observed, depending on the maturation of the individual. This provides an advantage to those more developed, normally the ones born closer to the cut-off date (Bell et al., 2009). González-Villoria and Pastor-Vicedo (2012) pointed to invasion sports: ─ especially football, basketball, handball, hockey, and rugby ─ as those in which RAE has been studied. A large number of these studies focus on RAE as a key variable (De Oliveira Castro, et al., 2022; Wrang et al., 2018), and some others examine it in relation to other variables, such as individual performance (minutes played), nationality, player position, collective performance (team classification, team competition level, results) (Augste and Lames, 2011).

Football is played all over the world. Because of its popularity and global impact, it has been a frequent subject of research. Within Europe, Helsen et al. (2012) compared the birth distributions of football players from nine major European leagues (England, Germany, Belgium, Netherlands, Spain, France, Italy, Denmark and Sweden) from the seasons 2000-01 to 2010-11. In turn Yagüe et al. (2020a) assessed RAE in international professional football in 2015, analyzing 115 teams from the *Union of European Football Associations* (UEFA) and 110 teams from the *South American Football Confederation* (CONMEBOL), producing a total sample of 6448 people. That research found a strong effect of relative age in all the leagues, except in the *Premier League* (England), which has a cut-off date different from the rest of the competitions. The *English Football Association* changed the categories division´s cut-off date, substituting January 1 as the first day of the cut-off date for January 1 September (González-Villora et al., 2015).

Several studies have been carried out over time, focusing on the influence of RAE on the *Professional Spanish Football League*. Lesma et al. (2011) assessed this effect during the 2009-10 season in the *BBVA League* (Spanish First Division), where 61% of the players were born in the first half of the year. In addition, they carried out a segmentation analysis by nationality, finding that 63.53% of the players who came from other countries were born in the first half of the year. Later, Prieto-Ayuso et al. (2015) analyzed the presence of relative age in the same league during the 2013-14 season obtaining similar results.

It should be noted that RAE has also been studied in the Spanish football youth categories (Jiménez and Pain, 2008). Gutiérrez Díaz del Campo et al. (2010) analyzed the youth categories of the 20 participating teams in the *National Professional Football League*, together with five amateur team academies during the 2005/06 and 2008/09 seasons. The overrepresentation of players born in the first

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semester was verified, especially in elite teams, but with a decrease in the RAE effect throughout the period analyzed. This effect also occurred in other countries such as Germany (Augste and Lames, 2011), Italy (Brustio et al., 2018), Russia (Bezuglov et al., 2019), and Brazil (Silva et al., 2015). In the same way, Yagüe et al. (2020b) analysed the RAE in youth Spanish categories (U12, U14, U16 and U19) and in professional Spanish football players, finding similar results, with an overrepresentation of players born in the first semester of the year. Their results showed a greater influence of RAE, the lower the category, and a progressive decrease as they approached the professional level, though some current investigation show results in the opposite direction (Figueiredo, et al., 2022).

As it has shown, this phenomenon has been widely studied. The strength of the present study is based on three main issues: the characteristics of the sample, the number of analyzed seasons, and the studied variables. The aim was to determine the effect of RAE in the two main professional male football leagues in Spain (*LaLiga Santander and LaLiga Smartbank*), during the 2018-19, 2019-20 and 2020-2021 seasons, as well as to assess how it affected the game, according to the players´ positions and teams´ classification at the end of the season, and in this way to analyze whether this phenomenon has attenuated, remains or has increased in recent years.

Methods

Participants

The sample consisted of all the players (n=4097) of the two professional football competitions in Spain, *LaLiga Santander* (First Division) and *LaLiga Smartbank* (Second Division) of the Spanish Professional Football League and the Royal Spanish Football Federation during 2018-19, 2019-20 and 2020-21 seasons. Forty-two teams per season took part (20 teams in *LaLiga Santander* and 22 in *LaLiga Smartbank*). The characteristics of the sample are shown in Table 1.

The study was performed in a manner that respected the principles established by the Declaration of Helsinki and by the Ethics Committee of the authors' university.

Measures

The variables used in this research have been categorized and conceptualized in Table 2.

Procedure

The data were collected manually from two public access football statistics websites called www.transfermarkt.com and www.livefutbol.com, following a similar procedure to that several studies carried out previously like Figueiredo et al. (2022), Gutiérrez del Campo et al. (2010) or Yagüe et al. (2020a). Since the cut-off date was established on January 1, the year was divided into four quartiles.

Statistical analysis

A frequency analysis was carried out by means of contingency tables, showing both the frequency (fr) and the percentage (%) of the variables in this study. To check the homogeneity of the distribution throughout the four quartiles (Q1: January-March; Q2: April-June; Q3: July-September; and Q4: October-December), an analysis of the observed frequencies and the months of birth was conducted, using the chi square test (X2) and the degrees of freedom (DF) depending on the different variables subject of study. Most studies assume that the birth dates of players should be distributed equally across the four quartiles, with each quartile containing approximately 25 percent of the players (Helsen et al., 2012). That is also the assumption of this study. To assess potential differences in the distribution of birth dates between subgroups, an odds ratio was calculated for the different quartiles, with Q4 as the reference group. A higher odds ratio level would indicate higher probability of members of that group compared to the reference group.

To calculate the effect size in those nominal variables, a Cramer's V test was used, where values of V=.06 to .17 indicate a small effect size, V=.18 to .29 a medium effect size, and V≥.30 a large effect size (Cramer, 2016). The significance level was p<.05. Data analysis was carried out using the Statistical Package for Social Sciences (SPSS 26.0).

Table 1. Sample distribution according to the variables analysed.

Variables	Variables	*fr*	*%*
Competition	*LaLiga Santander* (1st Division)	1864	45.5
	LaLiga Smartbank (2nd Division)	2233	54.5
Game position	Goalkeeper	451	11
	Defender	1350	33
	Midfielder	1203	29.4
	Forward	1093	26.7
Season	2018/19	1357	33.1
	2019/20	1378	33.6
	2020/21	1362	33.2

Note. fr= frequency; %= percentage.

Table 2. Definition of study variables.

Variable	Definition
Birth quartile	Players' date of birth has been classified into four quartiles (Helsen et al., 2012): Q1 (January 1 – March 31), Q2 (April 1 – June 30), Q3 (July 1 – September 30) and Q4 (October 1 – December 31)
Playing Position	The players were classified according to the different roles that occur in football such as goalkeepers, defenders, midfielders and forwards.
Classification	It refers to the qualifying position of the teams in the leagues studied during the 2018/19, 2019/20 and 2020/21 seasons. The teams have been classified into three groups adapting the criteria used by Vogelbein et al. (2014): the first four places in each league (n=782), the last four places (n=777) and the middle of the table (the teams that were not in any of the previous groups, n=2538).

Note. Q= quartile.

Results

The distribution of the birthdates in the total sample for all three time periods showed significant differences in relation to the expected distribution (X^2=193.545; p=.000) and a *medium* size effect of RAE on the studied population (V= 0.217). Further, when both competitions were analyzed separately, significant differences were observed in the distribution across the quartiles, with a higher probability of birth dates occurring in Q1 compared with Q4. These results were reinforced by the odds ratio. The values of *Cramer's V* suggest a medium effect size, which would indicate that RAE is evident, in both competitions throughout the three seasons analyzed (Table 3).

One of the innovations in this investigation is shown in Table 4, where the evolution of the RAE was clear. Added to the statistical differences in the global distribution of the participants' birth dates, there was a greater probability (p<.000) that both the first and second category players were born between January and March. That was also reflected in a *medium* effect size (*Cramer's V*).

Analyzing the distribution of the birth month by playing position (Table 5) we found significant distribution differences in each game position (p<.000), with a higher frequency in the case of the first quartile of the year, together with a *medium* effect size of the RAE, in all game positions.

Finally, as Table 6 shows, the same distribution was found as with the independent variables considered previously, with subjects born in Q1 being significantly more frequent in the subgroups (teams classified in the top four places in their league, ranked mid-table, and belonging to the last four places). Once again, *medium* effects were found within the corresponding competitions (*LaLiga Santander* and *LaLiga Smartbank*). The impact of RAE was evident in the three groups: a higher clustering of players with birth dates in the first quartile of the year in the teams with the best performance at the end of the season. The finding was statistically significant (p<.000), producing a *medium* effect size (*Cramer's V*) in the three classification groups ($V_{four\ first\ places}$=0.280).

Table 3. Distribution of the birth quartile according to the analysed league.

League	Quartile				Total	X^2	df	*p*	*V*	Odd-ratio (CI 95%)		
	Q1 fr (%)	Q2 fr (%)	Q3 fr (%)	Q4 fr (%)						Q1-Q4	Q2-Q4	Q3-Q4
Total	1359 (33.2)	1077 (26.3)	895 (21.8)	766 (18.7)	4097	3.203	3	.361	.028			
LaLiga Santander	641 (34.4)	488 (26.2)	404 (21.7)	331 (17.8)	1864	114.116	3	.000***	.247	1.937 (1.937-1.937)	1.474 (1.474-1.474)	1.221 (1.221-1.221)
LaLiga Smartbank	718 (32.2)	589 (26.4)	491 (22.0)	435 (19.5)	2233	82.721	3	.000***	.192	1.651 (1.651-1.651)	1.354 (1.354-1.354)	1.129 (1.129-1.129)

Note. Q= quartile; fr= frequency; %= percentage; X^2=chi square; df =degrees of freedom; *p*= significance level; V= Cramer's V. *** *p* <0.001.

Table 4. Distribution of the birth quartile according to the season analysed.

Season	Quartile				Total	X^2	df	*p*	*V*	Odd-ratio (CI 95%)		
	Q1 fr (%)	Q2 fr (%)	Q3 fr (%)	Q4 fr (%)						Q1-Q4	Q2-Q4	Q3-Q4
Total	1359 (33.2)	1077 (26.3)	895 (21.8)	766 (18.7)	4097	1.884	6	.930	0.015			
2018-2019	453 (33.4)	350 (25.8)	309 (22.8)	245 (18.1)	1357	67.363	3	.000***	0.223	1.849 (1.849-1.849)	1.429 (1.429-1.429)	1.261 (1.261-1.261)
2019-2020	451 (32.7)	362 (26.3)	300 (21.8)	265 (19.2)	1378	57.907	3	.000***	0.205	1.702 (1.698-1.706)	1.366 (1.363-1.369)	1.132 (1.129-1.135)
2020-2021	455 (33.4)	365 (26.8)	286 (21.0)	256 (18.8)	1362	69.959	3	.000***	0.227	1.777 (1.776-1.778)	1.426 (1.425-1.427)	1.117 (1.117-1.118)

Note. Q= quartile; fr= frequency; %= percentage; X^2=chi square; df =degrees of freedom; *p*= significance level; V= Cramer's V. ***$p < 0.001$.

Table 5. Distribution of the birth quartile according to the game position.

Position	Quartile				Total	X^2	df	*p*	*V*	Odd-ratio (CI 95%)		
	Q1 fr (%)	Q2 fr (%)	Q3 fr (%)	Q4 fr (%)						Q1-Q4	Q2-Q4	Q3-Q4
Total	1359 (33.2)	1077 (26.3)	895 (21.8)	766 (18.7)	4097	12.008	9	0.213	.031			
Goalkeeper	145 (32.2)	136 (30.2)	99 (22)	71 (15.7)	451	31.115	3	.000***	.263	2.042 (2.038-2.046)	1.915 (1.911-1.919)	1.394 (1.391-1.397)
Defender	463 (34.3)	364 (27.0)	283 (21.0)	240 (17.8)	1350	85.716	3	.000***	.252	1.929 (1.928-1.931)	1.517 (1.516-1.518)	1.179 (1.178-1.180)
Midfielder	408 (33.9)	302 (25.1)	265 (22.0)	228 (19.0)	1203	60.099	3	.000***	.224	1.789 (1.789-1.789)	1.325 (1.325-1.325)	1.162 (1.162-1.162)
Forward	343 (31.4)	275 (25.2)	248 (22.7)	227 (20.8)	1093	27.977	3	.000***	.160	1.511 (1.510-1.512)	1.211 (1.210-1.212)	1.093 (1.093-1.094)

Note. Q= quartile; fr= frequency; %= percentage; X^2=chi square; df =degrees of freedom; *p*= significance level; V= Cramer's V. ***$p < 0.001$.

Table 6. Distribution of the birth quartile according to the classification at the end of the season.

Classification	Quartile				Total	X^2	df	*p*	*V*	Odd-ratio (CI 95%)		
	Q1 fr (%)	Q2 fr (%)	Q3 fr (%)	Q4 fr (%)						Q1-Q4	Q2-Q4	Q3-Q4
Total	1359 (33.2)	1077 (26.3)	895 (21.8)	766 (18.7)	4097	5.953	6	.428	.027			
Four first places	285 (36.4)	194 (24.8)	159 (20.3)	144 (18.4)	782	61.366	3	.000***	.280	1.979 (1.973-1.986)	1.347 (1.343-1.351)	1.104 (1.101-1.107)
Mid-table classified	815 (32.1)	675 (26.6)	563 (22.2)	485 (19.1)	2538	97.125	3	.000***	.196	1.680 (1.679-1.681)	1.392 (1.391-1.393)	1.161 (1.160-1.162)
Four last places	259 (33.3)	208 (26.8)	173 (22.3)	137 (17.6)	777	41.754	3	.000***	.232	1.891 (1.891-1.891)	1.518 (1.518-1.518)	1.263 (1.263-1.263)

Note. Q= quartile; fr= frequency; %= percentage; X^2=chi square; df =degrees of freedom; *p*= significance level; V= Cramer's V. ***$p < 0.001$.

Discussion

The main aim of this study was to analyze the birth dates of the players in order to observe the RAE using data from the 2018-19, 2019-20 and 2020-21 seasons in *LaLiga Santander* and *LaLiga SmartBank*, the two professional male football competitions in Spain. Likewise, it is intended to analyze the RAE according to the game position and the classification of the teams at the end of the season.

In our research, we found a significant overrepresentation of players born in Q1 participating in both studied leagues (*LaLiga Santander* and *LaLiga Smartbank*) supported with a *medium* size effect. The data obtained evince a clear decreasing percentage of those born in Q4 (17.8% in *LaLiga Santander* and 19.5% in *LaLiga Smartbank*) in relation to those born in Q1 (34.4% in *LaLiga Santander* and 32.2% in *LaLiga Smartbank*). In addition, a higher *odds ratio* was estimated when comparing Q1 and Q4 in *LaLiga Santander* in relation to *LaLiga Smartbank*. These results might indicate a talent selection linked fundamentally to anthropometric, physical and physiological variables, closely related to the RAE.

We have observed similarities in our study with different researches that address various competition leagues. First, Helsen et al. (2012) with data from the 2010-11 season, found significant differences in the RAE effect for all the leagues analyzed (England, Germany, Belgium, Netherlands, Spain, France, Italy, Denmark and Sweden), except for the *Primeira Liga* (Portugal). Second, Padrón-Cabo et al. (2016) during the 2014-15 season, showed that this phenomenon was present in all the leagues of his study (Spain, Germany, Italy, France, Portugal, Holland, Belgium, Ukraine, South Africa, Australia, Mexico and Brazil), except in the *Premier League* (England), the *Primeira Liga* (Portugal) and the *K-League Classic* (South Korea). Third, Yagüe et al. (2020b) analyzed the 2016-17 season and found significant differences in all the leagues studied (six from UEFA and six from CONMEBOL), except for the English league (*Premier League*). And fourth, Úbeda-Pastor et al. (2020) analyzed the five most powerful European leagues (Spain, Italy, Germany, France and England) in the 2016-17 season and their results showed statistically significant differences with respect to the expected distribution in all the leagues except for the English one (*Premier League*).

Other studies that only approach the Spanish league, such as the present study, confirmed a greater representation of players born in the first quartile (Q1). Lesma et al. (2011) confirmed the RAE during the 2009-10 season; Prieto-Ayuso et al. (2015) in the 2013-2014 season, Reverte-Masia et al. (2016) analyze the RAE on the U23 players of *LaLiga Santander* during the 2018-19 season. It should be noted that the longitudinal study by Salinero et al. (2014) reveals a significant RAE during the 2008-09, 2009-10, 2010-11 and 2011-12 seasons, and a more homogeneous distribution along the quartiles of birth during the 1999-2000 season. Most of the results coincide with those of the present study, where the three seasons analyzed (2018-19, 2019-20 and 2020-21) show a significant presence of the RAE. In addition, we can appreciate that, during these three years analyzed, the results did not offer any significant changes in the RAE in professional Spanish football depending on any of the independent variables analyzed, which emphasizes the robust nature of the phenomenon.

This effect has been studied with varied research designs in other countries, reaching similar results: an overrepresentation of those born in the first quartile of the year, as in Italy (Brustio et al., 2018), Belgium (Helsen et al., 2005), Brazil (Costa et al., 2012), Germany (Augste and Lames, 2011; Götze and Hoppe, 2021) or Australia (Van Den Honert, 2012). Mulazimoglu (2014) shows the presence of RAE in Turkey's elite football teams as well as in players from the best Turkish youth football clubs (n=2936 players).

Regarding the independent variable *position played in the game system*, the scientific literature (Lesma et al., 2011; Salinero et al., 2014) is not unanimous, it may be due to a structural weakness when approaching this variable, i.e. players sometimes change positions after selection or at the time of the study. Therefore, our results are consistent with some previous studies, showing significant distribution differences in the four positions analyzed (*defenders, midfielders, forwards and goalkeepers*), a higher *odds ratio* when comparing Q1 with the reference quartile, and higher RAE´s effect size in *goalkeepers and defenders* in relation to the other positions. Padrón-Cabo et al. (2016) also found the presence of the RAE in every player position in the 2014-15 season, but discrepancies in the degree of RAE according to the position (*defender* specific position was the most affected and the *goalkeeper* the least). Our findings partially disagree with Prieto-Ayuso et al. (2015), who analyzed the 2013-2014 season and found significant differences among the RAE in the *defender* and *forward* positions. In addition, the study by Lesma et al. (2011) shows little influence of the RAE on the *goalkeeper*, the

same as Figueiredo et al. (2022) in their current study with Brasilian elite soccer. This is surprising because height could be a performance factor for the goalkeeper position. It seems that the strongest conclusion of this study variable in football is that the *defender* position is the most affected by the RAE phenomenon, because it requires specific anthropometric characteristics (Salinero et al., 2014). In addition to the European research, there are studies in China and in the Turkish *Super League*. In the first case (Li et al., 2020), the results are consistent with our findings, showing significant values in all positions analyzed. In the Turkish league case, Arslan et al. (2020) obtained somewhat similar results with our research, with a total coincidence in the *League 2* and *League 3* leagues. However, the RAE was not significant in *League 1* in any position, nor in the *Super League* for the *goalkeeper* and the *forward*.

Finally, if we approach the incidence of the RAE related to the final classification of the teams in both leagues for the 2018-19, 2019-20, and 2020-21 seasons, significant differences were observed among the three subgroups analyzed (*teams ranked in the top four*, in the *middle of the rankings* and in the *last four positions*). In addition, a greater concentration of players born to the first quartile of the year was observed in the best-ranked teams´ group at the end of the season. These results allow us to comment, cautiously, on the importance of the RAE in the selection of top professional players as was also seen in research with young players (Augste and Lames, 2011). However, this statement must be interpreted cautiously, since both leagues do not have the same number of teams, and therefore of participating players, as well as the conditioning factor of the differences in terms of competitive level.

The widespread negative perception of the consequences of the RAE in sport talent recruitment has led to several proposals in the scientific literature, aimed at limiting its effects in order to achieve a hypothetical equality of opportunities and avoiding the loss of natural talent (Helsen et al., 2005; Padrón-Cabo et al., 2016). Our first proposal, given the complexity of the issue, would be to count on transversal teams during the selection proceedings (sports technicians, doctors, psychologists, biomechanics, etc.). This could allow greater knowledge about each footballer as a whole, perhaps avoiding the strong influence of chronological age during recruitment. This is what has been called *bio-banding* (Cumming et al., 2017), a strategy that consists of grouping athletes according to attributes related to growth and maturational development instead of using only chronological age as a selection criterion. A second option would be to modify the cut-off dates from time to time, so that all athletes at some point would benefit from the RAE phenomenon (Sierra-Díaz et al., 2017). Unfortunately, it seems that changing the cut-off date only produces a change in the distribution by months in elite football. Following this proposal, the *Australian Football Federation* decided to replace the January 1st cut-off date, for August 1st in its youngest categories. However, subsequent investigations showed that this change simply altered the birth months favored by
the RAE (Musch and Hay, 1999).

The third solution involves expanding the number of competition categories, for example, by at least one category per year. This means a smaller age difference between the players belonging to the same category and, therefore, with less impact (or effect) due to variable maturation of players. Finally, Mann and Van Ginneken (2017) carried out an experiment that consisted of observing a series of football matches with three groups of players: (1) without information on age, (2) with knowledge of the players´ birth dates and (3) the players wore a jersey with a number consistent with their relative age (the oldest wears the one, the youngest the largest number). The results revealed a significant selection bias for the first two groups, which was eliminated in the third group, when the coaches watched the matches knowing that the jersey number corresponded to the players´ relative age. However, we must be cautious with this evidence due to the possible influence of the previous information available to coaches.

We are aware that one of the limitations of the present study was not assessing the effective times played for each athlete in competitions. The inclusion of this kind of information could provide important insights into the degree of opportunities these players receive based on RAE. Based on the reflections of Figueiredo et al. (2022), we agree that future research should be directed towards the use of longitudinal approaches and the control of players' participation in official matches. Finally, it could also be interesting to extend the sample to women's football, a modality in clear development, and study the effect on some national team competitions organized by FIFA.

Conclusion

In conclusion, the results confirmed a greater representation of players born in Q1 and Q2, compared to other quartiles, indicating statistically significant values and a *medium* size effect for *LaLiga Santander* (First Division) and *LaLiga Smartbank* (Second Division) of the *Spanish Professional Football League* and the *Royal Spanish Football Federation*, for the 2018-19, 2019-20 and 2020-21 seasons. This significance was repeated for the *player position* variable. In addition, a higher *odds ratio* is estimated when comparing Q1 and Q4, as well as a higher effect size of the RAE in goalkeepers and defenders in relation to the rest of positions. Finally, in the *classification at the end of the season* variable, we can observe a significant effect in the three subgroups considered, with a greater concentration of players born in the first quartile of the year in the teams with the best performance at the end of the season.

The general conclusion confirms that, despite the strategies that literature proposes and practice apply in order to correct or, at least, to limit the RAE phenomenon, the problem persists in all the studied variables. Therefore, we must continue studying the phenomenon with the aim to restrict its harmful consequences in different aspects, highlighting to stand out an unfocused selection of talents with a recruitment oriented to the short-term aspects and results. It seems that a revision in the selection processes may be necessary in order to balance the chances of success for players born later in the year. Knowing the complexity of the subject, we propose a recruitment in which various aspects should be taken into consideration (psychological,

technical, tactical, family and social environment, etc.) through transversal teams. The main idea would be selecting young footballers according to their talent, rather than their physical level, with the aim of removing this social inequality that influences the experiences of the players, especially in their maturation. Recruitment should be far more sophisticated, with a long-term strategy that focuses on talent and long-term success rather than just immediate success.

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Key points

- The relative age effect (RAE) was present in a significant way in *LaLiga Santander* (First Division) and *LaLiga Smartbank* (Second Division) of the *Spanish Professional Football League* and the *Royal Spanish Football Federation*, for the 2018-19, 2019-20 and 2020-21 seasons.
- According to player position (goalkeeper, defender, midfielder and forward), defenders and goalkeepers were those that show a greater RAE.
- Based on the competitive ranking of each analysed leagues, there was RAE at all performance levels, that is to say the better performance, the greater concentration of players born in the first quartile.
- It is recommended to review the processes of talents' selection in football, proposing a long-term strategy that focuses on talent and long-term success rather than just immediate success.

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