

Article

Birthplace and Birthdate Effect during Talent Process in Professional Soccer Academy Players

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Abstract: The main objective of this study was to detect, from among a set of innate, acquired, and contextual factors, those variables that are ascribed to players ultimately promoted to the professional team of a Spanish league club during the earlier selection and development phases. The data were presented in frequencies and correlations and by means of a classificatory cluster model. The variables used for the analyses included date of birth, birthplace density, player position, laterality, academy entry stage, international participation, and debutant status. These variables were related to the talent selection and promotion phases (i.e., academy entry stage and player debut). A dataset of information on 1411 players from the last 30 seasons of the Athletic Club de Bilbao (1993–2021) was used. Regarding the results, first, there was an over-representation of players with respect to their Q1 birth date and K5 density quintile in the selection phase; however, once players joined the academy, their chances of promotion (debut) fell for players in the Q4 birth date and K3 density quintiles. Second, there was a significant correlation between players' debut and the stage of incorporation ($p < 0.01$; $V = 0.46$) and internationalisation ($p < 0.01$; $V = 0.5$). Finally, the birthplace density and laterality variables converged as classificatory features of the players.

Keywords: soccer; professional academy; male; talent selection and promotion; birthplace



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1. Introduction

The globalisation of soccer is a phenomenon that has had a great impact on modern society [1,2], as it is one of the most popular team sports in the world and boasts more than 240 million players, approximately 4% of the world's population [3]. Interest in continuous improvement has steadily grown among soccer clubs, as they compete in a highly contested market for young talent with the potential to succeed in the future [4–7]. In this sense, the ability to identify, detect, select, and develop talent [8,9] can guarantee not only future sporting success through promotion in professional soccer but also the financial achievements that come with sporting success [10,11]. Therefore, developing home-grown talent [12] in professional clubs through their academies is paramount [13,14] to the ability to seek a competitive advantage over rivals [15].

Recent studies have defined sports talent as a complex construct. Some authors define it as the innate or acquired ability of an athlete to excel in a specific sports discipline [16], whereas others conceptualise it as the result of the interaction between innate, acquired, and contextual factors [17,18]. Taking all these factors into consideration, talent management in sports is a complicated multifactorial process [19–22] that is composed of several phases, which include the identification [23], selection [24], development [25,26], and promotion of skilled athletes [27,28].

The identification and selection phase aims to target a potential player who is considered capable of becoming an elite athlete [29,30]. Decisions about this phase are often based on subjective assessments of physical quality [31,32]. However, research on the effectiveness of decisions in this identification phase is limited [33], even more so when it comes to young players [34]. This raises the question of what elements [35] objectively help to control for biological, psychological, and social developments in decisions at this early stage [23].

Talent development, which comes later, is a continuous and challenging phase of talent management. The key objective in this phase is to help and support athletes to reach their full potential through the development of their skills, knowledge, and abilities [16,36]. Such development takes place through sports growth processes, which are defined as a “relatively systematic combination of coaching support and play designed to move players forward” [35,37], whereby players are provided with what is considered an appropriate learning environment [38]. In the last phase, there is the promotion of talent, a period in which athletes reach the culmination of their sporting growth by joining elite sports structures that will allow them, in the future, to make their debuts in professional leagues [39].

In all of the aforementioned phases, knowing the characteristics of the players and the factors behind their composition is crucial for understanding the process of sporting growth. A review of the different factors influencing the qualities of professional players has suggested that these factors be classified into innate, acquired, and contextual categories [15,40–42].

Innate factors are those that are inherited and that provide a basis for the development of sporting talent [43,44]. This group of factors includes genetics, physical constitution, and cognitive abilities, among others [34,45]. One of the most studied innate factors related to the identification and selection phase is the effect of relative age [46]. To ensure equality in competition, sports officials assign athletes to chronological age groups based on their date of birth [38]. As a result, there are differences between young people of the same age born shortly after the cut-off date [25]. Soccer players who are relatively older at their cut-off date may be favored early on but tend to decline in player performance with advancing chronological age [6,36]. This concept is known as the “relative age effect” [47,48].

In the case of acquired factors, various authors have indicated that this group is developed through experience and training [49–51]. On a technical level, and within the range of factors acquired in the development phase, there are several important variables that can condition the growth of a soccer player. However, there is no doubt that playing position and laterality are highly important factors. For example, forwards and midfielders have higher market value than goalkeepers and wingers [52]. According to previous literature on the technical aspects linked to sporting development, the position of a soccer player is necessarily related to the laterality of the player. Specifically, data from the general population have revealed that 90% of people are right-handed, while 10% are left-handed. The percentage of left-handers increases in the case of soccer (40%) because of the need to cover specific soccer positions [53].

Contextual factors, which have been the least studied, have considerable weight in the identification and selection phases of an athlete [11,54,55] compared to acquired factors, which tend to be more important in the promotion phase, once the players are inside soccer academies. Contextual factors include place of birth [56–58], population density [37,59], sporting culture [60], and sports infrastructure [61], among others.

Within this set of contextual factors, some previous studies have analysed the effect of the place of birth [25,37,62,63]. Contrary to what one might think of the place of birth, there are other latent variables within this concept that authors such as Teoldo and Cardoso [37] have drawn attention to, such as the population of this place, the population density, and/or the number of sports facilities, since these features may have more beneficial effects when it comes to nurturing young talent—in short, areas or birthplaces in which to identify talented young soccer players. However, there is no consensus on the birthplace effect, as previous studies have revealed that low-density locations were more conducive to the

development of elite players [64]. However, recent studies have shown the effectiveness of high-density locations due to the favorable infrastructure and social opportunities that exist in certain communities [37].

Different scholars have pointed out inconsistencies in defining what constitutes an athlete's place of birth; it might denote their actual birthplace, the region where they developed athletically, or the clubs where they first played soccer. Although there are few studies on the dimension of the place of birth as a place of growth for a soccer player [61], it should be noted that the culmination in the debut of players in professional teams cannot be fully understood without an analysis of all the steps that made that a player grows, from participation in the first sports clubs as a child to passage through international competitions. Thus, the place of birth is not only a geographical space; both the place of birth and the actual growth of a player directly influence the achievement of sporting success [65,66].

These stages in the talent management process and their associated influencing factors are vital for professional club academies and their managers [32,67], as these entities have to make important decisions about the players' present and future possibilities [4]. Each professional club academy will choose to priorities or focus its talent management on one factor over another. In this research, we chose to carry out an analysis of the contextual factors, which have generally been less studied, that were salient in a professional club of the Spanish league, whose academy is currently the seventh largest contributor of players to the five major European leagues (La Liga, Premier League, Bundesliga, Serie A, and Ligue 1), as recently reported by the Swiss research center CIES [68].

Specifically, the Athletic Club de Bilbao is the organisation that currently has the most players [69] from its academy on the first team. This is a recognised case worldwide due to the special relevance that the academy has for the competitiveness of the club, given that it is the only club in the world who's professional first-team players can only play with players selected from the Basque geographical environment [69], who were either born or raised there. This trait is emblematic of the club and dictates that, to compete globally, they must adeptly pinpoint, select, and develop leading players from a restricted geographical zone [69], ensuring optimal resource utilisation. The rest of the academies of soccer clubs can resort at any time to recruiting from other parts of the world. This unique model, implemented in 1898 and extending to the present day, has led to the club becoming the seventh soccer academy that currently provides the most players in the five major European leagues. Therefore, this academy is very concerned about working on all phases of the talent management process, but above all, on the factors related to the origin and growth of the players, as this is the only source of nourishment for the club, which has been playing in the first division since 1898. This points to the high demands placed on this academy from which the players for the first team emerge.

A club like this one thus affords us a distinctive opportunity to analyse the significance of the place of birth and growth over a prolonged period, at least for as long as data have been available (30 seasons), as in no other academy do these elements carry as much weight since other clubs can sign any player to the first team as needed or required.

The objective of this study was to detect, among the individual (i.e., innate), acquired and contextual factors of the players: variables that were associated with promotion to the professional team. This knowledge depended on data made available by the club, which are listed in Table 1. A methodological approach called the Cross Industry Standard Process for Data Mining (CRISP-DM) [70] was proposed, which consisted of a process of data collection, transformation, cleaning, and standardisation that allowed for successive phases ranging from analytical exploration to the construction of a statistical model. Frequency analysis, correlations, and cluster analysis were developed. The results showed that place of birth and age were key variables in the selection and promotion phases of the players. In addition, it was observed that debut was related to the stage of incorporation and internationalisation and, finally, that place of birth and laterality converged as classifying elements of the players.

Table 1. Factors, variables, and indicators included in the survey.

Factors	Variables	Indicators
Innate factor	Date of birth	Q1, Q2, Q3, or Q4
	Laterality	Right-footed or left-footed
Acquired factor	Playing position	Goalkeeper, defender, midfielder, or striker
Contextual factors	Density of place of birth	K1, K2, K3, K4, or K5
Selection	Stage of joining the academy	U-12, U-14, U-16, U-18, U-23, or professional team
Promotion	Debut	Yes or no
	International	Yes or no

Q: Birth quartile; K: density quintile.

2. Materials and Methods

2.1. Participants

Data were collected on male soccer players ($n = 1411$) from the last 30 seasons (1993–2021) of play at a professional soccer academy. Data for all participants were collected during their membership in the academy. All available data were obtained from the club's database. The club provided open access to the data with prior notice and a written agreement from the club's management.

2.2. Sample Inclusion Criteria

All records correspond to players who participated in at least one season (with a valid date from the Spanish Soccer Federation and the Bizkaia Soccer Federation) in the soccer academy of the professional team under study. The players selected for the study had a minimum chronological age of nine years and a maximum age of 35 years.

2.3. Sample Exclusion Criteria

Players who were on trial in the selection process for the academy were not included. All players who did not belong to the development network of the satellite clubs linked to the main club were excluded.

2.4. Informed Consent

All participants (i.e., all players are authorised to submit data transfer protocols to the club, including both adults and minors) provided written informed consent to participate in this study, which was subsequently approved by the institutional review board in accordance with the Declaration of Helsinki and the Spanish Data Protection Act 15/1999 (University of Deusto Research Ethics Committee Ref.: ETK-3/21-22).

2.5. Procedure

All information was obtained from the club's database (all players participating in the study agreed to provide their data for the research). From the refinement of the data obtained, a definitive dataset was generated that required individual matching of each player by club staff for the last two seasons (2020–2021 and 2021–2022).

Using R Studio, the primary outcomes were systematically extracted and classified from the database. The results were determined based on the authors' research questions, which focused on the innate, acquired, and contextual factors and phases of the selection and promotion of players, with these being highlighted throughout the scientific literature as outstanding factors in the field of soccer [37,53,71,72].

For innate factors, the variables of date of birth and laterality were taken as a reference. For acquired factors, we referred to the playing position, and as contextual factors, we focused on the density of the place of birth. Within the talent management phases, the stage of incorporation into the academy was taken into consideration in the selection phase, and

the debut on the professional team was considered in the promotion phase. This scheme is reflected in Table 1.

Each of the variables in the study is described in the following sections.

2.5.1. Date of Birth

Players' birth dates were obtained from club database records using the distribution criteria published in previous studies [73]. Players were classified into birth quartiles, which are taken as a reference for European soccer seasons: Q1 refers from 1 January to 31 March, Q2 from 1 April to 30 June, Q3 from 1 July to 30 September, and Q4 from 1 October to 31 December. This classification was applied to the whole of the territory to which the players belong.

2.5.2. Laterality

The laterality variable was created by dividing the players into (1) right-footed and (2) left-footed categories [53].

2.5.3. Playing Position

The variable of playing position was created by categorising the players as (1) goalkeeper, (2) defender, (3) midfielder, or (4) striker [52,74].

2.5.4. Place of Birth

To collect the birthplaces of the athletes, similar procedures were applied as in previous studies on other team sports, such as basketball (NBA) [6]. For the distribution of the players' places of birth, the county (grouping of the municipalities in the area) was used. Data were obtained from the official website INE [75]. These data were grouped into quintiles according to population density, with the total number of inhabitants of the country divided by the total area, which was usually expressed as square kilometers. This allowed for all the extracted values from the players' birthplaces to be grouped and weighted.

The population density of the counties was grouped by quintile (K) ranges [76], representing 20% of the total number of individuals in the population. These ranges included the following: K1 (17.3 inhabitants/km), K2 (32.3 inhabitants/km), K3 (72 inhabitants/km), K4 (146.1 inhabitants/km), and K5 (658.63 inhabitants/km) [77].

2.5.5. Incorporation Stage

This variable reflects the point in each player's career at which they joined the club structure. The date of incorporation was determined by the moment at which the player obtained an official Club Federative card. The player would then be assigned the stage (category) that corresponded to his age.

The data for this variable were collected and classified according to the following categorisation (categories were mutually exclusive; a player in one category could not play in another): (1) U-12: players under 12 years of age, (2) U-14: players under 14 years of age, (3) U-16: players under 16 years of age, (4) U-18: players under 18 years of age, (5) U-23: players incorporated into the subsidiary team, and (6) players incorporated into the club's first team [78].

2.5.6. Debutant

This variable included those athletes who made their debuts with the first team of the study club. Players who had played at least one second with the first professional team were considered debutants. Generally, players were classified as (1) debutants and (0) non-debutants. Players who had played an official or friendly match with the first team were considered first-team debutants [79].

2.5.7. Internationality

Players called up by an international team were classified according to two levels: (0) not being called up by the national or international team, and (1) being called up by a national or international team in any of the academy's categories. Players who had participated in an official or friendly match with the national team were considered internal.

2.6. Statistical Analysis

Since the objective of the study was to detect those variables in the selection and development phases that described the players who were promoted to the professional team, we proceeded to explore the frequencies and correlations and developed a cluster model.

Data were presented as means and standard deviations. The Kolmogorov–Smirnov test was used to assess normality ($n > 50$). After testing for normality, parametric or non-parametric tools were used. A descriptive frequency analysis was performed. Frequencies were calculated using odds ratios (ORs) for each of the variables according to the selection and promotion phases. A correlational analysis of all the variables was performed using chi-square and Cramer's V techniques. The interpretation was conducted as follows: (1) $p < 0.01$, $V = 0.5$, very strong; (2) $p < 0.01$, $V = 0.46$, strong; (3) $p < 0.01$, $V = 0.27$, fair; (4) $p < 0.01$, $V = 0.17$, not very strong; and (5) $p < 0.01$, weak; $V = 0.13$, $V = 0.12$, $V = 0.11$, $V = 0.09$.

The focus of clustering models is to detect clusters of similar records and then categorise them according to their respective groups. Before the final representation of the clustering of the players, the optimal number of groups was defined [80]. All values were treated with 95% confidence intervals. A probability level of $p < 0.05$ was considered significant.

Summary of methodical approach (Figure 1).

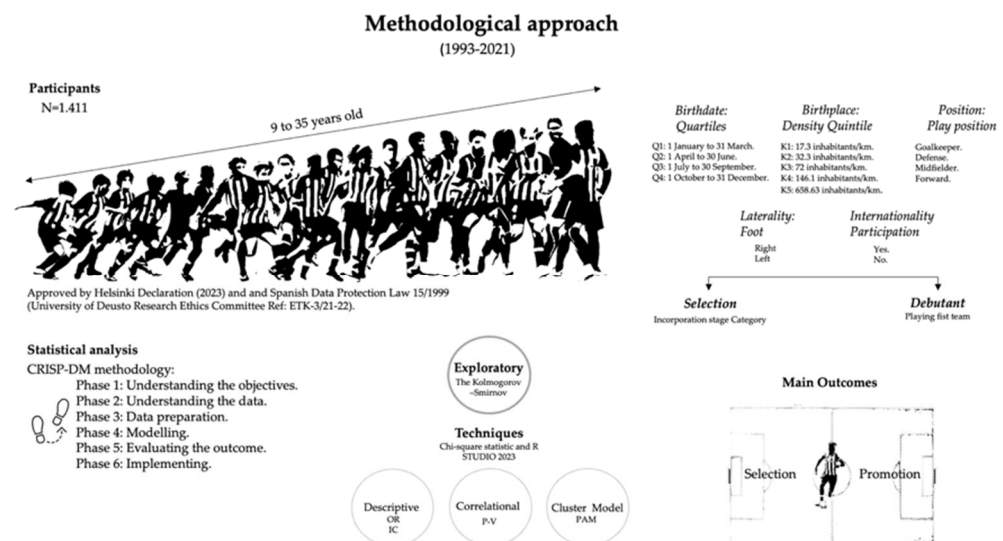


Figure 1. Methodological approach.

3. Results

The results are presented in terms of the different explorations carried out using frequencies, correlations, and clustering techniques. These approaches yielded three main results.

The first of the results shows how the variables of age and birthplace density were key in the incorporation and promotion of players to the academy. Regarding the analysis of the frequencies of the birth quartile variables compared to the general population, it was observed that the values of virtually all groups of players in the sample differed significantly from those of the general population. Particularly significant was that of players born in Q1 (1 January to 31 March), who had the highest representation (41%), while members of the general population born in Q1 accounted for 24%, followed by players born in Q2 (25%), Q3 (19%), and Q4 (15%) (Table 2).

Table 2. Birthdate distributions of incorporation stage according to quartile.

Birth Date	Population (%)	Incorporation Stage into the Academy													
		TOTAL		U-12		U-14		U-16		U-18		U-23		First Team	
		N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)
Q1	24.1	572 (41)	2.14 (1.92–2.39)	247 (43)	2.40 (2.03–2.84)	61 (43)	2.40 (1.72–3.35)	128 (47)	2.74 (2.16–3.48)	65 (32)	1.46 (1.09–1.96)	56 (32)	1.48 (1.08–2.04)	15 (33)	1.57 (0.84–2.92)
Q2	25.6	355 (25)	0.98 (0.87–1.11)	154 (27)	1.08 (0.9–1.3)	44 (31)	1.32 (0.92–1.89)	73 (27)	1.05 (0.8–1.37)	47 (23)	0.87 (0.63–1.21)	32 (18)	0.65 (0.44–0.95)	5 (11)	0.36 (0.14–0.91)
Q3	25.1	275 (19)	0.72 (0.63–0.82)	90 (16)	0.56 (0.45–0.7)	27 (19)	0.71 (0.47–1.08)	53 (19)	0.71 (0.53–0.96)	47 (23)	0.89 (0.64–1.23)	46 (26)	1.06 (0.76–1.49)	12 (27)	1.09 (0.56–2.11)
Q4	25.2	209 (15)	0.52 (0.45–0.6)	79 (14)	0.48 (0.38–0.61)	9 (6)	0.2 (0.1–0.39)	21 (8)	0.25 (0.16–0.39)	46 (22)	0.86 (0.62–1.2)	41 (23)	0.91 (0.64–1.29)	13 (29)	1.21 (0.63–2.31)

OR = odds ratio; CI = confidence interval.

In the case of the selection process relating to the academy entry stage, there continued to be a significant over-representation of Q1 at all stages, with 43% at U-12 and U-14, 47% at U-16, and 32% at U-18 and U-23. We observed that the ORs of the incorporation stages represented significant values in all the academy incorporation stages, except in the first team. Similarly, in the player selection phase, the U-12, U-14, and U-16 categories were under-represented in Q3, with values of 16% in the U-12 category and 19% in the U-14 and U-16 categories. In Q4, values of 14% in the U-12 category, 6% in the U-14 category, and 8% in the U-18 category were determined. In the case of the first team, the representation of the U-14 and U-16 categories was very low. The same was not true for the U-23 and first-team categories.

Regarding the analysis of the frequencies of the variable of place of birth in relation to territorial density, we observed that the total numbers of players relative to the general population were under-represented in all quintiles, except K5, where they were equally over-represented relative to the general population, with 72% of the players entering the academy. The rest of the results were distributed as follows: K3 and K4 (12%), K2 (4%), and K1 (1%). Similar to the overall distribution, the birthplace effect was over-represented by K1 at each of the entry stages (Table 3), with values of 79% at U-12, 75% at U-14, 64% at U-16, 68% at U-18, and 71% at U-23.

Table 3. Birthplace distributions of incorporation stages according to quintile.

Birth Place	Population (%)	Incorporation Stage into the Academy													
		TOTAL		U-12		U-14		U-16		U-18		U-23		First Team	
		N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)	N (%)	OR (CI)
K1	5.1	13 (1)	0.17 (0.1–0.29)	-	-	3 (2)	0.4 (0.13–1.26)	3 (1)	0.2 (0.06–0.62)	1 (0)	0.09 (0.01–0.64)	5 (3)	0.54 (0.22–1.31)	1 (2)	0.42 (0.06–3.05)
K2	8.8	52 (4)	0.4 (0.3–0.53)	14 (2)	0.26 (0.15–0.44)	4 (3)	0.3 (0.11–0.81)	17 (6)	0.68 (0.42–1.11)	6 (3)	0.31 (0.14–0.7)	10 (6)	0.63 (0.33–1.19)	1 (2)	0.23 (0.03–1.67)
K3	16.9	170 (12)	0.67 (0.57–0.79)	51 (9)	0.48 (0.36–0.64)	18 (13)	0.72 (0.44–1.18)	39 (14)	0.81 (0.58–1.14)	33 (16)	0.94 (0.65–1.36)	17 (10)	0.53 (0.32–0.87)	12 (27)	1.78 (0.92–3.45)
K4	21.7	163 (12)	0.47 (0.4–0.55)	53 (9)	0.37 (0.28–0.49)	14 (10)	0.4 (0.23–0.69)	40 (15)	0.61 (0.44–0.85)	26 (13)	0.52 (0.34–0.78)	19 (11)	0.44 (0.27–0.71)	11 (24)	1.17 (0.59–2.31)
K5	47.4	1013 (72)	2.82 (2.51–3.17)	452 (79)	4.25 (3.47–5.2)	102 (72)	2.9 (2.01–4.19)	176 (64)	1.97 (1.54–2.52)	139 (68)	2.34 (1.75–3.14)	124 (71)	2.7 (1.95–3.74)	20 (44)	0.89 (0.49–1.6)

OR = odds ratio; CI = confidence interval.

Regarding the influence of the date of birth and place of birth on the promotion phase, we observed that once players were integrated into the academy, those born in Q4 were more likely to debut on the professional team than those born in places with a density of K3. All these results, together with the findings for the rest of the variables, are represented in Figure 2.

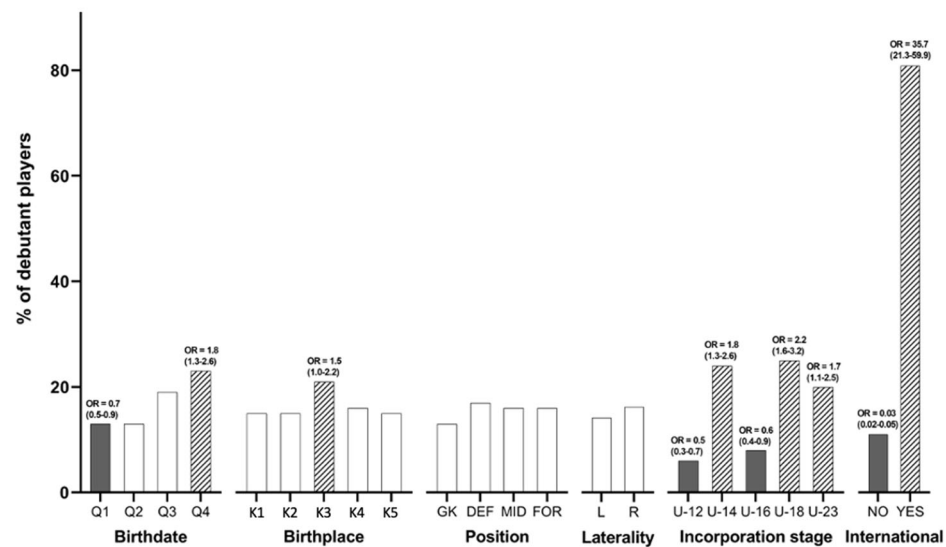


Figure 2. Percentage of debutant players according to variables (OR–IC).

Therefore, we observed that the profile of the players according to these variables differed, and their resulting selection (Q1 and K5) differed from the corresponding values for those whose training process culminated with their debut once incorporated into the academy (Q4 and K3).

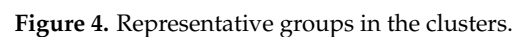
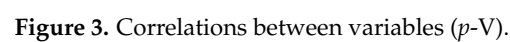
The second result showed that the debut of the players was strongly related to the stage of incorporation and internationalisation. In the first group of correlations, the most significant were those between the stage of incorporation and debutant status ($p < 0.01$, $V = 0.46$, strong) and those relating internationality to debutant status ($p < 0.01$, $V = 0.5$, very strong).

In the second group of correlations, internationality, and stage of incorporation ($p < 0.01$, $V = 0.27$, regular), position and laterality ($p < 0.01$, $V = 0.17$, not very strong), stage of incorporation and place of birth ($p < 0.01$, $V = 0.13$, weak), and debutant and place of birth ($p < 0.01$, $V = 0.12$, weak) stood out.

Significant correlations in the third group were between internationality and place of birth ($p < 0.01$, $V = 0.11$, weak), stage of incorporation and place of birth ($p < 0.01$, $V = 0.11$, weak), and laterality and stage of incorporation ($p < 0.01$; $V = 0.12$, weak). The remaining variables showed no significant correlations ($p \geq 0.05$). All correlations are represented in Figure 3.

Regarding this second result, we observed that internationality was an important factor when it came to achieving a debut. Furthermore, the result indicates that it is also important to consider the incorporation stage more carefully within the talent management processes.

The third and last of the results showed how the place of birth and laterality converged as classifying elements of the players. When the cluster classification technique was applied, in the most significant groupings shown, five main groups stood out (Figure 4). All participants had the common traits of belonging to the birth quintile K5 and being right-handed. Their dates of birth, however, varied significantly. The first group was represented by Q3, the second and third by Q1, the fourth by Q2, and the fifth by Q4. In terms of playing position, aside from the first group, where forwards stood out, the rest were divided between defenders and midfielders.



As the frequency tables (Table 4) show, players who joined at the U-12 stage were grouped according to date of birth in Q1 and Q2. In contrast, we observed that players who joined later (U-16 and the first team) corresponded to more advanced quartiles (Q3 and Q4, respectively).

Cluster Groups	Birthdate	Birthplace	Position	Laterality	International	Debutant	Incorporation Stage
1	Q3	K5	Forward	Right	0	0	U-16
2	Q1	K5	Midfielder	Right	0	0	U-12
3	Q1	K5	Defender	Right	0	0	U-12
4	Q2	K5	Midfielder	Right	0	0	U-12
5	Q4	K5	Defender	Right	1	1	First team

Q: birth quartile; K: density quintile.

4. Discussion

The objective of this study was to detect, among the set of individuals (innate), acquired, and contextual factors, those variables in the selection and development phases that describe the players who are promoted to the professional team. This study was conducted within the framework of an academy of a professional soccer team with a unique model and a very special cultural particularity [69] that provided data on its players. We were able to obtain a very large sample that spanned 30 seasons of the club, during which it has always remained in the top category. Our data referenced 1411 players, through which it was possible to evaluate those variables linked to individual (innate), acquired, and contextual factors.

At the same time, this study examined the processes of talent selection and development, which allowed us to evaluate the effectiveness of both processes by comparing the profiles of players who had been successful in making their debut on the first professional team with those who had not. To this end, several variables related to the origin and training process of the players (i.e., date of birth, place of birth, position, laterality, incorporation stage, internationality, and debut) were used to obtain a complete view of both processes.

The main results in relation to the date (i.e., relative age) and place of birth showed that there was an over-representation of players of birth Q1 and K5 density in the selection processes. However, once the players were integrated into the academy, the chances were more likely that debut players would be represented by players of birth Q4 and K3 density. These findings align with the existing literature. Specifically, some authors also identified a similar representation of players from Q1 in elite soccer leagues [7,15,38]. In a related study, Pedersen [63] indicated the persistence of a bias in the selection of athletes in favour of players born in the first quarter of the year, without specifying the possible consequences that this fact may have for talent management. Focus should be placed on the selection of players in this quartile, since talented capital may be lost due to technical decisions. In fact, Güllich [78] warned about processes implemented at early ages (e.g., five years in the case of soccer due to their possible lack of accuracy), concluding that early identification does not necessarily predict future success in adulthood. Those selected receive professional coaching, medical support, and high-quality training facilities, as well as superior competitive exposure compared to non-selected players, making it an important decision on the part of academy managers. This is even more important in a club like the one analysed in this research, whose reputation is dependent on the players it selects and subsequently trains in the academy.

With respect to the place of birth, the density of these places emerged as a crucial variable in this study. Players were generally recruited from areas of higher population density; however, once recruited to the academy, players from areas of medium population density (K3) had a higher probability of success [37]. Bongiovanni [81] pointed out that these variables are related to the recruitment of players; in this respect, it is important to understand the role that scouts play in the recruitment process. There were, however, other variables that escaped the analysis performed. However, the selected players are conscious of the opportunity provided to them and, therefore, strive to fully capitalise on the possibility offered. The high expectations placed upon a minor to enter and develop in an academy are factors that should be considered when talking about talent management.

Finally, with respect to the place of birth, the results of this research revealed the importance of identifying territorial hot spots in which to find promising young players with the potential to become elite players in time. These hot spots should be assessed based on the confluence of acquired factors with contextual factors, such as the level of equipment, the number of school sports clubs and intermediate soccer training schools, and all those elements in which a soccer player grows, as already pointed out in [37]. However, the difference that emerged in this study was that, given the proximity between the different hot spots, the effect of this density variable could be greater. Around this particular academy, there was a network of satellite clubs that trained players in their earliest stages and nurtured the academy's selection process. For those responsible for

talent management, knowing the territorial hot spots in which to find promising young players with the potential to eventually become elite players is key, even more so in a club like the one analysed, which depends on these hot spots to detect the players it needs to nurture into the professional first team.

5. Conclusions

Both the results and the discussion showed the importance of the confluence between innate factors and contextual factors, specifically the value of the place of birth as a determining variable in the selection and promotion of soccer players. This emerged in both the review carried out by the authors and the case analysed. However, this variable should not be understood only as a geographical one, since a specific place incorporates another series of elements, such as the level of equipment that characterises its institutions and facilities.

This research also found two biases in the selection and promotion of players. One was the bias of age, and the other was related to the density of the place of birth, which indicated that there was a group of players who were more likely to be selected solely by the mere fact of being in an age group. As for the density bias, there was another group of players who were born, grew up, or resided in localities with a higher density than in other places, and this enabled them to have better access to the selection process and future promotion than other players.

Finally, it is necessary to conclude that the incorporation stage was key to the probability of debuting on the first professional team; therefore, a review of the criteria of those professionals and technicians in charge of selecting these players is required.

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