International Journal of EXERCISE SCIENCE

Original Research

Youth-to-Senior Transition in Elite European Club Soccer

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ABSTRACT

International Journal of Exercise Science 14(6): 1192-1203, 2021. The priority for soccer academies is to develop youth players that graduate and transfer directly to their senior squads. The aim of this study was to assess the effectiveness of this direct youth-to-senior pathway by examining the extent to which club-trained players (CTPs) are currently involved in elite male European soccer. Relevant demographic longitudinal studies between 2009 and 2020 conducted by the International Centre for Sports Studies Football Observatory were analysed. The main findings were that the proportion of CTPs in senior squads has decreased from 23% to 17% over this time period, while the proportion of expatriates (EXPs) has increased from 35% to 42%. Moreover, clubs resorted more frequently to making new signings (NS, i.e. association-trained players (ATPs) and/or EXPs), with squad proportion increasing from 37% to 44%, while only launching one debutant (DBT, i.e. CTP with no previous senior experience) on average per season. Similar trends are observed in the evolution of playing time: while the fielding of CTPs remained constant (15%), EXPs and NS are fielded increasingly more (49% and 36%, respectively), despite a positive relationship between CTP match fielding and league ranking, with a Spearman Rank correlation r = 0.712 (95% confidence interval [0.381-0.881]), p < 0.01. In conclusion, young talents are still provided opportunities; however, these are limited and increasingly less frequent at their parent clubs. This potentially suggests a dysfunctional direct youth-to-senior development pathway.

KEY WORDS: Football, academy, effectiveness, club-trained player

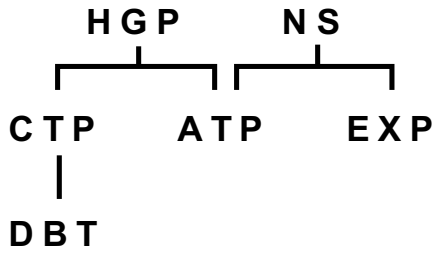
INTRODUCTION

Association football or soccer is arguably the most popular sport in the world. There are ~21.5 million registered youth players under the age of 18 worldwide; however, only ~113,000 (0.5%) are listed as professional players (15); i.e. have signed a ratified professional contract or agreement with a professional soccer club. This means the outcome for the vast majority of youth players in the development and beginning stages of their active soccer careers is subject to extreme competition and remains largely unknown and uncharacterized.

A characteristic of elite sports, including soccer, is low retention due to drop-out or deselection in the transition from elite youth to elite adult levels (2, 3). The main factors that explain this

include player-specific deficiencies related to body size and somatotype, functional capacity and performance, and sport-specific, technical and tactical skills (10, 14), whereas misjudged talent identification or under-performing development efforts by the club do not appear to explain it (33, 34). The Wylleman's development model on such transitions identify four holistic sub-areas (athletic, individual/psychological, psychosocial and academic/vocational) where young athletes need to develop sufficiently to make a successful transition (37), whereas others have also indicated that a successful youth-to-senior transition depends on factors beyond athletic development, such as social, personal and cognitive functioning (5, 6, 11, 18, 30, 31). Consequently, those unable to meet the expected standard of the higher competitive environment are either transferred to other clubs or released as "free agents" (4).

Thus, the youth-to-senior transition in soccer is demanding for both players and clubs, especially at elite top-division level where demands are exaggerated. Within professional soccer clubs, academies are charged with overseeing this, including the selection and subsequent development of those players (16, 17, 32, 33, 36), with the primary aim being to deliver high-quality players to their senior squads (9). Within this framework, the ideal scenario for both club and player would thus be graduation from academy with direct transfer to senior squad within the same club. Such academy graduates can most accurately be indicated by so-called club-trained players (CTPs) in senior squads, referring to those registered for minimum three seasons with the employer club between the ages of 15-21 (13) and therefore suggesting the player has been developed at the current club prior to inclusion in the senior squad (Figure 1).



Home-grown player (HGP): A player who has been registered for a minimum of 3 seasons between the ages of 15 and 21 at the current club of employment or at any different club affiliated to the same association
New signing (NS): ATPs or EXPs who were signed during the course of the current season
Club-trained player (CTP): A player who has been registered for a minimum of 3 seasons between the ages of 15 and 21 at the current club of employment
Association-trained player (ATP): A player who has been registered for a minimum of 3 seasons between the ages of 15 and 21 at a club, other than the current club of employment, affiliated to the same association
Expatriate (EXP): A player who has not been developed at the current club of employment or at any other club affiliated to the same association
Debutant (DBT): A player who make senior debut at the current club of employment without any previous senior experience

Figure 1. Definitions and relations of the terminology on the categorization of senior players.

However, the success rate from academy to first team transition in elite club soccer remains unknown. Therefore, the aim of this study was to examine the effectiveness of the youth academy-to-senior first team transition within elite top-division European soccer clubs, by quantifying the CTP squad and match involvement in those clubs.

METHODS

Protocol

The independent and publicly available online repository of the International Center for Sports Studies (https://football-observatory.com) Football Observatory was accessed, completed in

May 2021. This repository reports on player transitions and movements across European club soccer. Nineteen reports were identified as potentially relevant and following a full-text review, nine longitudinal demographic reports (Monthly Reports 9, 13, 24, 29, 33, 39, 45, 49, 59; References 21-29) containing relevant quantitative data were selected for inclusion, which included squad and match involvement of the relevant player categories in European elite club soccer 2009-2020, with definitions of those provided in Figure 1. Where overt overlaps of data between different reports were identified, the replicates were excluded from our analysis. These studies involved 31 European top division leagues, comprising ~470 teams/year and ~12,000 first team players/year. From these, we also extracted data from Europe's five highest-rated leagues (English Premier League, French Ligue 1, Italian Serie A, German Bundesliga, Spanish La Liga) to enhance the focus on the highest elite level. This research was carried out fully in accordance with the ethical standards of the International Journal of Exercise Science (19).

Statistical Analysis

We analyzed i) proportions of player categories in squads and ii) match involvement of those players, across Europe in the years 2009-2020. The relationship between CTP match involvement and club league ranking was statistically assessed by Spearman Rank non-parametric correlation, due to the monotonic and rank order nature of the data and no assumption of a distribution, with statistical significance $p < 0.05$ (SPSS version 27, IBM, Armonk, NY).

RESULTS

From 2009 to 2020, CTPs have consistently been outnumbered by players of other origin in senior squads in Europe's 31 top division leagues, and there has been a continuous decrease in the proportion of CTPs, from 23% to 17% (Figure 2). Conversely, the number of expatriates (EXPs) has increased from 35% to 42%, while the number of association-trained players (ATPs) has remained constant at 41-42%. This trend of an increased proportion of non-CTPs was also supported by assessing the number of new signings (NS), showing an increase from 37% to 44% during the same period. On average, clubs launched one debutant (DBT) each year.

The extent of CTP opportunities may also be measured by their match involvement; therefore, we assessed playing time. Fielding of CTPs remained constant at ~15% (range 12-19%) of the overall available playing time, which corresponds to 513 minutes over a typical 38-match season or 13.5 mins/match. Fielding of EXPs increased from 44% to 49%, resulting in 1648 min/season over the course of a 38-match season or 44 mins/match at the end of the period, whereas fielding of NS increased from 31% to 36%, resulting in 1194 mins/season or 32 mins/match.

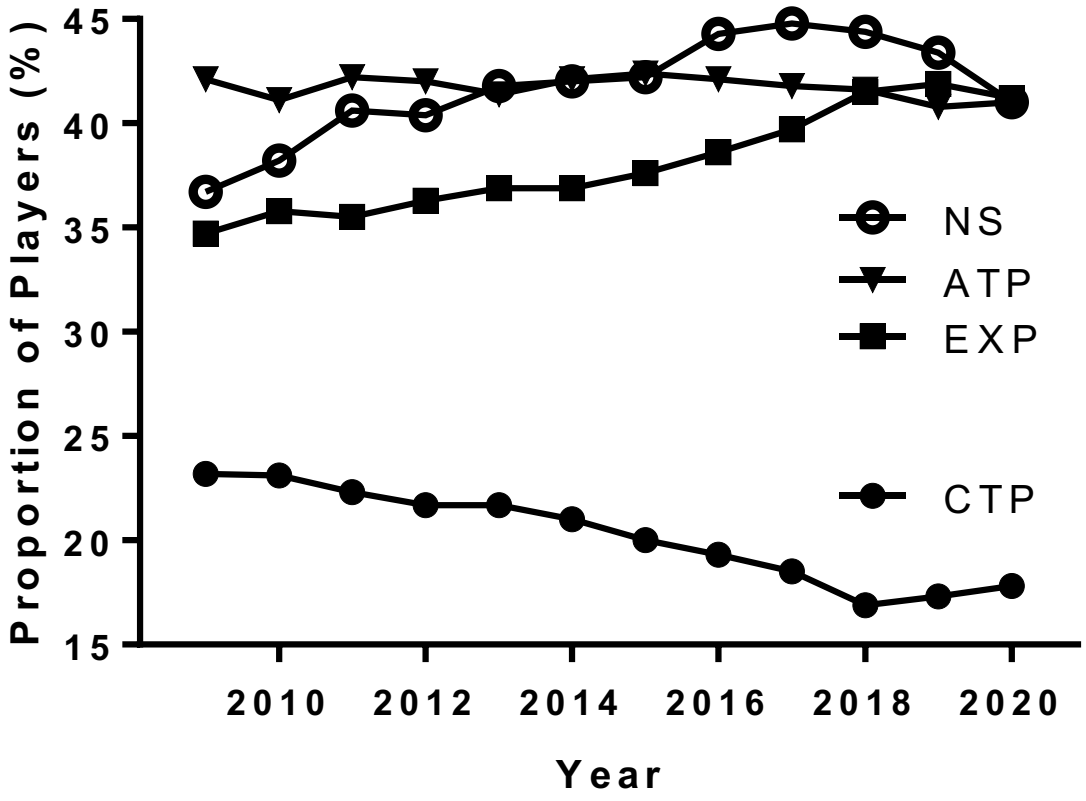


Figure 2. Proportion (%) of senior players per calendar year according to their categorization. Data includes all team squads from 31 European top division leagues between 2009-2020; NS: new signings; ATP: association-trained players; EXP: expatriates; CTP: club-trained players.

Match time for players under the age of 21 (Under-21) remained at 10-11%; the equivalent of ~10 mins/match. Match time for players under the age of 22 (Under-22) showed slightly higher participation, on average 15% of the overall match time, resulting in 13 mins/match, whereas match time for Under-22 ATPs remained 11-12%, corresponding to 10-11 mins/match. In contrast, there was an increase in match time from 19% to 26% for Under-22 EXPs, resulting in 23 mins/match at the end of the period.

Converting the involvement of CTPs to a matchday scenario results in three CTPs making a typical matchday squad of 18, of which two CTPs make the team of 11, playing on average 14 of the 90 minutes (Figure 3). The remainder of the matchday squad consists of seven EXPs and eight ATPs, of which four EXPs and five ATPs make the starting 11. Similar to ATPs, eight NS would make the matchday squad, with five in the starting 11.

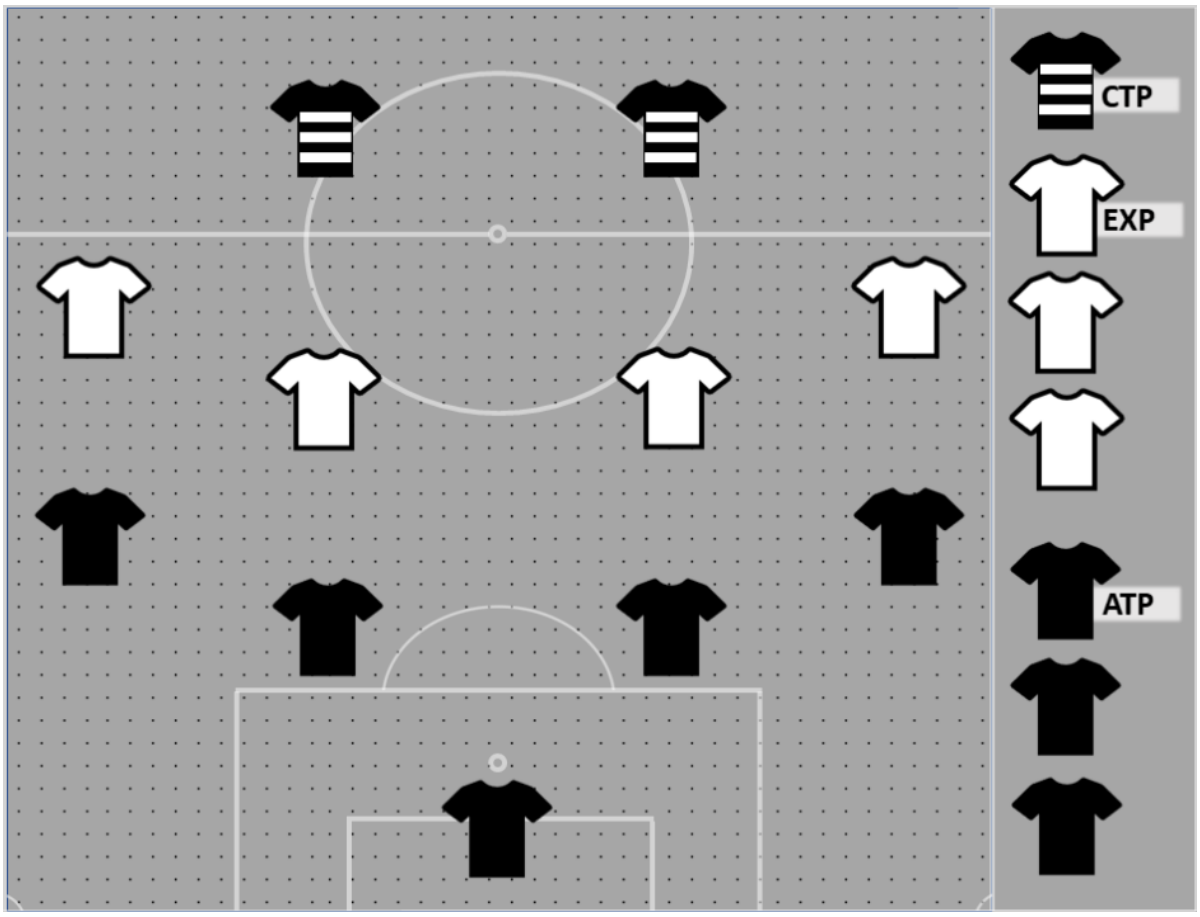


Figure 3. Graphic representation of the average proportions of senior players during a typical matchday squad in elite European soccer, with representative starting 11 and substitute players on the pitch and sideline, respectively. CTP: club-trained players (striped shirts); EXP: expatriates (white shirts); ATP: association-trained players (black shirts).

Regional differences regarding origin of players exist in Europe's 31 national top divisions. For CTPs, the highest proportion was found in Israel, with 104 CTPs of 317 players (33%) in 2020, whereas the lowest proportion was found in Portugal, with 33 of 474 players (7%). Conversely, for EXPs, the highest proportion was found in Cyprus, with 234 of 345 players (68%), whereas the lowest proportion was found in Serbia, with 76 of 513 players (15%). For NS, the highest proportion was found in Serbia, with 274 of 513 players (54%), whereas the lowest proportion was found in England, with 144 of 509 players (28%). The highest number of DBTs was recorded in Ukraine in 2015, with 2.29/team.

We assessed Europe's 5 highest rated leagues (England, France, Germany, Italy, Spain). First, the proportion of CTPs (9-20%) relative to all senior players was throughout below proportions of ATPs (29-46%), EXPs (35-58%), and NS (30-41%) in 2020 (Figure 4) and essentially similar in previous years. Secondly, match involvement reported between 2010 and 2017 (not reported subsequently) ranged for CTPs 5-23 mins/match, while EXPs and NS accrued 22-58 and 21-40 mins/match, respectively (Table 1).

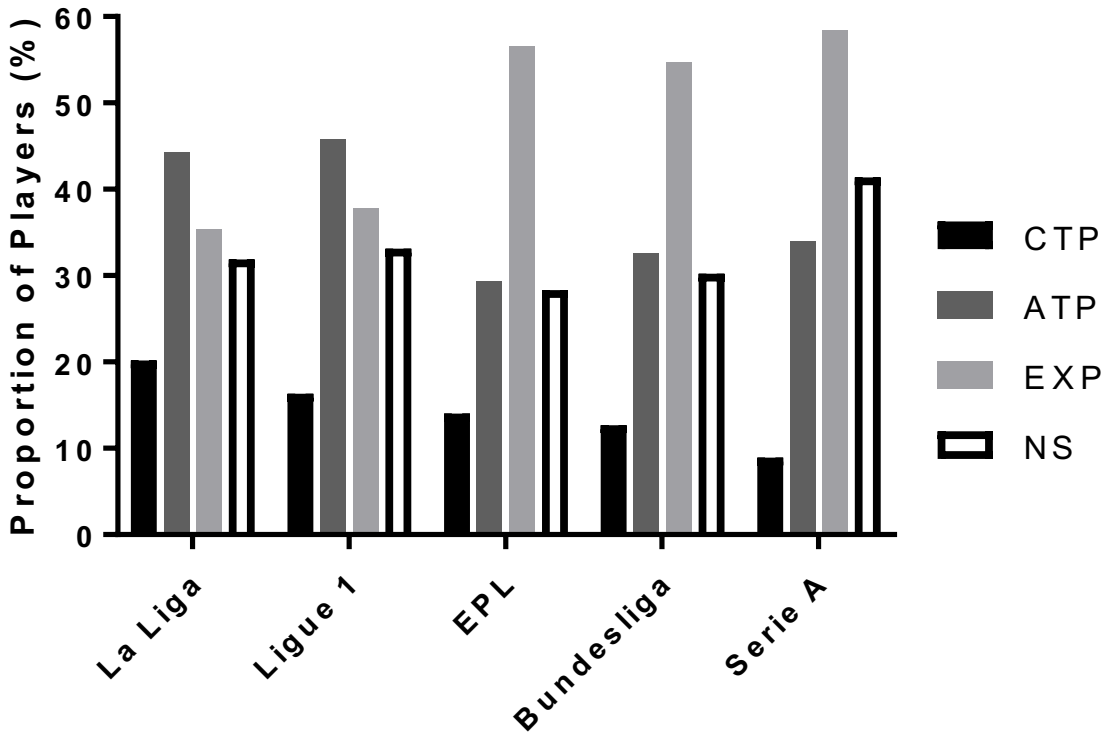


Figure 4. Proportion of senior players in Europe's five highest rated leagues in 2020. CTP: club-trained players; ATP: association-trained players; EXP: Expatriates; NS: new signings; EPL: English premier league.

Table 1. Minimum (Min)-maximum (Max) range of match fielding of club-trained players (CTP), expatriates (EXP), and new signings (NS) in Europe's five highest rated leagues between 2010-2017.

	CTP Range Min-Max		EXP Range Min-Max		NS Range Min-Max	
	Mins/Match	% of Match	Mins/Match	% of Match	Mins/Match	% of Match
Spanish La Liga	16-23	17.6-25.7	32-38	35.2-42.0	26-37	29.2-41.1
French Ligue 1	13-20	14.9-22.6	22-30	24.8-32.8	24-35	26.5-39.3
German Bundesliga	10-16	11.3-17.9	36-47	40.1-52.4	24-31	26.5-34.8
English Premier League	5-12	6.1-13.6	48-58	53.3-64.4	21-32	23.2-35.3
Italian Serie A	5-8	5.4-9.3	37-53	40.8-58.9	28-40	30.9-44.6

Note: Data is based on six-month period averages, normalized to 90-minutes (Mins) match time.

With exception for the minimum fielding of NS in the English Premier League, the minimum amount of match time for EXPs and NS exceeded the maximum amount for CTPs in all five leagues. The Spanish La Liga featured the highest CTP player proportion and match involvement, whereas the Italian Serie A and English Premier League featured the lowest CTP proportion and involvement. This was further supported by examining how much individual clubs fielded CTPs during matches. The top ten clubs permitted CTPs 48-75% match time, and of these, Spanish La Liga clubs were over-represented with three (Real Sociedad, Athletic Bilbao,

Barcelona) of top ten places and all those within top four. In contrast, the bottom ten clubs permitted CTPs 0-1% match time, with English Premier League teams over-represented with seven (Bolton Wanderers, Fulham, Burnley, Birmingham City, Watford, Blackpool, Bournemouth) of bottom ten places (Figure 5). This also revealed a positive relationship between CTP match involvement and respective national league ranking, showing a clear tendency towards high CTP match involvement associating with greater league success (Figure 5).

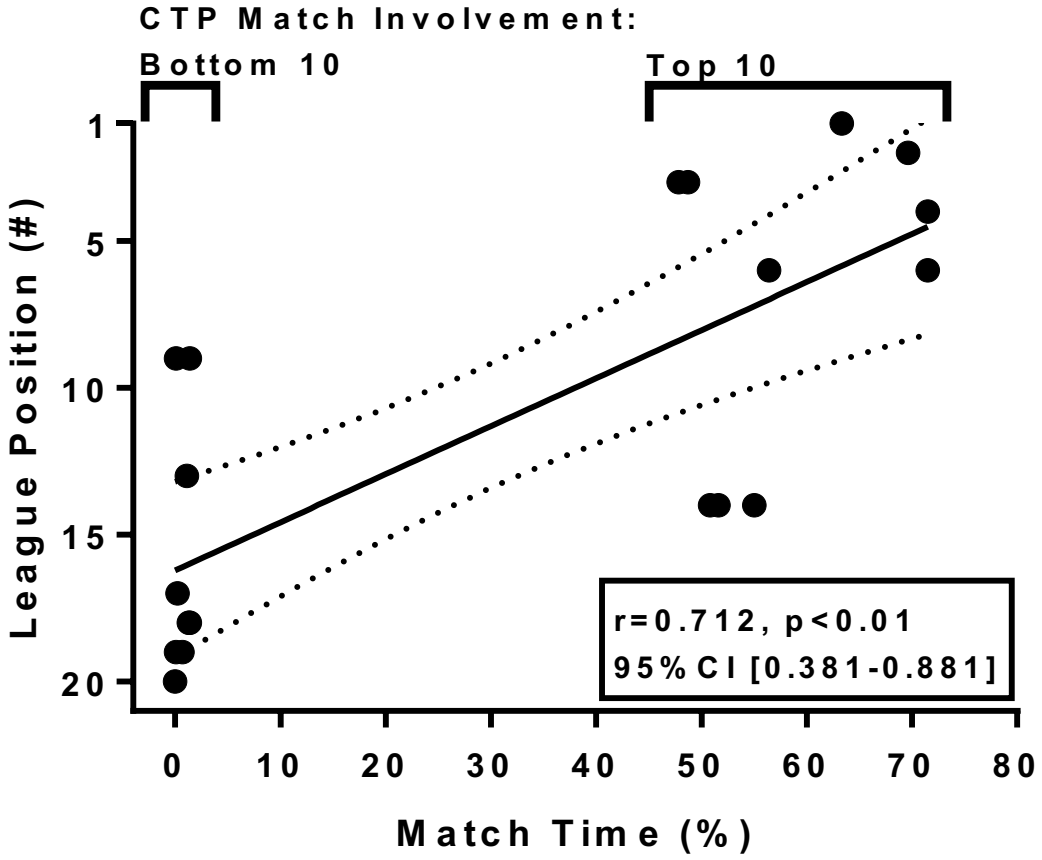


Figure 5. Relationship and Spearman Rank correlation between club-trained player (CTP) match involvement and club performance in national league. Match time is averaged over six-month periods, while league position is at end of season.

DISCUSSION

We assessed the effectiveness of youth-to-senior transition in elite European soccer, by examining the extent to which CTPs were involved in elite top-division European club soccer, with data made available 2009-2020. This showed that the annual proportion and involvement of CTPs in elite clubs has been limited and consistently decreasing, whereas in contrast, EXPs, ATPs and NS have enjoyed a proportionally larger and increasing involvement in the same clubs. This tendency has been observed among all European leagues, including the five highest

rated leagues, which is somewhat surprising given that there is simultaneously a tendency toward CTP fielding breeding success.

The above therefore indicates that clubs rely more on ATPs and EXPs for bringing in new players. This coincides with the general globalization of sport including soccer (35), whereby the increased mobility of players and internationalization of club squads, including players under the age of 22 (30), allows clubs to recruit players globally, which may bring specific qualities the club wants while at the same time expanding its fan-base. The negative outcome of this is however the fewer opportunities afforded young players to gain success in their development clubs, illustrated by the low number of DBTs launched each year. Below, we discuss potential motivations and explanations for these trends.

'Money talks.' Clubs that can afford it may sign top-level ready-to-perform players, whether domestic or foreign, to reinforce their teams; a strategy shown to ensure success (20), despite the positive relationship we show between the CTP usage and club success. This comes at the cost of promoting academy graduates. However, and while no correlation has yet been established between financial power and player recruitment within clubs, a noticeable trend suggests that financial inferiority may link to increased success of academy graduates: of those clubs launching a minimum of four DBTs per year (21), none ranked among the wealthiest clubs in Europe (12). A different view is however that CTPs may also provide a significant return to the club that invests in them either through generating income as a player and/or by a future sale, and as such CTPs also provide a route to club success and income on and off the pitch.

These findings raise questions about effectiveness in CTP promotion in clubs. The Union of European Football Associations have introduced the "financial fair play" and the "home-grown player" (HGP; Figure 1) rules, which require clubs name a minimum of eight HGPs in their 25-player senior squads. However, the rules apply only to Union of European Football Associations competitions or those national leagues that have chosen to adopt them, and moreover, clubs are not required to include HGPs in matchday squads or field them on the pitch, and therefore they have failed to substantially improve youth development (8). Instead, short-term loans of young players out to lower-level clubs and introduction of elite club B-squads in lower-level leagues or specific Under-21 competitions have been designed to develop and promote young players.

Another suggestion under consideration has been to reduce the HGP maximum age limit from 21 to 18 and thus require the player to be registered with the current club from the age of 15 to satisfy the three-season requirement (Figure 1) that qualifies the player as HGP. This would force clubs to invest in and facilitate young player development, but since European Union legislation only allows free movement for work purposes across borders from the age of 16, it follows that it would reduce international mobility of young players, and as a consequence support local talented players. It is also conceivable this will be compounded in the United Kingdom by its leaving the European Union ("BREXIT"), and in Europe as well as globally by the Coronavirus-19 disease epidemic, for which effects cannot yet be fully appreciated, albeit the early trend is a greater reliance on CTPs and less on EXPs (29).

Despite strategies to protect and promote young players, given that first teams employ 25 and academies employ typically > 200 players; given each first team playing career extends ~10 years, and given the overall high number of players (15), it should be acknowledged that the realistic chances of successful transition to an elite-level first team are minimal for young players, with some suggesting a 0.012% success rate (7).

It has anecdotally been suggested that the low proportion of CTPs in soccer may be due to actual or perceived inferior quality. Likewise, it has been suggested non-local young players excel versus local, despite refusal of this myth (1). It should however be recognized that players in this category undergo constant development and maturation commensurate to their age and thus clubs should exercise patience in handling CTPs, especially given our analysis indicates that increasing involvement of CTPs in matches does not deter success for the club.

Several limitations should be noted. Ambiguous terminology in this field may cause confusion. CTP- and HGP-terms are often mistakenly used to describe the same players, even though they differ (Figure 1). While CTP refers to development in a player's current club, HGP refers to development in current club or a club associated with the same national football association, which therefore encompasses both CTPs and ATPs. From the current datasets, we have assessed true player status as much as possible rather than make potentially unfounded assumptions.

Notwithstanding the above, a measure of CTPs may not be a true reflection of the effectiveness of the youth-to-senior transition in a club or indeed of a club's academy. A better indicator would be the proportion of academy graduates playing in professional senior squads and hence also include ATPs and EXPs regardless of origin, as this would be a measure of successful academy production. However, this metric is not available, and hence CTPs are recorded as surrogate measures of youth-to-senior transition success.

The relationship we show between CTP match involvement and respective club league ranking (Figure 5) is due to data availability constructed from only the top and bottom ten clubs with respect to CTP match time and thus lacks data from the majority of clubs. It nonetheless indicates a positive relationship that we consider important, but we acknowledge it is incomplete. It should also be acknowledged that a universal and optimum value of CTPs in club football may not exist; it may be fluid, vary, and depend on other circumstances, but it also seems CTPs may be under-valued, to the detriment of both players and clubs.

In conclusion, we aimed to assess the effectiveness of the direct youth-to-senior pathway in soccer by examining whether and the extent to which CTPs were involved in elite-level European soccer between 2009-2020. We found the annual proportion of CTPs in elite professional soccer has been limited and decreasing, with CTPs playing a minimum amount of overall match time compared to ATPs, EXPs and NSs. These trends indicate that clubs are less inclined to employ academy products and resort progressively more to external transfers of incoming players to supplement and reinforce their squads.

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