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An investigation of talent identification processes in the youth academies of professional soccer clubs for male foundation phase players (5-11 years old)

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Abbreviations

1. BQ – Birth Quartile
2. CASP - Critical Appraisal Scoring Programme
3. EPL – English Premier League
4. EPPP – Premier League's Elite Player Performance Plan
5. FA – The Football Association
6. FDP – Foundation Phase
7. OR – Odds Ratio
8. PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-analyses
9. RAE – Relative Age Effect
10. TID – Talent Identification

1.0 Abstract

Talent Identification (TID) is a large field within professional soccer, helping clubs find the best young ‘talent’ to support with future success for their club. Soccer clubs can sign players as young as 8 years old into their academy system, providing player development activities such as training and fixtures to help the player improve their overall game. However, TID processes within professional soccer academies hasn’t been assessed in detail, in particular within the youngest ages (5-11 years old). Our aim was to survey practitioners working within professional soccer academies that support with the identification of players between 5-11 years old, with 19 practitioners responding to the survey. Results highlighted that 1) players may be selected / not selected at a young age due to the month of the academic / cohort year they were born in (Relative Age Effect), 2) coaches will tend make decisions on what they see in training / fixtures, leaning on their experiences rather than using any testing procedures to provide any additional data to support their selection decisions, and 3) results from the survey indicate a lean towards a later recruitment age .

1.0 Introduction

Talent is not easy to define and there are numerous ways to interpret this concept within sport (Schorer, Wattie and Cobley, 2017). For example, Gagné (2011, pg. 11) defined talent as: "*the outstanding mastery of systematically developed abilities, called competencies (knowledge and skills), in at least one field of human activity to a degree that places a person at least among the top 10% of age peers who are or have been active in that field*". Brown (2001, pg. 3) described talent as: ''*a special, natural ability*'' and ''*a capacity for achievement or success*". Finally, Hohmann & Seidel (2004, pg. 185) defined a talented individual as: "*a person, whose athletic performance capabilities are, by taking into account their training experience, above-average compared to a reference group of similar biological development status and similar life habits*". Regardless of which definition seems most appropriate, consensus is that we are dealing with individuals who excel at a given task.

Identifying talent at a young age is deemed important in the long-term development of footballing proficiency, which can result in future elite performance at adult level (Le Gall et al., 2010; Meylan et al., 2010). From a professional soccer club's perspective, embedding and developing talented youth soccer players into their club can bring competitive and financial gains over their opponents once a player achieves elite adult performance (Vaeyens et al., 2008; Reilly et al., 2000). However, predicting future success at a young age can be unpredictable and isn't guaranteed. As a result, professional soccer clubs will have 'academies' in place to bring talented youth players into their club from as young as eight years old, to support and develop the player, with the end goal of the player representing their professional adult team in the future. Professional soccer academies will have different approaches and strategies on how they identify and develop talent to improve the chances of success at their club. For example, scouts/coaches may be tasked to recruit players based on the attributes and skills they possess that will suit the style of play at their club, (Unnithan et al., 2012). Some clubs may

identify size, strength, and speed as key attributes for individual players to possess to enable the club's style of play to be successful (Unnithan et al., 2012). Other clubs may look for a style of play with a larger focus on the individual's skill and technique, with clubs such as Ajax FC from the Netherlands having a focus on players with strong technique, intelligence (decision making), personality (resilience), and speed, (Brown, 2001).

Williams and Reilly (2000), presented four stages in the process of searching for excellence or talent in sport: 1) detection, 2) identification, 3) selection, and 4) development. 1) Detection "*refers to the discovery of potential performers who are currently not involved in the sport in question"* (Williams and Reilly, 2000, pg. 658), 2) identification looks "*to identify young athletes who possess extraordinary potential for success in senior elite sport, and to select and recruit them into talent promotion programmes*" (Vaeyens, Güllich and Warr, 2009, pg. 1367), 3) selection *"refers to the on-going process of choosing players within the development programme who demonstrate attributes suitable for progression to a future squad or team, such as next age group team in a youth academy or nation"* (Williams & Reilly, 2000, pg. 1200), and 4) development "*aims at providing the most appropriate learning environment to realise this potential*" (Reilly et al., 2000, pg. 1719).

The English Premier League (EPL) and The Football association (FA) introduced the Elite Player Performance Plan (EPPP) in 2012, which included: "*a long-term strategy with the aim of developing more and better home-grown players*" (Premier League, 2022). Professional soccer academies are independently audited by the EPL, categorising clubs from 1-4, with one being the most 'elite'. During auditing, clubs are graded on ten different factors, such as productivity rates (1st team appearances), training facilities, coaching, education, and welfare provisions, (Premier League, 2022). Under EPPP guidelines, once a player signs for a professional soccer academy (8 years old / Under 9), they can only play for this club and cannot continue to play grassroots football, (Premier League, 2022). Additionally, foundation phase

(FDP) players can only be scouted / recruited within a one-hour drive of their training ground location to help localise player recruitment, (Premier League, 2022).

Professionals working in talent identification (TID) within the FDP attempt to predict future elite adult performance at a very young age, which is a complex task with multiple different factors to consider. Arguably, this may result in the coaches working in professional soccer academies selecting players based on what types of attributes / skills the player is presenting at that moment. There has been extensive research into the Relative Age Effect (RAE), which is a well-known trend, distinguished by an overrepresentation of players born towards the start of their cohort selection year, and is particularly apparent in elite teams, (Huertas et al., 2019, Kelly et al., 2020, Mann & Ginneken, 2017, Mujika et al., 2009, Muller et al. 2018, and Patel et al., 2019). Players born at the start of the cohort year, could have 9-11 months more growth / development time, compared to players born at the end of the same cohort year. When scouts and coaches are observing players during trial events for example, players born earlier in the cohort year may present more advanced physical traits such as height and strength and be more proficient in certain skills such as balance, coordination, and speed, which may favour them during the selection process. The frequent selection and de-selection of players to and from youth academies is also a common trend due to the unpredictability of predicting future elite adult performance (Güllich, 2014). Güllich (2014) assessed the retention of players across age groups at 13 youth academies of professional clubs in Germany. The annual turnover of players (selection in and de-selection out) was 25%, with only 7% of players progressing from U10 to U19. Results found that most young players selected at a very young age, were replaced within a short time by players that had developed outside of the youth academy system. The model appeared to be one of selection, as opposed to promotion of players, further highlighting the complexity of predicting future elite adult performance at a young age.The aim of this research is to identify whether professional soccer academies can predict future ‘talent’ as young as 8

years old, and whether there is an alternative solution to the current recruitment processes to create a 'promotion' system for players to move up the age groups / stay in the professional soccer academy for a longer period of time, as opposed to a 'selection/de-selection' process, as identified by Güllich (2014).

The objectives of this research is to investigate the current literature available on TID processes taking place in professional soccer academies within the FDP for male youth soccer players. Following the results from the literature available, we aim to provide further research to gain additional insight into the TID processes within the FDP at professional soccer academies, providing future recommendations for further research within this field.

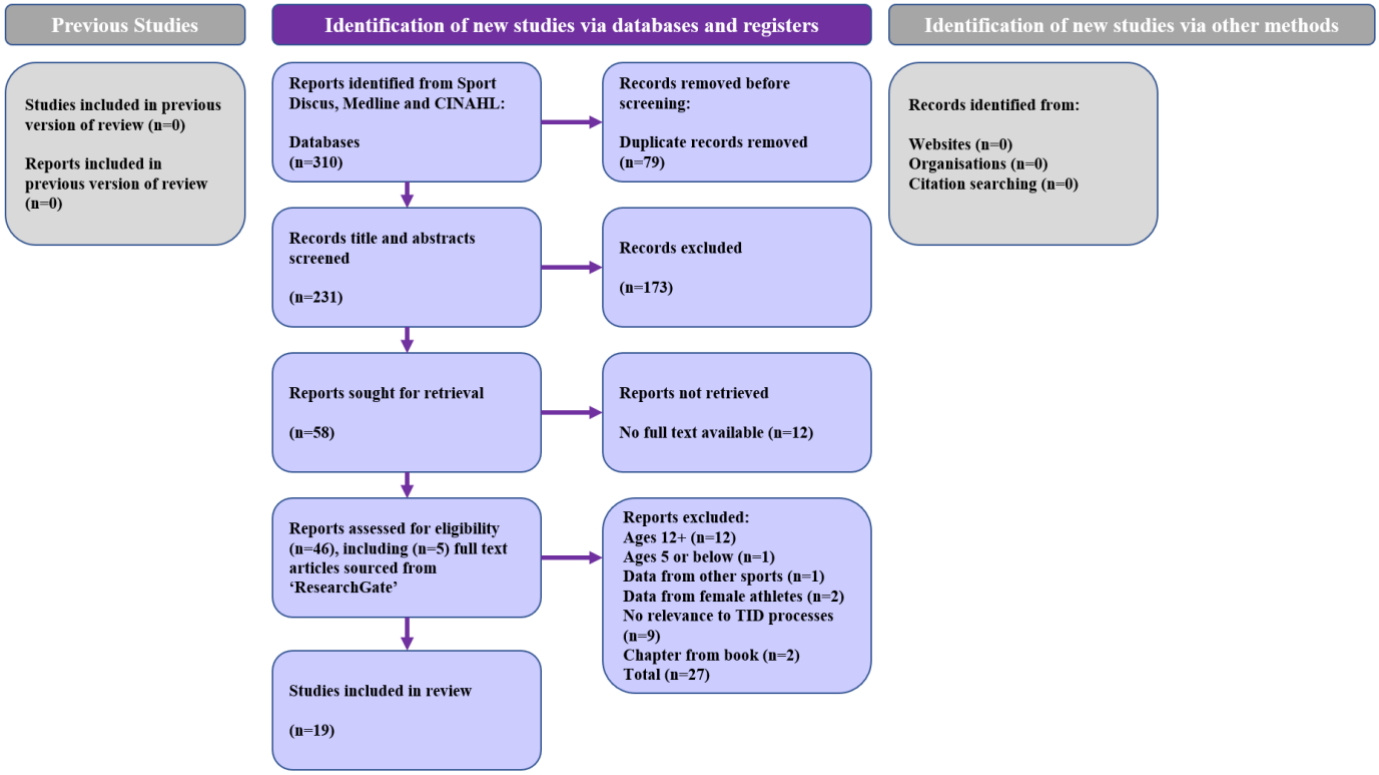
2.0 Systematic Review of Literature

To review the literature currently available in relation to TID processes in the FDP at professional soccer academies, a systematic review was deemed the most appropriate method to obtain a clear and comprehensive outline of the available evidence on the given topic.

2.1 Search Strategy: Databases and Inclusion Criteria

A systematic review of original and peer-reviewed articles was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines, (Page et al., 2021). To ensure article quality, articles were reviewed using the electronic databases of Sport Discus, Medline and CINAHL. Articles were reviewed prior to 14th May 2022 using the following key terms (talent* or identification) AND (soccer or football) AND (child* or "youth football"). Figure 1 provides a schematic overview of the search methodology process. Using the above search terms, the inclusion criteria required articles to be: 1), peer reviewed, 2), published in English Language, 3), using male youth soccer players, 4), between the ages of 5-11 years.

Figure 1. Flow diagram showing the identification and selection of studies in the available body of literature for the current review, (Page et al., 2021).



2.2 Extraction of Data

A total of 310 papers were initially returned from the research databases of Sport Discus, Medline and CINAHL through the search terms. Once duplicates were removed (n=79), 231 research papers titles and abstracts were eligible to be screened within this systematic review. Subsequently, the title and abstract from these articles were analysed, with a further 173 removed due to having no relevance to talent identification within soccer for 5–11-year-olds. 12 articles were removed due to not being able to gain full text access, which resulted in 46 full text articles to be assessed, with 5 of these papers sourced from ResearchGate. Thereafter, papers were reviewed and analysed to check for relevance in support for talent identification processes within the FDP (Figure 1), resulting in 19 studies being checked for quality and agreed to be used for final analysis in this systematic review.

2.3 Quality Assessment of Studies

A study quality scoring system was used using an adapted version of the 2018 Critical Appraisal Scoring Programme (CASP) checklist for research, (CASP, 2018). The rationale behind using the CASP quality scoring system is based on the appraisal checklist being designed for systematic reviews, and helps the researcher identify whether a research paper is relevant to the research question, (CASP, 2018). Each study was assessed using the eight criterions (Table 1) using the following scoring system: Yes = 2, Can't tell = 1, No = 0. Each study was then scored and converted into a percentage (0-100%).

Table 1. Study quality scoring system (CASP, 2018).

No.	Question / Checklist	Score
1	Was there a clearly focused research question and statement of the aims of the research?	0-2
2	Right type of study; Did the Authors use an appropriate method to answer their questions?	0-2
3	Was the data collected from a clear and suitable source? Were the participants suitable to help answer the research question?	0-2
4	Did the author mention / dedicate time to avoid any bias within the research?	0-2
5	Have ethical issues been taken into consideration?	0-2
6	Was the data analysis sufficiently rigorous?	0-2
7	Is there a clear statement of findings? Are they clear for the reader?	0-2
8	How valuable is this research to better understand TID processes?	0-2
	TOTAL	**0-16**

2.4 Quality of Studies

The quality of the studies analysed can be found in Table 2. All papers were categorised into four subgroups, 1), RAE, 2), anthropometric and physiological, 3), selection/de-selection, and 4), childhood experiences. Subgroups were created based on the keywords stated at the start of each research paper and based on the direction/results of the research stated within the abstract. The most notable results were that: (1) the mean score of the 19 selected studies was 96%; (2) nine publications achieved the maximum score of 100%; and (3) only two publications scored lower than 90%.

Table 2. Summary of the study quality scoring system, (CASP, 2018)

Reference	***Study***	***Individual Criteria***								***Total (%)***
		1	***2***	***3***	***4***	***5***	***6***	***7***	***8***	
Clarke, Cushion, and Harwood (2018)	Childhood Experiences	2	2	2	2	2	2	2	1	94%
Craig and Swinton (2021)	RAE	2	2	2	1	2	2	2	2	94%
Deprez et al., (2015)	Anthropometric and Physiological	2	2	2	2	2	2	2	2	100%
Erikstad et al., (2018)	Childhood Experiences	2	2	2	2	2	2	2	1	94%
Fenner, Iga, and Unnithan, (2016)	Anthropometric and Physiological	2	2	2	0	2	2	2	2	88%
Ford et al., (2020)	Selection/De-selection	2	2	2	2	2	2	2	2	100%
Gil et al., (2014)	Anthropometric and Physiological	2	2	2	2	2	2	2	2	100%
Goto et al., (2017)	Anthropometric and Physiological	2	2	2	2	2	2	2	2	100%
Goto et al., (2019)	Anthropometric and Physiological	2	2	2	2	2	2	2	2	100%
Gullich (2014)	Selection/De-selection	2	2	2	1	2	2	2	2	94%
Huertas et al., (2019)	RAE	2	2	2	1	2	2	2	2	94%
Kelly et al., (2020)	RAE	2	2	2	2	2	2	2	2	100%
Mann and Ginneken, (2017)	RAE	2	2	2	2	2	2	2	2	100%
Mujika et al., (2009)	RAE	2	2	2	1	2	2	2	2	94%
Mills et al., (2012)	Childhood Experiences	2	2	2	2	2	2	2	1	94%
Moran et al., (2020)	Anthropometric and Physiological	2	2	2	2	1	2	2	1	88%

Reference	*Study*	*Individual Criteria*								*Total (%)*
		1	***2***	***3***	***4***	***5***	***6***	***7***	***8***	
Muller et al. (2018)	RAE	2	2	2	2	2	2	2	2	100%
Patel, R et al. (2019)	RAE	2	2	2	2	2	2	2	2	100%
Zibung and Conzelmann, (2013)	Childhood Experiences	2	2	2	2	2	2	2	1	94%

3.0 Results – Systematic Review

Table 3 highlights the results from the first section of results from the systematic review, the RAE.

Table 3. Relative Age Effect – Key Findings

Reference	Subjects	Testing Procedures	Key Findings
Huertas et al., (2019)	(*n*=105) young male soccer players aged 9.2–12.2 years old, who were enrolled in two youth elite academies of La Liga clubs in the Valencia region of Spain. The best two U10 teams and two U12 teams in each club participated.	Age & anthropometrics; age(y), height(cm), weight(kg). Physical fitness; Agility t-test(s), speed 24m (s), Endurance – TTE (min). RAE based on players' distribution by BQ: chi-square tests.	U10 (*n*=52) BQ1 (*n*=25, 48.1%), BQ4 (*n*=8, 15.4%) RAE: U10s – *P*<0.002 Height (cm): BQ1 (141), BQ4 (135) Agility t-test(s): BQ1 (8.09), BQ4 (8.30) Endurance – TTE (min): BQ1 (6.50), BQ4 (6.76)

Reference	Subjects	Testing Procedures	Key Findings
Kelly et al., (2020)	Part 1: (*n*=556) current or previously registered academy players. Oldest player born in 1989 and youngest player born in 2008. Part 2: (*n*=364) previously registered academy players. Oldest born in 1989 and youngest born in 1999.	September-August BQ Months split Compared against expected distribution in Eng & Wales Graduates; Achieved pro contract (min 1 yr.) Chi-square analysis to compare quartile distribution	BQ1 (*n* = 224, 40.29%), BQ2 (BQ2 *n* = 168, 30.22%) BQ3 (*n* = 88, 15.83%), and BQ4 (*n* = 76, 13.66%). BQ1 2.9 times more likely to be selected than BQ4 players. BQ4s represented a larger portion of professional contracts awarded for academy graduates (*n* = 8, 14.0%) compared to the other BQs (BQ1 *n* = 5, 3.5%; BQ2 *n* = 8, 7.4%; BQ3 *n* = 6, 11.1%).

Reference	Subjects	Testing Procedures	Key Findings
Mann & Ginneken, (2017)	(*n*=25) Male Scouts PSV - Netherlands	Match A: (*n*=8) players, 2 players from each birth quartile (BQ1-BQ4), 4v4. Filmed. Match B: (*n*=10, 2 GK's weren't assessed) U11 age group (overseas academy). Four players were born in the first quartile (two allocated to each of Team A and B), three in the second quartile (Two to A and one to B), and one in the fourth quartile (Team B). Filmed. All scouts viewed the video footage. The task for scouts was to rank the eight field players in each match from one to eight according to their potential as a footballer. Prior to watching the video footage, scouts were split off into three subgroups 1. A no-age group (*n* = 9) who did not know the ages of the players 2. A date-of-birth group (*n* = 8) who received each player's birthdate 3. An age-ordered shirt numbering group (*n* = 8) who were told that the shirt numbers of the players corresponded to their age. Effect sizes are reported as partial eta squared ($\eta_p 2$) or Cohen's d where appropriate.	The selection bias of the age ordered shirt-numbering group was significantly less (d=0.21), than it was for both the no-age (d = 1.44*) and date-of-birth groups (d = 1.13*), *= *P*>0.05 When the scouts were aware that the shirt numbering corresponded to the relative ages of the players, the selection bias seen for both the no-age and date-of-birth groups was eliminated (d=0.09).

Reference	Subjects	Testing Procedures	Key Findings
Mujika et al., (2009)	13,519 male Basque senior and youth football players. <u>Four subgroups</u> Senior: (*n*=114) professional players who have played for Athletic Club Bilbao senior side. Elite youth: (*n*=189) attended Athletic Club Bilbao academy U11-U18. Regional youth: (*n*=4382) U11 to U14 who were registered at the Basque Football Federation. School youth: (*n*=8834) U10 and U11 who were registered for school level football in the Basque province school districts.	Players before 1977, old selection year (Aug-July). Example: BQ1 (Aug-Oct) Players born in or after 1977, new selection year (Jan-Dec). Example: BQ1 (Jan-Mar) Chi-square statistics: Differences between the observed (sample) and expected birth date distributions (Basque male population)	Chi square analysis: Observed vs Expected (birth date distribution vs general Basque population Elite youth (U11-U18): BQ1 (88, 46.6%), BQ4 (19, 10%) *P*<0.001 Regional youth (U11-U14): BQ1 (1254 (28.6%), BQ4 (927, 21.2%) *P*<0.001 School youth (U10-U11): BQ1 (2395, 27.1%), BQ4 (2024, 22.9%) *P*<0.001 Odds ratios (and 95% confidence interval) examining birth-date distributions in relation to football subgroup. <u>Q1 vs Q4</u> Elite youth: 4.44 (2.70–7.28) Regional youth: 1.30 (1.19–1.41) School youth: 1.13 (1.07-1.20)

Reference	Subjects	Testing Procedures	Key Findings
Patel et al., (2019)	(*n*=426) youth soccer players U9-1st Team. DOB: 1975-2009. 2010/2011-2017/2018 (*n*=1) English Football Club	Relative Age Sept-Aug Relative age analysis was conducted for each age group (U9 to First Team) using odds ratios (OR) and 95% confidence intervals (95% CI) to calculate between quartiles comparisons, with Q4 as the referent group. Anthropometrics CA (y) APHV (y) Height (cm) Body mass (kg) Physical Performance Counter movement jump (cm) Agility (modified t-test). (s) 10m sprint (s) 30m sprint (s) Yo-Yo IRI (m)	U9 (*n*=31): BQ1: (19, 61.3%), BQ4 (1, 3.2%), OR: 19.0, *P*<0.05 U10 (*n*=34): BQ1: (15, 44.1%), BQ4 (5, 14.7%), OR: 3.0, *P*<0.05 *Note that the U9 and U10 groups were only included for 2016/2017 and 2017/2018 seasons.* U11 (*n*=132): BQ1: (62, 47.0%), BQ4 (13, 9.8%), OR: 4.8, *P*<0.05 U11 CA (y): BQ1 (11.2), BQ4 (10.4) *P*<0.05. APHV (y): BQ1 (13.4), BQ4 (13.1), *P*<0.05. Yo-Yo IRI (m): BQ1 (1074), BQ4 (1530), *P*<0.05. BQ1 players were 6.0 times more likely to represent in this club than BQ4 players. BQ1 (185, 43.4%), BQ4 (31, 7.3%)
Muller et al., (2018)	(*n*=222) youth soccer players U9 Data from 20 European teams competing in the U9 Euro Championships 2016	Relative Age Jan-Dec Odds ratio (OR) and 95% confidence intervals (95% CI) were calculated Biological maturity status; height (cm), weight (kg), sitting height (cm), age (yrs), APHV (yrs) Players divided into three groups of maturity (late, normal, and early maturing) based on the mean (M) ± standard deviation (SD) of the APHV of the total sample (normal: APHV within M ± SD; early: APHV < M – SD; late: APHV > M + SD).	BQ1 (*n*=86): height (cm): 137.1, weight (kg): 31.3, sitting height (cm): 71.7, age (y): 9.3. BQ4 (*n*=39): height (cm): 133.9, weight (kg): 30.1, sitting height (cm): 70.4, age (y): 8.6. Descriptive odds ratio across all relative age quarters BQ1:BQ2 *P*<0.004, OR: 2.73 BQ1:BQ3: *P*<0.001, OR: 3.65 BQ1:BQ4 - *P*<0.001, OR: 4.86 Players who were born in BQ1 had a 2.7 to 4.9 times higher likelihood of selection compared to the other three quarters.

Reference	Subjects	Testing Procedures	Key Findings
Craig & Swinton (2021)	Elite Scottish soccer academy 2006-2016 U10-U17 (*n*=512) players (*n*=100) awarded contracts (*n*=362) released (*n*=50) retained	Stature (CM), Mass (KG), BMI, 5M Time, 10M Time, 20M Time, CMJ (CM), YYIR1 Level, YYIR1 Distance (M), Relative Age mixed-effect linear regression models were performed for each of the physical tests. Relative age was included as a four-level factor variable according to the quarter of birth, and player success was entered as a binary variable according to whether or not a player received a professional contract.	BQ1 = 0.37; BQ2 = 0.28; BQ3 = 0.22 and BQ4= 0.13, *P*<0.001 Professional contracts awarded: BQ1 = 0.50; BQ2 = 0.26; BQ3 = 0.20 and BQ4= 0.05, *P*<0.001

3.1 Relative Age Effect (RAE)

Table 3

Seven studies explored the RAE in FDP youth male soccer players (Craig and Swinton, 2021, Huertas et al., 2019, Kelly et al., 2020, Mann and Ginneken, 2017, Mujika et al., 2009, Muller et al., 2018, Patel et al., 2019), (Table 3). Huertas et al., (2019), Kelly et al., (2020), Mujika et al., (2009), and Patel et al., (2019), all found the RAE to be present within their studies from their sample of players within professional soccer academies in Spain and England. Patel et al., (2019) reported an odds ratio (OR) analysis indicating that in the U9 group, there was a 19.0 times greater chance of being selected for players born in BQ1 versus BQ4 (P<0.05), with only one player out of 34 players within the U9 sample being born in BQ4. Muller et al., (2018), also revealed within the U9 age group at the U9 European Championships in 2016, significant differences between BQ1 and all other quarters, BQ1:BQ4 (P<0.001), with OR analysis indicating players who were born in BQ1 having a 2.7 to 4.9 times higher likelihood of selection compared to the other three quarters. Muller et al., (2018) also found within the U9 sample, BQ1 players were taller (standing height (cm): BQ1 137.1, BQ4: 133.9 and sitting height (cm) BQ1: 31.3, BQ4, 30.1)). Huertas et., (2019) found just under half of their sample of U10 academy players (n=52) represented BQ1 (n=25), with BQ1 players also taller (standing height (cm): BQ1 141, BQ4: 135). Mujika et al., (2009), discovered the proportion of BQ1 players increased as the competition level increased. From a large sample (n=8834), the school youth subgroup (U10-U11) highlighted BQ1 players (2395, 27.1%) vs BQ4 players (2024, 22.9%), and regional youth (n=4382) (U11-U14) displayed BQ1 players (1254, 28.6%) vs BQ4 players (927, 21.2%). Whilst the elite youth subgroup displayed BQ1 players (88, 46.6%) vs BQ4 players (19, 10%) from a considerably smaller sample (n=189). Mann and Ginneken, (2017) presented a RAE tool to try and reduce selection bias towards players born earlier in the cohort year during the identification stage. Scouts were split into three groups, age ordered

shirt-numbering, no age, and date of birth, with results analysed using Cohen's d effect size where appropriate (table 3). Mann and Ginneken, (2017) found during their age ordered shirt-numbering group during the talent identification process, the selection bias of the age ordered shirt-numbering group was significantly smaller (d=0.21) than it was for both the no-age (d=1.44) and date-of-birth groups (d=1.13), $P<0.05$. When the scouts were aware that the shirt numbering corresponded to the relative ages of the players, the selection bias seen for both the no-age and date-of-birth groups was subsequently eliminated (d=0.09). Kelly et al., (2020) showed BQ4 players represented a larger portion of professional contracts awarded for academy graduates (*n*=8, 14.0%) compared to the other BQs (BQ1 *n*=5, 3.5%; BQ2 *n*=8, 7.4%; BQ3 *n*=6, 11.1%). Only significant OR was found between BQ1 and BQ4 players, with BQ4 more likely to attain professional status (OR: 4.72). This is also emphasised in almost twice as many observed (BQ4 *n*=8) than expected (BQ4 *n*=4.23) for contracts awarded. On the contrary, Patel et al., (2019) and Craig and Swinton (2021), found BQ1 players were more likely to represent at adult / elite performance within their study than BQ4 players. Patel et al., (2019) presented BQ1 players were 6.0 times more likely to attain a professional contract than BQ4 players, BQ1 (185, 43.4%), BQ4 (31, 7.3%). Craig and Swinton (2021) identified a strong RAE across the 100 players awarded a professional contract with the proportion of births across the four yearly quarters, (BQ1=0.50; BQ2=0.26; BQ3=0.20 and BQ4=0.05), $P<0.001$.

Table 4. Anthropometric and Physiological Analysis– Key Findings

Table 4 presents the second section of results from the systematic review, anthropometric and physiological analysis focused research papers.

Reference	Sample	Testing Procedures	Key Findings
Deprez et al. (2015)	(*n*=388) youth soccer players 8.6-16.6 years old (*n*=2) Belgian professional soccer clubs Comparison between players who end up receiving a professional contract (Club) and players that do not (drop out).	Age (y), maturity offset (y), height (cm), sitting height (cm), weight (kg), body fat %, jumping sideways, moving sideways, backward balance, dribble test (with & without the ball) (s), standing broad jump (cm), counter movement jump (cm), Yo-Yo intermittent recovery test (m), 5m & 30m sprint (s) The Ghent University (UGent) dribbling test ("dribble ball" to measure dribbling skill). Players who were not able to keep control of the ball (ball crossing a border of 2 m away from the trajectory) got a second chance. A single observer measured the time (0.01 seconds) from start to finish with a handheld stopwatch. without the ball ("dribble foot" to measure agility Descriptive statistics for club and dropout players in each age groups are presented as mean (SD) values	Club vs Drop Out compared U10 Weight (kg): Club (29.7), Drop out (31.1), $P<0.05$ Dribbling with the ball (s): Club (23.8), Drop out (25.6), $P<0.05$ 30m Sprint (s): Club (5.54), Drop out (5.70), $P<0.05$

Reference	Sample	Testing Procedures	Key Findings
Fenner, Iga, and Unnithan, (2016)	(*n*=16) youth soccer players U10 (*n*=1) English Soccer Academy	Small Sided Games (SSG). Participants were separated into two groups of eight. Within their groups, two teams of four players were made. Each team played six, four versus four matches, which were 5 min in duration, with 3 min of passive recovery, on a pitch 18.3 m x 23 m in dimension. Game Technical Scoring Chart (GTSC) & Total Points (TP) Total points (TP): 4 points for a win, 2 points for a draw and 0 points for a loss. Game technical scoring chart (GTSC): 1 - poor, 2 - below average, 3- average, 4 - very good, 5 - excellent. The criteria in the GTSC were Cover/Support, Communication, Decision-making, Passing, first touch, Control, one versus One, Shooting, Assist and Marking. Time motion analysis: GPS, total distance covered and high-speed running distance.	TP & GTSC: $P<0.001$. Players that received the most match points (TP) from the result of each game, were also scored high within the GTSC. GTSC and high-speed running distance: $P< 0.05$. GTSC and total distance covered: $P<0.05$ TP and total distance covered: $P<0.05$

Reference	Sample	Testing Procedures	Key Findings
Gil et al., (2014)	First Selection: (*n*=64) Soccer Camp players: (*n*=34) Final Selection: (*n*=21) 9-10-year-olds (*n*=1) Professional Soccer Club	CA (y), training years, weight (kg), height (cm), sitting height (cm), leg length (cm), BMI, sum skinfolds (mm), limb fat (mm), body fat (mm), fat (%), bone (%), muscle (%), endomorphy, ectomorphy, predicted height (cm), percentage predicted height, testosterone (pg.ml-1), DHEA (ng.ml-1), maturity offset (years), APHV (years), velocity 15m (s), velocity 30m (s), agility 15m (s), agility 30m (s), Yo-yo IR test (m), HG (kg), and counter movement jump (cm).	Selected vs non-Selected: 9-10 yrs. olds CA (y): Selected (9.95) and non-selected (9.78) *P*<0.05 Predicted height (%): Selected (78.02) and non-selected (77.31) *P*<0.05. Agility 15m (s): Selected (2.80) and non-selected (2.91) *P*<0.01 Agility 30m (s): Selected (5.68) and non-selected (5.86) *P*<0.05 Yo-yo IR test (m): Selected (725.71) and non-selected (574.85) *P*<0.05.

Reference	Sample	Testing Procedures	Key Findings
Goto et al., (2017)	U9: (*n*=22) U10: (*n*=12) (*n*=1) English Premier League Academy	Soccer matches were analysed during the season 2008–2009 and 2009–2010 using a 1 Hz GPS (SPI Elite, GPSport). The match analysis took place in various parts of the season (September/ October, December/January, February/March, and May) to reflect the variation in match performance during the season. GPS Total distance covered (m), walking (m), jogging (m), low-speed running (m), moderate-speed running (m), and high-speed running (m).	U9/U10: Retained vs Released Total distance covered (m): Retained (4478), Released (4091), $P<0.05$. Low speed running (m): Retained (1,226) vs Released (1,005), $P<0.05$.

Reference	Sample	Testing Procedures	Key Findings
Goto et al., (2019)	(*n*=80) outfield youth soccer players U9-U16 (*n*=1) English Premier League Soccer Academy	Estimated chronological age at PHV was used to determine the biological maturity of the players, and they were separated into earlier and later maturers based on the estimated chronological age at PHV. Chronological age (y), sitting height (cm), estimated chronological age at PHV (y), mean playing time (min), total distance (m), walking (m), jogging (m), low-speed running (m), moderate-speed running (m), and high-speed running (m).	U9/U10 Earlier vs Later maturing players Estimated CA at PHV (y) 12.6 vs 13.0 (*P*<0.01) Mean playing time (min) 57.5 vs 51.4 (*P*<0.01) Total distance (m) 4604 vs 4069 (*P*<0.01) Walking (m) 990 vs 878 (*P*<0.05) Jogging (m) 1692 vs 1490 (*P*<0.05)
Moran et al., (2020)	(*n*=140) youth soccer players from the English Premier League (*n*=6) individuals serving as participants for the case analysis	6-year period Age (y), sitting height (cm), mass (kg), maturity offset (y), 10m sprint (s), 20m sprint (s), CMJ cm).	20 m sprint (s) 1-year period from −1 years before PHV to +0.15 years after PHV, Player 1 & 2 from middle of the sample to top of the sample. 20m Sprint (s) – Start Player 3 (3.4) Player 1 (3.6) Player 2 (3.6) Player 4 (3.6) Player 6 (3.6) Player 5 (3.8) 20m Sprint (s) – End Player 1 (2.9) Player 2 (2.9) Player 6 (2.9) Player 3 (3.0), Player 4 (3.2) Player 5 (3.2)

3.2 Anthropometric and Physiological Analysis

Table 4

Deprez et al., (2015) analysed differences within their U10 sample between 'club players' and 'drop out players'. Club players were categorised as players who were still playing for a youth team in 1 of the 2 participating professional soccer clubs at the start of the 2013–2014 soccer season. Drop out players, were categorised as players who dropped out of a high-level training program. Dropping out was defined as changing to a lower level or quitting soccer altogether within 2 years after the first test assessment. Deprez et al., (2015) presented the following results (table 4).

1. Weight (kg): Club players (29.7) vs drop out players (31.1) (P<0.05).
2. 30m Sprint (s): Club players (5.54) vs drop out players (5.70) (P<0.05),
3. Dribbling with the ball (s): Club players (23.8) vs drop out players (25.6) (P<0.05).

   Information on the dribbling with the ball test (the Ghent University (UGent) dribbling test) presented in table 4.

Gil et al., (2014) presented the following results (table 4) within their sample of finally selected and the non-selected 9–10-year-olds from a talent identification camp.

1. Predicted height (%): Selected (78.02) vs non-selected (77.31) (P<0.05)
2. Agility 15m (s): Selected (2.80) vs non-selected (2.91) (P<0.01)
3. Agility 30m (s): Selected (5.68) vs non-selected (5.86) (P<0.05)
4. Yo-yo IR test (m): Selected (725.71) vs non-selected (574.85) (P<0.05)

Goto et al., (2017) compared U9/U10 retained and released players from one EPL academy. Retained players stayed at the academy for 2 more seasons after the season in which the match analysis was completed. Released players, 4 players were released at the end of the season in which the match analysis took place, 9 players were released during or at the end of the first

season after the match analysis took place, and 7 players were released during or at the end of the second season after the match analysis took place. Goto et al., (2017) found retained players to outperform released players within the below areas (table 4).

1. Total distance covered (m): Retained (4478) vs Released (4091) (P<0.05),
2. Low speed running (m): Retained (1,226) vs Released (1,005) (P<0.05).

In a separate study, Goto et al., (2019) compared U9/U10 early and late maturing players (estimated chronological age at PHV), with Goto et al., (2019) finding significant differences in the below areas (table 4).

1. CA at PHV (y): early (12.6) vs late (13.0) (P<0.01)
2. Mean playing time (min): early (57.5) vs late (51.4) (P<0.01)
3. Total distance (m): early (4604) vs late (4069) (P<0.01), walking (m): early (990) vs late (878) (P<0.05), and jogging (m): early (1692) vs late (1490) (P<0.05).

Moran et al., (2020) found that players at the start of their study could be slower than their other teammates, but if given time (6-year period in this study) can become the best performer(s). Within the 20 m sprint test (s), 1-year period from −1 years before PHV to +0.15 years after PHV, players 1 & 2 are middle of the sample in terms of performance, who are then top of the sample at the end of the study (table 4).

Start: Player 3 (3.4), Player 1 (3.6), Player 2 (3.6), Player 4 (3.6), Player 6 (3.6), and Player 5 (3.8).

End: Player 1 (2.9), Player 2 (2.9), Player 6 (2.9). Player 3 (3.0), Player 4 (3.2), and Player 5 (3.2).

Fenner et al., (2016) implemented a small-sided game observation tool and GPS trackers to test players' performances as an individual. Sixteen U10 soccer players (Mean ± SD; age, 10.6 ±

0.3 years) were recruited from one youth professional soccer academy in England. Participants were separated into two groups of eight. Within their groups, two teams of four players were created. Each team played six, 4v4 matches, which were 5 minutes in duration. During each individual small-sided game protocol, each player was awarded total points (TP) for the outcome of each match, 4 points for a win, 2 points for a draw, and 0 points for a loss. Additionally, during the small-sided game protocol, all players' performances was evaluated on ten soccer attributes / skills, and were given a score between 0 and 5, using a game technical scoring chart (GTSC), (table 4). Each point explained the players' performance using the following criteria: 1 – poor, 2 – below average, 3 – average, 4 – very good and 5 – excellent. The criteria in the GTSC were cover/support, communication, decision-making, passing, first touch, control, 1v1, shooting, assists, and marking. There was a significant and large relationship between TP's and GTSC ($P<0.001$). The results suggest that it is viable to distinguish the most talented player, according to the coach's subjective scoring system, simply by analysing if they won the highest number of games (Fenner et al., 2016). There was also a significant odds relationship between high GTSC scores and high-speed running distance ($P<0.05$), high GTSC scores and total distance covered, and high total amount of points scored (TP) and total distance covered ($P<0.05$).

Table 5. Selection/De-selection – Key Findings

Table 5 presents the third section of results from the systematic review, selection, and de-selection focused research papers.

Reference	Sample	Testing Procedures	Key Findings
Ford et al., (2020)	(*n*=29) Professional Soccer Clubs (*n*=24) Technical/Academy Directors (*n*=7) Scouts (*n*=6) Sports Scientists/ Physiologists (*n*=5) Coaches (*n*=4) Strength & Conditioning Coaches (*n*=2) Physiotherapists (*n*=1) Psychologist (*n*=11) staff members with other roles in the club's academy.	(*n*=27) question Survey Multiple choice, simple multiple choice (yes/no), checkbox, numerical, or ranking. The survey was created by a panel of six experts with ten or more years of experience working in European, American, and Middle-Asian professional youth academies, and who also had scientific backgrounds.	Descriptive statistics for responses on talent identification processes Reporting that the academy uses open doors scouting events: 8-11 years old (62%) and 12-16 years old (31%) Reporting that the academy invites players in on trial: 8-11 years old (90%) and 12-16 years old (93%) Median no. (IQR) of players recruited in the last season: 8-11 years old (24 (18-32)) and 12-16 years old (17 (14-25)) Median no. (IQR) of players dismissed in the last season: 8-11 years old (10 (1-17)) and 12-16 years old (15 (10-20)). Annual turnover of players (selections/de-selections): 31.8% 8-11 years old – Scouting Processes Around half of clubs used medical assessment (41%), fitness testing (45%) and family background assessment (69%), whereas a minority of clubs used psychological testing (21%), video feedback (28%) and soccer statistics (17%), as a method to identify players.
Gullich (2014)	Germany National U15 team in 2006–2013 (*n* = 189) Germany U16 to U19 national team in 2001–2013 (*n* = 870) Total (*n* =1059)	Longitudinal DOB Descriptive data Frequency distribution, mean value, and standard deviation (M ± SD)	Transition to age group (Mean turnover) U10/11: 17.2% U11/ 12: 27.4% Probability of not being in the programme anymore three years later was >50% and after five years >70%.

3.3 Selection/De-selection

Table 5

Ford et al., (2020) investigated the TID and talent development processes within professional soccer academies around the world. Ford et al., (2020) found annual turnover of players (selections/de-selections) for 8–11-year-olds was 31.8%, in addition to the median number of players that were recruited in the previous season (2016/2017) (24 (18-32)), and median number of players dismissed in the last season (2016/2017) (10 (1-17)) for 8–11-year-olds (table 5). Additionally, Ford et al., (2020) found when identifying 8–11-year-olds, half of clubs used medical assessment (41%), fitness testing (45%) and family background assessment (69%), whereas a minority of clubs used psychological testing (21%), video feedback (28%) and soccer statistics (17%), as a method to identify players. 62% of clubs would also use 'open door' scouting events when identifying 8-11-year-olds, (Ford et al., 2020). Gullich (2014), discovered when investigating past and present soccer players within the Germany national youth soccer system, U10/U11 age group had a mean turnover transitional rate of 17.2%, compared to U11/ U12 (27.4%) Gullich (2014), found the probability of not being in the programme anymore three years later was >50% and after five years >70% (table 5).

Table 6. Childhood Experiences – Key Findings

Table 6 presents the fourth and final section of results from the systematic review, with research papers focusing on childhood experiences within soccer and other sports.

Reference	Sample	Testing Procedures	Key Findings
Clarke, Cushion, Harwood (2018)	5 youth soccer players registered at a category two English academy, aged 11 years old (U11).	Five 31-47 minutes semi structured focus group interviews Thematic analysis and coding.	*Being scouted as an authentic choice* Developed identities as footballers with the potential to be successful. *Feeling special* Players started to make comparisons against players outside of the academy system, such as more skilled. *Fragile self* Status as talented footballers was fragile due to the retain/release process. Talent could be improved with effort, but with the release process, their talent status was under constant risk.

Reference	Sample	Testing Procedures	Key Findings
Erikstad et al., (2018)	515 Norwegian U14 (*n* = 285) and U15 (*n* = 230) youth football players participated in the study.	The questionnaire recorded yearly accumulated amount of coach led football practice, peer-led football practice and peer-led football play conducted at different age categories from the age of six to 12 years. Self-regulation: A condensed version of The Football-Specific Self-Regulation Learning Questionnaire (22 questions to measure self-regulated learning in the football context) A quadratic term of time was added to investigate if player's involvement in distinct types of practice evolves linearly or tend to level off or increase over time. This procedure was done for each type of practice as a dependent variable, and with self-regulation (high/low) and team level (regional/national) as independent variables in separate analyses. Three analyses were thereby conducted for each of the two groups. All the analyses were performed using Stata 14.1 software.	Players scoring high on self-regulation (n=238) were significant more likely to be selected at the national level compared to less self-regulated players (n=254) *P*<.05. 25.2% of the higher self-regulated players were selected for national initiatives compared to 16.5 % of the less self-regulated players. Time2 – Quadratic term of time Peer-led play: -.1 Peer-led practice: 1.3 (*P*<0.01) Coach-led practice: 1.5 (*P*<0.01) Higher self-regulated players increased their involvement peer-led practice by 6.7 hours per year, and 2.1 hours of coach-led practice per year, compared to low self-regulated players, *P*<.001

Reference	Sample	Testing Procedures	Key Findings
Mills et al., (2012)	(*n*=10) expert development coaches aged between 31 and 62 years (m 47.5, + s ¼ 10.5 years) participated in the study. Full time coaches 6-22 years coaching experience UEFA Pro or A license coaches	Semi structured interviews Codes & Themes	High-order categories – perceived by expert coaches to influence player development Awareness, resilience, goal directed attributes, intelligence, sport-specific attributes, and environmental factors The coaches felt it was imperative for young players to understand that adversity can facilitate development. In this study, adversities were largely perceived as 'opportunities to grow' whereby players must introspectively 'dig deep' to evolve. Effective development was considered a 'people business' and having the 'right' people (i.e., academy personnel) was seen as instrumental in cultivating a positive motivational climate.

Reference	Sample	Testing Procedures	Key Findings
Zibung & Conzelmann (2013)	(*n*=346) players who had been born between 1981 and 1987 and who had played at least once on a U16 to U21 national youth team. (*n*=159) players completed the questionnaire, corresponding to a return rate of 46.0%.	Adult level performance Level 1: Players at International level (*n*=24) Level 2: Players at top national level (*n*=42) Level 3: Players at national level (*n*=59) Level 4: Players at regional level (*n*=34) The questionnaire covered a long period of their lives and some events lay in the distant past. Cluster Analysis; The LICUR method (Linking of Clusters after removal of a Residue) Cluster 1 – Average players (does not deviate substantially from the mean value for all players in any of the factors), (*n*=45), Cluster 2 – Football abstainers (joined a club late), (*n*=43), Cluster 3 – poly-supportive players (above average score for non-football activities, (*n*=21), Cluster 4 – poly-supportive club players (played less football than average but explored other sports intensively), (*n*=19), and Cluster 5 – specialised club players (engaged in more football than average and explored in a few other sports), (*n*=23).	Cluster 4 (poly supportive club players) were 2.1 times more likely to become a player at international level (Level 1), Cluster 5 (specialised club players), 2.0 times more likely to become a player at international level (Level 1). Cluster 1 (average players) were 1.5 times more likely to become a player at regional level (level 4), and 3.4 times less likely to become a player at international level (Level 1). Cluster 2 (football abstainers) were 1.4 times more likely to become a player at national level (Level 3) Residue's The residues were analysed using the Residue module of the statistical package SLEIPNER (Bergman & El-Khouri, 2002), presented in z scores. Only one player achieved top level performance as an adult. This player has an extreme high level of free play (z=4.94) and an above average activity in other sports (z=2.06), basketball.

3.4 Childhood Experiences

Table 6

Clarke et al., (2018), interviewed five youth soccer players registered at a category two English soccer academy, aged 11 years old (U11). Through thematic analysis and coding, three main themes were highlighted within the results; 1), being scouted as an authentic choice (developing identities as footballers with the potential to be successful), 2), feeling special (players started to make comparisons against players outside of the academy system, such as more skilled), and 3), fragile self (status as talented footballers was fragile due to the retain/release process), (table 6). Mills et al., (2012) conducted semi structured interviews with 10 full time coaches, with 6-22 years coaching experience, and either UEFA Pro or A license coaching qualifications, to understand the perceived core values / principles required from youth soccer players to get to the top level. Through coding and themes, high order categories were identified; awareness, resilience, goal directed attributes, intelligence, sport-specific attributes, and environmental factors (table 6). Zibung & Conzelmann (2013) investigated the notion of 'early specialization' through questionnaires, cluster analysis and adult performance. Cluster 4 (poly supportive club players, played less football than average but explored other sports intensively) were 2.1 times more likely to become a player at international level (Level 1), Cluster 5 (specialised club players, engaged in more football than average and explored in a few other sports), were 2.0 times more likely to become a player at international level (Level 1). Zibung & Conzelmann (2013) also explored individuals within the study using the residue module of the statistical package 'SLEIPNER' (table 6), presented in z scores. The residues are on the boundary between actual patterns and ones that are only theoretically viable. These boundaries are important for the advancement of young talent because outstanding performance can be understood to come about through outstanding patterns. Only one player achieved top level performance as an adult. This player has an extreme high level of free play

(z=4.94) and an above average activity in other sports (z=2.06), basketball (table 6). Erikstad et al., (2018) investigated the amount of practice conducted at different age levels through a Norwegian practice history questionnaire for (*n*=515) Norwegian U14 (*n*=285) and U15 (*n*=230) youth soccer players (table 6). Players scoring high on self-regulation (*n*=238) were significant more likely to be selected at the national level compared to less self-regulated players (*n*=254), *P*<.05, as 25.2% of the higher self-regulated players were selected for national initiatives compared to 16.5 % of the less self-regulated players. Higher self-regulated players increased their involvement peer-led practice by 6.7 hours per year, and 2.1 hours of coach-led practice per year, compared to low self-regulated players, *P*<.001, (Erikstad et al., 2018).

4.0 Discussion of the Literature

The objective of this research was to investigate the current literature available on TID processes taking place in professional soccer academies within the FDP for male youth soccer players. Following the results from the literature available, we aim to provide further research to gain additional insight into the TID processes within the FDP at professional soccer academies. Overall, the systematic review findings demonstrate a limited evidence base for TID for male youth soccer players aged 5-11 years. This is based on the quantity of papers available within the focused age bracket of this research paper, in addition with many of the papers research focus on talent development, as opposed to talent identification. However, there seems to be some evidence for characteristics (e.g., physical) that may support talent identification and future attainment within professional soccer. These findings highlight the complexity and uncertainty of predicting future adult performance when assessing an FDP player and future research is needed to inform this practice that is common within football academies around the world.

4.1 Relative Age Effect (RAE)

Results highlighted seven studies exploring the RAE in FDP youth male soccer players, (Craig and Swinton, 2021, Huertas et al., 2019, Kelly et al., 2020, Mann and Ginneken, 2017, Mujika et al., 2009, Muller et al., 2018, Patel et al., 2019), (table 3). Huertas et al., (2019), Kelly et al., (2020), Mujika et al., (2009), and Patel et al., (2019), all found the RAE to be present within their studies from their sample of players within professional soccer academies from Spain and England. Mujika et al., (2009) provided a valuable insight into the sample of players from BQ1-BQ4 through various competition levels on the development pathway (elite youth, regional youth, and school youth) within the Basque region of Spain. Mujika et al., (2009) reported the higher the competition level, the higher the risk of favouring BQ1 players vs BQ4 players within the selection process (table 3), particularly within the 'elite youth' level (academy), which highlights BQ1 players are being 'favoured' within the recruitment process into academy environments. In England, Patel et al., (2019) found only one player within their U9 sample at their English soccer academy born in BQ4, with U9 BQ1 players 19.0 times more likely to represent the club at adult level. Based on the results, arguably across Europe, players born during BQ1 vs players born during BQ4 are being favoured in the selection process. Perhaps BQ1 players will naturally demonstrate more advanced physical attributes due to receiving 6-9 months more time to develop physically, compared to BQ4 players, which may seem more attractive to the 'naked eye' during the identification/selection stage. Gil et al., (2014) highlights this within the identification stage in the anthropometric and physiological analysis results section of this study (table 4), with final selected 9–10-year-old players more agile, and faster. Huertas et al., (2019) and Muller et al., (2018) also highlight this point, with the BQ1 players of their sample taller than their BQ4 counterparts. Based on the results, BQ1 players are receiving more opportunities to enter a professional soccer academy environment during the identification stage, as demonstrated through the over representation of BQ1 players

within a professional soccer academy environment, (Huertas et al., 2019, Kelly et al., 2020, Mujika et al., 2009, Patel et al., 2019). BQ1 players will tend demonstrate advanced physical attributes such as height (Huertas et al., 2019 and Muller et al., 2018), and perform better in physical tests such as agility and speed (Gil et al., 2014), which may seem more attractive on the 'naked eye' for the observer during the identification/selection stage, particularly within the FDP.

Patel et al., (2019) and Craig and Swinton (2021), both found that BQ1 players were overrepresented at their professional soccer academy and more likely to receive a professional contract once they moved into elite adult performance at their club. It is difficult to create any real conclusions based on these findings. If BQ1 players continue to be favoured within the identification/selection process, this creates a larger pool of players from BQ1 compared to the other three BQ's to select from when looking to offer professional contracts. On the contrary, Kelly et al., (2020) results presented BQ4 players representing the highest proportion of professional contracts awarded (n=8) (table 3). However, a total of only 27 contracts were awarded across all BQ's from the sample of 364 academy graduates from this research study, so difficult to draw conclusions from the BQ4 data presented.

Based on the results above, arguably professional soccer academies need to try and create a fairer / no bias identification processes, to ensure all players get equal opportunities to showcase their abilities. A short-term fix to reduce the RAE and selection bias would be to run regular trial events within professional soccer academies during the identification stage, with a focus on birth quartiles. This would allow players to train, play, and perform against players in the same birth quartile, allowing the coaches, scouts, and observers to assess players of similar age, based on the month they were born, rather than the cohort year they were born in. EPL and professional soccer academies have started to implement bio-banding events, where players are banded together using the Khamis-Roche method. Players aged 12-15 have their

level of maturation calculated based on their height, weight, and height of both parents. Players are then banded into two groups, 1), 85-90% of predicted adult height (PAH), or 2), 90-95% PAH. Players are then observed in a match environment against players within the same maturation band, with players providing feedback after the event, (Premier League, 2016). However, these events are currently focused on maturation and within the youth development phase (U13-U15), rather than BQ / relative age, with players already in the development stage, as opposed to the identification stage. In relation to the research question at hand, creating BQ trial events is a simple tool to split players off during trial events to ensure the coaches are observing players against players of similar relative age, and requires minimal data to implement. Once a player is signed (development stage), practitioners can start to collect data to start to look more into the maturation status of each player. Mann and Ginneken, (2017) also highlighted the importance of knowledge and awareness when it comes to recruiting/selecting players, by eliminating selection bias when the scouts were informed that the corresponding shirt numbers represented the players relative age. Fundamentally, Mann and Ginneken, (2017) found simple knowledge of birthdates was not enough to eliminate the age bias when scouts were informed of the players birthdates, with the effect persisting. This underlines the need for clear identifiers that increases awareness of relative age and does not create fundamental interference with coaching activities during the recruitment process, (Jackson and Comber, 2020). We would argue that based on success of Mann and Ginneken, (2017) findings (table 3), could this be rolled out on a larger scale to further test its validity? As a result, this could be a regulated TID tool rolled out within professional soccer academies to aid and support the practitioners when recruiting/selecting players into their academy to ensure we create opportunities for all players, regardless of when they were born in the cohort year, without minimal interference to recruitment processes in place. The results from the literature in the RAE section has identified an area of research into whether the practitioners /

professional soccer academies have good knowledge and understanding of the RAE, and whether they are using any innovative tools / practices to make the scouts/coaches aware of the RAE during the identification stage.

4.2 Anthropometric and Physiological

A common trend occurred during the results of this section of this study (table 4); total distance covered within a match / across a season. Fenner et al., (2016) used an innovative TID tool, using small-sided games alongside a subjective game technical scoring chart (GTSC) from the coaches for each individual player within the sample, and the total points won from each game. There was a significant odds relationship between the GTSC, total points (TP) scores and total distance covered (table 4). In relation to this and as mentioned earlier (table 4), Goto et al., (2019) found the early maturing players covered more total distances during matches across a season than their later maturing players within the U9/U10 age group. Goto et al., (2017), also found in a separate study, players that were eventually retained at the end of the season, covered more total distances during matches across the season, than players of the same age group, that were eventually released from this professional soccer academy. Based on the results, can we really expect to claim that players that can cover more distances during a game / across a season are better soccer players? Probably not. However, with the advanced technology in today's game, GPS trackers (which was used throughout the three studies highlighted above) could be a very useful tool during the identification stage to support the observers alongside their observations through the 'naked eye'. This would provide the observers with 'live' data to support their selection process, rather than just looking at players that are physically strong or advanced in their physical attributes, as highlighted within the RAE discussion section of this paper. Additionally, Fenner et al., (2016) has provided a simple and cost-effective talent identification tool that can help practitioners during the identification stage. A note of caution, this was performed on a very small sample, and the subjective nature of the coaches scoring in

the GTSC will vary from coach to coach. Similar with Mann and Ginneken's, (2017) RAE talent identification tool, if this was rolled out on a larger scale to tests its validity, this could provide practitioners with a simple tool to assess players performances during trial events, again, rather than just relying on the 'naked eye'.

Deprez et al., (2015), Goto at al., (2017) and Gill et al., (2014) all provided research examining two different subgroups within the identification/selection and/or selection/deselection process, such as released vs retained, club players vs drops out players, and first selection vs final selection. Results favoured the players that remained within the elite environments, with players being taller, lighter, faster, more agile, and demonstrating good competency when dribbling with the ball, all vital attributes / skills required for a modern-day footballer. Arguably, we would expect players that are retained, club players and/or final selection players to be outperforming players from the other subgroups, released, dropouts and/or first selection, within areas such height, weight, speed, agility, and technical ability with the ball. All these key attributes are fundamental for high performance within soccer, as players that continue within the academy system, we would expect to be excelling in these areas over players that are eventually released. Additionally, most of these studies will generally investigate one specific academy. To gain a better understanding of what makes a successful / retained FDP player, we would require a study that investigates numerous academies within the same age group (i.e., U9/U10), and all using the same subgroups (i.e., retained vs released). We would hopefully then be able to see any common trends from the results. For example, retained FDP players demonstrated a strong odds relationship for height, speed etc. vs FDP players that were eventually released. Practitioners could then start to build testing procedures to try to bring out these key FDP attributes/skills during the identification stage to help support their selection decisions during the identification stage. This section of the results does highlight a lack of research into testing and procedures within the identification stage, highlighting a need for

further research in this area, e.g., do coaches use any data to support their selection / deselection decisions.

4.3 Selection / De-selection

Following on from the discussion around the complexity of the selection / de-selection process and whether practitioners can predict future success, Ford et al., (2020) presented findings of the uncertainty of selecting players within the FDP, with (selections/de-selections) highest at 31.3%. Gullich (2014) presented 17.2% annual turnover for U10/U11, which increased to 27.4% for U11/U12. Gullich (2014), also found the probability of not being in the programme anymore three years later was >50% and after five years >70%. This again suggestsand raises the question, can we really expect to know if a 9-year-old will make it as a professional soccer player? Results suggest no and raise a few considerations. Firstly, do academies need to bring players into the system at such a young age? Could the academies support the grassroots clubs / coaches more in developing better coaches and better development environments for the players, whilst keeping them in a less pressured environment at a young age? This would allow the scouts/coaches time to monitor FDP players of interest over various seasons, building portfolios of observations and video footage to support them when making their decisions further down the line on whether to offer the player a contract. Additionally, enhancing the coaching provision at grassroots level, may create a bigger pool of talented players to choose from. Secondly, players as young as 8 years old (once signed at U9), their sporting experience will now be focused on academy football only, with grassroots football prohibited under EPPP guidelines (Premier League, 2022), and their sporting environment changed from grassroots to an 'elite' environment with regular assessments and observations on their development, which arguably may add doubts and uncertainties within the players emotional side of the game. To reaffirm this point, Clarke., et al (2018), found that U11 academy players felt their status as talented footballers was fragile due to the retain/release process, and their talent status was

under constant risk. Arguably, if a system allows players to join the elite environment at a later age, such as U12 (YDP), players/parents are then educated around the academy system during the U9-U11 stage, they may be more emotionally ready/prepared for this 'elite' environment and the retain/release process. Thirdly, the number of players that gain a professional contract at the end of the very long journey is very low, as previously highlighted by Kelly et al., (2020), with a total of only 27 contracts awarded across all BQ's from the sample of 364 academy graduates. The current system may have a player within the elite environment for 10 years (8-18 years old), with the potentiality of a release decision at the end of the journey at 18 years old. A system where players join later into the elite environment (e.g., U12 (YDP)), and with more education around the retain/release process for players and parents, would perhaps favour the players emotional side of the game when the decision is made at 18 years old whether the professional football club will offer the player a professional contract. The selection / deselection literature results highlights a need to understand whether the practitioners working within the professional soccer academies feel whether players should be recruited into the clubs at a later age, and why.

4.4 Childhood Experiences

The results from the childhood experiences section of this study (table 6) have highlighted players within the FDP need to possess good self-awareness (Mills et al., 2012) to understand the academy system and the retain/release process, (Clarke et al., 2018). FDP Players are already understanding the 'threat' of release and will need to develop resilience to keep pushing themselves to improve further. Mills et al., (2012) through thematic analysis and coding following interviews with soccer coaches working in a professional soccer academy, identified one of the key attribute's players need to possess to be successful; awareness. Clarke et al., (2018), identified through semi structured interviews with a group of U11 academy soccer players, they were aware of the retain and release process, and they identified that they needed

to keep working hard to improve further to avoid being released. Mills et al., (2012), also identified resilience within the key attributes for players. . Arguably, players as young as 11 years old, feel the pressure of the retain and release process during their time within a professional soccer academy, with Mills et al, (2012) defining this as their 'fragile self'. From one side of the argument, this awareness and resilience of the situation will push players to constantly improve and get better to avoid being released. From the other side of the argument and the points raised earlier in the discussion, pressure for players as young as 11 years old may create unnecessary doubts and uncertainties for the child, which may prevent them from enjoying their football and ultimately their performances may decline. Again, more education at an early age for the FDP players around the retain/release process, in addition to a later recruitment age may mentally prepare the players better for such disappointment, should they be released.

Zibung & Conzelmann, (2013) highlighted specialised club players (engaged in more football than average and explored in a few other sports during their childhood), were 2.0 times more likely to become a player at international level once an adult, whilst Erikstad et al., (2018), found higher self-regulated players were more likely to play at national level compared to their low self-regulated players, with high self-regulated players increasing their involvement peer-led practice by 6.7 hours per year, and 2.1 hours of coach-led practice per year, compared to low self-regulated players ($P<.001$). Results have highlighted that players with higher self-regulation (resilient, goal-directed attributes), as highlighted from Mills et al., (2012) as key attributes for success, increased their involvement in practice over 'free play', and as a result, were more likely to play at national level. However, Zibung & Conzelmann, (2013) also found cluster 4 (poly supportive club players, played less football than average but explored other sports intensively) were 2.1 times more likely to become a player at international level (Level 1). Additionally, Zibung & Conzelmann, (2013) only had one player achieving top level

performance as an adult within their study, with this player having an extreme high level of free play (z=4.94) and an above average activity in other sports (z=2.06), basketball, during their childhood. Results have indicated mix results, with data / results highlighting both the benefits of specialising in one sport, and the benefits of exploring other sports alongside their primary sport. We would argue opportunities for players to explore other sports whilst signed for a professional soccer academy at the FDP level would be beneficial. As highlighted earlier, this would provide a less 'elite' environment for the player to have sporting experiences within, without the doubts and uncertainties of the retain and release process. This would also provide a sport to fall back into or develop in further should they be released from their professional soccer academy. Further understanding on whether coaches feel players should be playing multiple sports whilst at a professional academy, will help the direction for future research.

Review of Literature

The objective of this research is to investigate the current literature available on TID processes taking place in professional soccer academies within the FDP for male youth soccer players. Following the results from the literature available, we aim to provide further research to gain additional insight into the TID processes within the FDP at professional soccer academies, providing future recommendations for further research within this field.

Results from the literature review have highlighted 1), players born earlier in their cohort year, are more likely to be favoured during the selection process within the FDP (RAE), 2) a lack of evidence/research around data used within the identification stage to support the practitioners selection decisions, 3) the regular selection/de-selection of players can create 'stress' and uncertainty for the players, which may affect performances, and 4), there is some evidence of playing multiple sports at a young age can benefit players opportunities in a single sport later in their development.

5.0 Based on the results, professional soccer academies are looking to recruit the best 'talent' from a young age, to try and embed the player into their club, with the potential of future adult success at the club. Clubs will support players through the different stages of 'skill acquisition', such as cognitive stage (players focusing on what they can do and how to do it), and associative stage (after unspecific amount of practice, performance starts to improve) (Williams & Ford, 2009) . Players to enter professional soccer academies arguably need to demonstrate a high level of skill acquisition during their trial period to 'catch the eye' of the scouts / coaches to have a chance of being selected. In relation to the RAE, players that are born earlier in the cohort year could have more general training time (number of months/years in training and sampling of sports) and/or their sport specific training age will be more advanced than players born later in cohort year, as the individual may have already started to specialise in a single sport already. As a result, players born earlier in the cohort year may demonstrate more advanced attributes relevant to the demands of the game, such as dribbling (technical), spatial awareness (tactical), speed and/or strength (physical), decision making (psychological), and competitiveness (social) to name a few examples. These advanced attributes will 'catch the eye' of the scouts / coaches during the identification stage compared to players potentially 11 months behind in their general training time and sport specific age. In relation to the physical side of the game, growth & maturation, can also have an impact on player selection. For example, chronological age (number of years and months you have been alive) can have a positive effect on players born earlier in the cohort year, as highlighted above, players will have more time/months sampling / specialising in sport compared to players born later in the cohort year. Arguably, players will become more proficient due to having more time to practice/play, giving the individual a more advanced 'technical age' (technical proficiency in a given task) (REF). Biological age is typically calculated through the maturity offset of the player (predicted years from peak height velocity). Simple regular (3-6 months) measurements of the players height can provide velocity curves (e.g., how fast a child is growing). In relation to TID, it is important to have information on how far away a player is from their peak height velocity, as players nearer to their peak height velocity are arguably more physical developed (e.g., muscle and bone development), resulting in performing certain skills to a higher level, such as sprinting, using their body against an opponent, striking a ball with more power. Players further away from their peak height velocity, arguing won't be able to perform certain skills to a high level yet, due to being further away / less developed in terms of muscle / bone development. As a result, it's important we try to further understand the processes within TID at professional soccer academies, such as important attributes for a FDP player, knowledge & understanding of the RAE, whether coaches use any data to support their selection decisions, and if there is a believe for any changes in terms of the current recruitment age. **Survey Study**

5.1 Introduction

As highlighted previously, the systematic review has provided a small quantity of research papers that specifically focuses on TID within the 5–11-year-old age bracket at professional

soccer academies. As a result, it is deemed appropriate for an additional research study to further examine this research area. This research study will investigate the current gaps within the results found so far from the systematic reviews, such as if the practitioners have been exposed to any RAE events during the identification stage, what type of testing they use during the identification stage (if any), their feelings on the EPPP guidelines in relation to the youngest age players can sign for a professional soccer academy, and whether there should be any flexibility in relation to playing other sports and/or players continuing to player for their grassroots football club in 'pressure free' environments. As a result, the researcher is hoping to find some correlations between the two research studies results and/or the new results providing new insight into this specific research area with potential growth for future research.

5.2 Methodology

An online survey was used to directly reach practitioners working within TID in professional soccer academies within the FDP. The researcher targeted practitioners through their own network, hoping to build the sample size through networking, instead of a strategic decision to target specific professional soccer academies. The online survey would enable the researcher to ask multiple questions to gather quantitative and qualitative data, based on the practitioners' opinions, thoughts, and experiences to date. The survey targeted practitioners working in professional soccer academies that are directly involved within the TID process, such as coaches, scouts, and recruitment officers. The survey also targeted professionals working within the FDP at their football club, to focus on the research question in hand. This study plans to analyse the data by analysing the importance of the data results through frequency and thematic analysis. A survey of this type was implemented to allow the researcher to engage

with numerous practitioners and professional soccer academies at one time, resulting in multiple data responses over a shorter time period.

5.3 Procedures

Prior to the survey going live, a pilot was undertaken to evaluate how the survey would work when participants were answering the questions, to ensure we were able to comprehensively collect the data required. The survey link was distributed to practitioners working within a professional soccer academy via email and/or LinkedIn, with instructions of the survey's purpose, followed by instructions for survey completion. The survey opened on Monday 14th March 2022 and closed on Monday 25th April 2022. Institutional ethics was achieved prior to the survey going live, and each participant had to agree to give consent to be included within the survey.

5.4 Measures

Online software (Qualtrics^{XM}, England) was used to create the survey regarding TID processes within professional soccer academies, with a focus on players within the FDP. The online survey consisted of 35 questions, with the full version available as an online supplementary material (Survey Results – Online Access).

Part 1 of the survey obtained consent from the participants. Part 2 of the survey focused on participant characteristics, experiences, and qualifications within soccer coaching/recruitment and within professional soccer academies to date. Part 3 of the survey focused on the participants knowledge of talent and TID, looking to gain a consensus on the definition of talent and TID (Brown, 2001 and Vaeyens et al., 2009), with practitioners able to share their own definition of 'talent' and 'TID' should they not agree with each of the provided definitions. Part 3 of the survey also investigated what resources/data are currently used to identify talent with the FDP, and what skills/attributes the practitioners deem the most valuable when

assessing FDP players. Part 4 of the survey introduced the RAE to the participants, gaining knowledge of the practitioner's awareness of the RAE, their opinion on whether they believe there is an unfair selection bias for players born earlier in the cohort year, and if they/their academy use any practices/tools to try and reduce the RAE. Part 4 of the survey also explored opinions and thoughts on subjects such as appropriate entry age into professional soccer academies, grassroots football, and other sport commitments. Finally, the survey asked one final question to determine if they would change any practices regarding how professional soccer academies recruit FDP players.

5.5 Participants

Nineteen male participants, aged between 25 – 58 years old, with a median age of 36 years old, agreed to take part in the study. In relation to soccer coaching experience, one participant had 5-6 years' experience, two had 7-8 years' experience, three had 9-10 years' experience, and 13 had 10+ years' experience. Regarding the participants coaching qualifications received from the FA in England, nine participants are FA UEFA A soccer coaching qualified, six FA UEFA B, one FA Level 2, and three stated other, such as one participant receiving their UEFA B qualification in Denmark. The FA also have specific TID courses, with ten participants receiving the entry level FA Talent Identification Level 1 qualification, eight the FA Talent Identification Level 2, and one 'other'. Seven participants have achieved the FA Advanced Youth Award within the Foundation Phase course designed for practitioners working in professional soccer academies within the FDP. Seven received a Batchelors degree, one Higher National Certificate and Diploma, four had master's degree, and one Premier League: Elite Heads of Coaching. All participants work within a professional soccer academy in England, with three working within a category 1 academy, nine in a category 2 academy, and seven working within a category 3 academy, based on the academy categorisation status, which in turn is based on the EPPP from the Premier League (Premier League, 2022). Based on the

participants current job roles, two are Academy Mangers, three are Head of Coaching, six are Phase Lead, one Full time coach, two Part time coach, two Head of Recruitment, two Recruitment Officer, two Part time scout, and two 'other'. Multiple answers could be selected for this question with various job roles within professional soccer academies combining two or more roles into one. Three participants have been working in a professional soccer academy within the foundation phase for 1-2 years, three for 3-4 years, four for 5-6 years, three for 7-8 years, and six for 10+ years. One of the participants predominantly works within the pre-academy age group (U6-U8), six predominantly work within the U9-U11/U12 age groups, and 12 predominantly work across both pre academy (U6-U8) and U9-U11/U12 age groups.

5.6 Statistical Analysis

Questions where respondents were asked to rank the importance of certain aspects using a Likert scale of importance were categorised into three subgroups, 1) strongly agree & agree, 2) neither agree nor disagree, and 3) disagree & strongly disagree. Subsequently, frequency analysis was used to rank the importance of the results based on the percentage, extremely important = 100% of respondents, >75% = very important, 55-75% = somewhat important, ~50% = not so important, and ~30% = not at all important, (Starling & Lambert, 2017). For multiple choice questions with one answer required, frequency analysis was also employed as follows: All = 100% of respondents, most = >75%, majority = 55 to 75%; Approximately half = 40 to 54%, approximately a third = 30 to 39%, and minority = ~ 29% (Starling & Lambert, 2017). Opened ended questions/answers were analysed using thematic analysis which allow the researcher to find patterns within and across the data. This would allow the researcher to further understand the experiences, viewpoints, and current practice taking place within professional soccer academies, helping the researcher to understand how the professionals working within the academies think, feel, and do, (Clarke et al., 2015). Thematic analysis involves a six-step process, 1) familiarising yourself with the data, 2) generating initial codes,

3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report/manuscript, with final codes and themes highlighted in table 9, (Kiger & Varpio, 2020). Final themes were related back to Williams and Reilly's, (2000) four stages in the process of searching for excellence or talent in sport: 1) detection, 2) identification, 3) selection, and 4) development (table 9). This allowed the researcher to align codes from the data into the different stages of searching for excellence or talent.

6.0 Results – Survey

Figure 2 presents the perceived best resource to recruit FDP players into a professional soccer academy. Grassroots football club (scouted) (84% - *very important*), pre-academy (U6-U8) (74% - *somewhat important*) and showcase fixtures (58% - *somewhat important*). Figure 3 highlights the perceived key skills / attributes an FDP must possess for potential future success. Psychological awareness (84% - *very important*), technical competency (79% - *very important*), social understanding (74% - *somewhat important*), physical attributes (68% - *somewhat important*), and tactical awareness (58% - *somewhat important*). Figure 4 highlights whether the practitioners use any data to support their selection decisions when assessing an FDP player. Relative age data, such as date of birth, (74% - *somewhat important*), physiological data, such as sprint and bleep tests (32% - *not so important*), Match data, such as the number of touches or sprints per match (16% - *not at all important*), and anthropometric measurements, such as height and weight (11% - *not at all important*). Figure 5 presents the tools/practices the practitioners will use during trial events. Participants deemed small-sided games (100% - *extremely important*), technical tests, such as dribbling and shooting tests (58% - *somewhat important*), social tests, such as teamwork and leadership (42% - *not so important*), psychological tests, such as reactions and decision making (37% - *not so important*), and physiological tests, such as sprint tests (16% - *not at all important*). Table 7 presents the findings from the multiple-choice questions of the survey. *Most* (89%) agreed with the

definitions for talent & talent identification (table 7). *Most* (79%) believe they have full knowledge and understanding of the RAE and how this may affect player selection/deselection. *Majority* (58%) believe there is an unfair selection bias towards players born in the first half of the selection year in professional soccer academies. However, the *majority* (58%) have not been shown any tools/practices that can be used during trial events that can help them understand the relative age of each player better. When asked which age they believe professional soccer academies should sign a player, *approximately a third* (37%) stated 9-10 years old, which is the current age under EPPP guidelines (Premier League, 2022), and *approximately half* (42%) felt this should be increased to 11-12 years old. Participants were also asked if a player signs for a professional academy, at which age group do they believe they should stop playing for their local grassroots football club. *Approximately a third* (37%) felt this should be increased to U11-U12, with a *minority* (16%) stating U9-U10, which is the current age group players must stop playing for their grassroots football club once signed at a professional soccer academy under EPPP guidelines (Premier League, 2012). All participants (100%) believe it is *extremely important* for foundation phase players to experience other sports whilst playing within a professional soccer academy. As highlighted earlier, results from the open questions, formed codes and themes through thematic analysis (table 9), which was related back to Williams & Reilly (2000) four stages of searching for excellent/talent in sport to allow the researcher to align the data with the quantitative data when critiquing within the discussion section of the survey.

Figure 2. Likert scale: best resource to bring FDP players into a professional soccer academy.

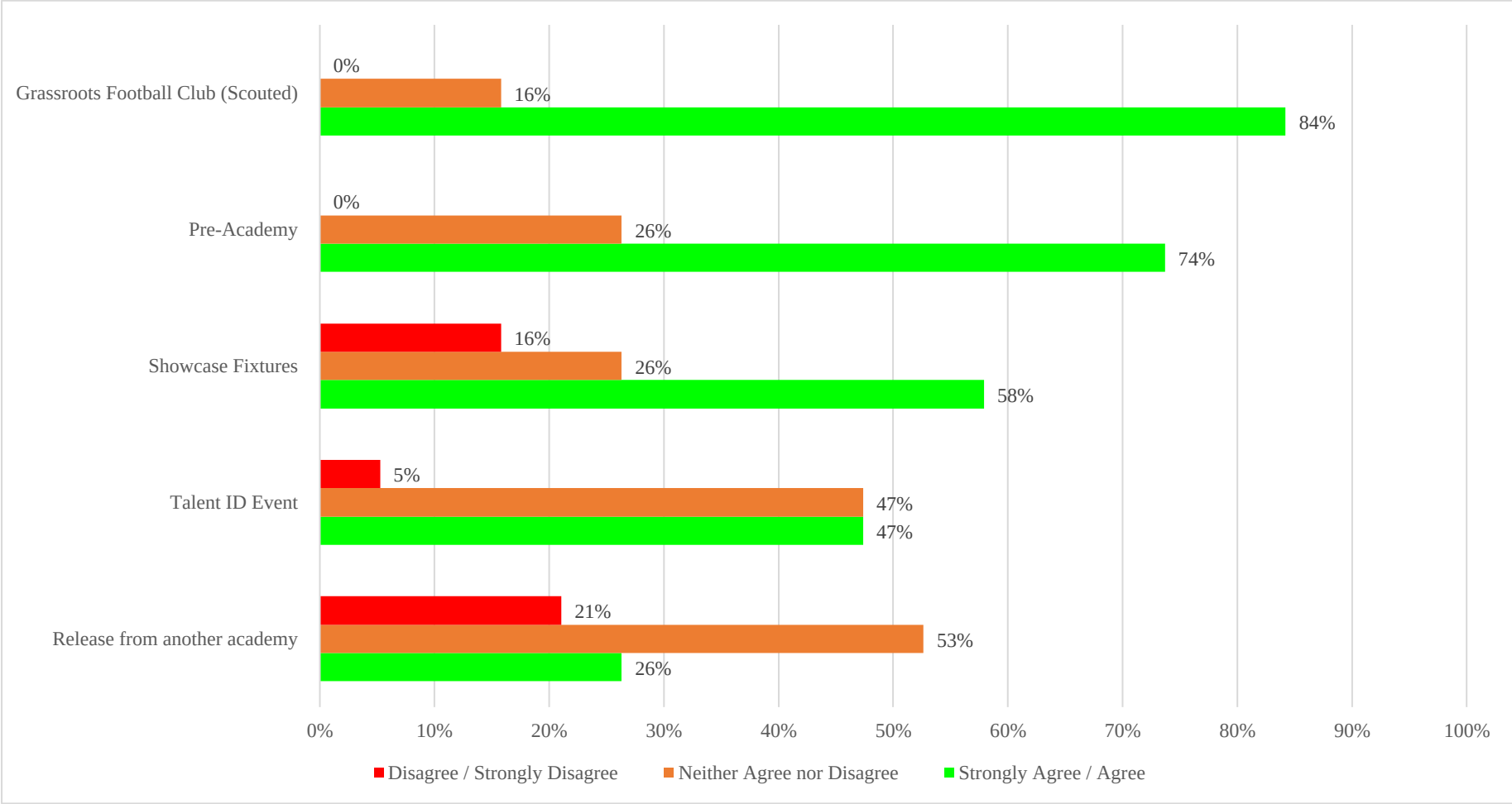


Figure 3. Likert scale: attributes / skills deemed important for an FDP player to possess for potential success.

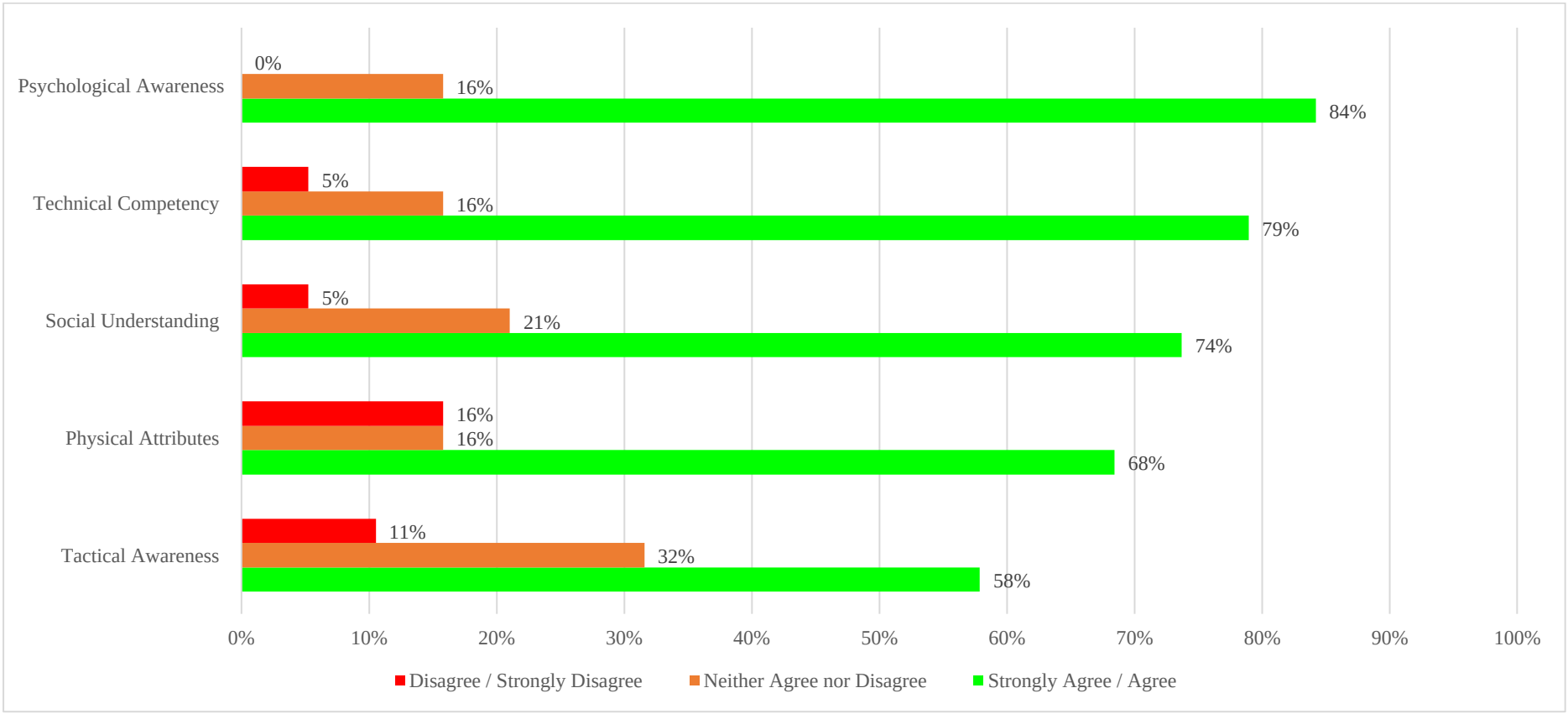


Figure 4. Likert scale: data used to support practitioners' decisions when selecting an FDP player.

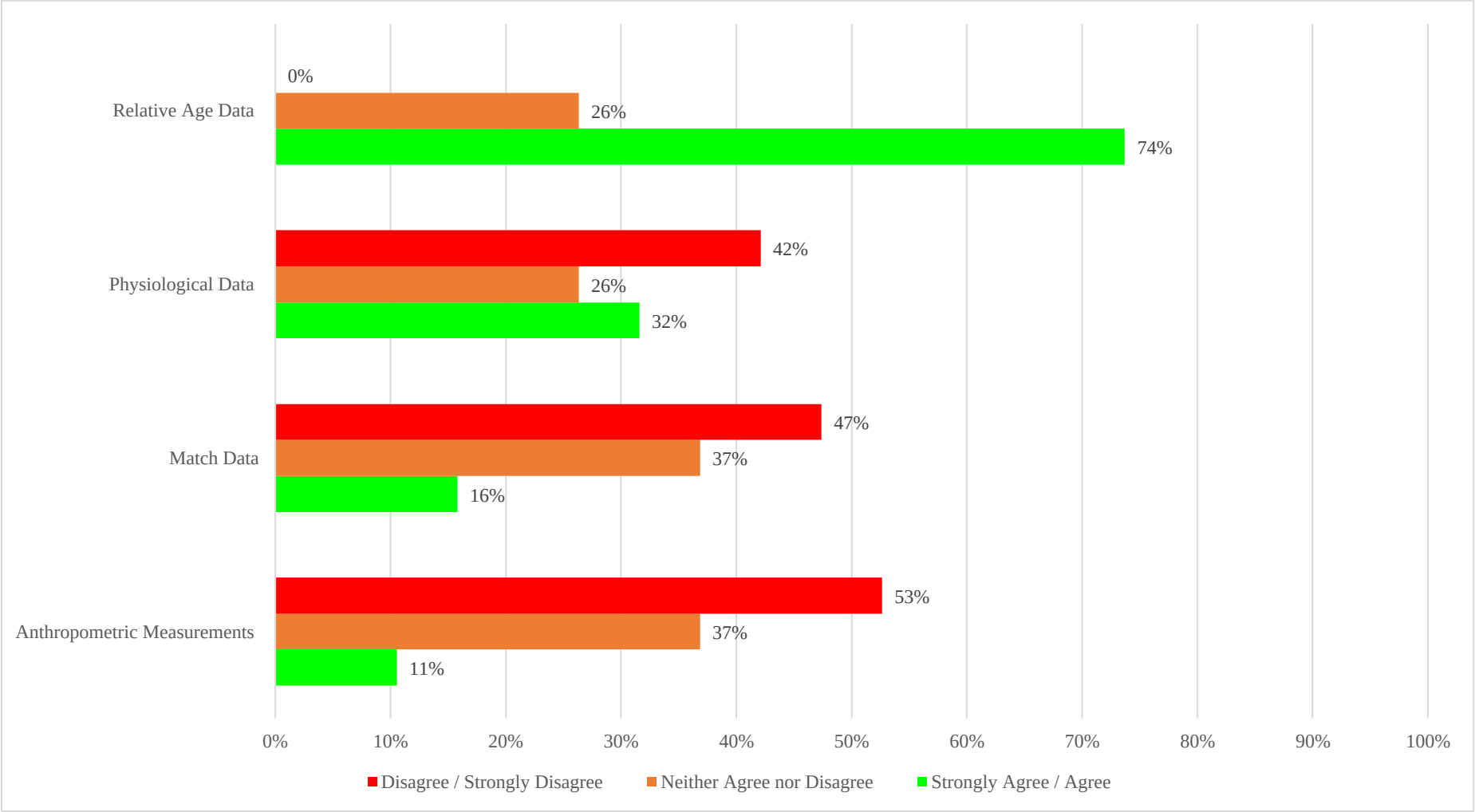


Figure 5. Likert scale: tools/practices used when assessing FDP players during trial events.

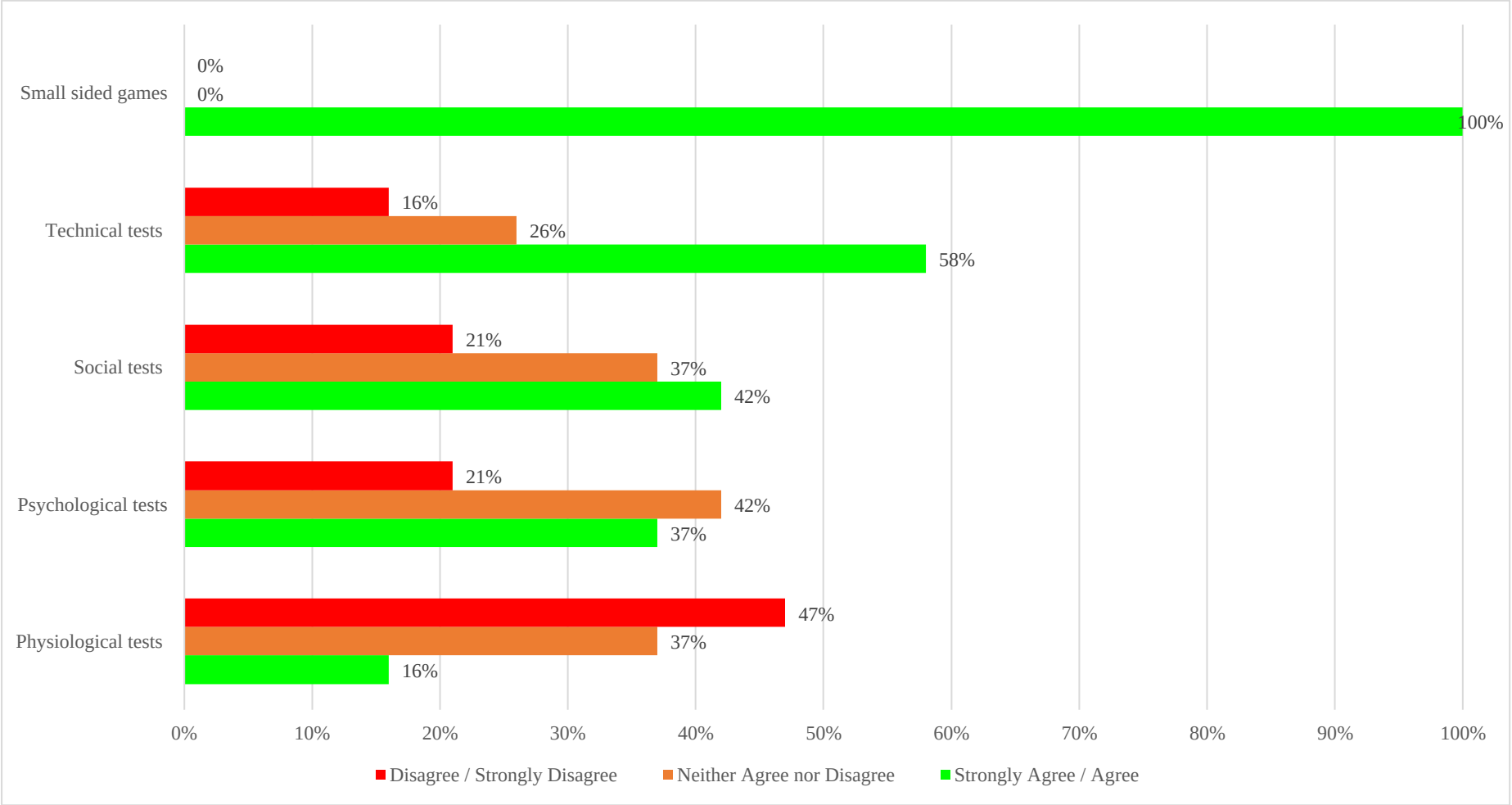


Table 7. Multiple choice questions: talent, RAE, age appropriateness, and early specialization.

Statement / Question	Response
Do you agree with the following definition of 'Talent'? ‘‘*a special, natural ability*’ ’and ‘‘*a capacity for achievement or success*” (Brown, 2001, pg. 3)	YES: 89% (17) *Most* NO: 11% (2) *Minority*
Do you agree with the following definition of 'Talent Identification'? “*To identify young athletes who possess extraordinary potential for success in senior elite sport, and to select and recruit them into talent promotion programmes*” (Vaeyens et al., 2009, pg. 1,367).	YES: 89% (17) *Most* NO: 11% (2) *Minority*
I have full knowledge and understanding of the Relative Age Effect (RAE) and how this may affect player selection/deselection.	Strongly agree/agree: 79% (15) *Most* Neither agree nor disagree: 5% (1) *Minority* Disagree/strongly disagree: 16% (3) *Minority*
Have you been shown any tools/practices that can be used during trial events that can help you understand the relative age of each player?	YES: 42% (8) *Approximately half* NO: 58% (11) *Majority*
Do you think there is an unfair selection bias towards players born in the first half of the selection year (Sept-Feb) in professional soccer academies?	YES: 58% (11) *Majority* NO: 42% (8) *Approximately half*
At which age do you believe professional soccer academies should be allowed to sign a player?	5-6 years old: 0% (0) 7-8 years old: 0% (0)

Statement / Question	Response
	9-10 years old: 37% (7) *Approximately a third* 11-12 years old: 42% (8) *Approximately half* 12+ years: 21% (4) *Minority*
Once a player signs for a professional academy, at which age group do you believe they should stop playing for their local grassroots football club?	U9-U10: 16% (3) *Minority* U11-U12: 37% (7) *Approximately a third* U13-U14: 26% (5) *Minority* U15-U16: 5% (1) *Minority* They should be allowed to do both during their time at an academy: 16% (3) *Minority*
Do you believe it is important for foundation phase players to experience other sports whilst playing within a professional soccer academy?	YES: 100% (19) *All* NO: 0% (0)

Table 8. Open-ended questions – Responses.

Statement / Question	Responses
Does not agree with the definition of talent ‘‘*a special, natural ability’ ‘and ‘‘a capacity for achievement or success*” (Brown, 2001, pg. 3). Participant provided an alternative definition.	*“A special ability that has to be nurtured and requires hard work to achieve success”* *“Talent will not necessarily be a capacity for achievement or success”*
Does not agree with the following definition of 'Talent Identification'? “*To identify young athletes who possess extraordinary potential for*	*“Talent identification is not restricted to young athletes”*

Statement / Question	Responses
success in senior elite sport, and to select and recruit them into talent promotion programmes" (Vaeyens, Güllich and Warr, 2009, pg. 1,367). Participant provided an alternative definition.	*"To identify young athletes who possess a high potential for success in senior elite sport and to recruit them into a talent programme"*

Table 9. Opened-ended questions – Thematic Analysis

Statement / Question	Codes	Themes
Any other good resources to bring in an FDP player into a professional soccer academy.	Development Centres / Private Academies Bring a friend Schools	Detection
Any other skills / attributes that are deemed important for an FDP player to possess, to have a chance of being selected by a professional soccer academy?	Hard work Respect Personality Learning	Selection
Any other data that is used to help with selection decisions.	Don't use data Maturation / physical stats Performance ratings	Selection
Any other tools / practices used during Talent ID events.	NO Races / challenges	Identification

Statement / Question	Codes	Themes
Any other tools/practices used during trial events that can help practitioners understand the RAE.	Birth quartile events Age numbered shirts / bibs Bio-banding Average age events	Identification
Do you think there is an unfair selection bias towards players born in the first half of the selection year (Sept-Feb) in professional soccer academies? If yes, please state why.	Physical advantages Results before development Current talent / ability	Selection
Additional comments around the suitable recruitment age for an FDP player into a professional soccer academy.	Fun & enjoyment Prevent early specialization Predicting future talent Pressure Later recruitment age	Selection
Additional comments around the benefits of FDP players experiencing other sports whilst at a professional soccer academy.	Physical development Prevent early specialization Social development Psychological development Transferrable skills	Development

Statement / Question	Codes	Themes
State one change on how professional soccer academies recruit FDP players.	Pre-academy regulations Combined academy & grassroots approach Better release support network Monitor players at grassroots level Multi sports approach at TID stage Reduce travel recruitment time Increase first recruitment age	Detection Identification Selection Development

Key findings from the open-ended questions suggest that *most* (79%) of the participants feel they have full knowledge and understanding of the RAE and how this may affect player selection/deselection. *Majority* (58%) feel there is an unfair selection bias towards players born in the first half of the selection year (Sept-Feb). However, *majority* (58%) have not been shown any tools/practices that can be used during trial events that can help them understand the relative age of each player. *Approximately half* (42%) feel that players should sign with a professional soccer academy later into their development at 11-12 years old, compared to *approximately a third* (37%) stating that this should stay the same under EPPP guidelines (U9). Finally, *approximately a third* (37%) of participants stated that players should be able to continue to play for their local grassroots club alongside their academy until the U11-U12 age group, with a *minority* (16%) stating players should stop playing for their local grassroots football club at the U9/U10 age group, which is the current guidelines under the EPPP. *All* (100%) of participants believe it is important for foundation phase players to experience other sports whilst playing within a professional soccer academy. **7.0 Discussion**

7.1 Attributes & Testing

Figure 3 highlighted the perceived key skills / attributes an FDP player must possess for potential future success. All key skills / attributes (psychological awareness, technical competency, social understanding, physical attributes, and tactical awareness) were perceived with some level of importance. This ultimately highlights that FDP players must excel in a number of different areas to be selected. However, for the coaches to fully understand each skill / attribute, there must be some level of testing during trial events to highlight these attributes. For example, psychological attributes, such as decision making and reactions, was rated the highest (*very important)* from the participants, as the key attribute / skill they look for within an FDP player. However, psychological testing was deemed *not so important* (figure 5), when asked what type of tools/practices the practitioners would use to test the key attributes of

the FDP players during trial events. So, how would the practitioners test the perceived key skill/attribute (psychological skills) during trial events if they don't tend to use tests to highlight psychological skills such a quick reactions and decision making? Results from figure 5 may provide some insight into the question raised. Figure 5 highlighted the use of small-sided games during trial events as an *extremely important* tool/practice to use when assessing/observing FDP players during trial events. Arguably, the game of soccer involves lots of psychological decisions (e.g., when to pass, dribble or shoot), particularly in smaller formats such as 3v3s, due to the reduced size in playing area. Within an observed 10-minute 3v3 game from the FA, each outfield player had 71 touches on average, compared to 57 touches within a 5v5 game, and 37 touches within a 7v7 game, (FA, 2022). Jones & Drust (2007) also examined the differences between an 8v8 and 4v4 format with elite youth soccer players, with a mean ± SD age of 7 ± 1 years from one single Premier League academy. Reducing the number of players in the game considerably increased the number of individual ball contacts per game, from 13 ± 7 in 8v8 to 36 ± 12 in 4v4 (P<0.05). As the results highlight, small-sided games will provide players with more touches of the ball, arguably producing more psychological actions such as quick decision making on when to pass, dribble or shoot, providing practitioners with a simple tool to bring out lots of psychological actions for the players, which the coaches can observe and assess during trial events. However, we would further encourage the practitioners to increase their knowledge of TID and FDP players through two FA courses. 1) The FA Advanced Youth Award within the FDP, only seven participants from the survey have achieved this qualification. This course is especially designed for academy coaches working within the FDP, to further their knowledge on all aspects that are relevant for FDP players, such as the technical and psychological corner of the game for 5–11-year-olds. 2) The FA Talent Identification courses, 18 out of the 19 participants from the survey are only qualified up to Level 2, with the course going up to Level 5. Coaches are heavily relied upon to observe and

assess players during trial events, so coaches need to be fully aware/educated on how to make justified, evidence-based decisions when recruiting players into their club, which the FA Talent Identification courses from Level 3 upwards will provide.

7.2 Relative Age Effect (RAE)

Various studies from the systematic review (Huertas et al., 2019, Kelly et al., 2020, Mujika et al., 2009, and Patel et al., 2019) (table 3) have highlighted the RAE to be present within professional soccer academies in England and Spain, within the FDP. Results from this survey (table 7) state that *most* of the participants have full knowledge and understanding of the RAE and how this may affect player selection/deselection. Participants highlighted the use of RAE data, such as date of birth, as *somewhat important,* with the *majority* of participants stating they believe there is an unfair selection bias towards players born in the first half of the selection year (September – February) within professional soccer academies. Results from the thematic analysis (table 9), highlighted codes within the theme 'selection' such as 'physical advantages', 'results before development', and 'current talent/ability' as some of the reasons for the perceived unfair selection bias. Additionally, the *majority* of participants (table 7) have not been shown any tools/practices that can try to reduce the RAE during trial events. Based on the results above, practitioners making the selection decisions probably have a good understanding of, 1) what the RAE is, and 2), how this effects the selection process. Arguably, this knowledge would have been gained from in house training events on the RAE, and the RAE being highlighted within the EPPP under the 'Talent Identification' section of the plan as an area to consider when recruiting players into academies (Premier League, 2022). Based on the results, the third and final point is the area that will need further education within the soccer academy system, which is 3) what the practitioners can do to counteract the RAE during trials, to avoid selection bias. At present, as highlighted in the results (figure 4), practitioners use RAE data by looking at the players' date of birth and the month they were born in the selection year, but

arguably don't know how to use this data effectively to support their selection decisions, based on the high representation of BQ1 players in professional soccer academies, (Huertas et al., 2019, Kelly et al., 2020, Mujika et al., 2009, and Patel et al., 2019). Table 7 also highlighted that the *majority* of the sample have not been shown any tools/practices to try and counteract the RAE during trial events. As highlighted within the RAE discussion section of the systematic review of literature, tools/practices such as Mann and Ginneken, (2017) will be vital to try and eliminate selection bias during the identification stage. There have been some promising results from the thematic analysis (table 9) theme 'identification', with codes highlighting the use of birth quartile events, age numbered shirts/bibs, bio-banding, and average age events. As highlighted in the RAE discussion section of the systematic review, we would argue it is now time for practitioners to be educated on how to use simple tools such as Mann and Ginneken, (2017), which as a result may decrease selection bias during the identification stage, with the potential long-term results of reducing the RAE within professional soccer academies. Additionally, providing more opportunities for BQ4 players, such as BQ4 trial events, will not only provide more opportunities for these players to trial and showcase their ability, but the observers will also gain experience of observing players of similar relative age alongside each other at a trial event. The thematic analysis results (table 9) have highlighted the use of such events which is promising, however, with the *majority* of the sample stated they have not been shown any tools/practices to try and reduce the RAE during trial events, suggesting more work is needed in this area to create a fair selection process in the FDP.

7.3 The 'Naked Eye'

Results have indicated that practitioners tend not to use much data to support their selection decisions when assessing an FDP player (figure 4). Physiological data (e.g., sprint tests) was deemed *not so important*, and match data (e.g., distance covered) and anthropometric measurements (e.g., height) were deemed *not at all important* during an FDP player's trial

period. Thematic analysis results (table 9) also highlighted within the theme 'selection' codes such as practitioners 'don't use data'. This agrees with the Ford et al., (2020) survey within TID and talent development processes for youth soccer academies around the world, who found only 17% of clubs to be using soccer statistics at the FDP level. Arguably, this indicates a lot of the selection decisions are based on opinions and observations of the 'naked eye', with practitioners basing their decisions on their experience and knowledge of FDP players to date, and the playing philosophy of the club and whether the player will suit their style of play. Could professional soccer academies do more during the identification stage to support practitioners with these selection decisions? As highlighted in the anthropometric and physiological discussion section of the systematic review, Fenner et al., (2016) created a simple small-sided game format that also implemented the use of GPS devices. We suggest that clubs should consider using the resources available at the club not just with the players already signed (development stage), but with players in the identification stage, (Williams & Reilly, 2000). Clubs should start to use GPS devices to track data such as high-speed running and distance covered to provide data alongside their 'naked eye' observations of the trialist. This relates to performance as clubs may be looking for a player in a certain position that has certain physical attributes / strengths, such as a full back or wing back that requires both speed and is able to cover long distances in matches due to the attacking and defending demands of this position. Additionally, as presented by Fenner et al., (2016), could professional soccer academies look to produce a TP's and GTSC system during the small-sided games in trial events that gives the observers a set criterion to mark against each player, which they can then compare against and discuss afterwards? This could be produced by multi-disciplined practitioners within the club, to produce a set criterion based on the players age (e.g., FDP), demands of the game (e.g., quick decision making) and their suitability to the club's philosophy / style of play (e.g., individual technique). Within the 'selection' theme of the thematic analysis (table 9), one code

'performance ratings' highlighted the use of different coaches / scouts' performance ratings, linked to the club's main strengths (core values) when assessing players. However, results from this survey have highlighted the lack of use of such assessment tools/data (figure 4 and 5) to support the practitioners during trial events / selection decision meetings. We recommend when discussing whether to sign an FDP trialist or not, practitioners should use the following to further support their decisions, resulting in a more results/data driven decision, rather than a 'naked eye' opinion-based decision.

1. Technology made available to be used during trial events (GPS)
2. A 'game technical scoring chart' created by multi-disciplined practitioners within the club, linked to the club's core values, style of play, and individual attributes required.
3. Track total points (Fenner et al., 2016) of each player within the heavily used small-sided games TID tool.
4. Use the experience and knowledge of the coaches working within the FDP to gain their opinions and thoughts of the players, which is invaluable to the recruitment process.

7.4 Recruitment Age

A*pproximately a third* (table 7) of participants wanted the minimum recruitment age to stay the same at U9/U10 under EPPP guidelines (Premier League, 2022), and *approximately half* would like this increased to the U11/U12 age group. Additionally, *approximately a third* believed in increasing the age for when players should be made to stop playing for their local grassroots football club to U11/U12, with a *minority* stating they should stop at the U9/U10 age group, which is the current rules under EPPP guidelines (Premier League, 2022). The theme formed through thematic analysis (table 9) 'selection', codes highlighted areas such as 'fun & enjoyment', 'prevent early specialization', predicting future talent', and 'pressure' as some of the reasons for a shift to a later recruitment age. The participants shared their views on their answers, stating clubs need to "*shift away from early professionalisation"* with the FDP

being *"too early to call future success".* Another suggestion from the participants was for FDP players to attend sessions but with no official club registration until youth development phase (U12-U16). To add to the results from the survey, the results from the childhood experiences section of the systematic review, Clarke., et al (2018), highlighted U11 academy players felt their status as talented footballers was fragile due to the retain/release process, and their talent status was under constant risk, adding pressure (as highlighted above) to FDP players during the development stage. Based on the results both from the systematic review and survey study, we recommend professional soccer academies to bring players into the system at a more developed age, such as the 11–12-year-old age bracket as suggested by the participants in the survey study. This would then allow the academies to support the grassroots clubs / coaches in developing better coaches and better development environments for the players, whilst keeping them in a less pressured environment at a young age. his would allow the scouts/coaches time to monitor FDP players of interest over various seasons, building portfolios of observations and video footage to support them when making their decisions further down the line on whether to offer the player a contract. Alternatively, as mentioned by one of the participants within the study, could clubs create sessions at the FDP level for players of interest to attend periodically, allowing the coaches and scouts to observe, assess and support (develop) the players further, whilst in a pressure free environment, with selection decisions not made until U12, allowing more time to create large portfolios on the players. Arguably, this would potentially reduce the high selection/de-selection rate as highlighted by Ford et al., (2020) and Gullich (2014), as scouts and coaches have more time to make more informed selection decisions. Additionally, this allows for more time to educate the players/parents of the expectations of academy soccer, and the retain & release process. For example, if a player is to be released, the youngest age would be 14 years old (U14), after receiving a two-year contract at U12. As a result, players/parents may be more emotionally ready/prepared for this

environment and the retain/release process. Finally, the recruitment travel time as highlighted earlier, should be decreased under EPPP guidelines to localise recruitment further to remove competition between clubs for young players.

The objective of this research is to investigate the current literature available on TID processes taking place in professional soccer academies within the FDP for male youth soccer players. Following the results from the literature available, we aim to provide further research to gain additional insight into the TID processes within the FDP at professional soccer academies, providing future recommendations for further research within this field.

The overarching question: can practitioners predict talent at the age of 8? No one can predict the future and what is happening at present is practitioners are making their decisions based on 'current talent/ability', and their knowledge of players within the FDP and what perceived stronger attributes they must possess to have a chance of being successful. Results from the literature review have suggested players born earlier in their cohort year are favoured in the selection process, whilst the survey results have suggested that practitioners deem to have good knowledge and understanding of the RAE but haven't been shown any innovative tools/practices to help them to try and reduce the RAE during the identification stage. In the current recruitment process within professional soccer academies, we argue clubs must do more during the recruitment process to try and reduce the RAE, such as BQ groupings, average age events, which don't require much data and allows the coaches/scouts to see players train/play alongside players of similar age, rather than cohort year groups in a 'one size fits all' approach. Additionally, in its current format, could professional soccer academies use simple forms of data to support their selection decisions? Results from the literature review and the survey have suggested a lack of data used within the identification stage. Suggestions of the use of GPS

devices or the creating of a technical scoring chart on a small group of trialists in their final stage of the trial period to provide data on sprint speeds etc. could be beneficial. Lastly, survey results have indicated in favour of increasing the lowest recruitment age to 11-12 years old (U11/U12). This would enable clubs to build up portfolios on players across a number of seasons, whilst inviting them into their academy system on an ad hoc basis. Once the selection decision time arises, arguably clubs will have more information / data on the player to support their selection decision.

8.0 Limitations

The main limitations to this systematic review are as follows. 1), TID research papers that are dedicated to the FDP age bracket, 2), majority of papers focusing on how they test players once they have been signed and within a professional soccer academy environment (i.e., selection and development stages), with limited amount of literature investigating the detection and identification stages (Williams & Reilly, 2020), and 3), majority of studies providing lots of data on the RAE, with only one paper providing an insight of how to counteract this phenomenon. As a result, the current literature available still leaves many unanswered questions.

The first limitation of the survey study was the number of coaches recruited (*n*=19), with more participants undoubtedly providing a more robust consensus on the talent identification process. Leaving the online survey open for longer may have resulted in more participants within the survey. A second limitation of this study would be that the data received from the answers is all based on the practitioners' experiences to date. Each participant and professional soccer academy will differ in terms of structure, funding (EPPP categorisation), and playing style. A future longitudinal study might look to recruit quantitative data on the amount of FDP

players that come into trial each season, their decision following their trial, and if they are still within this professional soccer academy the following season. As a result, this might highlight the complexity of identifying talent within the FDP, and also highlight the high turnover rate of FDP players coming in and out of academies following their trial period, which may push for a consideration on a later recruitment age, as suggested earlier. A third limitation was within question 21 of the survey, surrounding the type of data the participants may or may not use when assessing players (figure 4). Question 19 gives the option of 'psychological awareness' when asking around key skills / attributes of an FDP players, and question 23 gives the option of 'psychological test' when asking around the type of tests they may or may not use during trial events. However, on question 21, there was no option to choose 'psychological data'. With psychological attributes rated the highest in the results, if would have been beneficial to see if the participants use any type of data to measure these attributes. Additionally, during the survey for participants, clarification was needed for each of their selections in the Likert scale questions. For example, 'psychological awareness', what is psychological awareness and some examples of psychological awareness within a soccer context would have made the selection decision for the participants easier to clarify. As a result, participants may have selected an option which they perceived as something different to the researcher. Finally, questions could have considered whether the participants received any 'in house training' in relation to TID processes at their professional soccer club. The survey only asked whether they have received governing bodies qualifications, with staff tending to go onto the next level every 2-3 years. It would have been useful to know what type of training (if any) they get from their club around TID process, to further their knowledge.

9.0 Conclusion

As highlighted throughout the study, there is limited research that focuses on the FDP during the identification stage of recruitment in professional soccer academies. Current research

highlights that younger athletes are unreasonably discriminated during the selection process into professional soccer academies within the FDP, through the notion of the RAE. Minimum research has been identified during the identification stage, with majority of testing trying to distinguish between ability levels taking place once players are signed for an academy (talent development). Results have also highlighted the complexity of predicting if a player within the FDP will make it a professional soccer player when reaching adult / elite performance. Lastly, results haven't provided a clear conclusion if early specialization will benefit a player looking to become a professional soccer player. More studies with a focus on the FDP and within the identification stage would help us gain a better understanding of the challenges that practitioners face during the identification stage. Additionally, more surveys and/or semi structured interviews with the practitioners working within the FDP in professional soccer academies would help shape future research based on their opinions, experiences, and challenges faced within the identification stage.

Practical Applications

The research survey that followed the systematic review looked to gain further insight into the TID processes with professional soccer academies. The results from this survey have highlighted the following conclusions/recommendations.

1. The overarching conclusion is that selection decisions for FDP trialists is mainly based on the opinion and observations of the 'naked eye' from practitioners, with scouts and coaches relying on their past experiences and knowledge of FDP players. Further education in relation to TID and FDP players is recommended based on lack of practitioners qualified in TID and FDP specific courses run by the FA.
2. A lack of data is used to support these decisions and more innovative tools and technology is needed during the identification stage to help separate 'talent', such as

Mann & Ginneken, 2017 age ordered shirt numbering system, and Fenner et al., 2016, use of GPS trackers & small sided games maycreate a fairer selection process during the identification stage

Lastly, we recommend (based on the evidence provided in the survey study) that professional soccer academies and grassroots football clubs work closer together to build 'portfolios' of players across many seasons, particularly in the FDP. If a later recruitment age was implemented, the portfolio of observations, notes, data and video footage could be accumulated, which would offer more time on their selection decisions, providing a more thorough selection process. However, for this to happen, a change in the EPPP's lowest age recruitment (8 years old), would need to implemented by the EPL & FA.

An investigation of talent identification processes in the youth academies of professional soccer clubs for foundation phase players (5-11 years old), has been concluded through a systematic review of the current literature and a survey to gain further insight from the practitioners working in the professional soccer academies. A lack of research within the identification stage of searching for talent is apparent throughout the current literature, with the majority of literature tending to focus on the development stage. Additionally, a lack of research within the FDP, with researchers tending to focus on ages 12 and above. Results have highlighted practitioners working with the FDP tend to not use any data to support their selection decisions, with decisions made based on opinions and observations of the 'naked eye', hence the over population of BQ1 players within professional academies at present.

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