

Central Lancashire Online Knowledge (CLOK)

Title	Establishing consensus of position-specific predictors for elite youth soccer in England
Type	Article
URL	https://clock.uclan.ac.uk/id/eprint/26436/
DOI	https://doi.org/10.1080/24733938.2019.1581369
Date	2019
Citation	Roberts, Simon J., McRobert, Allistair P., Lewis, Colin J. and Reeves, Matthew J. (2019) Establishing consensus of position-specific predictors for elite youth soccer in England. <i>Science and Medicine in Football</i> , 3 (3). pp. 205-213. ISSN 2473-3938
Creators	Roberts, Simon J., McRobert, Allistair P., Lewis, Colin J. and Reeves, Matthew J.

It is advisable to refer to the publisher's version if you intend to cite from the work.
<https://doi.org/10.1080/24733938.2019.1581369>

For information about Research at UCLan please go to <http://www.uclan.ac.uk/research/>

All outputs in CLOK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the <http://clock.uclan.ac.uk/policies/>

Title: Establishing consensus of position-specific predictors for elite youth soccer in England

Abstract

Purpose: To construct a valid and reliable methodology for the development of position-specific predictors deemed appropriate for talent identification purposes within elite youth soccer in England. **Method:** $N = 10$ panel experts participated in a three-step modified e-Delphi poll to generate consensus on a series of generic youth player attributes. A follow up electronic survey completed by coaches, scouts and recruitment staff ($n = 99$) ranked these attributes to specific player-positions. **Results:** A final list of 44 player attributes found consensus using the three-step modified e-Delphi poll. Findings indicated that player-positional attributes considered most important at the youth phase are more psychological and technical than physiological or anthropometric. Despite ‘hidden’ attributes (e.g. coachability, flair, versatility, vision, etc.) finding consensus on the e-Delphi poll, there was no evidence to support these traits when associated with a specific playing position. **Conclusion:** For those practitioners responsible for talent recruitment, our findings may provide greater understanding of the multiple attributes required for some playing positions. However, further ecological research is required to assess the veracity of our claims.

Keywords: talent identification, youth, expertise, recruitment, e-Delphi

31 **Introduction**

32 Talent identification of youth soccer players is an important function of professional clubs in
 33 England and Wales and continues to receive research attention in the sport, exercise and
 34 pedagogic literature (Unnithan et al., 2012; Fenner, Iga & Unnithan, 2016; Larkin & Reeves,
 35 2018). In the pursuit of this goal, the English Premier League introduced the Elite Player
 36 Performance Plan (EPPP) in an attempt to increase the number of players graduating from clubs
 37 who participate in the top four professional leagues in England (i.e. English Premier League,
 38 Championship, League 1 and League 2) (Towilson et al., 2017). Professional clubs in England
 39 and Wales annually invest between £2.3 and £4.9 million in their youth (i.e. U12 to U16 years:
 40 Premier League, 2011) talent identification and development environments (Tears, Chesterton
 41 & Wijnbergen, 2018; Premier League, 2011). Such investiture in the academy infrastructure
 42 has seen an increase in the number of state-of-the-art, purpose-built facilities, all designed to
 43 support talented players' development and progression (Haugaasen, Toering, & Jordet, 2014).
 44 Despite this investment, however, evidence demonstrates that maintaining a place in an
 45 academy is challenging, with ~90% of youth players in England and Wales failing to achieve
 46 full professional status (Anderson & Miller, 2012).

47 Regarding previous talent identification research, studies have explored the skills and
 48 qualities that may discriminate between skilled and less-skilled youth soccer players. (Coutinho
 49 et al., 2016; Coelho e Silva et al., 2010; Vaeyens et al., 2006). For instance, skilled youth
 50 players tend to be heavier, taller (Coelho et al, 2010), and faster (Gil et al., 2014) than there
 51 less skilled counterparts. In a team sport such as soccer where body size, strength and power
 52 also contain advantages (Boone et al., 2012), the selection process has resulted in the over-
 53 representation of relatively older players due to advanced normative growth advantages around
 54 the time of age of peak height velocity (Cobley, Schorer, & Baker, 2008; Philippaerts et al.,
 55 2006).

Whilst these studies provide useful, informative data, the assumption that talented youth players can replicate features of peak adult performance appears to be flawed (Baker, Schorer & Wattie, 2018; Vaeyens, et al., 2008). This predictive, early selection approach is problematic for a number of reasons: (i) talent identification and development is reported to be complex, multifaceted and non-linear with confounding elements such as growth and maturation which are difficult to control (Leyhr et al., 2018; Malina, 2008) and (ii) current performance does not always translate into future potential (Vaeyens et al., 2008; Unnithan et al., 2012).

Talent identification continues therefore to rely on subjective evaluations of players by recruitment staff (Christensen, 2009), and for those individuals responsible for identifying talented youth (i.e. talent scouts, academy coaches, recruitment staff, etc.) the job is complex, as no objective or valid indicator or measure of talent exists (Baker, Schorer, Wattie, 2018). This state of affairs was illustrated recently in a series of talent studies conducted in elite youth soccer environments in England, where the complex, and at times confused relationship between the organisational requirements, and the ‘on the ground’ work undertaken by recruitment staff was exposed (Reeves et al., 2018a; Reeves et al., 2018b; Larkin and Reeves, 2018). For instance, the multidimensional nature of talent in youth soccer can include prognostic dimensions such as ‘physical abilities’, ‘fitness requirements’, ‘technical skills’, ‘perceptual-cognitive skills’ and ‘personal skills’ (Murr et al., 2018; Vrljic & Mallet, 2008). Due to the multifaceted nature of talent some have called for more objective predictors of future potential (i.e. Larkin & O’Connor, 2017) or research designs that are in a position to infiltrate applied talent identification practice (Collins, MacNamara, & Cruickshank, 2018).

Indeed, our recent talent identification work with talent scouts, heads of recruitment and academy coaches, provides some initial evidence to support this supposition. Using a verbal reporting protocol, we captured concurrent cognitions of recruitment staff during formal

11 v 11 competition (under 16s) at a professional English Premier League Academy. Content analysis of the concurrent verbal reports indicated that the recruitment staff openly disagreed about the skills and attributes required for identical playing positions. Furthermore, in a series of face-to-face follow up interviews, discrepancies between their own judgements and their club's recruitment philosophy were also captured (Lewis et al., in review).

Soccer is a team sport where each outfield playing position has role responsibilities that are both unique and common to other positions in the team (Murr et al., 2018). Due to the continuous, invasion-type nature of soccer, in a natural sequence of events players are required to act as either attackers or defenders depending upon the configuration of play (Gréhaigne, Richard & Griffin, 2005). The rules of soccer do not constrain players to zones and so they are free to move up and down the field exploiting the width and depth of the playing area by creating or reducing space and time to achieve the game's primary objective (e.g. score or not concede goals). Despite previous attempts to establish a relationship between playing position and specific anthropometrical and fitness performance characteristics (Bidaurrazaga-Letona et al., 2015; Towlson et al., 2017) there currently appears to be no definitive agreement concerning position-specific differences and the attributes of youth players. For instance, Deprez et al., (2015) reported anthropometric, physical fitness and functional profile differences in 744 high-level soccer players aged 8 – 18 years. Amongst the outfield positions defenders were observed to be taller than midfield and attacking players. Midfield players performed better on dribbling tests (U9 – U15) and exhibited superior endurance attributes. Attacking players were recorded as the most explosive, fastest and agile when compared to other outfield positions (Deprez et al., 2015). However, this study was unable to include other talent predictors such as training history, and bio-psycho-social factors considered to be as important in the talent identification process (Collins, MacNamara, & Cruikshank, 2018). A later cross-sectional study reported the physical fitness characteristics of elite youth players in

central versus lateral roles and found specific anthropometrical attributes such as relatively older, mature, taller and heavier players selected for goalkeeping and central defensive positions (Towilson et al., 2017). However, with the exception of Larkin and O'Connor (2017) who aimed to understand generic attributes considered important for youth coaches at the entry level of representative soccer in Australia, there is limited agreement on generic attributes when associated with certain playing positions. Therefore, the specific aim of this study was to propose a methodological framework for establishing position-specific attributes for talent scouts and coaches involved in the talent identification and development process.

Methods

The position-specific consensus process featured a three-step modified e-Delphi method (Meshkat et al., 2014) and online survey which took place between September 2017 and March 2018 following full ethical approval from an Institutional Review Board in the United Kingdom. The Delphi method, developed (primarily) by Dalkey and Helmer (1963) is an iterative process that provides a process of acquiring consensus from experts where there is little or no evidence and where opinion is considered important (Eubank et al., 2016). Initially, a comprehensive list of generic attributes was identified and consensus was built from the feedback provided by experts from the proceeding rounds. For the present study the modified e-Delphi method consisted of three rounds of email questionnaires.

Panel selection

As our study required consensus of attributes in elite youth soccer, involvement from recruitment staff, coaches, academy directors, coach educators and academics involved in talent identification research was necessary. Despite no exact criterion for the selection of Delphi participants available in the extant literature, it is considered important that panel members are highly trained and competent within the area of specialist knowledge (Hsu, 2007). Initial recruitment strategies for our panel included a presentation of our proposed body of

research at the World Conference on Science and Soccer held in Rennes in April 2017 (i.e. Reeves et al., 2018). Face-to-face meetings were then conducted with members of the Football Association's (FA) talent identification department, before a series of final face-to-face meetings were held with delegates and academics interested in researching talent in soccer at the International Council for Coach Education (ICCE) conference held in Liverpool in July 2017.

Interested participants were contacted further, on the basis of talent identification and recruitment experience and expertise. As the aim of our study was to provide position-specific predictors for talent scouts and coaches and since our aim was to also advance the evidence base for talent identification in youth soccer, players were not included as panel members. Following verbal agreement to participate, a letter of invitation was forwarded to each of our panel members. The participants who agreed to be involved completed a written consent form and provided an email address for correspondence purposes. Following receipt of written consent, the aim of the project was explained. The final panel included the following members; the Academy Director of an English Premier League club, talent identification staff at the English Football Association ($n = 2$), head of player recruitment at an English Premier League club and Championship club, Union of European Football Associations (UEFA) B licensed coaches working in elite youth football in England ($n = 4$) and a professor of sport sciences who specialises in researching and writing about talent identification in sport.

Generic attribute statements

For stage one of the study, we requested from our panel a list of generic attributes archetypal of a talented youth soccer player. An open-ended text document with four categories: 'technical attributes', 'physical attributes', 'psychological attributes', and a heading termed 'hidden attributes' was forwarded to our panel. The first three headings (i.e. technical, physical, and psychological) were adapted from the model of potential talent criteria by Williams and Reilly

(2000). The term ‘hidden’ was adopted as this was a phrase commonly used by heads of recruitment, academy coaches and talent scouts in a recent study (i.e. Reeves et al., 2018). Other studies have adopted the term ‘personal’ (Jokuschies, Gut, & Conzelmann, 2017) or ‘social’ (Williams & Reilly, 2000). Panel members were invited to propose generic attribute statements under the four headings and invited to provide a brief explanation for its inclusion. The final list was compiled into a Microsoft Excel (2016) spreadsheet and reviewed by author (3) who had worked previously as a professional youth soccer coach with an English League club and author (4) who had worked as a performance analyst for an English Premier League club. All the attributes were then compiled into a draft consensus document.

Round 1:

In the first round of the e-Delphi process the draft consensus document was forwarded to our ten panel members. Each participant was requested to state how important each attribute was using a nine-point scale (Meshkat et al., 2014). As with previous e-Delphi studies (i.e. Meshkat et al., 2014) a score between 1-3 indicated that the panel disagreed with the attribute; 4-6 represented an attribute that was ambiguous; and 7-9 represented a statement that found agreement. Attributes for which 70% of participants did not grade within the scale 7-9 were eliminated. The results were then distributed back to participants for round 2.

Round 2:

The list of attributes that did not meet consensus from round 1 were forwarded to each panel member using the email address provided. Each participant was requested using the same nine-point scale to grade the remaining statements eliminated at the end of round 1. At the end of round 2 two new attributes were introduced by one of the panel members (i.e., ‘coachability’ and ‘flair’) these were accepted by the research team and included under the ‘hidden attributes’ category for round 3.

Round 3:

During round 3, the participants graded the attributes using the same nine-point scale but with the knowledge of the group scores from the previous two rounds. An identical procedure of elimination was then performed and a final list of attributes was agreed.

Online survey

Following final consensus, the generic physical, psychological, technical, and hidden attributes were then incorporated into a position-specific survey using an online survey tool (<https://www.onlinesurveys.ac.uk>). Specific examples of each of the attributes was included to avoid any potential confusion. The online survey was distributed using various social media platforms (i.e. Facebook, Twitter, LinkedIn) for a period of four weeks. Specifically, on-line communities considered relevant for talent identification in soccer (e.g. The Football Collective, Professional Football Scouts Association) were targeted. The survey consisted of two sections. The first of these included a series of demographic questions for each respondent (i.e. age and gender, country of residence, coaching qualification and current job role). The second section required each respondent to imagine they were responsible for talent recruitment and using the generic attributes captured in the e-Delphi poll rank them according to a recognised playing position.

For example, after selecting a recognised defensive position (e.g. central defender and/or full-back), midfield positions (e.g. central midfield, left midfield, right midfield) and/or attacking positions (e.g. wide attacking player and centre-forward), participants were asked to select an attribute from the e-Delphi they thought was indicative of the position and rank using a 7-point Likert scale. Attributes were ranked in order of importance from: (7 = most important; 1 = least important). The frequency of responses was recorded on a Microsoft Excel (2016) spreadsheet for each playing position and the overall mean score was determined by summing the item rank scores and dividing by the frequency of respondents to each question (See Table 1 for an example). Therefore, higher values indicated higher levels of importance

for each attribute and player-position. Due to the specialist nature of the position and the specific coaching and talent identification routeway goalkeepers are not included in this analysis.

Table 1 About Here

Results

e-Delphi

Ten panel members with high levels of expertise and experience in the field of talent identification and player recruitment in elite youth soccer participated in three e-Delphi rounds. Following the first round 95 attributes did not reach full consensus. 31 of the original 126 attributes were accepted into the final list without modification. At the beginning of round two, 95 attributes that did not reach agreement were disseminated to the panel members. Following the second round of voting, agreement was reached on five positional attributes. Twenty-three attributes were omitted and 67 out of 95 attributes did not reach any consensus. During the third and final round, four attributes reached agreement. In addition, two new attributes were introduced and accepted. The panel also agreed to omit 61 attributes as they could not reach 70% agreement. The final list of physical, psychological, technical, and hidden player attributes that received full consensus from the e-Delphi poll are presented in Table 2. A breakdown of the full e-Delphi process and results is provided in Figure 1.

TABLE 2 ABOUT HERE

FIGURE 1 ABOUT HERE

Online survey

During the four weeks that the survey was live (12th April 2018 – 10th May 2018), a total of 99 participants registered their interest and fully completed the online survey. The majority of the participants were male ($n = 88$). All of the participants held a formal soccer coaching qualification which ranged from the UEFA A licence or equivalent, to the FA Level 2 in

coaching soccer, or equivalent. None of our respondents indicated whether they had completed any formal talent identification awards (i.e. FA level 1 in talent identification: an introduction to scouting). The participants recorded a range of job roles within soccer which included; professional soccer academy managers, academy coaches who had responsibilities for player recruitment, participation coaches, coach educators and designated talent scouts. The respondents were located in various geographic locations around the world including; Europe ($n = 81$), Oceania ($n = 13$), North America ($n = 4$) and Asia ($n = 1$).

The descriptive statistics (mean $\pm$ standard deviation) and rankings for the player positional requirements based on responses to physical, psychological, technical, and hidden attributes generated by the e-Delphi poll are provided in Table 3. Of note is the relative importance attached to perceptual-cognitive skills, with *decision-making* ranked highest for central defensive positions, central midfield positions, and left/right midfield positions. The importance of *anticipation* was ranked highest for central attacking and wide positions. Participants rated technical skills such as *technique under pressure* in congested areas of the pitch (i.e. central midfield and right/left midfield) as important. *Tackling* was recorded as most important for full-back positions with technical skills such as *crossing* and *passing* also highly rated. Interestingly, there were relatively low scores for physiological or anthropometric attributes. The highest recorded mean scores for physiological requirements included *agility* for right/left midfield positions, *strength* for central defensive positions, *stamina* for central midfield positions and *speed* for central/wide attacking positions.

TABLE 3 ABOUT HERE

Discussion

The aim of this study was to develop a robust methodology for the construction of player-positional attributes, considered important for talent identification purposes in elite youth soccer. This was accomplished by the implementation of a validated e-Delphi protocol

(Meshkat et al., 2014) and an online survey. This paper, therefore, adds to previous research (i.e. Larkin & O'Connor, 2017) by providing a hierarchy of player attributes that are explicitly linked to outfield positions. During our e-Delphi poll our panel members reported similar generic attributes to those identified previously by Larkin and O'Connor (2017). However, when the list of attributes was compiled into an online survey and linked to player position we observed some interesting differences to that of our Australian colleagues. For instance, Larkin and O'Connor (2017) rated a number of generic technical skills as most important (i.e. first touch, 1 v 1, and striking the ball). In the follow up interviews conducted as part of Larkin and O'Connor's study, the justification for first touch as the most important attribute for players at the U13 age group was because it was considered to be a 'foundation skill' and a pre-requisite for all on-the-ball actions. Whilst we do not disagree with this assumption, we too found literature on the importance of a player's first touch limited and so further work is required in this area. The same may be said for indicating whether the player was receiving the ball with their stronger or weaker foot and this may be worthy of further examination.

In contrast, our respondents ranked perceptual-cognitive skills such as *decision-making* in central defensive and midfield positions (i.e. central and right/left) and *anticipation* in attacking positions higher than any technical skills such as first-touch, passing or 1 v 1. Moreover, technical attributes were only considered most important when *under pressure* which supports Larkin & O'Connor's (2017) point that further research is required to provide more ecologically valid assessments for assessing the technical abilities of young players.

Perceptual-cognitive skills

Previous soccer related research has consistently demonstrated that players with enhanced perceptual-cognitive skills (e.g., decision-making and anticipation), have a considerable advantage when compared to less-proficient players (Roca et al., 2011; Vaeyens et al., 2007). In this respect the development of perceptual-cognitive adaptations appropriate for decision-

making are believed to be optimized when the training environment includes game-specific activities (O'Connor, Larkin & Williams, 2017, Roca et al., 2012; Savelsbergh, Van Gastel, & Van Kampen, 2010 Williams & Ford, 2013). The quality of decision-making is often defined as the appropriateness of the decision preceding an appropriate action (O'Connor, Larkin & Williams, 2017, Hohman, Obelöer Schlapkohl, & Raab, 2016), and evidence of experts having superior visual search behaviour and fewer fixations to determine responses when compared to near-experts, or non-experts has been demonstrated in striking and fielding sports (i.e. cricket; McRobert et al., 2011) and invasion type sports such as a handball (Rabb & Johnson, 2007) and field hockey (Elferink-Gemser, et al., 2007). Research surrounding how practice structure should be designed in order to promote the improvement of decision-making and anticipation in soccer has suggested practice should replicate the experiences a player encounters during competition (Patterson & Lee, 2008; Vickers, 2007; Williams & Ford, 2009). For instance, Ford et al. (2010) examined the differences between two types of practice activities structure – Training Form (TF) and Playing Form (PF) – in English youth soccer. While TF was defined as the type of activities that are based on technical and skill practices that did not contain game-specific elements (i.e. opposition); PF was defined as activities similar to the game-context incorporated through either small-sided games or phases-of-play. The results indicated that TF was predominantly used in the youth soccer sessions when compared to the PF. Despite this, several authors (i.e. Roca et al., 2012; Williams et al., 2012) have suggested that practices designed with a structure similar to the PF are beneficial to promote the development of decision-making and anticipation. This is supported by evidence that casual links exist between superior anticipation and decision-making skills for those players who experienced higher levels of soccer-specific play and practice hours during adolescence (Roca et al., 2013).

Technical attributes

Similar to Larkin and O'Connor (2017) our respondents rated the importance of technical attributes such as *tackling*, *heading*, *passing* and *crossing* for defensive and midfield positions and *shooting*, and *1 v 1* for more attacking positions and *technique under pressure*. Clearly the ability to distribute the ball effectively from one player to another in order for a team to maintain possession is imperative, and there is evidence a positive association between time in possession of the ball, and overall team success exists (Bradley et al., 2013). However, some caution is required here as ball possession is multifaceted and influenced by factors such as the playing style (Fernandez-Navarro et al. (2016), the quality of the opposition (Lago, 2009), the score and the match location (Lago & Martin, 2007). *Passing* was indicated to be an important technical indicator for fullbacks. This has also been reported in high percentage ball possession teams where defensive players performed better passing completions than offensive players (Bradley et al., 2013).

An important technical attribute for midfield players was *technique under pressure*. One might speculate that due to the often small, congested area where midfield players operate, their ability to control the ball, pass, dribble and turn is performed while under a rapidly changing environment with constraints on time and space (Vaeyens et al., 2006). This particular attribute is an interesting one given that the interdependency of executing a technique (i.e. passing) in an unpredictable, interactive environment could arguably be termed a 'technical skill' rather than 'technique' *per se*, due to the ability to adapt to different in-game scenarios, and decision-making processes (Le Moal et al., 2014). For instance, previous research has illustrated that when the proportion of attacking to defensive players in open-play situations is constrained by numbers, time and space (i.e. 2 vs. 1, 3 vs. 1, 3 vs 2, 4 vs. 3 and 5 vs. 3) typically skilled youth players employ faster and more accurate decisions than their less-skilled counterparts (Vaeyens et al., 2007a, 2007b). This has been attributed to more skilful players employing a smaller number of fixations for longer periods in 2 versus 1 or 3 versus 1

situation towards the ball or player in position of the ball. Whereas in situations where the number of attacking and defensive players is increased (i.e. 3 vs 2, 4 vs. 3, and 5 vs 3) skilled players employed a higher number of fixations for a shorter time period (Vaeyens et al., 2007a, 2007b). However, some have questioned the ecological validity of such skill-related performance tests as they are conducted independent of match context (Aquino et al., 2017).

Physiological attributes

Because soccer has movement demands such as walking, jogging, running, sprinting, and jumping, it was no surprise that eight physiological attributes found consensus in the e-Delphi process. However, the respondents in our survey only selected five of these (i.e. speed, stamina, strength, agility and acceleration) and when requested to associate these with specific player positions it was noticeable how physiological attributes recorded relatively lower mean scores when compared to tactical and technical attributes. Clearly, an emphasis on physiological requirements are important considerations when assessing talented youth players, and as such there are a battery of standardised tests which sports science and medicine staff employ as part of both a habitual training programme (Enright et al., 2018) and the EPPP requirement that periodic audits of player somatic maturation status are carried out (Towlson et al., 2017). For example, repeated sprint ability tests (Chaouchi et al., 2010), agility tests (Pojskic et al., 2018), vertical jump height (Acero et al., 2011) and the Yo-Yo intermittent recovery test 2 (Krustrup & Bangsbo, 2001). However, due to the unpredictable nature of youth development (Bailey and Collins, 2013) some have questioned the relevance of such tests in the talent selection process (Carling & Collins, 2014).

The importance of *stamina* was reported for midfield players but not for central defenders, fullbacks, or those players in more offensive positions. This is supported by well-established research that midfield players cover more total and high-intensity running than central defenders (Bradley et al., 2013; Gregson, Drust, Atkinson & Di Salvo, 2010) and is

consistent with cross-sectional studies conducted amongst elite-youth populations (Deprez et al., 2015).

The inclusion of *acceleration* instead of *stamina* for fullbacks may be indicative of modern styles of play where fullbacks require explosiveness to pass an opponent in wide areas of the pitch. Diverse speed abilities such as *acceleration* were considered important antecedents for fullbacks and players with attacking roles. This appears to be supported by a recent study where elite youth fullbacks and wide midfield recorded superior sprint times across 10m and 20m when compared to other outfield positions (Towlson et al., 2017).

A recent systematic review of the physiological and physical characteristics in youth soccer also confirmed the relevance of these performance indicators (Murr, Raabe, & Höner, 2018). Similarly, motor skills such as *agility* and the ability to change direction is also well established in the literature (Murr, Raabe, & Höner, 2018), however, it is worth noting that agility can be considered a speed-related motor ability without cognitive loads (Young, Dawson, & Henry, 2015). Our e-Delphi poll and online survey however was not sensitive enough to distinguish the potential differences between agility and change-of-direction, therefore the term motor ability may be a more intuitive term.

Despite the stated importance of power in soccer (i.e. Boone et al., 2012) this physiological attribute was not recorded in the final list or included on the survey. This omission is not easily explained, however, power was recently reported to only contain small prognostic relevance as a performance indicator (Murr, Raabe, & Höner, 2018) although the authors did provide a footnote stating that power can also be regarded as a component of speed and, therefore, should not be totally discounted. Anthropometric and physical performance attributes which have featured in previous talent research (i.e. body mass, body height, maturation and chronological age) were not accepted into the final list. This may be due to a body of well-established research suggesting that biological maturity temporarily affected

several attributes, which makes these attributes not a stable predictor of future performance (Bidaurrezaga-Letona et al., 2015; Vandendriessche, et al., 2012).

Limitations

Despite making a novel contribution to the sport, exercise, and pedagogy literature this study contains a number of methodological limitations which need to be acknowledged. Firstly, consensus methods such as e-Delphi may contain bias in the recruitment of participants or participants may be obliged to vote in a certain way to pacify the group. The selection of panel members is considered to be the most important stage in the Delphi process (Hsu, 2007), as it relates to the quality of the eventual data capture. Despite our best efforts to recruit participants who were appropriately qualified and had experiences and knowledge of talent recruitment, we acknowledge that our completely male panel, who were all residents of the same country may be biased towards a national, rather than international context. Future studies should, therefore, consider including more international participants as well as female members. Another consideration may be the inclusion of players: as key stakeholders in this process, their input into the criteria selection would be beneficial as issues of vocabulary and definition might vary between scouts, coaches, and players. Secondly, the sample size of the online survey was modest, with the majority of those completing the survey listed as coaches, and it was not clear how many of these coaches had responsibility for player recruitment. Thirdly, the player-position attributes are reported as isolated, discrete statements and a further suggestion is whether these attributes can occur in combination.

In order to verify the veracity of some of our claims, we propose that future research considers capturing verbal cognitions of talent scouts using real game footage. As talent identification processes are often undertaken away from the professional academy

environment, this may help support coaches, teachers, and scouts identify potentially talented players as a grading system could be added to each of the positional components.

Conclusion

Talent identification in youth soccer continues to operate with a limited number of objective measures or consensus surrounding generic player-positional attributes. Thus, the purpose of this study was to provide real-world information surrounding player-positional attributes which, in-turn, could help inform youth talent selection programs for both coaches and recruitment staff. The findings include some initial evidence that player-positional attributes considered important at the junior-elite phase are more perceptual-cognitive and technical than physiological or anthropometric. Despite ‘hidden’ attributes (e.g. coachability, flair, versatility, vision etc) finding consensus in the e-Delphi poll, there was no evidence to support these traits when associated with a specific playing position.

Acknowledgements

The authors would like to thank the panel members and the soccer coaches and recruitment staff who participated in this exploratory study.

References

Anderson G, Miller R. 2012. The academy system in English professional football. Liverpool, Liverpool University Management School.

Baker J, Schorer J, Wattie N. 2017. Compromising Talent: Issues in Identifying and Selecting Talent in Sport. *Quest.* iFirst:1–16. doi:10.1080/00336297.2017.1333438.

Bidaurrezaga-Letona I, Lekue JA, Amado M, Santos-Concejero J, Gil SM. 2015. Identifying talented young soccer players: conditional, anthropometrical and physiological characteristics as predictors of performance. *Rev Int Cienc Deporte.* 11(39):79–95. doi:10.5232/ricyde2015.03906.

Boone J, Vaeyens R, Steyaert A, Bossche L Vanden, Bourgois J. 2012. Physical Fitness of Elite Belgian Soccer Players by Player Position. *J Strength Cond Res.* 26(8):2051–2057. doi:10.1519/JSC.0b013e318239f84f.

Bradley PS, Lago-Peñas C, Rey E, Gomez Diaz A. 2013. The effect of high and low percentage ball possession on physical and technical profiles in English FA Premier League soccer matches. *J Sports Sci.* 31(12):1261–1270. doi:10.1080/02640414.2013.786185. Carling

Christensen MK. 2009. “An Eye for Talent”: Talent Identification and the “Practical Sense” of Top-level Soccer Coaches. *Sociol Sport J.* 26(3):365–382.

- 452 Coelho e Silva MJ, Figueiredo AJ, Simões F, Seabra A, Natal A, Vaeyens R, Philippaerts R,
 453 Cumming SP, Malina RM. 2010. Discrimination of U-14 Soccer Players by Level and Position.
 454 Int J Sports Med. 31(11):790–796. doi:10.1055/s-0030-1263139.Coutinho P,
 455
- 456 Collins D. 2014. Comment on “Football-specific fitness testing: adding value or confirming
 457 the evidence?” J Sports Sci. 32(13):1206–1208. doi:10.1080/02640414.2014.898858.
 458
- 459 Collins D, MacNamara A, Cruickshank A. 2018. Research and practice in talent identification
 460 and development – some thoughts on the state of play. J Appl Sport Psychol. 0: 1-12.
 461
- 462 Deprez D, Fransen J, Boone J, Lenoir M, Philippaerts R, Vaeyens R. 2015. Characteristics of
 463 high-level youth soccer players: variation by playing position. J Sports Sci. 33(3): 243-254
 464 doi: 10.1080/02640414.2014.934707
 465
- 466 Elferink-Gemser MT, Visscher C, Lemmink KAPM, Mulder T. 2007. Multidimensional
 467 performance characteristics and standard of performance in talented youth field hockey
 468 players: A longitudinal study. J Sports Sci. 25(4):481–489. doi:10.1080/02640410600719945.
 469
- 470 Enright K, Morton J, Iga J, Lothian D, Roberts S, Drust B. 2018. Reliability of “in-season”
 471 fitness assessments in youth elite soccer players: a working model for practitioners and
 472 coaches. Sci Med Footb. 2(3):177–183. doi:10.1080/24733938.2017.1411603.
 473
- 474 Fenner JSJ, Iga J, Unnithan V. 2016. The evaluation of small-sided games as a talent
 475 identification tool in highly trained prepubertal soccer players. J Sports Sci. 34(20):1983–1990.
 476 doi:10.1080/02640414.2016.1149602.

477

478 Fernandez-Navarro J, Fradua L, Zubillaga A, Ford PR, McRobert AP. 2016. Attacking and
479 defensive styles of play in soccer: analysis of Spanish and English elite teams. *J Sports Sci.*
480 34(24):2195–2204. doi:10.1080/02640414.2016.1169309.

481

482 Ford PR, Yates I, Williams AM. 2010. An analysis of practice activities and instructional
483 behaviours used by youth soccer coaches during practice: Exploring the link between science
484 and application. *J Sports Sci.* 28(5):483–495. doi:10.1080/02640410903582750.

485

486 Gil SM, Zabala-Lili J, Bidaurrezaga-Letona I, Aduna B, Lekue JA, Santos-Concejero J,
487 Granados C. 2014. Talent identification and selection process of outfield players and
488 goalkeepers in a professional soccer club. *J Sports Sci.* 32(20):1931–1939.
489 doi:10.1080/02640414.2014.964290.

490

491 Gregson W, Drust B, Atkinson G, Salvo V. 2010. Match-to-Match Variability of High-Speed
492 Activities in Premier League Soccer. *Int J Sports Med.* 31(04):237–242. doi:10.1055/s-0030-
493 1247546.

494

495 Gréhaigne J-F, Richard J-F, Griffin LL. 2005. *Teaching and Learning Team Sports and Games.*
496 Abingdon, Oxon: Routledge.

497

498 Haugaasen M, Toering T, Jordet G. 2014. From childhood to senior professional football: A
499 multi-level approach to elite youth football players' engagement in football-specific activities.
500 *Psychol Sport Exerc.* 15(4):336–344. doi:10.1016/j.psychsport.2014.02.007.

501

Helmer-Hirschberg O. 1963. An experimental application of the Delphi method to the use of experts. *Manage Sci.* 9(3):458–467.

Hohmann T, Obelöer H, Schlapkohl N, Raab M. 2016. Does training with 3D videos improve decision-making in team invasion sports? *J Sports Sci.* 34(8):746–755. doi:10.1080/02640414.2015.1069380.

Hsu C-C, Sandford BA. 2007. The Delphi Technique: Making Sense Of Consensus. *Pract Assess Res Eval.* 12(10):1–8.

Lago-Ballesteros J, Lago-Peñas C, Rey E. 2012. The effect of playing tactics and situational variables on achieving score-box possessions in a professional soccer team. *J Sports Sci.* 30(14):1455–1461. doi:10.1080/02640414.2012.712715.

Lago C. 2009. The influence of match location, quality of opposition, and match status on possession strategies in professional association football. *J Sports Sci.* 27(13):1463–1469. doi:10.1080/02640410903131681.

Lago C, Martín R. 2007. Determinants of possession of the ball in soccer. *J Sports Sci.* 25(9):969–974. doi:10.1080/02640410600944626.

Larkin P, O'Connor D. 2017. Talent identification and recruitment in youth soccer: Recruiter's perceptions of the key attributes for player recruitment. Sampaio J, editor. *PLoS One.* 12(4):e0175716. doi:10.1371/journal.pone.0175716.

- 527 Larkin P, Reeves MJ. 2018 Jan 31. Junior-elite football: time to re-position talent
528 identification? Soccer Soc.:1–10. doi:10.1080/14660970.2018.1432389.
529
- 530 Le Moal E, Rue O, Ajmol A, Abderrahman AB, Hammami MA, Ounis OB, Kebisi W, Zouhal
531 H. 2014. Validation of the Loughborough Soccer Passing Test in Young Soccer Players. J
532 Strength Cond Res. 28(5):1418–1426. doi:10.1519/jsc.0000000000000296.
533
- 534 Leyhr D, Kelava A, Raabe J, Höner O. 2018. Longitudinal motor performance development in
535 early adolescence and its relationship to adult success: An 8-year prospective study of highly
536 talented soccer players. Plos ONE. 13(5):1-16.
537
- 538 Lewis CJ, McRobert AP, Reeves MJ, Roberts SJ. In Review. Using a verbal reporting
539 technique to establish talent scout cognitions during formal competition. High Abil Stud.
540
- 541 Malina, RM. 2008. Biocultural factors in developing physical activity levels. In Smith, AL &
542 Biddle, SJH (Eds), *Youth Physical Activity and Inactivity* (pp. 141-166). Champaign, IL:
543 Human Kinetics.
544
- 545 McRobert AP, Ward P, Eccles DW, Williams AM. 2011. The effect of manipulating context-
546 specific information on perceptual-cognitive processes during a simulated anticipation task. Br
547 J Psychol. 102(3):519–534. doi:10.1111/j.2044-8295.2010.02013.x.
548
- 549 Meshkat B, Cowman S, Gethin G, Ryan K, Wiley M, Brick A, Clarke E, Mulligan E. 2014.
550 Using an e-Delphi technique in achieving consensus across disciplines for developing best
551 practice in day surgery in Ireland. J Hosp Adm. 3(4). doi:10.5430/jha.v3n4p1.

552

553 Meylan C, Cronin J, Oliver J, Hughes M. 2010. Talent Identification in Soccer: The Role of
 554 Maturity Status on Physical, Physiological and Technical Characteristics. *Int J Sport Sci Coach*.
 555 5(4):571–592.

556

557 Mesquita I, Fonseca AM. 2016. Talent development in sport: A critical review of pathways to
 558 expert performance. *Int J Sports Sci Coach*. 11(2):279–293.
 559 doi:10.1177/1747954116637499.Dalkey

560

561 Murr D, Raabe J, Höner O. 2018. The prognostic value of physiological and physical
 562 characteristics in youth soccer: A systematic review. *Eur J Sport Sci*. 18(1):62–74.
 563 doi:10.1080/17461391.2017.1386719.

564

565 Nicholls SB, Worsfold PR. 2016. The observational analysis of elite coaches within youth
 566 soccer: The importance of performance analysis. *Int J Sports Sci Coach*. 11(6):825–831.
 567 doi:10.1177/1747954116676109.

568

569 O'Connor D, Larkin P, Mark Williams A. 2016. Talent identification and selection in elite
 570 youth football: An Australian context. *Eur J Sport Sci*. 16(7):837–844.
 571 doi:10.1080/17461391.2016.1151945.

572

573 Patterson JT, Lee TD. 2008. Organizing practice: the interaction of repetition and cognitive
 574 effort for skilled performance. In: Farrow D, Baker J, McMahon C, editors. *Developing Sports*
 575 *Expertise: Researchers and Coaches Put Theory into Practice*. Abingdon, Oxon: Routledge. p.
 576 119–134.

577

578 Philippaerts RM, Vaeyens R, Janssens M, Van Renterghem B, Matthys D, Craen R, Bourgois
579 J, Vrijens J, Beunen G, Malina RM. 2006. The relationship between peak height velocity and
580 physical performance in youth soccer players. *J Sports Sci.* 24(3):221–230.
581 doi:10.1080/02640410500189371.

582

583 Raab M, Johnson JG. 2007. Expertise-based differences in search and option-generation
584 strategies. *J Exp Psychol Appl.* 13(3):158–170. doi:10.1037/1076-898X.13.3.158.

585

586 Reeves MJ, McRobert AP, Littlewood MA, Roberts SJ. 2018a. A scoping review of the
587 potential sociological predictors of talent in junior-elite football: 2000–2016. *Soccer Soc.*
588 doi:10.1080/14660970.2018.1432386.

589

590 Reeves MJ, Roberts SJ, McRobert AP, Littlewood MA. 2018b. Factors affecting the
591 identification of talented junior-elite footballers: a case study. *Soccer Soc.*
592 doi:10.1080/14660970.2018.1432383.

593

594 Roberts SJ. 2014. Talking relative age effects: a fictional analysis based on scientific evidence.
595 *Asia-Pacific J Heal Sport Phys Educ.* 5(1):55–66. doi:10.1080/18377122.2014.868290.

596

597 Roca A, Ford PR, McRobert AP, Mark Williams A. 2011. Identifying the processes
598 underpinning anticipation and decision-making in a dynamic time-constrained task. *Cogn*
599 *Process.* 12(3):301–310. doi:10.1007/s10339-011-0392-1.

600

- 601 Roca A, Williams AM, Ford PR. 2012. Developmental activities and the acquisition of superior
 602 anticipation and decision making in soccer players. *J Sports Sci.* 30(15):1643–1652.
 603 doi:10.1080/02640414.2012.701761.
 604
- 605 Savelsbergh GJP, Van Gastel PJ, Van Kampen PM. 2010. Anticipation of penalty kicking
 606 direction can be improved by directing attention through perceptual learning. *Int J Sport*
 607 *Psychol.* 41(1):24–41.
 608
- 609 Tears C, Chesterton P, Wijnbergen M. 2018. The elite player performance plan: the impact of
 610 a new national youth development strategy on injury characteristics in a premier league football
 611 academy. *J Sports Sci.* 36(19):2181–2188. doi:10.1080/02640414.2018.1443746.
 612
- 613 Towlson C, Cobley S, Midgley A, Garrett A, Parkin G, Lovell, R. 2017. Relative age,
 614 maturation, and physical biases on position allocation in elite-youth soccer. *Int J Sports Med.*
 615 38(3):201-209.
 616
- 617 Unnithan V, White J, Georgiou A, Iga J, Drust B. 2012. Talent identification in youth soccer.
 618 *J Sports Sci.* 30(15):1719–1726. doi:10.1080/02640414.2012.731515.
 619
- 620 Vaeyens R, Lenoir M, Williams AM, Mazyn L, Philippaerts RM. 2007. The Effects of Task
 621 Constraints on Visual Search Behavior and Decision-Making Skill in Youth Soccer Players. *J*
 622 *Sport Exerc Psychol.* 29(2):147–169. doi:10.1123/jsep.29.2.147.
 623

- 624 Vaeyens R, Lenoir M, Williams AM, Philippaerts RM. 2007. Mechanisms Underpinning
625 Successful Decision Making in Skilled Youth Soccer Players: An Analysis of Visual Search
626 Behaviors. *J Mot Behav.* 39(5):395–408. doi:10.3200/JMBR.39.5.395-408.
627
- 628 Vaeyens R, Lenoir M, Williams AM, Philippaerts RM. 2008. Talent identification and
629 development programmes in sport: Current models and future directions. *Sport Med.*
630 38(9):703–714.
631
- 632 Vaeyens R, Malina RM, Janssens M, Van Renterghem B, Bourgois J, Vrijens J, Philippaerts
633 RM. 2006. A multidisciplinary selection model for youth soccer: the Ghent Youth Soccer
634 Project. *Br J Sports Med.* 40(11):928–934. doi:10.1136/bjism.2006.029652.
635
- 636 Vandendriessche JB, Vaeyens R, Vandorpe B, Lenoir M, Lefevre J, Philippaerts RM. 2012.
637 Biological maturation, morphology, fitness, and motor coordination as part of a selection
638 strategy in the search for international youth soccer players (age 15–16 years). *J Sports Sci.*
639 30(15):1695–1703. doi:10.1080/02640414.2011.652654.
640
- 641 Vilar L, Araújo D, Davids K, Correia V, Esteves PT. 2013. Spatial-temporal constraints on
642 decision-making during shooting performance in the team sport of futsal. *J Sports Sci.*
643 31(8):840–846. doi:10.1080/02640414.2012.753155.
644
- 645 Vrljic K, Mallett CJ. 2008. Coaching Knowledge in Identifying Football Talent. *Int J Coach*
646 *Sci.* 2(1):63–81.
647

648 Williams AM, Ford PR. 2009. Promoting a skills-based agenda in Olympic sports: The role of
649 skill-acquisition specialists. *J Sports Sci.* 27(13):1381–1392.
650 doi:10.1080/02640410902874737.

651

652 Williams AM, Ford PR. 2013. “Game intelligence”: anticipation and decision making. In:
653 Williams AM, editor. *Science and Soccer: Developing Elite Performers*. 3rd ed. Abingdon,
654 Oxon: Routledge. p. 103–138.

655

656

657

658

659

660

661

662

663

664

665

666

667

668

669

670

671

672

673 Table 1. Frequency of responses to attributes for 'Full-Back' position.

674

675

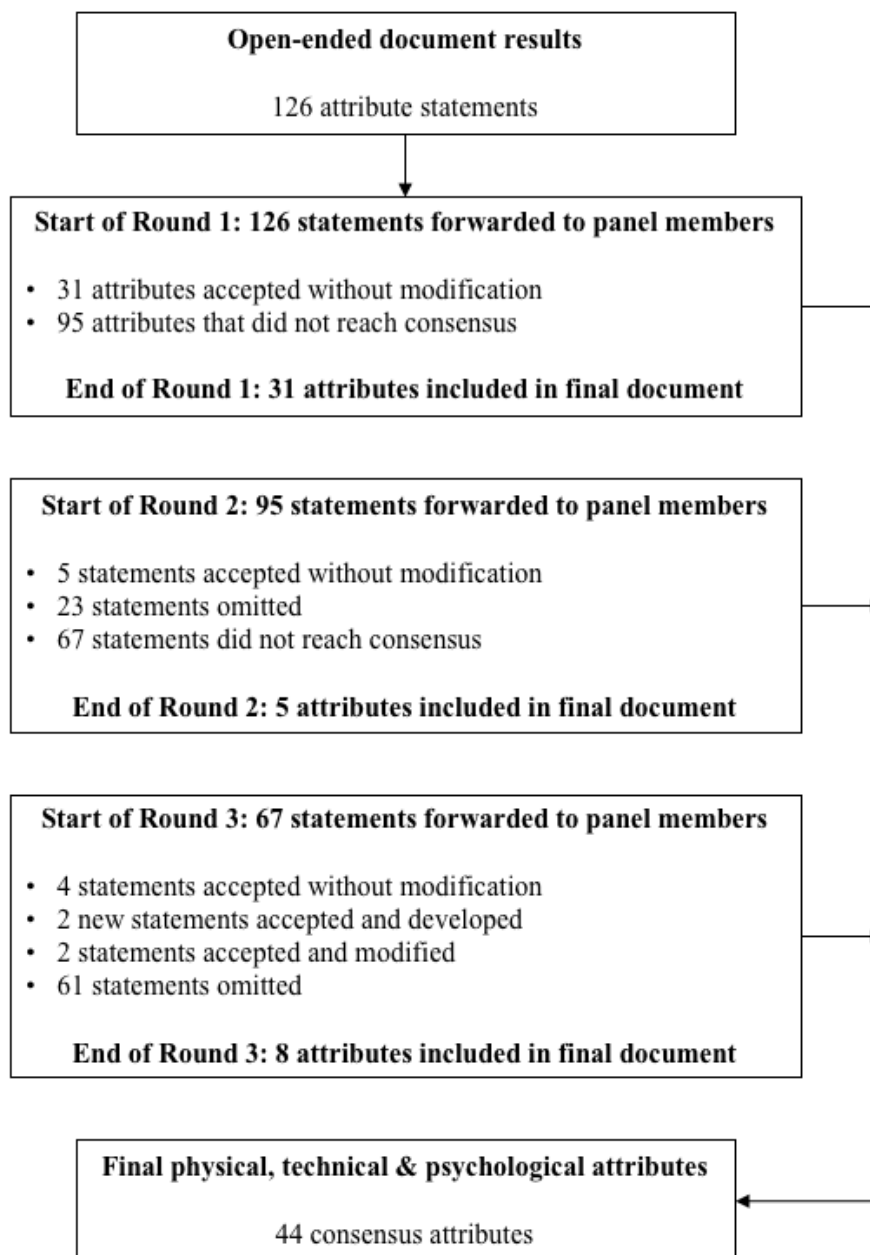
Attribute	Ranking							Mean
	1	2	3	4	5	6	7	
Tackling	0	0	0	6	4	21	22	6.1

676

Table 2: Final list of agreed player attributes resulting from e-Delphi poll

Physical	Psychological	Technical	Hidden
Acceleration	Aggression	First touch	Adaptability
Agility	Anticipation	Crossing	Consistency
Balance	Bravery	Corners (delivering)	Versatility
Fitness	Composure	Dribbling/running with the ball	Important matches
Speed	Concentration	Finishing	Coachability
Stamina	Decision-making	Free-kicks (delivering)	Communication
Strength	Determination	Heading	Flair
Jumping reach	Leadership	Long-range shooting	Creativity
	Off-the-ball thinking	Long throw-ins	
	Positioning	Passing accuracy	
	Team work	Marking	
	Attitude	Penalty taking	
	Vision	Tackling	
		1v1	
		Technique under pressure	

Figure 1. E-Delphi process and results



Player Position	Attribute	Mean score	SD
Central Defender	Decision making	5.21	0.64
	Heading	5.01	0.69
	Marking	4.84	1.71
	Positioning	3.83	1.61
	First touch	3.63	1.13
	Strength	3.32	0.52
Full-back (Left/Right)	Tackling	6.11	0.51
	Crossing	5.67	2.72
	Passing accuracy	5.53	1.66
	Agility	3.13	2.08
	First touch	2.94	2.28
	Acceleration	2.93	1.13
Central Midfield	Decision-making	5.82	1.10
	Technique under pressure	5.71	1.00
	Passing accuracy	4.56	1.79
	Positioning	3.94	1.72
	First touch	3.73	1.91
	Stamina	3.13	2.24
Midfield (Left/Right)	Decision-making	6.14	2.16
	Technique under pressure	5.28	1.05
	Crossing	5.14	1.14
	Dribbling	4.14	1.05
	Agility	4.12	1.06
	Stamina	2.86	1.99
Central/Wide Attacking	Anticipation	5.64	1.82
	Shooting	3.65	1.49
	Finishing	3.23	1.74

First touch	3.14	3.18
1 v 1	3.01	1.66
Speed	2.64	1.45

Table 3. Mean scores of player attributes according to position