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

2 **Abstract**

3 **Purpose:** To construct a valid and reliable methodology for the development of position-
4 specific predictors deemed appropriate for talent identification purposes within elite
5 youth soccer in England. **Method:** $N = 10$ panel experts participated in a three-step
6 modified e-Delphi poll to generate consensus on a series of generic youth player
7 attributes. A follow up electronic survey completed by coaches, scouts and recruitment
8 staff ($n = 99$) ranked these attributes to specific player-positions. **Results:** A final list of
9 44 player attributes found consensus using the three-step modified e-Delphi poll.
10 Findings indicated that player-positional attributes considered most important at the
11 youth phase are more psychological and technical than physiological or anthropometric.
12 Despite 'hidden' attributes (e.g. coachability, flair, versatility, vision, etc.) finding
13 consensus on the e-Delphi poll, there was no evidence to support these traits when
14 associated with a specific playing position. **Conclusion:** For those practitioners
15 responsible for talent recruitment, our findings may provide greater understanding of the
16 multiple attributes required for some playing positions. However, further ecological
17 research is required to assess the veracity of our claims.

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

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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) (Towlson 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).

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

64 Talent identification continues therefore to rely on subjective evaluations of players by
65 recruitment staff (Christensen, 2009), and for those individuals responsible for identifying
66 talented youth (i.e. talent scouts, academy coaches, recruitment staff, etc.) the job is complex,
67 as no objective or valid indicator or measure of talent exists (Baker, Schorer, Wattie, 2018).
68 This state of affairs was illustrated recently in a series of talent studies conducted in elite youth
69 soccer environments in England, where the complex, and at times confused relationship
70 between the organisational requirements, and the ‘on the ground’ work undertaken by
71 recruitment staff was exposed (Reeves et al., 2018a; Reeves et al., 2018b; Larkin and Reeves,
72 2018). For instance, the multidimensional nature of talent in youth soccer can include
73 prognostic dimensions such as ‘physical abilities’, ‘fitness requirements’, ‘technical skills’,
74 ‘perceptual-cognitive skills’ and ‘personal skills’ (Murr et al., 2018; Vrljic & Mallet, 2008).
75 Due to the multifaceted nature of talent some have called for more objective predictors of future
76 potential (i.e. Larkin & O’Connor, 2017) or research designs that are in a position to infiltrate
77 applied talent identification practice (Collins, MacNamara, & Cruickshank, 2018).

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

81 11 v 11 competition (under 16s) at a professional English Premier League Academy. Content
82 analysis of the concurrent verbal reports indicated that the recruitment staff openly disagreed
83 about the skills and attributes required for identical playing positions. Furthermore, in a series
84 of face-to-face follow up interviews, discrepancies between their own judgements and their
85 club's recruitment philosophy were also captured (Lewis et al., in review).

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

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

114 **Methods**

115 The position-specific consensus process featured a three-step modified e-Delphi method
116 (Meshkat et al., 2014) and online survey which took place between September 2017 and March
117 2018 following full ethical approval from an Institutional Review Board in the United
118 Kingdom. The Delphi method, developed (primarily) by Dalkey and Helmer (1963) is an
119 iterative process that provides a process of acquiring consensus from experts where there is
120 little or no evidence and where opinion is considered important (Eubank et al., 2016). Initially,
121 a comprehensive list of generic attributes was identified and consensus was built from the
122 feedback provided by experts from the proceeding rounds. For the present study the modified
123 e-Delphi method consisted of three rounds of email questionnaires.

124 *Panel selection*

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

131 research at the World Conference on Science and Soccer held in Rennes in April 2017 (i.e.
132 Reeves et al., 2018). Face-to-face meetings were then conducted with members of the Football
133 Association's (FA) talent identification department, before a series of final face-to-face
134 meetings were held with delegates and academics interested in researching talent in soccer at
135 the International Council for Coach Education (ICCE) conference held in Liverpool in July
136 2017.

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

150 *Generic attribute statements*

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

156 (2000). The term ‘hidden’ was adopted as this was a phrase commonly used by heads of
157 recruitment, academy coaches and talent scouts in a recent study (i.e. Reeves et al., 2018).
158 Other studies have adopted the term ‘personal’ (Jokuschies, Gut, & Conzelmann, 2017) or
159 ‘social’ (Williams & Reilly, 2000). Panel members were invited to propose generic attribute
160 statements under the four headings and invited to provide a brief explanation for its inclusion.
161 The final list was compiled into a Microsoft Excel (2016) spreadsheet and reviewed by author
162 (3) who had worked previously as a professional youth soccer coach with an English League
163 club and author (4) who had worked as a performance analyst for an English Premier League
164 club. All the attributes were then compiled into a draft consensus document.

165 *Round 1:*

166

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

174 *Round 2:*

175

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

182 *Round 3:*

183

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

187 *Online survey*

188

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

201 For example, after selecting a recognised defensive position (e.g. central defender
202 and/or full-back), midfield positions (e.g. central midfield, left midfield, right midfield) and/or
203 attacking positions (e.g. wide attacking player and centre-forward), participants were asked to
204 select an attribute from the e-Delphi they thought was indicative of the position and rank using
205 a 7-point Likert scale. Attributes were ranked in order of importance from: (7 = most
206 important; 1 = least important). The frequency of responses was recorded on a Microsoft Excel
207 (2016) spreadsheet for each playing position and the overall mean score was determined by
208 summing the item rank scores and dividing by the frequency of respondents to each question
209 (See Table 1 for an example). Therefore, higher values indicated higher levels of importance

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

213 Table 1 About Here

214 **Results**

215

216 *e-Delphi*

217 Ten panel members with high levels of expertise and experience in the field of talent
218 identification and player recruitment in elite youth soccer participated in three e-Delphi rounds.
219 Following the first round 95 attributes did not reach full consensus. 31 of the original 126
220 attributes were accepted into the final list without modification. At the beginning of round two,
221 95 attributes that did not reach agreement were disseminated to the panel members. Following
222 the second round of voting, agreement was reached on five positional attributes. Twenty-three
223 attributes were omitted and 67 out of 95 attributes did not reach any consensus. During the
224 third and final round, four attributes reached agreement. In addition, two new attributes were
225 introduced and accepted. The panel also agreed to omit 61 attributes as they could not reach
226 70% agreement. The final list of physical, psychological, technical, and hidden player attributes
227 that received full consensus from the e-Delphi poll are presented in Table 2. A breakdown of
228 the full e-Delphi process and results is provided in Figure 1.

229 *****TABLE 2 ABOUT HERE*****

230 *****FIGURE 1 ABOUT HERE*****

231 *Online survey*

232

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

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

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

257 *****TABLE 3 ABOUT HERE*****

258 **Discussion**

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

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

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

282 *Perceptual-cognitive skills*

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

287 making are believed to be optimized when the training environment includes game-specific
288 activities (O'Connor, Larkin & Williams, 2017, Roca et al., 2012; Savelsbergh, Van Gastel, &
289 Van Kampen, 2010 Williams & Ford, 2013). The quality of decision-making is often defined
290 as the appropriateness of the decision preceding an appropriate action (O'Connor, Larkin &
291 Williams, 2017, Hohman, Obelöer Schlapkohl, & Raab, 2016), and evidence of experts having
292 superior visual search behaviour and fewer fixations to determine responses when compared
293 to near-experts, or non-experts has been demonstrated in striking and fielding sports (i.e.
294 cricket; McRobert et al., 2011) and invasion type sports such as a handball (Rabb & Johnson,
295 2007) and field hockey (Elferink-Gemser, et al., 2007). Research surrounding how practice
296 structure should be designed in order to promote the improvement of decision-making and
297 anticipation in soccer has suggested practice should replicate the experiences a player
298 encounters during competition (Patterson & Lee, 2008; Vickers, 2007; Williams & Ford,
299 2009). For instance, Ford et al. (2010) examined the differences between two types of practice
300 activities structure – Training Form (TF) and Playing Form (PF) – in English youth soccer.
301 While TF was defined as the type of activities that are based on technical and skill practices
302 that did not contain game-specific elements (i.e. opposition); PF was defined as activities
303 similar to the game-context incorporated through either small-sided games or phases-of-play.
304 The results indicated that TF was predominantly used in the youth soccer sessions when
305 compared to the PF. Despite this, several authors (i.e. Roca et al., 2012; Williams et al., 2012)
306 have suggested that practices designed with a structure similar to the PF are beneficial to
307 promote the development of decision-making and anticipation. This is supported by evidence
308 that casual links exist between superior anticipation and decision-making skills for those
309 players who experienced higher levels of soccer-specific play and practice hours during
310 adolescence (Roca et al., 2013).

311 *Technical attributes*

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

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

337 situation towards the ball or player in position of the ball. Whereas in situations where the
338 number of attacking and defensive players is increased (i.e. 3 vs 2, 4 vs. 3, and 5 vs 3) skilled
339 players employed a higher number of fixations for a shorter time period (Vaeyens et al., 2007a,
340 2007b). However, some have questioned the ecological validity of such skill-related
341 performance tests as they are conducted independent of match context (Aquino et al., 2017).

342 *Physiological attributes*

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

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

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

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

370 A recent systematic review of the physiological and physical characteristics in youth soccer
371 also confirmed the relevance of these performance indicators (Murr, Raabe, & Höner, 2018).
372 Similarly, motor skills such as *agility* and the ability to change direction is also well established
373 in the literature (Murr, Raabe, & Höner, 2018), however, it is worth noting that agility can be
374 considered a speed-related motor ability without cognitive loads (Young, Dawson, & Henry,
375 2015). Our e-Delphi poll and online survey however was not sensitive enough to distinguish
376 the potential differences between agility and change-of-direction, therefore the term motor
377 ability may be a more intuitive term.

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

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

389

390 **Limitations**

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

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

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

413

414 **Conclusion**

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

424

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428

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

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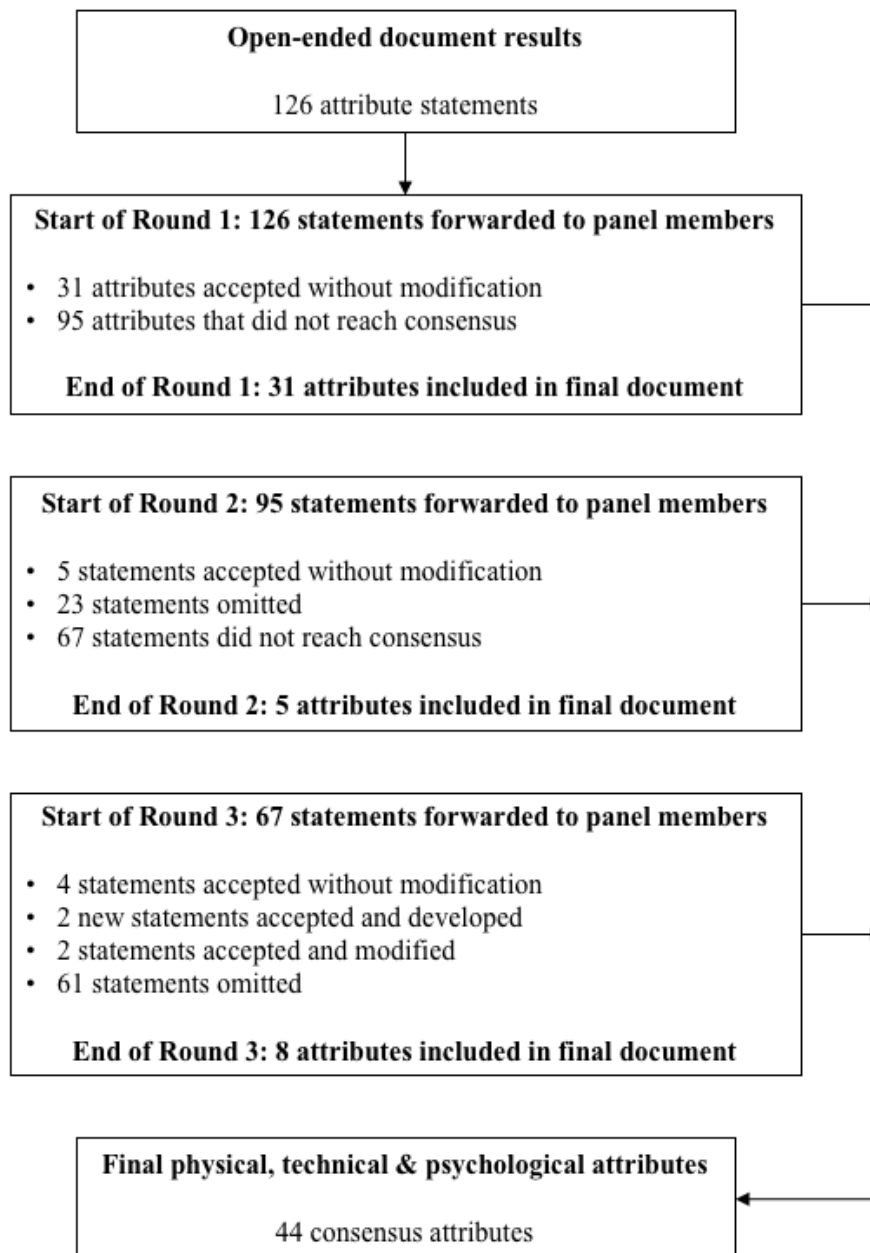
Attribute	Ranking							Mean
	1	2	3	4	5	6	7	
Tackling	0	0	0	6	4	21	22	6.1

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