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

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

32 **Abstract**

33 **Purpose:** To construct a valid and reliable methodology for the development of position-
34 specific predictors deemed appropriate for talent identification purposes within elite
35 youth soccer in England. **Method:** $N = 10$ panel experts participated in a three-step
36 modified e-Delphi poll to generate consensus on a series of generic youth player
37 attributes. A follow up electronic survey completed by coaches, scouts and recruitment
38 staff ($n = 99$) ranked these attributes to specific player-positions. **Results:** A final list of
39 44 player attributes found consensus using the three-step modified e-Delphi poll.
40 Findings indicated that player-positional attributes considered most important at the
41 youth phase are more psychological and technical than physiological or anthropometric.
42 Despite 'hidden' attributes (e.g. coachability, flair, versatility, vision, etc.) finding
43 consensus on the e-Delphi poll, there was no evidence to support these traits when
44 associated with a specific playing position. **Conclusion:** For those practitioners
45 responsible for talent recruitment, our findings may provide greater understanding of the
46 multiple attributes required for some playing positions. However, further ecological
47 research is required to assess the veracity of our claims.

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

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61 **Introduction**

62 Talent identification of youth soccer players is an important function of professional clubs in
63 England and Wales and continues to receive research attention in the sport, exercise and
64 pedagogic literature (Unnithan et al., 2012; Fenner, Iga & Unnithan, 2016; Larkin & Reeves,
65 2018). In the pursuit of this goal, the English Premier League introduced the Elite Player
66 Performance Plan (EPPP) in an attempt to increase the number of players graduating from clubs
67 who participate in the top four professional leagues in England (i.e. English Premier League,
68 Championship, League 1 and League 2) (Towlson et al., 2017). Professional clubs in England
69 and Wales annually invest between £2.3 and £4.9 million in their youth (i.e. U12 to U16 years:
70 Premier League, 2011) talent identification and development environments (Tears, Chesterton
71 & Wijnbergen, 2018; Premier League, 2011). Such investiture in the academy infrastructure
72 has seen an increase in the number of state-of-the-art, purpose-built facilities, all designed to
73 support talented players' development and progression (Haugaasen, Toering, & Jordet, 2014).
74 Despite this investment, however, evidence demonstrates that maintaining a place in an
75 academy is challenging, with ~90% of youth players in England and Wales failing to achieve
76 full professional status (Anderson & Miller, 2012).

77 Regarding previous talent identification research, studies have explored the skills and
78 qualities that may discriminate between skilled and less-skilled youth soccer players. (Coutinho
79 et al., 2016; Coelho e Silva et al., 2010; Vaeyens et al., 2006). For instance, skilled youth
80 players tend to be heavier, taller (Coelho et al., 2010), and faster (Gil et al., 2014) than there
81 less skilled counterparts. In a team sport such as soccer where body size, strength and power
82 also contain advantages (Boone et al., 2012), the selection process has resulted in the over-
83 representation of relatively older players due to advanced normative growth advantages around
84 the time of age of peak height velocity (Cobley, Schorer, & Baker, 2008; Philippaerts et al.,
85 2006).

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

94 Talent identification continues therefore to rely on subjective evaluations of players by
95 recruitment staff (Christensen, 2009), and for those individuals responsible for identifying
96 talented youth (i.e. talent scouts, academy coaches, recruitment staff, etc.) the job is complex,
97 as no objective or valid indicator or measure of talent exists (Baker, Schorer, Wattie, 2018).
98 This state of affairs was illustrated recently in a series of talent studies conducted in elite youth
99 soccer environments in England, where the complex, and at times confused relationship
100 between the organisational requirements, and the ‘on the ground’ work undertaken by
101 recruitment staff was exposed (Reeves et al., 2018a; Reeves et al., 2018b; Larkin and Reeves,
102 2018). For instance, the multidimensional nature of talent in youth soccer can include
103 prognostic dimensions such as ‘physical abilities’, ‘fitness requirements’, ‘technical skills’,
104 ‘perceptual-cognitive skills’ and ‘personal skills’ (Murr et al., 2018; Vrljic & Mallet, 2008).
105 Due to the multifaceted nature of talent some have called for more objective predictors of future
106 potential (i.e. Larkin & O’Connor, 2017) or research designs that are in a position to infiltrate
107 applied talent identification practice (Collins, MacNamara, & Cruickshank, 2018).

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

111 11 v 11 competition (under 16s) at a professional English Premier League Academy. Content
112 analysis of the concurrent verbal reports indicated that the recruitment staff openly disagreed
113 about the skills and attributes required for identical playing positions. Furthermore, in a series
114 of face-to-face follow up interviews, discrepancies between their own judgements and their
115 club's recruitment philosophy were also captured (Lewis et al., in review).

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

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

144 **Methods**

145 The position-specific consensus process featured a three-step modified e-Delphi method
146 (Meshkat et al., 2014) and online survey which took place between September 2017 and March
147 2018 following full ethical approval from an Institutional Review Board in the United
148 Kingdom. The Delphi method, developed (primarily) by Dalkey and Helmer (1963) is an
149 iterative process that provides a process of acquiring consensus from experts where there is
150 little or no evidence and where opinion is considered important (Eubank et al., 2016). Initially,
151 a comprehensive list of generic attributes was identified and consensus was built from the
152 feedback provided by experts from the proceeding rounds. For the present study the modified
153 e-Delphi method consisted of three rounds of email questionnaires.

154 *Panel selection*

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

161 research at the World Conference on Science and Soccer held in Rennes in April 2017 (i.e.
162 Reeves et al., 2018). Face-to-face meetings were then conducted with members of the Football
163 Association's (FA) talent identification department, before a series of final face-to-face
164 meetings were held with delegates and academics interested in researching talent in soccer at
165 the International Council for Coach Education (ICCE) conference held in Liverpool in July
166 2017.

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

180 *Generic attribute statements*

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

186 (2000). The term ‘hidden’ was adopted as this was a phrase commonly used by heads of
187 recruitment, academy coaches and talent scouts in a recent study (i.e. Reeves et al., 2018).
188 Other studies have adopted the term ‘personal’ (Jokuschies, Gut, & Conzelmann, 2017) or
189 ‘social’ (Williams & Reilly, 2000). Panel members were invited to propose generic attribute
190 statements under the four headings and invited to provide a brief explanation for its inclusion.
191 The final list was compiled into a Microsoft Excel (2016) spreadsheet and reviewed by author
192 (3) who had worked previously as a professional youth soccer coach with an English League
193 club and author (4) who had worked as a performance analyst for an English Premier League
194 club. All the attributes were then compiled into a draft consensus document.

195 *Round 1:*

196
197 In the first round of the e-Delphi process the draft consensus document was forwarded to our
198 ten panel members. Each participant was requested to state how important each attribute was
199 using a nine-point scale (Meshkat et al., 2014). As with previous e-Delphi studies (i.e. Meshkat
200 et al., 2014) a score between 1-3 indicated that the panel disagreed with the attribute; 4-6
201 represented an attribute that was ambiguous; and 7-9 represented a statement that found
202 agreement. Attributes for which 70% of participants did not grade within the scale 7-9 were
203 eliminated. The results were then distributed back to participants for round 2.

204 *Round 2:*

205
206 The list of attributes that did not meet consensus from round 1 were forwarded to each panel
207 member using the email address provided. Each participant was requested using the same nine-
208 point scale to grade the remaining statements eliminated at the end of round 1. At the end of
209 round 2 two new attributes were introduced by one of the panel members (i.e., ‘coachability’
210 and ‘flair’) these were accepted by the research team and included under the ‘hidden attributes’
211 category for round 3.

212 *Round 3:*

213

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

217 *Online survey*

218

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

231 For example, after selecting a recognised defensive position (e.g. central defender
232 and/or full-back), midfield positions (e.g. central midfield, left midfield, right midfield) and/or
233 attacking positions (e.g. wide attacking player and centre-forward), participants were asked to
234 select an attribute from the e-Delphi they thought was indicative of the position and rank using
235 a 7-point Likert scale. Attributes were ranked in order of importance from: (7 = most
236 important; 1 = least important). The frequency of responses was recorded on a Microsoft Excel
237 (2016) spreadsheet for each playing position and the overall mean score was determined by
238 summing the item rank scores and dividing by the frequency of respondents to each question
239 (See Table 1 for an example). Therefore, higher values indicated higher levels of importance

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

243 Table 1 About Here

244 **Results**

245 *e-Delphi* 246

247 Ten panel members with high levels of expertise and experience in the field of talent
248 identification and player recruitment in elite youth soccer participated in three e-Delphi rounds.
249 Following the first round 95 attributes did not reach full consensus. 31 of the original 126
250 attributes were accepted into the final list without modification. At the beginning of round two,
251 95 attributes that did not reach agreement were disseminated to the panel members. Following
252 the second round of voting, agreement was reached on five positional attributes. Twenty-three
253 attributes were omitted and 67 out of 95 attributes did not reach any consensus. During the
254 third and final round, four attributes reached agreement. In addition, two new attributes were
255 introduced and accepted. The panel also agreed to omit 61 attributes as they could not reach
256 70% agreement.

257 The final list of physical, psychological, technical, and hidden player attributes that received
258 full consensus from the e-Delphi poll are presented in Table 2. A breakdown of the full e-
259 Delphi process and results is provided in Figure 1.

260 *****TABLE 2 ABOUT HERE*****

261 *****FIGURE 1 ABOUT HERE*****

262 *Online survey*

263
264 During the four weeks that the survey was live (12th April 2018 – 10th May 2018), a total of 99
265 participants registered their interest and fully completed the online survey. The majority of the
266 participants were male ($n = 88$). All of the participants held a formal soccer coaching

267 qualification which ranged from the UEFA A licence or equivalent, to the FA Level 2 in
268 coaching soccer, or equivalent. None of our respondents indicated whether they had completed
269 any formal talent identification awards (i.e. FA level 1 in talent identification: an introduction
270 to scouting). The participants recorded a range of job roles within soccer which included;
271 professional soccer academy managers, academy coaches who had responsibilities for player
272 recruitment, participation coaches, coach educators and designated talent scouts. The
273 respondents were located in various geographic locations around the world including; Europe
274 ($n = 81$), Oceania ($n = 13$), North America ($n = 4$) and Asia ($n = 1$).

275

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

289

TABLE 3 ABOUT HERE

290 **Discussion**

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

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

314 *Perceptual-cognitive skills*

315 Previous soccer related research has consistently demonstrated that players with enhanced

316 perceptual-cognitive skills (e.g., decision-making and anticipation), have a considerable
317 advantage when compared to less-proficient players (Roca et al., 2011; Vaeyens et al., 2007).
318 In this respect the development of perceptual-cognitive adaptations appropriate for decision-
319 making are believed to be optimized when the training environment includes game-specific
320 activities (O'Connor, Larkin & Williams, 2017, Roca et al., 2012; Savelsbergh, Van Gastel, &
321 Van Kampen, 2010 Williams & Ford, 2013). The quality of decision-making is often defined
322 as the appropriateness of the decision preceding an appropriate action (O'Connor, Larkin &
323 Williams, 2017, Hohman, Obelöer Schlapkohl, & Raab, 2016), and evidence of experts having
324 superior visual search behaviour and fewer fixations to determine responses when compared
325 to near-experts, or non-experts has been demonstrated in striking and fielding sports (i.e.
326 cricket; McRobert et al., 2011) and invasion type sports such as a handball (Rabb & Johnson,
327 2007) and field hockey (Elferink-Gemser, et al., 2007). Research surrounding how practice
328 structure should be designed in order to promote the improvement of decision-making and
329 anticipation in soccer has suggested practice should replicate the experiences a player
330 encounters during competition (Patterson & Lee, 2008; Vickers, 2007; Williams & Ford,
331 2009). For instance, Ford et al. (2010) examined the differences between two types of practice
332 activities structure – Training Form (TF) and Playing Form (PF) – in English youth soccer.
333 While TF was defined as the type of activities that are based on technical and skill practices
334 that did not contain game-specific elements (i.e. opposition); PF was defined as activities
335 similar to the game-context incorporated through either small-sided games or phases-of-play.
336 The results indicated that TF was predominantly used in the youth soccer sessions when
337 compared to the PF. Despite this, several authors (i.e. Roca et al., 2012; Williams et al., 2012)
338 have suggested that practices designed with a structure similar to the PF are beneficial to
339 promote the development of decision-making and anticipation. This is supported by evidence
340 that casual links exist between superior anticipation and decision-making skills for those

341 players who experienced higher levels of soccer-specific play and practice hours during
342 adolescence (Roca et al., 2013).

343 *Technical attributes*

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

356 An important technical attribute for midfield players was *technique under pressure*. One might
357 speculate that due to the often small, congested area where midfield players operate, their
358 ability to control the ball, pass, dribble and turn is performed while under a rapidly changing
359 environment with constraints on time and space (Vaeyens et al., 2006). This particular attribute
360 is an interesting one given that the interdependency of executing a technique (i.e. passing) in
361 an unpredictable, interactive environment could arguably be termed a 'technical skill' rather
362 than 'technique' *per se*, due to the ability to adapt to different in-game scenarios, and decision-
363 making processes (Le Moal et al., 2014). For instance, previous research has illustrated that
364 when the proportion of attacking to defensive players in open-play situations is constrained by

365 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
366 players employ faster and more accurate decisions than their less-skilled counterparts (Vaeyens
367 et al., 2007a, 2007b). This has been attributed to more skilful players employing a smaller
368 number of fixations for longer periods in 2 versus 1 or 3 versus 1 situation towards the ball or
369 player in position of the ball. Whereas in situations where the number of attacking and
370 defensive players is increased (i.e. 3 vs 2, 4 vs. 3, and 5 vs 3) skilled players employed a higher
371 number of fixations for a shorter time period (Vaeyens et al., 2007a, 2007b). However, some
372 have questioned the ecological validity of such skill-related performance tests as they are
373 conducted independent of match context (Aquino et al., 2017).

374 *Physiological attributes*

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

390 The importance of *stamina* was reported for midfield players but not for central defenders,
391 fullbacks, or those players in more offensive positions. This is supported by well-established
392 research that midfield players cover more total and high-intensity running than central
393 defenders (Bradley et al., 2013; Gregson, Drust, Atkinson & Di Salvo, 2010) and is consistent
394 with cross-sectional studies conducted amongst elite-youth populations (Deprez et al., 2015).
395 The inclusion of *acceleration* instead of *stamina* for fullbacks may be indicative of modern
396 styles of play where fullbacks require explosiveness to pass an opponent in wide areas of the
397 pitch. Diverse speed abilities such as *acceleration* were considered important antecedents for
398 fullbacks and players with attacking roles. This appears to be supported by a recent study
399 where elite youth fullbacks and wide midfield recorded superior sprint times across 10m and
400 20m when compared to other outfield positions (Towlson et al., 2017).

401 A recent systematic review of the physiological and physical characteristics in youth soccer
402 also confirmed the relevance of these performance indicators (Murr, Raabe, & Höner, 2018).
403 Similarly, motor skills such as *agility* and the ability to change direction is also well established
404 in the literature (Murr, Raabe, & Höner, 2018), however, it is worth noting that agility can be
405 considered a speed-related motor ability without cognitive loads (Young, Dawson, & Henry,
406 2015). Our e-Delphi poll and online survey however was not sensitive enough to distinguish
407 the potential differences between agility and change-of-direction, therefore the term motor
408 ability may be a more intuitive term.

409 Despite the stated importance of power in soccer (i.e. Boone et al., 2012) this
410 physiological attribute was not recorded in the final list or included on the survey. This
411 omission is not easily explained, however, power was recently reported to only contain small
412 prognostic relevance as a performance indicator (Murr, Raabe, & Höner, 2018) although the
413 authors did provide a footnote stating that power can also be regarded as a component of speed
414 and, therefore, should not be totally discounted. Anthropometric and physical performance

415 attributes which have featured in previous talent research (i.e. body mass, body height,
416 maturation and chronological age) were not accepted into the final list. This may be due to a
417 body of well-established research suggesting that biological maturity temporarily affected
418 several attributes, which makes these attributes not a stable predictor of future performance
419 (Bidaurrezaga-Letona et al., 2015; Vandendriessche, et al., 2012).

420

421 **Limitations**

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

439 In order to verify the veracity of some of our claims, we propose that future research considers
440 capturing verbal cognitions of talent scouts using real game footage. As talent identification
441 processes are often undertaken away from the professional academy environment, this may
442 help support coaches, teachers, and scouts identify potentially talented players as a grading
443 system could be added to each of the positional components.

444

445 **Conclusion**

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

455

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459

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

705

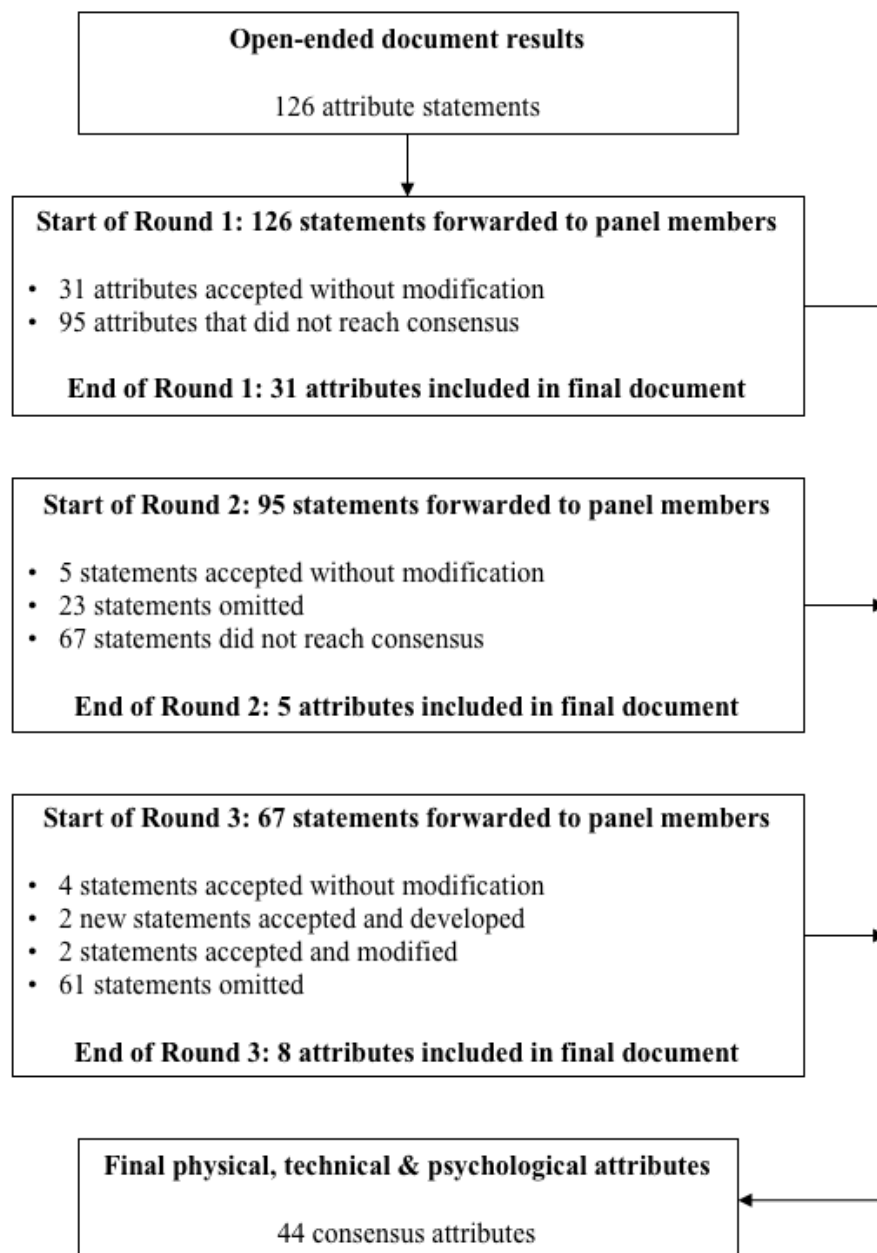
706

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

707

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