RUNNING HEAD: Practitioners' Perspectives of Soccer Talent

Practitioners' multi-disciplinary perspectives of soccer talent according to phase of development and playing position

By

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Abstract:

The study aimed to establish the perceived importance that academy soccer practitioners placed on technical/tactical, physical, psycho-social player attributes during player selection, and explore if perceptions change according to Elite Player Performance Plan (EPPP) phase. Seventy academy practitioners working within EPPP programs (Category 1: n = 29; Category 2: n = 13; Category 3: n = 28,) completed an online survey. Psychological factors were rated significantly ($p \leq 0.01$) higher than sociological, technical/tactical, and physical factors, with recruitment staff specifically valuing psychological factors significantly ($p \leq 0.01$) more than medical staff. Youth development phase practitioners valued sociological factors significantly ($p < 0.05$) more than in the Foundation phase, which was also true for physical factors. Practitioners indicated significant positional differences for most physical and technical/tactical attributes. There was no playing position effect for relative (RAE) age or maturity. Between playing position variance of outfield players for most technical and physical attributes increased according to advancing EPPP phase. Attitudes to holistic talent identification criteria likely change according to practitioner role. Therefore, this study provides evidence to suggest that EPPP practitioners place less perceived importance on enhanced maturity status and relative age of players, but does indicate an enhancing and significant positional preference for physical and technical/tactical attributes. Suggesting that practitioners are less likely to (de)select players based on transient, maturity related attributes and instead place greater emphasis on specialist physical/technical position specific attributes as players navigate the EPPP pathway towards professional status.

Keywords: Talent Identification, Soccer, Maturity, Relative Age Effect, Elite Player Performance Plan

Introduction

In 2012, the English Premier League in conjunction with its clubs, the English Football League, and the English Football Association (FA) developed the Elite Player Performance Plan (EPPP) (The English Premier League, 2011). The basis for the EPPP was to address the need to develop more and better home-grown players (The English Premier League, 2011). This development was in part aimed to improve the quality and number of 'home-grown' player's available for both domestic senior and international soccer selection, but also an attempt to meet the Union of Europeans Football Associations (UEFA) financial fair play requirements (UEFA, 2012). Although talent identification (ID) practices have long been a fundamental component of soccer, the introduction of the EPPP and its long-term aim of increasing the number of better 'home-grown' soccer players, who are eligible for international representation (The English Premier League, 2011), has perhaps initiated relatively high levels of research attention being paid to talent ID process and the EPPP (Lovell et al, 2015; Read et al, 2018; Tears et al, 2018; Towlson et al, 2017). Such attention is likely due to the significant playing and financial benefits that can be accrued through clubs having talent ID strategies that result in a high number of academy graduates making the transition to playing first-team, professional soccer for their parent club and subsequently enhancing the pool of players available for international selection. It is through this drive for clubs and national governing bodies to select the 'very best' players that the talent space has become highly contested and competitive (Bailey & Collins, 2013). However, it is not altogether clear as to how, what and why soccer talent practitioners are identifying.

It is well-recognized that attempts to identify 'talented' soccer players can be reduced to little more than 'guess work' (Bailey & Collins, 2013), as decisions are based on coaches' and talent scouts' 'gut-feeling', intuition, knowledge and experiences of player movement patterns, gained from being players and coaches, them-selves (Christensen, 2009; Christensen & Henriksen, 2012). This has led

to (sub)-conscious selection philosophies that seemingly place more emphasis on discrete components of players physical and anthropometrical characteristics (Deprez et al., 2014; Lovell et al., 2015; Malina et al., 2004; Towlson et al., 2017) that can often result in the biggest, fastest, and strongest children being selected in preference for their less biologically mature counterparts (Deprez et al., 2014; Lovell et al., 2015; Malina et al., 2004; Towlson et al., 2017). That said, talent ID practitioners have also shown to be characterized by their preference for soccer players, who are perceived as being hard-working, dedicated and possess a willingness to learn (Christensen, 2009). In recognition of this, holistic approaches to talent ID have been called for, which appreciate players' psychological and social characteristics, as well as the technical/tactical and physical components of performance (Reilly et al, 2000; Unnithan et al, 2012). Such philosophy, is evidenced through the FAs Four-Corner model for player development (The Football Association, 2014) that advocates the assessment and development of players according to their technical/tactical, physical, psychological and sociological characteristics. While the FA has long encouraged this holistic approach to player development, it is not well understood how this has filtered down into the practices of those responsible for identifying talent working within the EPPP.

One reason why it is so challenging for soccer clubs and governing bodies to employ talent ID strategies that will ensure identified players' progress to the elite, professional and international level is because child development is non-linear, and therefore players develop at different rates (Malina et al, 2004a). Nonetheless, some recommendations have been made that could assist in helping clubs make more informed decisions regarding their talent ID strategies. For example, where clubs take a singular approach to talent ID (i.e. a focus on one area of performance), there is concern that players who are relatively younger (i.e. born later in the selection period), who can sometimes also be biologically less mature can either be prematurely deselected, drop-out or overlooked in favour of players who possess relatively more mature physical and anthropometric characteristics, which are

particularly pronounced within the Foundation (under 5 to 11 years) phase of the EPPP (Lovell et al, 2015). It has been established in team-based sports, such as soccer, that a selection bias exists towards those players who are relatively older (i.e. born earlier in the selection period) (Carling et al, 2009; Hirose, 2009; Mujika et al, 2009) and those who are often more anthropometrically mature (Deprez et al, 2014; Lovell et al, 2015; Malina et al, 2000). Indeed, Towlson et al (2017) have demonstrated that there is a bias towards selecting soccer players for specific playing positions dependent on their physical characteristics prior to the adolescent growth spurt, commonly referred to within research literature as peak height velocity (PHV) (Fransen et al, 2018; Mirwald et al, 2002; Moore et al, 2015; Towlson et al, 2018). For example, relatively older and more mature players who sometimes possess enhanced anthropometric characteristics (in particular, stature) are more likely to be recruited into the positions of goalkeeper or central-defence (Deprez et al, 2014; Towlson et al, 2018). However, given the transient nature of physical and anthropometrical development, these characteristic enhancements will likely to dissipate when players' reach PHV and indeed full maturation (Lovell et al, 2015). As such, talent ID practitioners should perhaps be considerate of other characteristics as players navigate the player development pathway. For example, Larkin & O'Connor (2017) identified that talent ID practitioners demonstrated hierarchical perceived importance for player technical/tactical and psychological attributes during talent selection processes. Although informative, given the somewhat narrow (n = 20) and limited (under 13 age group only) sample of soccer talent ID practitioners and the absence of information pertaining to players biological maturity, relative age and playing position, further exploration and implementation of talent ID processes across the EPPP are required. Without developing a better understanding of the talent ID practices of those who are principally responsible for identifying soccer talent, it is difficult to comprehend the appropriateness of clubs and governing body talent ID practices, and just how well informed those responsible for identifying talent are (Miller et al, 2015). Invariably, it is the talent scout who is tasked with this initial responsibility of identifying players for development programs.

However, if a genuinely holistic approach to talent ID is to be adopted, it seems reasonable to argue that sport science, technical match-play, fitness and social science experts should be included within this process to work alongside coaches and talent scouts. So, this study is not only making attempts to address a gap in the literature related to the perspectives of talent ID practitioners operating across the EPPP, but also moves beyond a focus solely on coaches, to appreciate other staff who are integral to the employment of clubs talent ID strategies. Therefore, the principle aims of this study were to: 1) examine the perceived importance that academy soccer practitioners' place on specific sub-components of the widely endorsed FA Four Corner Model for long-term player development (The Football Association, 2014) as a framework for talent practitioners to apply to player selection and position allocation, and 2) investigate if these perceptions change according to the role and the EPPP phase of player development that practitioners primarily work within.

Methods

Participants

Having gained local ethical consent, seventy UK soccer academy practitioners, working within EPPP academy development programs (Category 1: n = 29, 41.4 %; Category 2: n = 13, 18.6 %; Category 3: 28, 40.0 %) attached to clubs competing within the 2016-17 English Premier League (n = 14, 20.%), Championship (n = 34, 48.6%), League One (n = 11, 15.7%), and League Two (n = 11, 15.7%) soccer leagues completed an online survey (surveymonkey.com, California, Palo Alto, USA) taking approximately 30 minutes. To prevent duplicate responses, respondents were required to answer *No* and then *Yes* to; *Have you previously completed (and submitted) responses to this survey?*; *Are you currently working within an elite youth soccer academy participating in the Elite Player Performance Plan)?* Failure to adhere to these criteria resulted in the responses being excluded from the final data set. Survey respondents consisted of talent scouts (n = 25, 35.7 %), heads' of recruitment (n = 14, 20.0 %), sport scientists' (n = 13, 18.6 %), dedicated EPPP phase

(Foundation, Youth, Professional development phase) coaches (n = 9, 12.9 %), lead coaches (n = 5, 7.1 %), head coaches (n = 2, 2.9 %), and an academy manger (n = 1, 1.4 %) who worked either full-time, permanent (n = 35, 50 %), part-time (n = 27, 38.6 %) or voluntary (n = 8, 11.4 %) within the Foundation (U9 to U11: n = 14, 21.4 %), Youth (U12 to U16: n = 37, 52.9 %), and Professional (U17 to U21: n = 18, 25.7%) development phases of the EPPP. Of which, 15 (21%) and 27 (38%) respondents possessed either (or both) FA Level 4 and (or) Level 3 coaching qualifications, in addition to also holding a FA Talent ID Level 1 (n = 32, 46%) and Level 2 (n = 23, 33%) certifications. In addition to soccer specific qualifications, 21 (30%) and 13 (19%) respondents had completed relative undergraduate and postgraduate degrees.

The survey was electronically distributed to prospective respondents during the in-season, second trimester (January to May) of the 2016/17 English soccer season to ensure that responses reflected normal in-season practices (Towlson et al, 2013). This was accompanied by a second electronic invitation for practitioners to complete the survey during latter weeks of the soccer season (April 2017) to those practitioners who had not previously responded, resulting in a 41.6 % survey completion rate. The content validity of the survey was assessed via discussion with both academic (n = 5) and soccer academy (Category 1: n = 4; Category 2: n = 1) practitioners (n = 5) respondents. This resulted in only physical and technical/tactical player attributes being evaluated according to playing position, as feedback suggested that many of the psychological and social characteristics were unlikely to be playing position specific. In addition, 3 questions were removed due them being deemed repetitive. Lastly, two new themed questions (biological maturity and relative age) were included, and 26 questions were rephrased to include agreed definitions for key terms to reduce question and response ambiguity (see Table 1). Once modified, the survey was redistributed to the focus group for approval.

***** INSERT TABLE 1 NEAR HERE *****

Survey content

Given that the strategic plan of the EPPP is to develop more and better 'home grown' players who are eligible for international representation and the widely used FA Four (Technical/Tactical, Psychological, Physical and Sociological) Corner Model for long-term player development (The Football Association, 2014), it was considered appropriate that the survey structure was based upon this framework. To reduce survey 'fatigue', the 232 questions were categorized in to five smaller individual sections (Section 1: '*General information*'; Section 2: *Foundation Phase;* Section 3: *Youth Development Phase;* Section 4: *Professional Development Phase;* Section 5: *Self-competency and club philosophy profile*), using the FA 'Four Corner Model' for long-term player development as a framework. All the information disclosed within *Section 1* of the survey directly related to the general characteristics of the responder. *Sections 2-4* of the survey examined which discrete components of the FA Four Corner Model (physical, tactical/technical, psychological, and social) the responder perceived as the most (or least) important for player selection during each phase (Foundation, Youth and Professional) of the EPPP. The survey was distributed via email using the FAs educations' directorate for past and prospective attendees of the FA talent ID education courses. Furthermore, professional soccer clubs were invited to distribute the survey internally to appropriate staff. Lastly, a link and associated recruitment posts were shared on Twitter.

Section 1: General information

This section was comprised of 9 multiple-choice questions, designed to ascertain the eligibility, suitability and additional practitioner characteristics, which were considered important to contextualize talent ID philosophy. Required information included: The league in which the senior first team competes in, the academy EPPP category rating (category 1, 2, 3 or 4), employment status (full/part time etc.), primary role (academy manager, scout, sport scientist etc.), which phase of the

EPPP do you primarily work within (Foundation, Youth or Professional phases) and relevant professional qualifications (F.A. coaching, talent ID awards etc.).

Sections 2 to 4: Player selection philosophy according to EPPP phase

As per previous survey design (Malone et al, 2018), responders' were required to use blinded, sliding 0-100 scales (0 = *least important*; 50 = *undecided*; 100 = *most important*) to evaluate the level of importance they gave to discrete physical (*e.g. Please indicate how important you feel endurance (*e.g. *the ability to exercise continuously for long periods of time without fatiguing) is on player selection for each playing position?),* technical/tactical, *(*e.g. *Please indicate how important you feel vision (e.g. ability to identify possible passes , shots etc.) is on player selection for each playing position?)* psychological , *(*e.g. *Please indicate how important you feel creativity (e.g. the use of imagination and inventiveness etc.) is on player selection for each playing position?* and sociological (e.g. *Please indicate how important you feel accountability is on player selection for each playing position?)* player characteristics during player selection according to the phase (Foundation, Youth and Professional) of the EPPP they primarily work in. Each section was concluded by ascertaining the respondents' global perceptions of the importance each section of the FA 'Four Corner Model' relative to the phase of the EPPP. This was achieved by having responders rank which attribute (technical/tactical, psychological, physical and sociological) they considered as the most important for soccer player selection within the particular EPPP phase.

Statistical analyses

Given that a principle aim of this study was to examine if the perceived importance that academy soccer practitioners' place on specific attributes when selecting players for different playing positions (Goalkeeper: GK; Full-back: FB; Central defender: CD; Wide midfielder: WM; Defensive central midfielder: DCM; Attacking central midfielder: ACM; Forward: FWD) changes according to their

job title, it was considered appropriate to generalise practitioners' roles into three categories (recruitment n = 39, 55.7 %; coaching: n = 16, 22.9 %; medicine: n = 14, 21.4 %) to enable statistical analysis. These sub-groups were chosen to best reflect the core departments in which the respondents likely resided. Preliminary screening of data examined missing data, outliers, and normality. Given that the survey was designed for this study and had therefore not been previously validated, we tested internal consistency using omega point estimates and bootstrapped confidence intervals. This method was preferred to Cronbach's alpha, as it holds fewer assumptions (Dunn, Baguley, & Brunsden, 2013). For the main analyses, we examined a series of general linear models with post-hoc tests and 1,000 bootstrap samples. To correct for type 1 error as a result of multiple comparisons in all statistical analyses, Benjamini-Hochberg *q* was derived from calculating the False Discovery Rate (FDR; (Benjamini & Hochberg, 1995). The null hypothesis was rejected if and only if $p < q$ and the 95% confidence interval did not contain zero. A series of one-way ANOVAs examined multiple comparisons with Sidak post-hoc test of perceptions of technical/tactical and physical attributes by position, with 95% confidence intervals derived from 1,000 bootstrapped samples. A two-way ANOVA examined position by phase effects on all attributes. Effect sizes were calculated as Cohen's *d*, which was interpreted in accordance with the recommendations of Cohen (1988) of 0.20 = *small*, 0.50 = *medium*, 0.80 = *large*, and 1.30 = *very large*.

Results:

Perceptions of FA Four Corner importance

ANOVA multiple comparisons revealed significant effects for overall value, primary role and EPPP phase. Overall, psychological factors were rated significantly ($p \leq 0.01$) higher than sociological, technical/tactical, and physical factors. Technical/tactical factors were rated significantly higher ($p \leq$

242 0.01) than sociological and physical factors. Specifically, recruitment staff valued psychological
243 factors (82.61 ± 10.42) significantly ($p \leq 0.01$) more than medical staff did (68.53 ± 21.10; $d = .85$).
244 Similarly, recruitment staff valued sociological factors (70.95 ± 14.89) significantly ($p \leq 0.05$) more
245 than medical staff did (58.86 ± 19.44; $d = 0.70$). A similar finding was evident for valuing maturity
246 ($M_{diff} = 20.22$, $p < .05$, $d = 0.75$) and relative age ($M_{diff} = 23.74$, $p < .05$, $d = 0.81$). In terms of EPPP
247 phase, staff involved in the Youth Development phase valued sociological factors (71.43 ± 13.44)
248 significantly ($p \leq 0.05$) more than in the Foundation phase (59.53 ± 14.09, $d = 0.86$). The same was
249 true for physical factors (Youth Development = 70.39 ± 11.85; Foundation = 56.78 ± 15.77, $d =$
250 0.98).
251
252 *Positional effect*
253 For technical/tactical attributes, all presented a statistically significant effect ($p < q$) with the exception
254 of tactical awareness. Specifically, all comparisons with a *medium* or *larger* effect size in Table 1
255 were statistically significantly different. Within the technical/tactical corner, practitioners working in
256 the Youth phase of the EPPP placed significantly ($p < q$) greater value on players having enhanced
257 aerial ability in comparison to their Foundation phase counterparts (GK: $M_{diff} = 18.84$, $d = .67$; FB:
258 $M_{diff} = 24.40$, $d = .87$; CD: $M_{diff} = 28.59$, $d = 1.10$; DCM: $M_{diff} = 20.43$, $d = .73$; ACM: $M_{diff} = 17.97$,
259 $d = .65$; FWD: $M_{diff} = 27.17$, $d = 1.02$). Differences between the Youth and Professional phases were
260 not statistically significant for this attribute.
261
262 Table 2 presents data pertaining to comparisons for physical attributes by position. All attributes
263 indicated significant positional differences ($p < q$) except for agility, balance, coordination and
264 muscular endurance. *Medium* and *larger* effect sizes as indicated in Table 2 are statistically
265 significantly different. There was no positional effect for relative age or maturity. Figure 1 illustrates
266 a clear increase in the relative variance in perceived importance placed on each discrete

technical/tactical attribute (except tactical awareness) from Foundation, to Youth, to Professional development phases. For enhanced body mass, Foundation phase coaches rated this as significantly less important for CD than both Youth (M_{diff} = -24.07, d = 0.96) and Professional (M_{diff} = -30.34, d = 1.52).

Maximum sprint speed was more important for GK in Foundation phase (Youth M_{diff} = 12.94, d = 0.59; Professional M_{diff} = 29.27, d = 1.55), while vertical jump ability was less important for GK (Youth M_{diff} = -16.40, d = 0.86; Professional M_{diff} = -14.97, d = 0.81), CD (Youth M_{diff} = -20.40, d = 0.90; Professional M_{diff} = -21.67, d = 0.99), and FWD (Youth M_{diff} = -16.46, d = 0.64). In general, Foundation phase coaches did not place a high value on repeated sprint ability. Specifically, they indicated statistically significantly ($p < q$) values for FB (Youth M_{diff} = -28.10, d = 1.13; Professional M_{diff} = -27.30, d = 1.14), WM (Youth M_{diff} = -26.22, d = 1.04; Professional M_{diff} = -26.94, d = 1.08), DCM (Youth M_{diff} = -22.27, d = 0.92), ACM (Youth M_{diff} = -18.04, d = 0.69), and FWD (Youth M_{diff} = -23.53, d = 0.90; Professional M_{diff} = -19.46, d = 0.76).

***** INSERT TABLE 2 NEAR HERE *****

***** INSERT TABLE 3 NEAR HERE *****

***** INSERT TABLE 4 NEAR HERE *****

***** INSERT FIGURE 1 NEAR HERE*****

Discussion

The principle aims of this study were to: 1) examine the perceived importance that academy soccer practitioners' place on specific sub-components of the widely endorsed FA Four Corner Model for

long-term player development (The Football Association, 2014) as a framework for talent practitioners to apply to player selection and role allocation, and 2) investigate if these perceptions change according to the role and the EPPP phase of player development that practitioners primarily work within. Key findings identified were: 1) with the exceptions of medical staff, psychological factors were rated significantly ($p \leq 0.01$) higher than sociological, technical/tactical, and physical factors by practitioners, with recruitment staff specifically valuing psychological factors significantly ($p \leq 0.01$) more than medical staff did; 2) Practitioners involved in the Youth Development phase valued sociological and physical factors significantly ($p < 0.05$) more than in the Foundation phase 3) Practitioners indicated significant positional differences ($p < q$) for most physical (except agility, balance, coordination and muscular endurance) and technical/tactical (except tactical awareness) attributes; 4) There was no positional effect for relative age or maturity; 5) Between playing position variance of outfield players (FB, CD, WM, DCM, ACM and FWD) for each discrete technical/tactical (except tactical awareness) and physical (except muscular strength) attribute increases according to advancing EPPP phase (Foundation, Youth and Professional development phase). These findings then, serve as useful in enabling talent ID and recruitment practitioners to reflect on their talent ID and recruitment strategies, and whether these are aligned with the players they do identify and recruit into their academies.

Perceptions of Four Corner importance

Overall, psychological factors were rated significantly ($p < 0.01$) higher than sociological, technical/tactical, and physical factors. We postulate that increased opportunities to engage in formalized educational provision that relates to talent ID, such as the FA's talent ID courses have led to a greater awareness of psychological principles and their importance when identifying players. Indeed, from the sample of people who completed this survey, 46% (n = 32) had attained the FA Level 1 in talent ID and 32% (n = 23) the FA Level 2 in talent ID. In addition, a similar percentage

313 to those who had completed the talent ID Level 1 and 2 had completed the FA's Youth Awards 1
314 and 2, where again, the focus of these awards were on developing a holistic learning environment
315 and developing coaching practice accordingly. Although, it is positive to see those involved in talent
316 ID are looking beyond technical/tactical and physical characteristics of performance, this finding
317 does perhaps highlight a need to be cautious that these are not overlooked altogether. Therefore,
318 practitioners should perhaps consider the manipulation of game format (i.e. bio-banding,
319 categorizing players according to biological maturity status; See Cumming et al (2017a); Cumming
320 et al (2017b)) during talent selection process (i.e. "Late" versus "Late", "Late" versus "Early",
321 "Early" versus "Early" maturers) in order to tease out certain desirable player characteristics which
322 might otherwise be masked during chronologically aged match-play (Cumming et al, 2018).

323 While using bio-banding for identifying talented young soccer players is very appealing, there is no
324 soccer-specific objective evidence for its efficacy as a talent (de)selection tool. For bio-banding to be
325 fully endorsed by UEFA and widely used by its national associations, its efficacy must be
326 demonstrated from a multi-disciplinary (physical, technical, psychological) perspective (The Soccer
327 Association, 2010; Unnithan et al, 2012). Moreover, as bio-banding is designed to group players
328 together based on anthropometric characteristics, it is unknown if staff responsible for the
329 (de)selection of players can effectively evaluate the key tactical (e.g. spatial exploration, creativity)
330 and psychological (e.g. confidence, attitude, competitiveness) characteristics of players, as these are
331 generally displayed in times of adversity, notably when competing against taller, stronger and faster
332 players (i.e. more mature).

333 An interesting finding was that practitioners involved in the Youth Development phase valued
334 sociological factors significantly more than in the Foundation phase. There is a consensus within the
335 literature that sociological factors are determinants of sport expertise. For example, Baker et al (2003)
336 reported that cultural influences such as the importance that a country or society places on a particular

sport are a critical factor in sporting success, while Hopwood et al (2015) identified that the order of birth within their family influenced the likelihood of becoming an expert performer. Furthermore, Gagné (2004) theorised using the Differentiated Model of Giftedness and Talent that sociological factors were pivotal to enabling talent to be realised. However, literature exploring talent ID practitioners' views on the importance of sociological factors for player development are limited. In fact, we could not find one study that has investigated this. Therefore, it makes it challenging for us to explain why the practitioners in this study valued sociological factors as more important in the Youth Development phase than the Foundation phase.

Positional effect

The present study supports findings from a previous study showing that there was a perception that enhanced stature had a *small* to *large* significant difference for GK compared with other outfield playing positions (Towlson et al., 2017). What was surprising was that no significant difference (all $p > q$; $d < 0.41$[1]) was identified between GK and CD versus the remaining outfield playing positions for practitioners' perceived importance of player biological maturity, demonstrating only a *small* difference in perceived importance for biological maturity in playing positions typically associated (FB,WM and ACM) to smaller players (Towlson et al, 2017). This finding is interesting, given that key defensive playing positions (such as GK and CD) where enhanced stature is likely to be advantageous in aerial and physical duels with opponents have been shown to be typically allocated to earlier maturing soccer academy players. Such players have sometimes been shown to be born earlier in the selection years (Lovell et al, 2015; Towlson et al, 2017) and are can be beneficiaries of anthropometric and performance related advantages associated to early exposures to normative growth curves (Buchheit et al, 2010; Mendez-Villanueva et al, 2010; Philippaerts et al, 2006). These findings are in agreement with Larkin and O'Connor (2017), who have also stated that anthropometrical characteristics were among characteristics of least perceived importance, which

might suggest that practitioners feel they are either unable to identify how close players are to achieving full maturational status within a match (and talent ID) context, or that enhanced stature was an important attribute for certain playing positions (i.e. GK and CD), it was not a determining factor in whether players were identified into those positions. That said, practitioners primarily operating within the Foundation phase of the EPPP reassuringly demonstrated the lowest level (56.78 ± 15.77 AU) of perceived importance for physical factors.

Although few, and *small* physical differences have been shown to exist between a representative sample (n = 1,212) of EPPP academy soccer players who are born early (versus late) in the EPPP Foundation selection year (Lovell et al 2015), it has been shown that those relatively younger players can often possess an advanced growth status. This likely contributes toward a homogenous physical player phenotype (Lovell et al 2015). Such disparity within the literature and the present study might suggest that although practitioners are aware of the complexities of selecting players based on potentially transient physical enhancements, the temptation to select a player based on absolute terms in order to facilitate on field success may well remain too great. This notion is supported by the increase in between playing position variance (see Figure 2) for the perceived importance placed on discrete physical attributes (except muscular endurance) of outfield players (FB, CD, WM, DCM, ACM and FWD) according to advancing EPPP phase (Foundation, Youth and Professional development phase). This was demonstrated for technical/tactical attributes (except tactical awareness) as depicted in Figure 1.

In a similar manner to the physical data, there was less variance in how those working in the Foundation phase perceived the importance of technical/tactical playing attributes compared with those working within the Youth development and Professional development phases. This could suggest greater perceived importance is placed on position specific attributes within the Youth development and Professional development phases compared with the Foundation phase. Of course,

385 a certain level of variance will always exist, as the data shows (i.e. practitioners place a *small* to *large*
386 difference of perceived importance on GK and CD having to be taller than other playing positions)
387 and that is to be expected given that players will already have been identified based on their
388 performance within a certain playing position. However, the fact this variance is low suggests that
389 recruitment practitioners do not appear to be selecting the youngest players based on their
390 technical/tactical characteristics that would typically be associated to specific playing-positions (i.e.
391 tackling for defenders). We would caution against an approach where practitioners identify players'
392 technical/tactical attributes for specific playing positions in the Foundation and even Youth
393 development phase, given that UK EPPP soccer academy players are likely to undergo a period of
394 accelerated growth (10.7 to 15.2 years) that spans these phases (Towlson et al, 2018).

395 Although we consider that the design and content of the survey has added to the fields understanding
396 of what attributes practitioners across numerous roles involved in talent ID and recruitment consider
397 important, we do acknowledge that the cross-sectional survey design does limit the generalizations
398 and assertions that can be made to the sample of practitioners who participated within the study only.
399 soccer. We acknowledge that although the survey specifically requested practitioners to state their
400 personal level of perceived importance they place on each of the player attributes during initial player
401 selection, we do anticipate that the club talent ID and player selection philosophies may have
402 (sub)consciously influenced responses and therefore consider this as a limitation. Also, we
403 acknowledge the work conducted by Zuber et al (2016) who identified that late maturing,
404 achievement orientated and highly skilled players failed to transition from the under 14 to 15 age
405 groupings. This might suggest that although practitioners sampled within this study do place greater
406 importance on psychological characteristics as opposed to possible transient physical, maturity and
407 relative age characteristics, this awareness alone may not be great enough to prevent the early
408 deselection of late maturing players from the prospective international talent selection pool and this
409 finding should be treated with some caution. Lastly, given the emphasis of personal 'intuition' (or

410 'gut feeling') and previous experience of practitioners (Christensen, 2009; Christensen & Henriksen,
411 2012), we consider the omission of measuring the level of perceived importance placed on personal
412 'intuition' (or 'gut feeling') by practitioners as a limitation. This selection phenomena, was seemingly
413 of importance to some practitioners and should be accounted for within future studies.

414 **Conclusion**

415 Findings identified that talent ID practitioners rated players' psychological characteristics
416 significantly ($p \leq 0.01$) higher than any other corner (sociological, technical/tactical, and physical) of
417 the FAs Four Corner approach to player development (The Soccer Association, 2014).
418 Demonstrating that attitudes to holistic talent ID criteria likely change according to practitioner role,
419 emphasized by recruitment staff placing significantly ($p \leq 0.01$) more value on psychological factors
420 than medical staff. Such fluidity of perception is development phase specific, with practitioners also
421 showing that those involved in the Youth development phase placed significantly ($p < 0.05$) greater
422 emphasis on sociological factors than colleagues in the foundation phase which was also true for
423 physical factors. Lastly, practitioners indicated significant positional differences ($p < q$) for most
424 physical and technical/tactical attributes. Showing playing position specificity for most discrete
425 technical and physical attributes to increase according to advancing EPPP phase (Foundation, Youth
426 and Professional development phase). However, there was no evidence of positional effect for
427 relative age or maturity, suggesting that talent ID practitioners are aware of the transient bias that are
428 typically associated to some criteria in which players are benchmarked against and (de)selected.

429 *Applications for coaches*

430 If governing bodies, professional soccer clubs and their associated talent ID practitioners are to
431 employ a more holistic and multi-disciplinary approach to talent ID, the findings from this paper
432 suggest that there must be willingness for individuals responsible for (de)selecting talent to (1)

recognize and understand the multifaceted nature of player development, with a particular reference (but not exclusive to) to the four constituents of the FA Four Corner Model for long-term player development (2) understand their (sub)conscious bias for what constitutes talent, this in some instances might be inherent to the persons area of expertise (3) Be considerate of new and innovative ways (i.e. bio-banding etc.) to manipulate talent selection processes in order to afford players greater opportunity to showcase tactical/technical, physical, psychological and sociological attributes (4) employ an inclusive approach to talent (de)selection and identify the practitioners within the club and personnel further afield (such as academics and industry) who possess the necessary expert knowledge and experiences that are specific to one (or more) of the areas associated to a multi-disciplinary approach to talent ID.

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References:

1. Bailey, R. & Collins, D. (2013) The standard model of talent development and its discontents. *Kinesiology Review*, 2(4), 248-259.
2. Baker, J., Horton, S., Robertson-Wilson, J. & Wall, M. (2003) Nurturing sport expertise: factors influencing the development of elite athlete. *Journal of Sports Science & Medicine*, 2(1), 1.
3. Benjamini, Y. & Hochberg, Y. (1995) Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, 289-300.

4. Buchheit, M., Mendez-Villanueva, A., Simpson, B. & Bourdon, P. (2010) Match running performance and fitness in youth soccer. *International Journal of Sports Medicine*, 31(11), 818-825.
5. Carling, C., Le Gall, F., Reilly, T. & Williams, A. (2009) Do anthropometric and fitness characteristics vary according to birth date distribution in elite youth academy soccer players? *Scandinavian Journal of Medicine & Science in Sports*, 19(1), 3-9.
6. Christensen, M. K. (2009) "An eye for talent": Talent identification and the "practical sense" of top-level soccer coaches. *Sociology of Sport Journal*, 26(3), 365-382.
7. Christensen, M. K. & Henriksen, K. (2012) Coaches and talent identification.
8. Cumming, S. P., Brown, D. J., Mitchell, S., Bunce, J., Hunt, D., Hedges, C., Crane, G., Gross, A., Scott, S. & Franklin, E. (2017a) Premier League academy soccer players' experiences of competing in a tournament bio-banded for biological maturation. *Journal of Sports Sciences*, 1-9.
9. Cumming, S. P., Lloyd, R. S., Oliver, J. L., Eisenmann, J. C. & Malina, R. M. (2017b) Bio-banding in sport: applications to competition, talent identification, and strength and conditioning of youth athletes. *Strength & Conditioning Journal*, 39(2), 34-47.
10. Cumming, S. P., Searle, C., Hemsley, J. K., Haswell, F., Edwards, H., Scott, S., Gross, A., Ryan, D., Lewis, J. & White, P. (2018) Biological maturation, relative age and self-regulation in male professional academy soccer players: A test of the underdog hypothesis. *Psychology of Sport and Exercise*, 39, 147-153.
11. Deprez, Fransen, J., Boone, J., Lenoir, M., Philippaerts, R. & Vaeyens, R. (2014) Characteristics of high-level youth soccer players: variation by playing position. *Journal of Sports Sciences*, 1-12.

12. Fransen, J., Bush, S., Woodcock, S., Novak, A., Deprez, D., Baxter-Jones, A. D., Vaeyens, R. & Lenoir, M. (2018) Improving the prediction of maturity from anthropometric variables using a maturity ratio. *Pediatric Exercise Science*, 30(2), 296-307.
13. Gagné, F. (2004) Transforming gifts into talents: The DMGT as a developmental theory. *High Ability Studies*, 15(2), 119-147.
14. Hirose, N. (2009) Relationships among birth-month distribution, skeletal age and anthropometric characteristics in adolescent elite soccer players. *Journal of Sports Sciences*, 27(11), 1159-1166.
15. Hopwood, M., Farrow, D., MacMahon, C. & Baker, J. (2015) Sibling dynamics and sport expertise. *Scandinavian Journal of Medicine & Science in Sports*, 25(5), 724-733.
16. Larkin, P. & O'Connor, D. (2017) Talent identification and recruitment in youth soccer: Recruiter's perceptions of the key attributes for player recruitment. *PLOS one*, 12(4), e0175716.
17. Lovell, R., Towlson, C., Parkin, G., Portas, M., Vaeyens, R. & Cobley, S. (2015) Soccer Player Characteristics in English Lower-League Development Programmes: The Relationships between Relative Age, Maturation, Anthropometry and Physical Fitness. *PloS one*, 10(9), e0137238.
18. Malina, R. M., Bouchard, C. & Bar-Or, O. (2004a) *Growth, Maturation, and Physical activity*Human Kinetics Publishers.
19. Malina, R. M., Eisenmann, J. C., Cumming, S. P., Ribeiro, B. & Aroso, J. (2004b) Maturity-associated variation in the growth and functional capacities of youth soccer (soccer) players 13–15 years. *European Journal of Applied Physiology*, 91(5-6), 555-562.
20. Malina, R. M., Reyes, M. P., Eisenmann, J., Horta, L., Rodrigues, J. & Miller, R. (2000) Height, mass and skeletal maturity of elite Portuguese soccer players aged 11–16 years. *Journal of Sports Sciences*, 18(9), 685-693.

21. Malone, J. J., Harper, L. D., Jones, B., Perry, J., Barnes, C. & Towlson, C. (2018) Perspectives of applied collaborative sport science research within professional team sports. *European Journal of Sport Science*, 1-9.
22. Mendez-Villanueva, A., Buchheit, M., Kuitunen, S., Poon, T., Simpson, B. & Peltola, E. (2010) Is the relationship between sprinting and maximal aerobic speeds in young soccer players affected by maturation. *Pediatric Exercise Science*, 22(4), 497-510.
23. Miller, P. K., Cronin, C. & Baker, G. (2015) Nurture, nature and some very dubious social skills: an interpretative phenomenological analysis of talent identification practices in elite English youth soccer. *Qualitative Research in Sport, Exercise and Health*, 7(5), 642-662.
24. Mirwald, R. L., Baxter-Jones, A., Bailey, D. A. & Beunen, G. P. (2002) An assessment of maturity from anthropometric measurements. *Medicine and Science in Sports and Exercise*, 34(4), 689.
25. Moore, S. A., McKay, H. A., Macdonald, H., Nettlefold, L., Baxter-Jones, A. D., Cameron, N. & Brasher, P. M. (2015) Enhancing a somatic maturity prediction model. *Medicine & Science in Sports & Exercise*, 47(8), 1755-1764.
26. Mujika, I., Vaeyens, R., Matthys, S. P., Santisteban, J., Goiriena, J. & Philippaerts, R. (2009) The relative age effect in a professional soccer club setting. *Journal of Sports Sciences*, 27(11), 1153-1158.
27. Philippaerts, R. M., Vaeyens, R., Janssens, M., Van Renterghem, B., Matthys, D., Craen, R., Bourgois, J., Vrijens, J., Beunen, G. & Malina, R. M. (2006) The relationship between peak height velocity and physical performance in youth soccer players. *Journal of Sports Sciences*, 24(3), 221-230.
28. Read, P. J., Oliver, J. L., De Ste Croix, M. B., Myer, G. D. & Lloyd, R. S. (2018) An audit of injuries in six English professional soccer academies. *Journal of Sports Sciences*, 36(13), 1542-1548.

29. Reilly, T., Williams, A. M., Nevill, A. & Franks, A. (2000) A multidisciplinary approach to talent identification in soccer. *Journal of Sports Sciences*, 18(9), 695-702.
30. Tears, C., Chesterton, P. & Wijnbergen, M. (2018) The elite player performance plan: the impact of a new national youth development strategy on injury characteristics in a premier league soccer academy. *Journal of Sports Sciences*, 1-8.
31. The English Premier League (2011) Elite Player Performance Plan, [Lecture].unpublished.
32. The Soccer Association (ed), (2010) *The Future Game: The Soccer Association Technical Guide for Young Player Development*.
33. The Soccer Association (2014) *FA Chairman's update on England Commission.*
34. Towlson, C., Cobley, S., Midgley, A., Garrett, A., Parkin, G. & Lovell, R. (2017) Relative Age, Maturation and Physical Biases on Position Allocation in Elite-Youth Soccer. *International Journal of Sports Medicine*.
35. Towlson, C., Cobley, S., Parkin, G. & Lovell, R. (2018) When does the influence of maturation on anthropometric and physical fitness characteristics increase and subside? *Scandinavian Journal of Medicine & Science in Sports.*, Accepted.
36. Towlson, C., Midgley, A. W. & Lovell, R. (2013) Warm-up strategies of professional soccer players: practitioners' perspectives. *Journal of sports sciences*, 31(13), 1393-1401.
37. *UEFA Club Licensing and Fiancial Fair Play Regulations* (2012) Chapter http://www.uefa.com/MultimediaFiles/Download/Tech/uefaorg/General/01/80/54/10/1805410_DOWNLOAD.pdf: UEFA.
38. Unnithan, V., White, J., Georgiou, A., Iga, J. & Drust, B. (2012) Talent identification in youth soccer. *Journal of Sports Sciences*, 30(15), 1719-1726.
39. Zuber, C., Zibung, M. & Conzelmann, A. (2016) Holistic Patterns as an Instrument for Predicting the Performance of Promising Young Soccer Players–A 3-Years Longitudinal Study. *Frontiers in Psychology*, 7, 1088.

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Table 1. Terms and associated operational definitions of each characteristic for each sub component of the F.A. Four Corner (e.g. Technical/Tactical, Physical, Psychological and Sociological) Model, accompanied by maturity and relative age components of player development.

Technical/Tactical
Receiving the ball
Turning with the ball
Dribbling with the ball
Short passing (e.g. less than 10 m)
Long passing (e.g. greater than 10 m)
Shooting
Tackling
Aerial ability (e.g. heading for outfield players and catching etc. for goalkeepers)
Tactical awareness (e.g. the ability for a player to know their role and have positional awareness on the field, and possessing the ability make good decisions
Vision (e.g. ability to identify possible passes/shots)
Anticipation (e.g. ability to read and predict passages of match-play)

Physical
Enhanced body-mass (e.g. a greater mass than what you would perceive as the 'norm')
Enhance standing height (e.g. a greater standing height that what you would perceive as the 'norm')
Endurance (e.g. ability to exercise continuously for longer periods of time without fatiguing)
Acceleration
Maximal sprinting speed
Vertical jumping ability
Repeated sprint ability (e.g. ability to perform repeated bouts of high intensity running with minimal recovery)
Agility, Balance and Coordination (ABC)
Muscular strength (e.g. amount of force a muscle or group of muscles can produce with a single maximal effort)
Muscular endurance (e.g. ability of a muscle or group of muscles to repeatedly exert force against a resistance)

Psychological
On pitch confidence
On pitch creativity (e.g. the use of imagination and inventiveness)
Self-discipline (e.g. the ability to control ones feelings and overcome weaknesses)
Commitment (e.g. dedication to the cause, activity, objective)
Intrinsic motivation (e.g. own enjoyment and love etc.)
Extrinsic motivation (e.g. trophies, praise, bonuses etc.)
On pitch bravery (e.g. willingness to block a shot with own body etc.)
Positive attitude
Resilience (e.g. to bounce back from defeat or disappointment)
Calm under pressure.

Sociological
Self-reflection (e.g. critically assessing one's own performance
Teamwork (e.g. willingness to work within a team towards a common goal)
Positive relationships with team-mates and staff
Accountability (e.g. taking responsibility for own performance and actions)
Leadership (e.g. ability to lead a group of players)
Communication
Supportive family life (e.g. Parent/guardians actively engaging in players development)
Healthy socioeconomic background (e.g. players family perceived economic and social position in relation to others, based on income, education and occupation etc.)
City/town of residence

Maturity and Relative Age Characteristics
Enhanced player biological maturity (e.g. players who you might consider as being nearer to achieving an adult status [i.e. full maturation])
Relative age (e.g. the month in which the player was born within the football selection year)

Table 2. Mean (95% confidence intervals) level of perceived importance (0 = *least important*; 50 = *undecided*; 100 = *most important*) and associated effect sizes for between playing posi difference for Technical components of the FA Four Corner Model.

Variable	*n*	Cohort	GK	FB	CD	WM	DCM	ACM	FWD
Receiving the ball (AU)	70	77.1 (75.7 to 78.4)	67.5 (63.0 to 71.9) **FB^{S}, CD^{S}, WM^{M}, DCM^{M}, ACM^{M}, FWD^{M}**	74.1 (70.4 to 77.7) **GK^{S}, WM^{S}, DCM^{S}, ACM^{M}, FWD^{M}**	72.3 (68.7 to 75.9) **GK^{S}, WM^{S}, DCM^{M}, ACM^{M}, FWD^{M}**	78.5 (75.5 to 81.5) **GK^{M}, FB^{S}, DCM, ACM^{S}, FWD^{S}**	80.4(77.6 to 83.3) **GK^{M}, FB^{S}, DCM, ACM^{S}, FWD^{S}**	83.3 (80.6 to 86.0) **GK^{M}, FB^{M}, DCM, WM^{S}, DCM^{S}**	83.4 (80.6 to 86.2) **GK^{M}, FB^{M}, DCM WM^{S}, DCM^{S}**
Turning with the ball (AU)	70	70.1 (68.1 to 72.2)	39.8 (33.3 to 46.3) **FB^{M}, DCM, WM^{L}, DCM^{L}, ACM^{VL}, FWD^{VL}**	65.4 (60.8 to 70.5) **GK^{M}, WM^{M}, DCM^{S}, ACM^{M}, FWD^{L}**	63.7 (59.1 to 68.5) **GK^{M}, WM^{M}, DCM^{M}, ACM^{L}, FWD^{L}**	79.1 (75.8 to 82.4) **GK^{L}, FB^{M}, DCM, DCM^{S}, ACM^{S}, FWD^{S}**	75.5 (71.2 to 79.7) **GK^{L}, FB^{S}, DCM, WM^{S}, ACM^{S}, FWD^{S}**	82.9 (80.0 to 85.8) **GK^{VL}, FB^{M}, CD^{L}, WM^{S}, DCM^{S}**	84.5 (82.0 to 87.7) **GK^{VL}, FB^{L}, CD^{L}, WM^{S}, DCM**
Dribbling (AU)	70	67.8 (65.5 to 70.1)	31.9 (25.6 to 38.2) **FB^{L}, DCM, WM^{VL}, DCM^{M}, ACM^{M}**	73.1 (69.2 to 76.9) **GK^{L}, DCM^{S}, ACM^{S},**	56.7 (51.5 to 62.0) **GK^{M}, FB^{M}, WM^{L}, DCM^{S}, ACM^{L}, FWD^{L}**	87 (84.4 to 89.9) **GK^{VL}, FB^{M}, CD^{L}, DCM^{L}, ACM^{S}, FWD^{S}**	62.2 (57.6 to 66.8) **GK^{L}, FB^{M}, CD^{S}, WM^{L}, ACM^{M}, FWD^{M}**	81.6 (77.9 to 85.2) **GK^{VL}, FB^{S}, CD^{L}, WM^{S}, DCM^{M}**	82.1 (78.3 to 85.9) **GK^{VL}, FB^{S}, CD^{L}, WM^{S}, DCM**
Short passing (AU)	70	77.8 (76.5 to 79.2)	70.3 (65.4 to 75.1) **FB^{S}, CD^{S}, WM^{S}, DCM^{L}, ACM^{VL}, FWD^{VL}**	76.4 (72.8 to 79.9) **GK^{S}, DCM^{S}, ACM^{S}**	77.8 (74.6 to 81.1) **GK^{S}, DCM^{S}, ACM^{S}**	76.5 (73.0 to 80.0) **GK^{S}, DCM^{S}, ACM^{S}**	82.6 (79.5 to 85.7) **GK^{M}, FB^{S}, CD^{S}, WM^{S}**	82.0 (78.7 to 85.2) **GK^{M}, FB^{S}, CD^{S}, WM^{S}**	79.5 (75.9 to 83.0) **GK^{L}, FB^{L}, CD^{L}, WM^{M}, DCM^{M}, AC**
Long passing (AU)	70	72.6 (70.8 to 74.4)	81.1 (76.7 to 85.4) **FB^{VL}, DCM, WM^{M}, DCM^{S}, ACM^{M}, FWD^{L}**	76.0 (71.4 to 80.5) **GK^{VL}, CD^{L}, WM^{S}, ACM^{M}, FWD^{L}**	79.3 (75.5 to 83.0) **GK^{M}, FB^{L}, WM^{M}, DCM^{S}, ACM^{M}, FWD^{L}**	70.7 (65.8 to 75.7) **GK^{M}, FB^{S}, DCM, DCM^{S}, FWD^{M}**	77.1 (73.2 to 80.9) **GK^{S}, CD^{S}, WM^{S}, ACM^{S}, FWD^{M}**	68.4 (63.4 to 73.3) **GK^{M}, FB^{M}, DCM, DCMM^{S}, FWD^{S}**	55.8 (50.3 to 61.4)
Shooting (AU)	70	61.1 (58.3 to 63.8)	21.1 (15.0 to 27.3) **FB^{M}, DCM, WM^{VL}, DCM^{L}, ACM^{VL}, FWD^{VL}**	51.4 (45.4 to 57.3) **GK^{M}, CD^{S}, WM^{M}, DCM^{S}, ACM^{L}, FWD^{VL}**	45.6 (39.4 to 51.8) **GK^{M}, FB^{S}, WM^{L}, DCM^{S}, ACM^{L}, FWD^{VL}**	75.1 (71.4 to 78.7) **GK^{VL}, FB^{M}, CD^{L}, DCM^{M}, ACM^{M}, FWD^{L}**	57.2 (51.8 to 62.6) **GK^{L}, FB^{S}, CD^{S}, WM^{M}, ACM^{L}, FWD^{VL}**	83.4 (80.5 to 86.3) **GK^{VL}, FB^{L}, CD^{L}, WM^{M}, DCM^{L}, FWD^{M}**	93.7 (91.3 to 96.1) **GK^{VL}, FB^{VL}, CD^{VL} WM^{L}, DCM^{VL}, AC**
Tackling (AU)	70	69.3 (67.0 to 71.5)	38.4 (31.6 to 45.1) **FB^{VL}, CD^{VL}, WM^{M}, DCM^{VL}, ACM^{M}, FWD^{M}**	84.1 (80.7 to 87.4) **GK^{VL}, CD^{S}, WM^{M}, ACM^{M}, FWD^{L}**	88.1 (85.1 to 91.2) **GK^{VL}, FB^{S}, WM^{L}, DCM^{S}, ACM^{L}, FWD^{L}**	65.6 (60.8 to 70.5) **GK^{M}, FB^{M}, CD^{L}, DCM^{M}, FWD^{S}**	84.6 (81.5 to 87.7) **GK^{VL}, CD^{S}, WM^{M}, ACM^{L}, FWD^{L}**	64.0 (59.0 to 69.0) **GK^{M}, FB^{M}, CD^{L}, DCM^{L}**	60.1 (54.2 to 65.9) **GK^{M}, FB^{L}, CD^{L}, WM^{S}, DCM^{L}**
Aerial ability (AU)	70	73.3 (71.1 to 75.5)	80.3 (74.0 to 86.6) **FB^{S}, CD^{S}, WM^{M}, DCM^{S}, ACM^{M}**	71.2 (65.3 to 77.0) **GK^{S}, DCM, WM^{S}, ACM^{S}, FWD^{S}**	85.9 (80.8 to 91.0) **GK^{S}, FB^{M}, WM^{L}, DCM^{S}, ACM^{M}, FWD^{S}**	58.5 (52.9 to 64.0) **GK^{M}, FB^{S}, CD^{L}, DCM^{M}, ACM^{S}, FWD^{M}**	73.2 (67.7 to 78.6) **GK^{S}, CD^{S}, WM^{M}, ACM^{S}, FWD^{S}**	64.5 (58.7 to 70.3) **GK^{M}, FB^{S}, DCM, WM^{S}, DCM^{S}, FWD^{M}**	79.7 (74.5 to 84.9) **FB^{S}, CD^{S}, WM^{M}, DCM^{S}, ACM^{M}**
Tactical awareness (AU)	70	83.4 (81.9 to 84.9)	80.2 (75.7 to 84.6) **FB^{S}, CD^{S}, DCM^{S}, FWD^{S}**	84.5 (80.5 to 88.4) **GK^{S}**	85.5 (81.7 to 89.2) **GK^{S}, WM^{S}**	81.4 (76.8 to 86.0) **CD^{S}, DCM^{S}**	85.3 (81.5 to 89.0) **GK^{S}, WM^{S}**	83.1 (78.9 to 87.3)	84.0 (80.1 to 87.9) **GK^{S}**
Vison (AU)	70	80.5 (78.8 to 82.2)	76.3 (71.2 to 81.4) **WM^{S}, DCM^{S}, ACM^{M}, FWD^{S}**	77.7 (73. to 81.9) **WM^{S}, DCM^{S}, ACM^{M}, FWD^{S}**	75.6 (70.5 to 80.8) **WM^{S}, DCM^{S}, ACM^{M}, FWD^{S}**	81.7 (77.8 to 85.5) **GK^{S}, FB^{S}, CD^{S}, ACM^{S}**	83.0 (79.3 to 86.7) **GK^{S}, FB^{S},** CD^{S}, **ACM^{L}**	87.5 (83.9 to 91.0) **GK^{M}, FB^{M}, DCM, WM^{S}, DCM^{S}, FWD^{S}**	81.6 (77.5 to 85.6) **GK^{S}, FB^{S}, CD^{S}, ACM^{S}**
Anticipation (AU)	70	81.2 (79.8 to 82.6)	80.9 (76.8 to 84.9) **WM^{S}, DCM^{S}, FWD^{S}**	79.4 (75.9 to 82.9) **CD^{S}, WM^{S}, DCM^{S}, FWD^{S}**	83.4 (79.9 to 86.9) **FB^{S}, WM^{S}, ACM^{S}**	75.4 (70.7 to 80.0) **GK^{S}, FB^{S}, CD^{S}, DCM^{S}, ACM^{S},** FWD^{S}	84.3 (80.8 to 87.7) **GK^{S}, FB^{S}, WM^{S}, ACM^{S}**	80.2 (76.6 to 83.7) **CD^{S}, WM^{S}, DCM^{S}, FWD^{S}**	84.9 (81.5 to 88.3) **GK^{L}, FB^{L},** WM^{S}, **ACM^{S}**

Note. Statistically significant difference ($p < q$) denoted in bold; GK = goalkeeper, FB = full back, CD = central defence, WM = wide midfield, DCM = defensive central midfield, ACM = attacking central midfield, FWD = forward/striker. Observed effect magnitudes are denoted as small (^{S}), moderate (^{M}), large (^{L}), very large (^{VL}). AU = Arbitrary units.

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Table 3. Mean (95% confidence intervals) level of perceived importance (0 = *least important*; 50 = *undecided*; 100 = *most important*) and associated effect sizes for between playing p difference for Physical components of the FA Four Corner Model.

Variable	*n*	Cohort	GK	FB	CD	WM	DCM	ACM	FWD
Enhanced body-mass (AU)	*70*	50.0 (47.6 to 52.3)	55.1 (48.5 to 61.7) FB^{S}, **WM**^{S}, **ACM**^{S}	44.8 (39.0 to 50.6) GK^{S}, **CD**^{S}, DCM^{S}, FWD^{S}	60.1 (53.7 to 66.6) **FB**^{S}, **WM**^{M}, DCM^{S}, **ACM**^{M}, FWD^{S}	41.9 (36.6 to 47.1) **GK**^{S}, DCM^{S}, **FWD**^{S}	51.1 (44.8 to 57.4) FB^{S}, CD^{S}, WM^{S}, ACM^{S},	43.7 (37.7 to 49.6) **GK**^{S}, DCM, DCM^{S}, FWD^{S}	53.3 (46.4 to FB^{S}, CD^{S} **WM**^{S}, AC
Enhanced Stature (AU)	*70*	54.2 (52.2 to 57.6)	79.8 (74.1 to 85.4) **FB**^{L}, CD^{S}, **WM**^{L}, **DCM**^{M}, **ACM**^{L}, **FWD**^{M}	45.3 (38.9 to 51.6) **GK**^{L}, DCM, FWD^{S}	72.1 (65.4 to 78.8) GK^{S}, FB^{M}, **WM**^{M}, **DCM**^{M}, **ACM**^{M}, **FWD**^{S}	40.8 (34.9 to 46.7) **GK**^{L}, DCM^{S}, **FWD**^{S}	49.2 (42.6 to 55.9) **GK**^{M}, DCM,WM^{S}, ACM^{S}, FWD^{S}	41.9 (35.6 to 48.2) **GK**^{L}, DCM, DCM^{S}, **FWD**^{S}	55.2 (47.8 to **GK**^{M}, FB^{S}, **C** **WM**^{S}, DCM^{S},
Endurance (AU)	*70*	67.2 (64.8 to 69.6)	37.7 (31.7 to 43.7) **FB**^{L}, **DCM**, **WM**^{L}, **DCM**^{L}, **ACM**^{L}, **FWD**^{L}	77.9 (72.4 to 83.4) **GK**^{L}, DCM, DCM^{S}, FWD^{VL}	61.1 (55.6 to 66.6) **GK**^{M}, **FB**^{M}, **WM**^{M}, **DCM**^{S}, **ACM**^{S}, **FWD**^{S}	77.6 (72.0 to 83.1) **GK**^{L}, DCM^{S}, FWD^{S}	72.0 (66.2 to 77.8) **GK**^{L}, FB^{S}, **CD**^{S}, WM^{S}	73.5 (67.7 to 79.1) **GK**^{L}, **CD**^{S},	70.6 (65.0 to **GK**^{L}, FB^{S} **CD**^{S}, WM
Acceleration (AU)	*70*	74.1 (72.3 to 75.9)	77.8 (73.8 to 81.7) **FB**^{M}, **DCM**, **WM**^{L}, **DCM**^{S}, **ACM**^{M}, **FWD**^{L}	77.8 (73.8 to 81.7) **GK**^{M}, CD^{S}, WM^{S}, **DCM**^{S}, **FWD**^{S}	71.6 (67.1 to 76.0) **GK**^{M}, FB^{S}, **WM**^{M}, ACM^{S}, **FWD**^{M}	84.0 (80.3 to 87.8) **GK**^{L}, FB^{S}, **DCM**^{M}, **ACM**^{S}	68.0 (63.0 to 72.9) **GK**^{S}, **FB**^{S}, **WM**^{M}, **ACM**^{S}, **FWD**^{M}	76.4 (72.4 to 80.4) **GK**^{M}, CD^{S}, **WM**^{S}, **DCM**^{S}, **FWD**^{S}	84.6 (80.8 to **GK**^{L}, **FB**^{S}, D **DCM**^{M}, **AC**
Maximal sprint speed (AU)	*70*	69.2 (67.0 to 71.4)	44.0 (38.0 to 49.9) **FB**^{L}, **DCM**, **WM**^{L}, **DCM**^{M}, **ACM**^{M}, **FWD**^{L}	77.5 (72.7 to 82.3) **GK**^{L}, **CD**^{S}, WM^{S}, **DCM**^{M}, **ACM**^{S}, FWD^{S}	67.0 (61.8 to 72.2) **GK**^{M}, **FB**^{S}, **WM**^{M}, DCM^{S}, **FWD**^{M}	83.1 (78.7 to 87.4) **GK**^{L}, FB^{S}, **DCM**^{M}, **ACM**^{S}	61.4 (55.7 to 67.0) **GK**^{M}, **FB**^{M}, CD^{S}, **WM**^{M}, **ACM**^{S}, FWD^{M}	69.5 (64.1 to 74.9) **GK**^{M}, **FB**^{S}, **WM**^{M}, **DCM**^{S}, **FWD**^{M}	82.0 (77.7 to **GK**^{S}, FB^{S}, **C** WM^{M}, **DCM**^{S},
Vertical jump ability (AU)	*70*	71.8 (69.7 to 73.9)	84.9 (80.5 to 89.4) **FB**^{M}, **WM**^{L}, **DCM**^{M}, **ACM**^{M}, FWD^{S}	67.5 (62.3 to 72.7) **GK**^{M}, DCM, **WM**^{S}, ACM^{S}, **FWD**^{S}	82.4 (77.3 to 87.5) **FB**^{M}, **WM**^{M}, **DCM**^{M}, **ACM**^{M}, FWD^{S}	58.9 (53.2 to 64.5) **GK**^{L}, **FB**^{S}, **DCM**^{S}, **FWD**^{S}	68.4 (62.9 to 74.0) **GK**^{M}, **CD**, **WM**^{S}, ACM^{S}, **FWD**^{S}	62.9 (57.2 to 68.5) **GK**^{M}, FB^{S}, DCM, DCM^{S}, **FWD**^{M}	77.7 (72.0 to GK^{M}, **FB**^{S}, C **WM**^{S}, **DCM**^{S},
Repeated Sprint Ability (AU)	*70*	66.8 (63.8 to 68.8)	36.8 (30.9 to 42.6) **FB**^{VL}, **CD**^{L}, **WM**^{VL}, **DCM**^{L}, **ACM**^{VL}, **FWD**^{VL}	77.1 (71.1 to 83.1) **GK**^{VL}, **DCM**^{S}, ACM^{S}	58.5 (52.3 to 64.6) **GK**^{L}, **FB**^{M}, **WM**^{M}, **ACM**^{S}, **FWD**^{M}	80.5 (74.9 to 86.0) **GK**^{VL}, **DCM**^{M}, **ACM**^{S}	62.4 (56.4 to 68.4) **GK**^{L}, **FB**^{S}, **WM**^{M}, ACM^{S}, **FWD**^{M}	69.8 (63.9 to 75.7) **GK**^{VL}, FB^{S}, CD^{S}, **WM**^{S}, DCM^{S}, **FWD**^{S}	79.3 (73.8 to **GK**^{VL}, DC **DCM**^{M}, **AC**
A, B, C (AU)	*70*	84.0 (82.4 to 85.5)	85.6 (80.8 to 90.4) DCM^{S}	83.2 (79.1 to 87.3)	82.8 (78.6 to 86.9) FWD^{S}	84.9 (80.9 to 88.8) DCM^{S}	80.9 (76.4 85.4) GK^{S}, WM^{S}, FWD^{S}	84.2 (80.2 to 88.2)	86.2 (82.4 to CD^{S}, DCM
Muscular strength (AU)	*70*	62.4 (60.1 to 64.8)	62.4 (55.9 to 68.8) CD^{S}, WM^{S}, FWD	58.8 (52.7 to 64.8) **CD**^{S}, DCM^{S}, FWD^{S}	71.1 (65.0 to 77.1) GK^{S}, **FB**^{S}, **WM**^{M}, DCM^{S}, **ACM**^{S}	54.5 (48.1 to 60.8) GK^{S}, DCM^{S}, **FWD**^{S}	64.7 (58.4 to 71.1) FB^{S}, CD^{S}, WM^{S}, ACM^{S}	57.4 (50.9 to 63.8) **CD**^{S}, DCM^{S}, FWD^{S}	68.3 (62.0 to GK^{M}, FB^{S}, C **WM**^{S}, DCM^{S},
Muscular endurance (AU)	*70*	59.2 (56.8 to 61.7)	50.2 (43.8 to 56.5) FB^{S}, **CD**^{S}, WM^{S}, DCM^{S}, ACM^{S}, **FWD**^{S}	59.0 (52.4 to 65.5) GK^{S}	64.3 (57.8 to 70.8) **GK**^{S}, FB^{S}, ACM^{S}	57.9 (51.3 to 64.5) GK^{S}, CD^{S}, FWD^{S}	60.9 (54.6 to 67.3) GK^{S}	58.5 (51.9 to 65.1) GK^{S}, CD^{S}, FWD^{S}	64.0 (57.4 to **GK**^{S}, WM^{S}, F

Note. Statistically significant difference ($p < q$) denoted in bold; GK = goalkeeper, FB = full back, CD = central defence, WM = wide midfield, DCM = defensive central midfield, ACM = attacking central midfield, FWD = forward/striker, A, B, C = Agility, balance, coordination. Observed effect magnitudes are denoted as small (^{S}), moderate (^{M}), large (^{L}), very large (^{VL}). AU = Arbitrary units

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Table 4. Mean (95% confidence intervals) level of perceived importance (0 = *least important*; 50 = *undecided*; 100 = *most important*) of practitioners (n = 70) for discrete psychological and sociological components of the FA Four Corner Model

Psychological		Sociological	
On pitch confidence (AU)	82.4 (78.5 to 86.2)	**Self-reflection (AU)**	72.1 (67.2 to 77.0)
On pitch creativity (AU)	79.2 (75.0 to 83.3)	**Teamwork (AU)**	79.2 (74.5 to 83.8)
Self-discipline (AU)	80.5 (76.3 to 84.8)	**Positive relationships with team (AU)**	78.2 (74.0 to 82.3)
Commitment (AU)	86.0 (82.0 to 90.0)	**Accountability (AU)**	80.9 (76.8 to 85.0)
Intrinsic motivation (AU)	83.8 (79.4 to 88.1)	**Leadership (AU)**	67.2 (62.1 to 72.4)
Extrinsic motivation (AU)	48.4 (41.4 to 55.3)	**Communication (AU)**	75.2 (70.6 to 79.8)
On pitch bravery (AU)	76.9 (72.4 to 81.4)	**Supportive family life (AU)**	70.9 (64.9 to 76.8)
Positive attitude (AU)	86.2 (82.3 to90.1)	**Socioeconomic background (AU)**	41.6 (34.8 to 48.3)
Resilience (AU)	83.0 (79.1 to 87.4)	**City/town of residence (AU)**	36.6 (29.6 to 43.6)
Calm under pressure (AU)	81.2 (77.1 to 85.3)		

AU = Arbitrary units.

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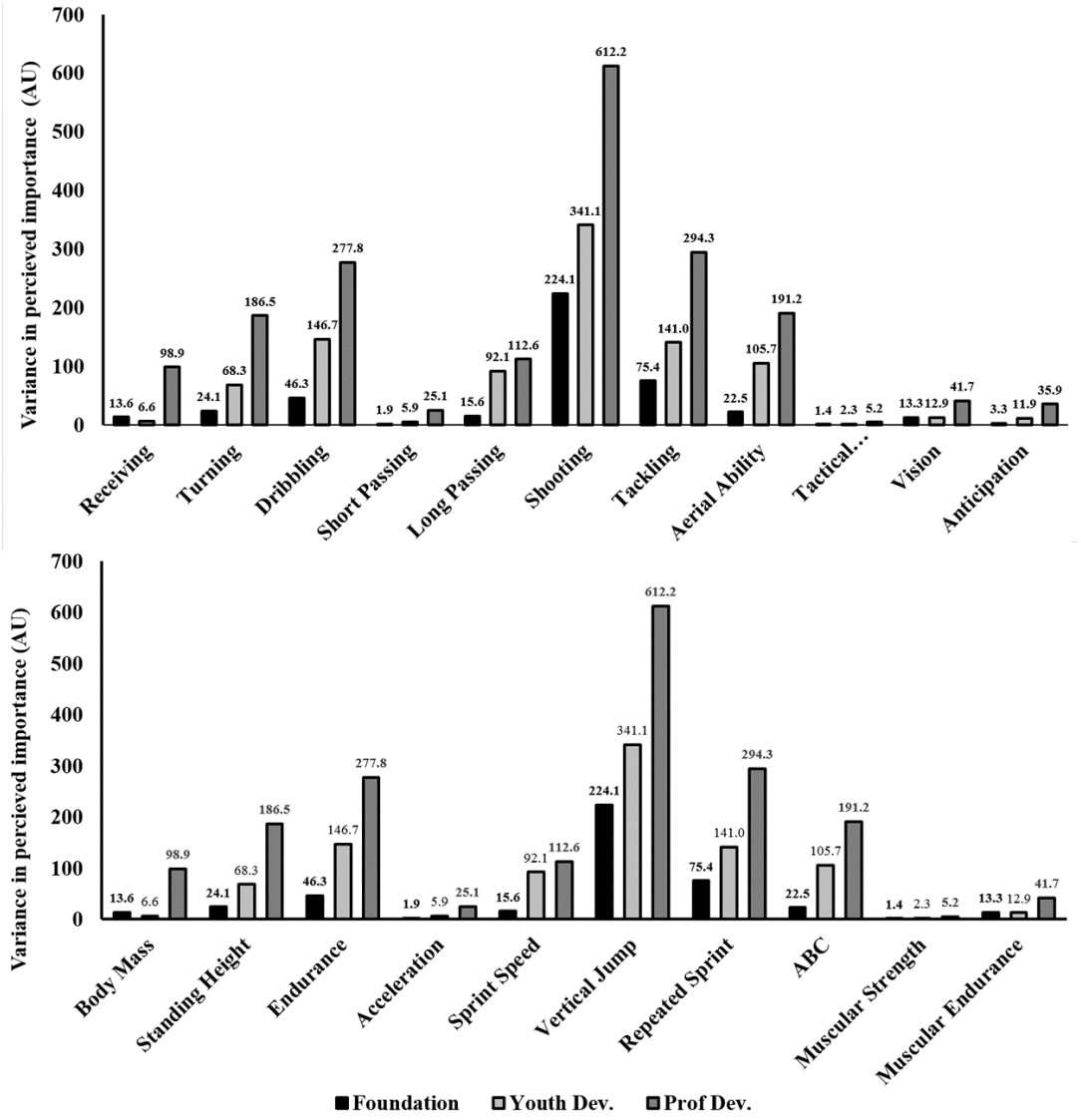

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571 Figure 1 and figure 2 (combined). The between playing position variance of outfield players (FB,
572 CD, WM, DCM, ACM and FWD) for each discrete technical (top) physical (bottom) attribute
573 according to EPPP phase (Foundation, Youth and Professional development (Dev) phase.

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