

1 **Examining the psychological characteristics of developing excellence profiles of male English**
2 **youth soccer players: Differences and commonalities across ages and performance levels**

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28 **ABSTRACT**

29 The aim of this study was to investigate differences in PCDEs across different age groups (U13, U14,
30 U15, U16 and youth team (YT)) and categories of participation (categories 1, 2 and 3 at academy level,
31 and grassroots (GR)) in male English youth soccer players ($n = 375$). Data was gathered using the PCDE
32 questionnaire version 2 (PCDEQ2). Differences between age groups and categories of participation
33 analysed using the Kruskal-Wallis H test. Across categories of participation highest differences in
34 PCDEs were reported in perfectionistic tendencies ($d = .64$, $p = <0.01$, self-directed control and
35 management ($d = .63$, $p = <0.01$) and adverse response to failure ($d = .58$, $p = <0.01$) with category one
36 players reporting the highest scores. Across age groups, highest differences were also demonstrated in
37 perfectionistic tendencies ($d = .57$, $p = <0.01$) and adverse response to failure ($d = .49$, $p = <0.01$) with
38 youth team players reporting the highest scores. YT and category one players also demonstrated the
39 highest scores in use of imagery and active preparation (IAP), with category one players also
40 demonstrating the highest and lowest score on use of active coping strategies and presentation of clinical
41 indicators, respectively. The findings of the current study have important implications for key
42 stakeholders involved in the planning and monitoring of a players talent development environment.
43 Careful consideration should be given to identifying and developing players' psychological
44 characteristics to ensure positive impacts are nurtured throughout their journey.

45

46 ***Lay summary***

47 This study explored the differences and similarities in PCDEs between different ages and categories of
48 participation in male English youth soccer players. Differences were particularly evident between
49 categories of participation in self-directed control and management, adverse response to failure and
50 perfectionistic tendencies, where higher categories of participation and older age groups demonstrated
51 the highest scores in these factors. Across age groups, the highest differences were also demonstrated

52 in perfectionistic tendencies with the oldest age group (i.e., youth team players) reporting the highest
53 scores. Monitoring of these factors by coaches, parents and other important stakeholders could help
54 facilitate positive psychosocial skills, characteristics and behaviours in players facilitating effective
55 talent development.

56

57 **IMPLICATIONS FOR PRACTICE**

- 58 • An adverse response to failure may have a dual-effect on players and may not necessarily be
59 negative. It could, in fact, facilitate deeper reflection that could benefit players' development
60 in the long-term by facilitating more honest self-evaluation.
- 61 • When using the PCDEQ2 practitioners should be aware of the potential 'dual-effect' nature of
62 perfectionism, and therefore carefully distinguish between adaptive (i.e., perfectionistic
63 strivings) and maladaptive (i.e., perfectionistic concerns) characteristics, if possible.
- 64 • Key stakeholders (e.g., parents and coaches) should be made aware of their own impact on
65 players' actions and wellbeing through educational workshops delivered by specialists into
66 PCDEs, such as sport psychologists.

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70 **Examining the psychological characteristics of developing excellence profiles of male English** 71 **youth soccer players: Differences and commonalities across age groups and performance levels**

72 **INTRODUCTION**

73 In soccer, talent identification and development systems (TIDS) exist to produce elite players
74 (Bergkamp et al., 2019). The ultimate aim of these systems is to select and then develop players who
75 will, *in the future*, outperform those players who are either not selected for academy programmes or de-
76 selected somewhere along the pathway (Larkin & Reeves, 2018). Traditional talent development

77 models have often been criticised due to adopting too narrow a focus on individual elements of
78 performance rather than adopting a more holistic approach (Collins et al., 2018; Gulbin et al., 2013; Till
79 & Baker, 2020). In 2012 the Elite Player Performance Plan (EPPP) was introduced by the English
80 Premier League with the intention of increasing the number of home-grown players in the English
81 league's top four divisions by adopting a holistic multi-disciplinary approach to talent development,
82 facilitated through increased contact time and specialist coaching (Premier League, 2011). Within the
83 EPPP there are three phases: (1) Foundation (U9 to U11), (2) Youth Development (U12 to U16) and
84 (3) Professional Development (U17 to U23) with contact time and amount of funding allocated by
85 academy status (i.e., category one being the 'most elite' and allocated the most). These phases are within
86 categories of participation (COP) from 1 to 4 (or grassroots) The holistic multi-disciplinary approach to
87 talent development emphasizes growing importance on player psychosocial development to harness the
88 necessary skills required to meet the challenges and emotions experienced on the talent development
89 journey (Gledhill et al., 2017; Larkin & Reeves, 2018; MacNamara & Collins as cited in Baker, 2017),
90 in addition to developing the necessary psychosocial skills required for achieving success in everyday
91 life events, which become increasingly important if the players are released (Rongen et al., 2018). This
92 can be considered particularly important for youth English academy football players where only a very
93 small amount (around 5%) of boys will go on to play professional football (Roe & Parker, 2016).

94 To date, however, much of the emphasis on 'measuring' the current performance and
95 development of academy soccer players has centered around more quantifiable data such as testing of
96 physical, technical and tactical attributes (Koopman et al., 2020), whilst somewhat neglecting the
97 psychosocial skills required. Indeed, Till and Baker (2020) advocated an evidence-based
98 'biopsychosocial' approach as a possible solution to optimizing talent development, emphasizing
99 particular importance on developing psychosocial characteristics within younger age groups where
100 these characteristics may not yet have emerged and may be critical to future success (Collins &
101 MacNamara, 2012; Gledhill et al., 2017; Sarmiento et al., 2018). Accordingly, Collins and MacNamara
102 (as cited in Baker, 2017) have called for more understanding and assessment of key psychological

103 characteristics to provide balance to the large body of literature focusing on technical, tactical and
104 physical factors.

105 MacNamara et al. (2010a; 2010b) developed psychological characteristics of developing
106 excellent (PCDEs) and later a questionnaire to assess these characteristics (MacNamara & Collins,
107 2011) currently practitioners are utilizing the second version of the PCDE questionnaire (PCDEQ2)
108 devised by Hill et al. (2019). This questionnaire comprises seven PCDE factors, including: (1) Adverse
109 response to failure (ARF), (2) Imagery and active preparation (IAP), (3) Self-directed control and
110 management (SDCM), (4) Perfectionistic tendencies (PT), (5) Seeking and using social support (SUSS),
111 (6) Active coping (AC) and (7) Clinical indicators (CI). The authors discovered that ARF, SDCM
112 SUSS, AC and CI discriminated between those athletes deemed by coaches to have a low and high
113 likelihood of developing to the elite level (Hill et al., 2019). Despite these findings and the potential
114 importance of the PCDEs, very little research has explored PCDE profiles in academy soccer (Kelly et
115 al., 2018; Saward et al., 2019). Contrary to Hill et al. (2019), Kelly et al. (2018) did not find any
116 association between PCDEs, and low and high performers as measured by the original version of the
117 questionnaire (PCDEQ). However, it is important to note that Kelly et al. (2018) looked at current
118 performance rather than potential development and may therefore have missed important psychosocial
119 skills that were gestating within the players, to potentially emerge at a later point. Saward et al. (2019)
120 also used the first version of the PCDEQ across a 20-month period to examine how PCDEs may be
121 associated with future playing standard. These authors discovered several age-related changes in PCDE
122 factors that may influence career progression and be characteristic of category 1 and 2 scholars across
123 the under-12 to under-16 age groups. Factors that were found to indicate membership of higher category
124 status were the ability to cope with performance and developmental pressures and evaluating
125 performances and working on weaknesses. Interestingly, imagery use (during practice and competition)
126 appeared to decrease with age, whereas coping with performance and developmental pressures appeared
127 to increase.

128 With this in mind, it should be noted that MacNamara et al. (2010b) describe the journey to
129 elite level as being a dynamic and individualised non-linear pathway (i.e., different for every athlete,

130 ever-changing and with many ups and downs). Collins and MacNamara (2012: 907) describe this
131 journey as the “rocky road to the top”, suggesting that an amount of structured challenge is necessary
132 within the development pathway in order to develop PCDEs alongside physical, technical and tactical
133 attributes. These challenges could include, for example, playing up or down an age groups, being de-
134 deselected for individual games or playing out of position. According to Van Yperen (2009) these could
135 also occur naturally such as parental divorce, having a larger number of siblings and being from certain
136 ethnic backgrounds. Crucially, players would also need to be supported by appropriate stakeholders
137 (e.g., parents and academy staff) to facilitate development through these challenges, perhaps in a
138 periodized manner (Hill et al., 2019, Taylor & Collins, 2020). In order for support requirements to be
139 identified and effectively dealt with, some knowledge into the differences and commonalities across
140 ages and COP would be necessary. This could then ensure that the correct level and amount of support
141 is provided according to player’s individual needs.

142 Accordingly, the purpose of this study was to examine differences and commonalities in the
143 seven PCDE factor scores across age groups and performance levels in male youth soccer players. It
144 was hypothesized that older players and those at higher levels of participation would have significantly
145 different scores across the seven PCDE factors.

146 **Methodology**

147 *Study design*

148 A cross-sectional research design was used to investigate differences and commonalities in
149 PCDE profiles across different age groups and performance levels in male English youth soccer
150 academy players. PCDE profiles were obtained from players between October 2019 and April 2020,
151 which is during the competitive playing period. The sample of players was purposefully selected from
152 the foundation, youth and professional development phases, and across all different levels of
153 participation (i.e., academy categories 1 to 3 and grassroots). Players were selected if they fulfilled the
154 criteria of playing in an age group between under-13 and under-18 (on 1st September in that selection
155 year). Ethical approval was granted from the author’s institutional ethics committee, with voluntary

156 informed or parental assent (participants under the age of 16) attained prior to participation. After
 157 seeking approval from relevant club officials, PCDEQ2 questionnaires were either e-mailed to
 158 prospective participants for completion using the online platform Survey Monkey or were completed
 159 under the supervision of the researcher. Participants were informed about the general purpose of the
 160 study and told that their identities would be kept strictly confidential and that all the items in the
 161 questionnaires should be answered as honestly as possible. The questionnaire was administered and
 162 took between 15 and 30 minutes to complete.

163 ***Participants***

164 Three hundred and seventy five male English youth soccer players (age: 12 to 18) participated in the
 165 study. Table 1 provides a breakdown of number of participants per age group and COP.

166 **Table 1.** Numbers per age group and category

Age Group	Category 1	Category 2	Category 3	Grassroots (GR)	Total
U13	15	17	26	20	79
U14	16	12	33	20	81
U15	31	11	28	21	91
U16	26	4	23	12	65
YT	25	18	9	8	59
Total	113	62	119	81	375

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171 *Psychological characteristics of developing excellence questionnaire version 2 (PCDEQ2)*

172 The PCDEQ2 questionnaire (Hill et al., 2019) was used, having been either electronically distributed
 173 to potential participants or completed by paper version in the presence of the researcher. The survey
 174 consisted of 88 statement items, with similarity responses marked on a 6-point Likert scale from 1
 175 (“very unlike me”) to 6 (“very like me”). A combination of positively framed (n = 72) and negatively
 176 framed (n = 16) items were used in an attempt to minimise response bias (Field, 2018) and acquiescence
 177 bias (Hagger & Smith as cited in Horn & Smith, 2019). Table 2 highlights the seven PCDE factors
 178 being measured. According to Hill et al. (2019) the reliability of the whole PCDEQ2 questionnaire at
 179 initial development was 0.879 demonstrating very good internal consistency.

180 **Table 2.** Subscales and Sample Items

Factors/subscales	Sample Items
Adverse response to failure (ARF - linked to fear of failure)	“When things are going wrong for me, my future seems uncertain”
Imagery and active preparation (IAP - for managing arousal and practising skilled performance)	“I include imagery in my preparation”
Self-directed control and management (SDCM - related to self-regulation in development)	“I often act without thinking through all the alternatives”
Perfectionistic tendencies (PT - including perfectionism, anxiety, fear of failure, obsessive passion, and realistic performance evaluation)	“The people around me expect me to be perfect at everything I do”
Seeking and using social support (SUSS - use of effective support networks in Talent Development)	“I often seek advice from different people”

Active coping (AC -proactive deployment of coping mechanisms)	“When we need to work hard I am first in the queue”
Clinical Indicators (CI - of mental health factors such as anxiety, depression and eating disorders)	“After eating, I sometimes feel guilty about its effect on my body shape”

181

182 **Data Analysis**

183 Descriptive statistics are reported using the median score. As the PCDEQ2 is an ordinal Likert scale,
 184 two Kruskal-Wallis *H* (non-parametric) tests were used to examine whether significant differences
 185 existed across age groups (U13, U14, U15, U16 and Youth Team (YT)) and categories (categories one,
 186 two, three and Grassroots (GR)) of participation (Pallant, 2016). When significant differences were
 187 observed across age groups and categories of participation, post-hoc analysis was completed using
 188 pairwise inter-group comparisons. Significance level was established at $p < 0.05$ (Field, 2018). Cohen’s
 189 *d* was calculated by transformation of partial eta squared to obtain the magnitude of differences through
 190 the effect size calculator for non-parametric tests (www.psychometrica.de/effect_size.html) and
 191 interpreted using the scale from Cohen (1998) as: 0 – 0.2 = trivial; 0.2-0.5 = small; 0.5-0.8 = moderate;
 192 > 0.8 = large.

193 **Results**

194 ***Analysis of Psychological Characteristics of Developing Excellence between Age Groups***

195 The median scores for all PCDE factors by age group are illustrated in table 3, which also reports
 196 significant differences and effect size differences between age groups for all PCDE factors. A
 197 statistically significant difference was found between age groups on: ARF ($H_4 = 24.21, p = .000$); IAP
 198 ($H_4 = 21.31, p = .000$); and PT ($H_4 = 30.60, p = .000$) factors but not in SDCM ($H_4 = 1.38, p = .849$);
 199 SUSS ($H_4 = 6.94, p = .139$); AC ($H_4 = 1.54, p = .819$); and CI ($H_4 = 3.22, p = .523$).

200

201 **Table 3.** Median values and differences across age groups and psychological characteristics of developing
 202 excellence factors

Age groups	Files (n)	Psychological characteristics of developing excellence (PCDEs)						
		ARF	IAP	SDCM	PT	SUSS	AC	CI
U13	79	2.71 ^d	3.60 ^{d,e}	4.43	3.10 ^{d,e}	4.44	4.40	2.33
U14	81	2.60 ^{d,e}	3.83 ^e	4.50	3.20 ^{d,e}	4.33	4.50	2.22
U15	91	2.79 ^e	3.53 ^{d,e}	4.64	3.10 ^{d,e}	4.56	4.50	2.11
U16	65	3.07 ^{a,b,c}	4.00 ^{a,c}	4.57	3.55 ^{a,b,c}	4.06	4.40	2.17
YT	25	3.33 ^{a,b,c}	4.20 ^{a,b,c}	4.43	3.70 ^{a,b,c}	4.33	4.60	2.33
Age effect		.000	.000	.849	.000	.139	.819	.523
Effect size		.49	.48	.18	.57	.18	.08	.09
Descriptor		Small	Small	Trivial	Moderate	Trivial	Trivial	Trivial

ARF = Adverse response to failure, IAP = Imagery and active preparation, SDCM = Self-directed control and management, PT = Perfectionistic tendencies, SUSS = Seeking and using social support, AC = Active coping, CI = Clinical Indicators, a = different from U13 with P < .05

203
 204 Effect sizes between age groups were trivial for SDCM, SUSS, AC and CI; small for ARF and IAP;
 205 and moderate for PT. Out of all PCDEs PT had the largest effect size difference between age groups (d
 206 = .57). Both the U16 and YT had significantly higher ARF, IAP and PT values than the U13-U15 age
 207 groups. There were no significant differences between age groups on SDCM, SUSS, AC and CI.

208 ***Analysis of psychological characteristics of developing excellence between categories of***
 209 ***participation***

210 Table 4 shows median scores for all PCDE factors by category of participation as well as significant
 211 differences and effect size differences between categories of participation for all PCDE factors. A
 212 statistically significant difference existed between categories of participation on: ARF ($H_3 = 31.31, p$

213 = .000); IAP ($H_3 = 11.60, p = .009$); SDCM ($H_3 = 34.60, p = .000$); PT ($H_3 = 36.49, p = .000$); AC
 214 ($H_3 = 9.40, p = .024$); and CI ($H_3 = 17.43, p = .001$), but not for SUSS ($H_3 = .79, p = .853$).

215

216 **Table 4.** Median values and differences across categories of participation and psychological characteristics of
 217 developing excellence factors

Categories of participation	Files (n)	Psychological characteristics of developing excellence (PCDEs)						
		ARF	IAP	SDCM	PT	SUSS	AC	CI
Category 1	113	3.10 ^c	4.00 ^{c, d}	4.71 ^d	3.60 ^{b, c, d}	4.44	4.60 ^d	2.00 ^{b, d}
Category 2	63	3.00 ^c	3.73	4.43 ^d	3.45 ^{a, d}	4.33	4.45	2.44 ^a
Category 3	118	2.45 ^{a, b, c}	3.73 ^a	4.64 ^d	3.10 ^a	4.44	4.50	2.11 ^d
Grassroots	81	2.86 ^c	3.70 ^a	4.00 ^{a, b, c}	3.00 ^{a, b}	4.33	4.20 ^a	2.56 ^{a, c}
Category		.000	.009	.000	.000	.853	.024	.001
Effect Sizes		.59	.32	.63	.64	.16	0.27	.41
Descriptor		Moderate	Small	Moderate	Moderate	Trivial	Small	Small

218 *ARF* = Adverse response to failure, *IAP* = Imagery and active preparation, *SDCM* = Self-directed control and
 219 management, *PT* = Perfectionistic tendencies, *SUSS* = Seeking and using social support, *AC* = Active coping, *CI*
 220 = Clinical Indicators, a = different from category 1 with $P < .05$, b = different

221 Effect sizes were trivial for SUSS; small for IAP, AC and CI; and moderate for ARF, SDCM
 222 and PT (the latter had the largest effect size at $d = .64$). There were no significant differences between
 223 categories of participation between age groups on SUSS. GR had significantly lower SDCM values
 224 than all the other three categories. Category one had significantly higher PT scores than all the other
 225 three categories, and Cat 2 was significantly higher than GR.

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228

229 Discussion

230 The measurement and development of PCDEs is a burgeoning area within contemporary sport science
231 research and application. Currently, however, little research has investigated their use in elite academy
232 soccer (Collins et al., 2018), especially when using the PCDEQ2 as an assessment tool. Therefore, the
233 aim of this study was to examine whether differences exist in scores on the seven factors of the PCDEQ2
234 between age groups and categories of participation (COP) (i.e., category one, two and three academies
235 and grassroots) in soccer. It was hypothesized that older soccer players and those at higher COP would
236 have significantly different scores on the seven PCDE factors. The key finding of this study was that
237 significant differences were found in some PCDE factors across age groups and COP. In agreement
238 with our hypothesis older players (U16 and YT) had significantly higher PCDE scores than younger
239 players (U13-U15) but only in ARF, IAP and PT. Interestingly, the highest effect size difference
240 between the older and younger age groups was in PT ($d = .57$). When examining differences between
241 COP, significant differences were evident in all PCDE factors apart from SUSS, with the largest effect
242 size differences in ARF, SDCM and PT ($d = .59$, $d = .63$ and $d = .64$ respectively).

243 In the current study older players (U16 and YT) had significantly higher ARF, IAP and PT than
244 younger players. Our results illustrated that ARF was highest in players participating in category one
245 and two academies and more prevalent in older players. The close links between perfectionism and fear
246 of failure (Hill et al, 2019) may suggest that an adverse response to failure could be a manifestation of
247 perfectionistic tendencies, particularly as both ARF and PT showed a linear increase through the age
248 groups (with the exception of the U14s) and in the highest COP (i.e., category one and two academies).
249 This would suggest that as players progress through the system, there is a likelihood of ARF and PT
250 increasing as they get closer to the professional phase (Noon et al., 2015). These factors could be
251 particularly pertinent at higher COP, where progression could also lead to playing at a higher
252 professional standard (i.e., playing in the English Premier League (EPL) rather than League Two). For
253 example, the vast majority (90%) of EPL clubs also have a category one academy status (Crane, 2018).
254 It is interesting to note that although higher ARF scores have previously been suggested to be due to
255 “suboptimal interaction with developmental challenge” (Hill et al. 2019: 524), it is also important to

256 recognize that both ARF and PT could have a “dual-effect” which may offer partial explanation for the
257 current study’s outcome. This could possibly mean that higher scores in these factors could also lead to
258 – or represent - positive psycho-behavioral characteristics (e.g., quality practice, goal-setting and self-
259 reinforcement, focus and distraction control), in addition to the negative characteristics previously
260 mentioned. Indeed, Taylor and Collins (2020) describe ‘emotional disturbances’ as being important
261 factors to embed into the TD pathway to monitor and enhance psychosocial skills. These disturbances
262 may be either positive (e.g., continued selection or attaining status within the squad) or negative (injury,
263 increased scrutiny or struggling to adjust to the group dynamic), with the latter presumably eliciting an
264 adverse response. Taylor and Collins (2021) claim that negative emotional states lead to athletes
265 engaging in more *detailed* reflection (as opposed to positive states that provoke a more *general* type of
266 reflection). This may again be evidence that an adverse response may not necessarily be detrimental
267 and could in fact lead to more detailed self-evaluation and learning (and could even be a coping
268 mechanism).

269 ***Perfectionistic Tendencies***

270 Perfectionism is generally accepted as being multidimensional (Hill et al., 2018), consisting of
271 perfectionistic strivings (adaptive, self-referenced and leading to setting of high standards) and
272 perfectionistic concerns (maladaptive worries over making mistakes and feeling an imbalance between
273 expected and actual performance (Madigan, 2016). Hill et al (2018) speculated that perfectionism may
274 change with age as individuals develop over their lifespan. It is a distinct possibility that the importance
275 of winning and outcome goals in general (e.g., competition for scarce places at the next age group) may
276 increase throughout adolescence, which in turn leads to greater levels of PT and ARF, as found in the
277 current study. Larkin et al. (2015) discovered that higher perfectionistic strivings in players seemed to
278 facilitate more engagement in types of soccer practice (coach-led, individual practice, peer-led play,
279 and indirect involvement), which ultimately lead to higher levels of performance. Therefore, if players
280 can avoid the negative connotations of perfectionist concerns (such as burnout and dropout), this could
281 be a helpful factor in advancing through age groups and reaching and/or staying at higher COP. It could
282 also explain why those athletes that are unable to deal with this in a certain manner may be filtered out

283 of the system as they get older or find their level further down the participation structure (at a lower
284 COP) – a form of sporting ‘natural selection’. Alternatively, adverse responses may be a part of an elite
285 players make-up and be necessary for them to progress to higher levels. Either way, player
286 support/training on how to avoid the negative consequences of perfectionistic concerns would seem like
287 a vital part of the process for player wellbeing and also to reduce the chance of type one (incorrectly
288 selected/retained) or type two errors (incorrectly removed/de-selected) when making decisions on
289 players’ futures (i.e., retain or release).

290 *Adverse Response to Failure*

291 It has been suggested that both ARF and PT can be affected by significant others, such as parents and
292 coaches (Madigan, 2016, Sagar & Stoeber, 2009). Indeed, various researchers and applied practitioners
293 (Collins et al., 2016; Madigan, 2016; Sagar & Stoeber, 2009) have identified “parental and coach
294 pressure to be perfect” (Madigan, 2016: 49) as influencing perfectionistic concerns. This in turn has
295 been linked with negative consequences such as avoidance behaviors, competitive anxiety and burnout.
296 For example, Collins et al. (2016) claimed that athletes at the ‘super-elite level’ had parents who were
297 more facilitative than those at the elite level, with the latter applying more pressure in the development
298 period. Furthermore, Sagar and Stoeber (2009) found that perceived coach pressure predicted a
299 heightened fear of experiencing shame and embarrassment in their participants when experiencing
300 failure, in comparison to less demanding coaches. However, this enhanced perceived pressure also
301 elicited more positive emotions after success (e.g., happiness, pride, satisfaction), perhaps again
302 illustrating the potential “dual-effect” nature of an ARF mentioned previously. These findings provide
303 further support that an ARF is not necessarily a bad thing and may be indicative of being part of an elite
304 environment where high expectations are the ‘norm’, especially as it seems to be a more prevalent trait
305 in older and higher category players. Coaches’ expectations and influence may become more intense as
306 players approach the youth and first team environments (Collins & MacNamara as cited in Baker, 2017).
307 This may also raise some important questions about the differences in coaching behaviors between
308 COP. For example, are higher COP coaches more demanding in terms of the pressure they apply to
309 players to win (Sagar & Stoeber, 2009)? Could this also be influenced by the additional contact time

310 for players at higher COP? For instance, under current EFL guidelines (EFL, 2018) category one under-
311 15 and above receive 46 weeks of coaching per year, compared to 40 weeks for category three. Is it also
312 possible that higher category coaches have different attitudes, knowledge and experience to lower
313 category and grassroots coaches? This could mean that players under their charge could receive
314 different types of coaching, arguably to a higher standard (although measurement of what constitutes a
315 higher standard could prove problematic depending on how coaching effectiveness is measured in this
316 domain). It would also be interesting to ascertain whether higher COP academies have bigger budgets
317 for coaches to access continuing professional development and the knowledge gained from multi-
318 disciplinary performance teams? Our findings would imply that careful consideration should be given
319 into how best to foster the psycho-behavioral skills required to deal with both negative and positive
320 effects of ARF and PT. Key stakeholders (such as parents and academy staff) would need to be educated
321 into how their input can be influential when designing appropriate and differentiated developmental
322 challenges throughout the talent development pathway, especially at lower COP and younger age
323 groups (Taylor & Collins, 2020). This could form the basis of future investigations, for example how
324 best to optimize this process.

325 *Imagery and Active Preparation*

326 Imagery and other forms of active preparation such as, pre-competition and competition focus plans
327 when used from an early age have been shown to enhance competition preparation, transitions to a
328 different level, coping with injury, and self-evaluation of performance (MacNamara et al., 2010a; Orlick
329 & Partington, 1988). The PCDE factor of imagery and active preparation (IAP) explores an athlete's
330 ability to use visualization for motor learning and arousal regulation purposes (Hill et al, 2019). In the
331 current study significant differences were observed between age groups in IAP, with category one
332 players appearing to visualize and actively prepare more than those in lower categories, including
333 grassroots. When comparing elite and sub-elite athletes there is a link between use of psychological
334 skills and level of performance (Elferink-Gemser et al., 2004). Additionally, top performers (i.e.,
335 Olympic and world champions) use more imagery and at a more demanding level (i.e., visualized
336 themselves achieving champion status), as opposed to less successful athletes that set their sights lower

337 (Orlick and Partington, 1988). The implications from this would be that IAP still be encouraged in
338 players from higher COP, but also enhanced in those from lower COP and from an earlier age where
339 time and budgets allow. One possible method may be to deliver workshops to players (and coaches and
340 parents) to explain and encourage use of IAP from as young as possible, with regular monitoring of
341 deployment of these skills.

342 *Self-directed Control and Management*

343 Development of the PCDE factor of self-directed control and management (SDCM) could lead to
344 performing at a more elite level. It includes elements such as metacognition, grit, and delayed – rather
345 than instant - gratification i.e., working hard for success in the long-term over the short-term (Toering
346 & Jordet, 2015). In the current study there was no difference between age groups, however, similar to
347 IAP, category one players had the highest scores. This would suggest that category one players have
348 better ‘self-control’ and focus towards their long-term goals, vital for motivating players towards
349 deliberate practice that may often be viewed as tedious and unenjoyable (Ericsson et al., 1993). Jonker
350 et al. (2010) noted in their research that elite youth players have stronger self-regulatory skills than
351 grassroots players. If this is the case, it may well follow that there could also be differences between
352 levels of SDCM and COP. Accordingly, Larkin et al. (2015) observed that higher perfectionistic
353 strivings may lead players to practice in ways which could enable them to progress to higher levels of
354 participation. Toering and Jordet (2015) suggest that better self-control and focusing on the bigger
355 picture (long-term goals and knowledge of the pathway) is vital in players’ willingness to do this extra
356 training compared to their peers and could be a distinguishing factor between top elite players and those
357 below them, possibly driven by PT and ARF. Players with higher self-regulation reflected more
358 (thought to facilitate advancement to higher levels) and tried harder, even under challenging conditions,
359 consequently learning more (possibly fueled by ‘emotional disruptions’ – Taylor & Collins, 2021).
360 Coaches again appear to be important when exploring SDCM. How best to guide players to think
361 autonomously rather than the coach being omnipotent and providing all the answers would be a
362 beneficial move (Gledhill et al, 2017; Ryan & Deci, 2000). Practice design would need to account for
363 coaching behaviors where players are given the chance to self-regulate. What Gledhill et al. (2017: 17)

364 describe as “autonomy supportive coaching” (providing practices that are specific, appropriately
365 challenging and more task/mastery-oriented) would allow players to engage more effectively with the
366 program leading to a greater sense of enjoyment and perhaps less chance of dropout.

367 *Active coping and clinical issues*

368 The PCDE factors of AC and CI had small significant differences between COP, but no differences
369 were found between age groups. With regards to AC the highest score was observed in category one
370 players, however when comparing to other COP no significant differences were noted. Active coping
371 is concerned with athletes proactively employing coping strategies that may help to mitigate against
372 negative stress (Hill et al, 2019). Our findings would suggest that players across all category levels seek
373 to deploy active coping mechanisms, and that this seems to be most prevalent in category one players,
374 but not to a significant degree. When these testing situations do arise, they are seen as more of a
375 challenge than a threat by ‘active copers’ (possibly those in higher COP) who also have more of a
376 tendency to engage in approach - rather than avoidance - behaviors. Education for players into the
377 benefits and workings of AC (e.g., Dweck’s Mindset approach, 2006) may be useful to improve their
378 progress on the pathway. Hill et al (2016) found similar results in CI (mental health issues such as eating
379 disorders, anxiety and depression) where athletes experiencing these issues tended to use avoidance
380 rather than approach coping methods. Although there was only a small effect size difference between
381 categories, category one players did have the lowest median score (2.00) which *may* initially suggest
382 that they have less clinical issues than their lower category counterparts. Sothorn and O’Gorman (2021)
383 found that category one academy soccer players reported having to play through pain and injury due to
384 the fear of de-selection, fueled by perceptions of how parents and coaches would react negatively if
385 they did not. Impression management seemed to be an important factor towards these significant others.
386 Indeed, as seen with other factors, the dynamic between players and key stakeholders appeared pivotal
387 in how players attempted to conform to perceived standards. It appears that players became ‘actors’ in
388 order to portray the behaviors they believed would gain approval from coaches and parents, trying to
389 appear “mentally tough” (Sothorn & O’Gorman, 2021: 8). Part of this facade was to avoid any
390 discussion about their thoughts or feelings for fear of appearing weak. It could be that category one

391 players are simply better at hiding their issues than their lower COP counterparts. Lack of awareness –
392 or denial - of clinical issues could potentially not only derail the TD process but cause distress to players
393 in their life outside of sport. *All* athletes could benefit from assessment of CI and appropriate
394 intervention when required (e.g., counselling – Wilkinson, 2021), not least to improve their all-round
395 wellbeing if we are to take a holistic and humanistic approach. A move away from the culture where
396 players are encouraged to internalize emotions and self-manage their mental wellbeing (Noon et al,
397 2015) would also be beneficial. Further examination of how the “hyper-masculine” environment (Ong
398 et al., 2018: 19) affects players across age groups and COP would be a useful step forward.

399 *Seeking and Using Social Support*

400 Finally, SUSS was the only factor which was non-significant across both age groups and COP
401 suggesting players sought similar amounts of support from those around them. Social support reduces
402 the potential negative impact of psychological distress (e.g., depression or anxiety), and facilitates a
403 more positive mental adjustment when under pressure (Hill et al, 2019). When related to sport this can
404 be expanded to include the network an athlete has around them on their Talent Development journey
405 (an externalized version of AC), which they proactively utilize (Hill et al, 2019). Reticence to ask for
406 support by players may be down to a number of elements such as bravado (Ong et al, 2018), or just
407 other social skill deficits such as extreme shyness or social anxiety resulting in avoidance rather than
408 approach strategies (MacNamara & Collins, 2015). It has been noted by Taylor & Stanton (2007) that
409 genes and socio-economic status may be linked to perceived social support. The results from the current
410 study may suggest that players are reasonably comfortable with seeking support but do not do it all the
411 time (otherwise median scores would be closer to 6). This could be down to reluctance to seek assistance
412 if their ‘supporters’ are not actually that supportive. This could provide a potential explanation as to
413 why category one players (in particular) tend to hide their issues rather than seeking assistance.
414 Otherwise, it might have been expected that category one players would have higher scores on SUSS if
415 this was to correlate with ARF scores. Alternatively, it may be that category one players do not need to
416 seek as much social support as they have the skills to cope with ARF. Van Yperen (2009: 326) found
417 in his study that those players to reach elite level as adults were more adept at dealing with stressful

418 situations “possibly by using their social resources more frequently and more flexibly”. The same may
419 be true of the sample used in the current study, although further study with a larger sample is warranted.
420 A facilitative style of support may be more beneficial than one that is overly judgmental (Collins et al,
421 2016). To reiterate a theme from this paper, educating key stakeholders into how to optimize their
422 supporting behaviors should be an important – if not vital – element of the TD pathway.

423

424 **Limitations and Future Directions**

425 The current study has a number of limitations that should be noted. Firstly, the sample size was smaller
426 than anticipated and was under-represented by category two and grassroots players. Therefore, a
427 replication study with a larger and more balanced sample would be useful. It was also decided to
428 combine the U17 and U18 age groups into a single ‘Youth Team’ group due to a particularly small
429 subsample in these age groups (34 and 25 respectively). However, it was felt that a YT group would be
430 more representative of what happens in academy soccer where the under-17 and under-18 age groups
431 form the youth team/scholars which is the initial part of the professional development phase (PDP).
432 Then there are the issues surrounding the measurement tool itself – the PCDEQ2. Although
433 questionnaires can be useful in providing a large set of cross-sectional data, certain drawbacks are also
434 evident and as a tool they seem to be waning in popularity amongst practitioners (Vealey et al., 2019).
435 Generally speaking, tools such as these run the risk of self-report bias and perhaps social desirability
436 (Hagger & Smith as cited in Horn & Smith, 2019). Miller et al., (2015) point out that much of the work
437 conducted in TID/TD has been of a quantitative nature. This may be useful to provide evidence that an
438 effect may exist but offers little as to the ‘why’. Therefore, future research should look to adopt a mixed
439 methods approach with the PCDEQ2 used as part of a larger armory of assessment tools. For example,
440 interviews with key stakeholders in the TD environment may well yield some useful insights into their
441 beliefs around psychosocial factors and how these might be developed in a positive manner.
442 Observation of player psycho-social behaviors could be used to either or both support and refute data
443 from the PCDEQ2 to test its ecological validity. Interviews with the players themselves (who should –
444 after all –be the most important people in the process) could also be useful to explore their beliefs

445 around psychosocial development in TD pathways (building upon previous work by Rongen et al.
446 (2020); Taylor & Collins, 2021; Willams & MacNamara, 2020).

447 Psychosocial concepts - such as PCDEs - are clearly very important but becoming too fixated
448 on them as the ‘only’ measures of potential success at the expense of other areas (i.e., physical, technical
449 and tactical) could be detrimental (Bergkamp et al, 2019), especially when measured using a single
450 assessment tool such as the PCDEQ2. Although this questionnaire’s authors (Hill et al, 2019) do
451 advocate the use of other methods – such as observation and discussion with athletes - for triangulation
452 purposes, little is divulged about how this could be deployed. There has been a criticism of PCDEs from
453 Gulbin et al (2013: 1321) who claimed that the PCDE approach “whilst advocating for a
454 multidimensional and dynamic understanding of development is predominately uni-dimensional with
455 over-emphasis on psychological skills & characteristics”. If a truly transdisciplinary approach is
456 required, then it should surely consider data from all types of performance indicators. It may be useful
457 to borrow some ideas that have been developed by the English Cricket Board in their current ‘multiple
458 eyes, multiple times’ approach to TID and TD (Barney, 2015). This involves using a hybrid of scouting,
459 testing and performance statistics across perceptual, physiological, psychological,
460 developmental/demographic, and technical/skill. A similar approach has been advocated by Kelly et al.
461 (2018) who completed a holistic study with academy soccer players using the original version of the
462 PCDE questionnaire (MacNamara & Collins, 2011).

463 A specific drawback of the PCDEQ2 is that it does not distinguish between perfectionistic
464 strivings (seen to be facilitative) and concerns (seen to be potentially debilitating). Stoeber and Janssen
465 (2011) point out that these two elements of perfectionism are highly correlated, but also that there is
466 still a need to differentiate between them as this affects how stakeholders may interact with players. It
467 could be argued that the healthier *strivings* (associated with positive processes and outcomes including
468 approach behaviors and positive affect) should be encouraged (Sagar & Stoeber, 2009), which
469 presumably would improve a player’s longevity within TD programs. The more harmful *concerns*
470 should be discouraged, but with the strong link between them it could be easy to mistake one for the
471 other using the PCDEQ2 alone. Without this distinction it is hard for practitioners to decipher whether

472 their actions would be helpful or a hindrance. Given the potential importance of ARF and PT identified
473 in this study, further research is needed to develop an assessment approach that clearly defines what an
474 adverse response to failure is and distinguishes between perfectionistic strivings and concerns. Also, the
475 limited research that has been conducted into academy soccer seems to center around higher COP;
476 further investigation into other categories would be useful and across age groups.

477

478 **Conclusion**

479 This study was the first to examine the differences in the seven PCDE factor scores between different
480 COP and age groups in youth soccer using the PCDEQ2. Significant differences were found across age
481 groups and categories of participation. In agreement with our hypothesis older players (U16 and YT)
482 had significantly higher PCDE scores than younger players (U13-U15) but only in ARF, IAP and PT.
483 When examining differences between COP significant differences were evident in all PCDE factors
484 apart from SUSS. Based on these findings, we suggest that further exploration is warranted specifically
485 into the mechanisms behind ARF and PT leading to, or being indicative of, higher performance.
486 Additionally, IAP should be encouraged in players from lower COP and at an earlier age. To improve
487 SDCM, an appropriate psychosocial skills program (e.g., PCDEs) should be delivered from as young
488 an age as appropriate regardless of COP, as well as educating key stakeholders into the concept and
489 benefits of SDCM and how best to guide players to be independent learners. More open discussion
490 around clinical issues (CI) and more engagement with emotions (negative and positive) should help to
491 create a greater sense of wellbeing amongst players. This in turn may allow players to seek and use
492 social support (SUSS) more effectively. Above all, possibly the biggest takeaway from this study is the
493 need to engage with key stakeholders in order to probe their opinions and experiences in TID/TD in
494 order to see what already seems to be working and what needs tweaking. This can then be allied to data
495 collected from the PCDEQ2 to give a more holistic and ecologically valid picture. Ultimately, it is the
496 players who should be the most important elements in TD, so any attempt to improve their chances of
497 progression along with their wellbeing (whether they progress or not) should be actively encouraged.

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