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

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19

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

27 **ABSTRACT**

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

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50 **Introduction**

51 In soccer, talent identification and development systems (TIDS) exist to produce elite players
52 (Bergkamp et al., 2019). The ultimate aim of these systems is to select and then develop players who
53 will, in the future, outperform those players who are either not selected for academy programmes or de-
54 selected somewhere along the pathway (Larkin & Reeves, 2018). Traditional talent development
55 models, however, have often been criticised due to adopting an overly narrow focus on individual
56 elements of performance rather than adopting a more holistic approach (Collins et al., 2018; Gulbin et
57 al., 2013; Till & Baker, 2020).

58 In 2012 the Elite Player Performance Plan (EPPP) was introduced by the English Premier
59 League with the intention of increasing the number of home-grown soccer players in the English
60 league's top four divisions by adopting "a holistic multi-disciplinary approach to talent development"
61 (Jones, 2018, p.307), facilitated through increased contact time and specialist coaching (Premier
62 League, 2011). The EPPP is structured across three phases: (1) Foundation (U9 to U11), (2) Youth
63 Development (U12 to U16) and (3) Professional Development (U17 to U23) with each academy
64 awarded a Category status from 1 to 4, with Category 1 being the "most elite" and receiving the most
65 funding (Premier League, 2011). As part of the EPPP all academy players should receive a holistic
66 multi-disciplinary learning programme that supports technical, tactical, physical, mental, lifestyle and
67 welfare development (Premier League, 2011).

68 Within the EPPP, and indeed any other talent development system, psychosocial skills are of
69 particular importance for players to develop the necessary skills required to meet the challenges and
70 emotions experienced on the talent development journey (Gledhill et al., 2017; Larkin & Reeves, 2018;
71 MacNamara & Collins, 2010a, 2010b). Many of these challenges come through transitions that can be
72 classified as normative (e.g., move to next phase of EPPP) or non-normative (e.g., injury or de-
73 selection) events that a player needs to navigate during their talent development journey (Wylleman &
74 Lavalley, 2004; Wylleman et al., 2013). However, it is important to note that players on the EPPP also
75 have non-athletic transitions, such as those that exist within their micro- (e.g., educational studies,
76 home) and macro-environments (e.g., youth and national culture) that may help to fulfil and facilitate

77 their holistic whole person development (Stambulova et al, 2021; Wylleman et al., 2013). Since only a
78 very small amount (~5%) of boys will go on to play professional soccer, psychosocial skills should be
79 considered particularly important for all EPPP academy soccer players (Roe & Parker, 2016) and will
80 become increasingly important if players are released (Rongen et al., 2018). To date, however, much of
81 the emphasis has been on measuring player physical, technical and tactical attributes (Koopman et al.,
82 2020), whilst somewhat neglecting the measurement of player psychosocial skills.

83 In their article titled “challenges and [possible] solutions to optimizing talent identification and
84 development in sport” Till and Baker (2020) emphasised the importance of developing psychosocial
85 characteristics within younger age groups where these characteristics may not yet have emerged and
86 may therefore be critical to future success. Indeed, future career success in adult professional soccer
87 players has been associated with psychosocial qualities that these players demonstrated whilst they were
88 adolescent youth players, such as, commitment to their goals, engaging in problem-focused coping
89 behaviours, and seeking out social support (van Yperen, 2009). Ryom et al. (2020) also highlighted in
90 their case study of KRC Gent’s academy in Belgium the importance of psychosocial skills on the talent
91 development pathway. The authors described a feature of “positive youth development environments”
92 (p.8) as developing the whole person across psychological, psychosocial and academic or vocational
93 levels within that player’s unique context. Also, player autonomy and seeking peer support (rather than
94 autocratic coaching) were encouraged with positive effects noted on later development. Similarly,
95 Larsen and colleagues’ (2020) case study with Ajax Amsterdam’s academy (synonymous with youth
96 development for many years) found that a long-term, developmental environment was more effective
97 than a more short-term ‘win at all costs’ approach. Additionally, like Ryom et al. (2020) the support
98 from coaches, parents and schools was vital to developing players’ psychosocial skills. However, it
99 should be noted that cultural differences may exist between English academies and their European
100 counterparts, highlighting the importance of investigations into the psychosocial characteristics of
101 English youth academy soccer players.

102 Such previous research highlights the importance of gaining a greater understanding of the key
103 psychological characteristics that may provide the foundations for players to optimise their technical,

104 tactical and physical development, in addition to enhancing life skills outside of soccer. MacNamara &
105 Collins (2010a, 2010b) explored the development pathway of both elite and successful developmental
106 athletes and identified a number of psychological characteristics of developing excellence (PCDEs) that
107 would be required by young athletes to help negotiate the challenges and transitions of a talent
108 development environment. MacNamara and Collins (2011) later devised a PCDE questionnaire
109 (PCDEQ) to assess six overarching PCDE factors: 1) support for long-term success, 2) imagery use, 3)
110 coping with pressure, 4) organising and engaging in quality practice, 5) evaluating performances and
111 6) working on weaknesses and support from others. However, the original PCDEQ was limited by not
112 accounting for maladaptive and dual-effects of PCDEs and not being validated with adolescent athletes.
113 Consequently, this led to a second version of the PCDEQ (PCDEQ2) being developed by Hill and
114 colleagues in 2019 to address these shortfalls. The PCDEQ2 comprises seven PCDE factors, including:
115 (1) Adverse response to failure (maladaptive responses to failure including items related to anxiety,
116 depression, focus and perfectionism), (2) Imagery and active preparation (ability to use visualisation
117 for skill refinement and management of arousal), (3) Self-directed control and management (intrinsic
118 willingness to engage without constant supervision), (4) Perfectionistic tendencies (perfectionism and
119 associated maladaptive facets such as anxiety, fear of failure and obsessive passion), (5) Seeking and
120 using social support (seeking help from appropriate stakeholders such as parents and coaches), (6)
121 Active coping (proactive self-regulated deployment of coping strategies) and (7) Clinical indicators
122 (mental health and associated factors such as anxiety, depression, eating disorders, and changes in
123 behaviour).

124 The PCDEQ2 has been advocated over other assessment tools such as grit (Duckworth et al.,
125 2007), growth mindset (Dweck, 2017) and resilience (Fletcher & Sarkar, 2016), which are often
126 oversimplified and only partially address some of the many complex psychosocial challenges faced on
127 the talent development journey (Collins et al., 2018; Laureys et al., 2021; Taylor et al., 2022). Due to
128 the comprehensive nature of the PCDEQ2, a notable advantage is its ability to differentiate between
129 athletes across various PCDE's, which can subsequently be used to identify PCDEs that require
130 development. Indeed, Hill et al. (2019) discovered that adverse response to failure, self-directed control

131 and management, seeking and using social support and clinical indicators discriminated between those
132 athletes deemed by coaches to have a low and high likelihood of developing to the elite level.

133 Despite these previous findings and the potential importance of the PCDEs, very little research
134 has explored PCDE profiles in academy soccer players (Kelly et al., 2018; Saward et al., 2019).
135 Contrary to Hill et al. (2019), Kelly et al. (2018) did not find any association between PCDEs, and low
136 and high performers as measured by the original version of the questionnaire (PCDEQ). However, it is
137 important to note that Kelly et al. (2018) examined current performance rather than potential
138 development and may therefore have missed important psychosocial skills that were gestating within
139 the players, to potentially emerge at a later point. Additionally, this research was conducted on a case
140 study basis that explored PCDEQ profiles within a single Category 3 academy and therefore did not
141 allow for any comparison between other categories of participation. Saward et al. (2019) also used the
142 first version of the PCDEQ across a 20-month period to examine how PCDEs may be associated with
143 future playing standard. These authors discovered several age-related changes in PCDE factors that may
144 influence career progression and be characteristic of Category 1 and 2 scholars across the U12 to U16
145 age groups. Importantly, factors that were found to indicate membership of higher category status were
146 the ability to cope with performance and developmental pressures and evaluating performances and
147 working on weaknesses. Interestingly, imagery use (during practice and competition) appeared to
148 decrease with age, whereas coping with performance and developmental pressures appeared to increase.
149 However, similar to Kelly et al. (2018) this study involved players from a single Category (Category 2)
150 from two clubs, further highlighting the importance of investigations across different age groups and
151 performance levels. To the authors' knowledge, however, there still remains no multi-club studies that
152 have investigated PCDEQ2 profiles across age groups and performance levels in male English youth
153 soccer players.

154 Identifying differences in PCDE factor scores across age groups and levels of participation
155 could provide key stakeholders (e.g., academy managers, coaches) in academy soccer with useful
156 insights into the psychosocial characteristics that may differentiate players at different ages and stages
157 of their development. Additionally, it could help to provide more focus on what PCDE factors to

158 develop at younger ages or at lower categories of participation that seem essential for future success
159 (Taylor & Collins., 2021b). This may also help to reduce the collateral damage of players being
160 incorrectly selected or de-selected (type I or Type II errors, respectively) whilst in a TIDS like the EPPP
161 (Wattie & Baker, 2017) and help to provide youth players with appropriate PCDEs to successfully
162 navigate the challenges and transitions they will inevitably face during their talent development journey.

163 Accordingly, the aim of this study was to examine differences in the seven PCDE factors across
164 age groups and performance levels in male English youth soccer players using the PCDEQ2. A further
165 aim was to examine differences in PCDEs across age groups at each category of participation and vice
166 versa, to determine interaction effects of age and category of participation. It was hypothesised that
167 older players and those at higher levels of participation would have significantly different scores across
168 the seven PCDE factors. The data collected from this study can also supplement existing knowledge
169 around normative PCDE profiles of academy players across different ages and performance levels.

170 **Methods**

171 *Study design*

172 A cross-sectional research design was used to investigate differences in PCDE profiles across different
173 age groups and performance levels in male English youth academy soccer and grassroots players.

174 *Participants*

175 Three hundred and seventy-five male English youth soccer players (age: 12 to 18) were purposively
176 sampled from Category 1 to 3 EPPP soccer academies (n = 294) or grassroots (n = 81) performance
177 levels. Table 1 provides the total number, mean age and standard deviation of participants across each
178 age group and performance level. The U17 and U18 age groups were merged into a youth team category
179 comprising academy first- and second-year scholars, which is representative of the academy structure
180 at these age groups. Participants were sampled from one club at Category 1 and 2, two clubs from
181 Category 3 and one club from grassroots. Soccer academies exist as TIDS with the aim of selecting and
182 producing elite players (Bergkamp et al., 2019), whereas grassroots soccer is more about providing

183 opportunities for amateur players to participate recreationally within community settings (Weissman et
184 al., 2022).

185 **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
Youth Team	25	18	9	8	59
Total	113	62	119	81	375

186

187 ***Procedure***

188 Ethical approval was granted from the author’s institutional ethics committee (approval number
189 BAHSS2 0012), with voluntary informed (for participants over 16) or parental consent (for participants
190 under the age of 16) attained prior to participation. Players were only selected if they fulfilled the
191 inclusion criteria of playing in an age group between under-13 and under-18 on 1st September in that
192 selection year. Participants were informed about the general purpose of the study and told that their
193 identities would be kept strictly confidential and that all the items in the questionnaire should be
194 answered as honestly as possible. Following gate keeper approval PCDEQ2 questionnaires were either
195 e-mailed to prospective participants for completion using the online platform Survey Monkey or were
196 completed under the supervision of the lead researcher following COVID-19 regulations. A major
197 advantage of electronic questionnaire is the greater flexibility allowed to participants, especially as
198 much of this study was conducted during COVID-19 lockdowns. Clear instructions on how to complete

199 the PCDEQ2 were provided to participants in the information sheet, including the importance of
 200 completing the questionnaire on their own. All PCDE questionnaires took between 15 to 30 minutes to
 201 complete and were obtained from players between October 2019 and April 2020 during the competitive
 202 playing period. All PCDE questionnaires took between 15 to 30 minutes to complete and were obtained
 203 from players between October 2019 and April 2020 during the competitive playing period.

204

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

206 The PCDEQ2 questionnaire devised by Hill et al. (2019) was used. The PCDEQ2 consists of 88 items,
 207 with similarity responses marked on a 6-point Likert scale from 1 (“very unlike me”) to 6 (“very like
 208 me”). A combination of positively framed (n = 72) and negatively framed (n = 16) items were used in
 209 an attempt to minimise response bias (Field, 2018) and acquiescence bias (Horn & Smith, 2019). Table
 210 2 highlights the seven PCDEQ2 factors with an example of sample items. The internal consistency of
 211 the PCDEQ2 has previously been reported by Hill et al. (2019) as good ($\alpha = 0.88$) with each individual
 212 PCDE factor also rated as good ($\alpha = 0.72-0.91$). In the current study the internal consistency of the
 213 PCDEQ2 ($\alpha = 0.87$) along with each individual PCDE factor was also rated as good ($\alpha = 0.74-0.93$)
 214 (Field, 2015).

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

Factors/subscales	Sample Items
Adverse response to failure (ARF - linked to fear of failure) 21 items	“When things are going wrong for me, my future seems uncertain”
Imagery and active preparation (IAP - for managing arousal and practising skilled performance) 15 items	“I include imagery in my preparation”

Self-directed control and management (SDCM - related to self-regulation in development) 14 items	“I often act without thinking through all the alternatives”
Perfectionistic tendencies (PT - including perfectionism, anxiety, fear of failure, obsessive passion, and realistic performance evaluation) 10 items	“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) 9 items	“I often seek advice from different people”
Active coping (AC -proactive deployment of coping mechanisms) 10 items	“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) 9 items	“After eating, I sometimes feel guilty about its effect on my body shape”

216

217 ***Statistical Analysis***

218 Descriptive statistics for all PCDE factors are reported using the median score and interquartile
 219 range (IQR). Normality of data for all variables was checked using a Kolmogorov-Smirnov Test and
 220 confirmed that non-parametric analysis should be used. Homogeneity of variance was checked with
 221 Levene’s test and confirmed equal variance across groups. To examine differences in PCDE
 222 factors across age groups and performance levels Kruskal-Wallis H (non-parametric) test was
 223 performed in SPSS (version 27, Chicago, Illinois). When significant main effects were found Dunn’s
 224 post-hoc analysis was used to determine pairwise comparisons between age groups and performance
 225 levels using the Bonferroni adjusted alpha level to reduce chance of a type I error. The level of

226 significance was set at $p < 0.05$. Cohen's d effect size was calculated by transformation of partial eta
 227 squared to obtain the magnitude of differences through the effect size calculator for non-parametric
 228 tests (www.psychometrica.de/effect_size.html) and interpreted using the scale from Cohen (1998) as:
 229 trivial (0-0.2), small (0.2-0.5), moderate (0.5-0.8) and large (>0.8).

230 **Results**

231 *Differences in Psychological Characteristics of Developing Excellence between Age Groups*

232 The median scores and IQR for all PCDE factors by age group are presented in table 3. Significant main
 233 effects were found between age groups on adverse response to failure ($H(4) = 24.21, p < 0.001, d$
 234 $= 0.49$), imagery and active preparation ($H(4) = 21.31, p < 0.001, d = 0.48$), and perfectionistic
 235 tendencies ($H(4) = 30.60, p < 0.001, d = 0.57$) (Table 3). Pairwise comparisons for PCDEs
 236 with significant main effects are also presented in table 3.

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

Age groups	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
Youth Team (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	p<0.000	p<0.000	p<0.849	p<0.000	p<0.139	p<0.819	p<0.523
Effect size	0.49	0.48	0.18	0.57	0.18	0.08	0.09
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 $P < 0.05$, b = different from U14 with $P < 0.05$, c = different from U15 with $P < 0.05$, d = different from U16 with $P < 0.05$, e = different from YT < 0.05

239

240 ***Differences in psychological characteristics of developing excellence between categories of***
 241 ***participation***

242 The median scores and IQR for all PCDE factors by category of participation are presented in
 243 table 4. Significant main effects were found between categories of participation on: adverse response
 244 to failure ($H(3) = 31.31, p < 0.001, d = 0.59$), imagery and active preparation ($H(3) = 11.60,$
 245 $p = 0.009, d = 0.32$), self-directed control and management ($H(3) = 34.60, p < 0.001, d = 0.63$),
 246 perfectionistic tendencies ($H(3) = 36.49, p < 0.001, d = 0.64$), active coping ($H(3) = 9.40, p =$
 247 $0.024, d = 0.27$) and clinical indicators ($H(3) = 17.43, p = 0.001, d = 0.41$) (Table 4). Pairwise
 248 comparisons for PCDEs with significant main effects are also presented in table 4.

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

Categories of participation	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 Effect		p<0.000	p<0.009	p<0.000	p<0.000	p<0.853	p<0.024	p<0.001
Effect Sizes		0.59	0.32	0.63	0.64	0.16	0.27	0.41
Descriptor		Moderate	Small	Moderate	Moderate	Trivial	Small	Small

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 category 1 with $P < .05$, b = different from category 2

251

252 ***Differences in psychological characteristics of developing excellence between age groups within***
 253 ***each category of participation.***

254 The median scores and IQR for all PCDE factors for age groups in each category of
 255 participation are presented in table 5. Across academy categories, significant main effects were only
 256 found between age groups in category 1 players on: imagery and active preparation ($H(4) = 25.50, p <$
 257 $0.001, d = 1.00$); self-determined control and management ($H(4) = 16.71, p = 0.002, d = 0.73$);
 258 perfectionistic tendencies ($H(4) = 28.46, p < 0.001, d = 1.08$); and seeking and using social support (H
 259 $(4) = 18.72, p < 0.001, d = 0.79$) (Table 5). Significant main effects were also found at Grassroots level
 260 in imagery and active preparation ($H(4) = 20.10, p < 0.001, d = 1.04$); self-directed control and
 261 management ($H(4) = 15.25, p = 0.004, d = 0.83$); and active coping ($H(4) = 14.08, p = 0.007, d = 0.78$)
 262 (Table 5). Pairwise comparisons for PCDEs with significant main effects are presented in table 5.

263 **Table 5.** Median (M), inter-quartile range (IQR) and differences in psychological characteristics of
 264 developing excellence (PCDE) factors across age groups in each category of participation.

Level of Particip ation	PCD E Fact ors	U13		U14		U15		U16		Youth Team		Main Effects		
		<i>M</i>	<i>IQ</i> <i>R</i>	<i>M</i>	<i>IQ</i> <i>R</i>	<i>M</i>	<i>IQ</i> <i>R</i>	<i>M</i>	<i>IQ</i> <i>R</i>	<i>M</i>	<i>IQ</i> <i>R</i>	<i>H</i>	<i>p</i>	<i>Cohe</i> <i>n's d</i>
Cat 1	ARF	3.10	0.98	2.91	1.18	2.81 ^d	1.48	3.10	1.04	3.48 ^b	0.79	13.41	0.009	0.96L
	IAP	3.23 ^{b,c,d,e}	1.13	4.53 ^a	1.07	3.73 ^a	1.53	4.07 ^a	1.30	4.33 ^a	1.13	25.50	<0.001*	1.00L
	SDC	4.25 ^c	0.57	4.79	0.50	4.93 ^{a,d}	0.50	4.36 ^c	0.89	4.50	1.32	16.71	0.002*	0.73M
	PT	3.60	1.10	3.70	1.13	3.20 ^{d,e}	0.70	3.95 ^c	1.17	4.10 ^c	0.90	28.46	<0.001*	1.08L
	SUS	3.83 ^c	1.25	4.50	1.50	4.78 ^{a,d}	0.78	3.78 ^c	1.81	4.44	1.17	18.72	<0.001*	0.79M
	AC	4.40	0.92	4.75	0.85	4.80 ^d	0.90	4.35 ^c	1.08	4.70	0.95	13.69	0.008*	0.63M
	CI	2.22	0.83	1.89	1.08	1.89	0.78	2.06	1.03	2.11	2.89	4.71	0.318	0.16T

Cat 2	ARF	2.52	0.98	2.67	1.18	2.95	1.48	2.00	1.04	3.07	0.79	3.30	0.51	0.22	S
	IAP	3.53	1.13	3.60	1.07	3.90	1.53	3.87	1.30	3.80	1.13	0.57	0.96	0.51	M
	SDC	4.50	0.57	4.29	0.50	4.64	0.50	4.93	0.89	4.32	1.32	1.38	0.84	0.44	S
	PT	2.80	1.10	3.65	1.13	3.40	0.70	2.80	1.17	3.50	0.90	5.94	0.20	0.38	S
	SUS	4.56	1.25	4.00	1.50	4.56	0.678	3.83	1.81	4.06	1.17	12.26	0.16	0.82	L
	AC	4.40	0.92	4.45	0.85	4.75	0.90	4.40	1.08	4.40	0.95	3.32	0.50	0.22	S
Cat 3	CI	2.33	0.83	2.72	1.08	2.44	0.78	1.44	1.03	2.33	0.72	2.88	0.57	0.28	S
	ARF	2.43	1.00	2.14	1.45	2.64	1.48	2.81	1.48	2.62	2.67	5.97	0.20	0.26	S
	IAP	3.80	1.47	3.53	1.38	3.73	1.13	3.83	1.70	4.20	0.90	4.69	0.32	0.16	T
	SDC	4.36	0.86	4.79	0.63	4.64	0.86	4.79	0.93	4.68	1.66	4.79	0.30	0.17	T
	PT	3.40	1.10	2.90	0.98	3.00	1.30	3.30	0.80	3.25	2.25	4.35	0.36	0.11	T

SUS	4.28	1.11	4.33	1.00	4.50	1.11	4.28	0.72	4.56	1.58	0.61	0.96	0.35
S													S
AC	4.55	1.40	4.30	1.15	4.35	1.00	4.60	0.80	4.80	1.00	3.33	0.50	0.54
													M
CI	2.33	1.11	1.94	1.08	2.11	1.00	2.11	0.94	2.39	2.89	2.42	0.65	0.24
													S
ARF	2.52	0.87	2.76	1.04	2.91	0.88	3.76	1.25	2.74	1.62	6.95	0.13	0.40
													S
IAP	3.67	0.38	3.73 ^d	1.25	3.33 ^d	0.73	4.43 ^{b,c}	0.53	4.23	0.87	20.10	<0.00	1.04
													L
													1*
SDC	4.64 ^c	1.05	4.00	0.96	3.46 ^a	0.86	4.39	1.25	4.21	0.93	15.25	0.00	0.83
M													L
PT	2.60	0.88	2.95	1.23	3.10	1.15	3.65	1.62	3.05	1.27	6.35	0.17	0.36
													S
SUS	4.56 ^c	0.53	4.39	1.00	3.78 ^a	0.78	4.17	0.86	4.39	0.53	9.96	0.41	0.58
S													M
AC	4.40	0.50	4.45 ^c	1.02	3.85 ^b	0.70	4.15	1.15	4.60	0.63	14.08	0.00	0.78
													M
CI	2.44	1.36	2.39	0.53	2.56	1.50	2.89	1.72	2.94	1.72	1.66	0.79	0.36
													S

Grassroots

265 Youth team = U17 and U18 age groups, ARF = Adverse response to failure, IAP = Imagery and
266 active preparation, SDCM = Self-directed control and management, PT = Perfectionistic tendencies,
267 SUSS = Seeking and using social support, AC = Active coping, CI = Clinical Indicators, T = Trivial

268 effect size, S = small effect size, M = moderate effect size. a = different from U13 with $p < 0.05$, b =
 269 different from U14 with $p < 0.05$, c = different from U15 with $p < 0.05$, d = different from U16 with p
 270 < 0.05 , e = different from youth team with $p < 0.05$. *Denotes significant main effect ($p < 0.05$).

271

272 ***Differences in psychological characteristics of developing excellence between categories of***
 273 ***participation for each age group.***

274 The median scores and IQR for all PCDE factors for categories of participation in each age
 275 group are presented in table 6. Significant main effects were found between categories of participation
 276 in the U14s, U15s and youth team (Table 6). In the youth team the only PCDE with a significant main
 277 effect between age groups was perfectionistic tendencies ($H(4) = 13.70$, $p = 0.003$, $d = 0.98$). In the
 278 U14s significant differences were found in adverse response to failure ($H(4) = 16.97$, $p < 0.001$, $d =$
 279 0.94), and self-directed control and management ($H(4) = 18.41$, $p < 0.001$, $d = 1.00$). In the U15s
 280 significant main effects were found in self-directed control and management ($H(4) = 30.22$, $p < 0.001$,
 281 $d = 1.35$), seeking and using social support ($H(4) = 15.46$, $p = 0.001$, $d = 0.82$) and active coping (H
 282 $(4) = 27.87$, $p < 0.001$, $d = 1.27$). Pairwise comparisons for PCDEs with significant main effects are
 283 presented in table 6.

284 **Table 6.** Median (M), inter-quartile range (IQR) and differences in psychological characteristics of
 285 developing excellence (PCDE) factors across categories of participation in each age group.

Level of Participati on	PCD Facto rs	Category 1		Category 2		Category 3		Grassroots		Main Effects		
		M	IQR	M	IQR	M	IQR	M	IQR	H	p	Cohen's d
U13	ARF	3.10	0.9	2.52	1.7	2.38	1.0	2.52	0.8	10.0	0.018	0.64
		^c	8		5	^a	0		7	3	*	M

	IAP	3.23	1.1	3.53	1.0	3.80	1.4	3.67	0.3	8.54	0.036	0.56
		^c	3		3	^a	7		8		*	M
	SDC	4.25	0.5	4.50	0.9	4.39	0.8	4.64	1.0	2.23	0.527	0.20 S
	M		7		3		6		5			
	PT	3.60	1.1	2.80	0.8	3.30	1.1	2.60	0.8	10.8	0.012	0.69
		^d	0		5		0	^a	8	7	*	M
	SUSS	3.83	1.2	4.56	0.6	4.33	1.1	4.56	0.5	13.2	0.004	0.79
		^{b, d}	5	^a	4		1	^a	3	0	*	M
	AC	4.40	0.9	4.40	0.6	4.60	1.4	4.40	0.5	1.63	0.653	0.27 S
			2		5		0		5			
	CI	2.22	0.8	2.33	1.1	2.33	1.1	2.44	1.3	1.09	0.779	0.32 S
			3		9		1		6			
U14	ARF	3.05	1.2	2.67	1.9	2.14	1.0	2.76	1.1	16.9	<	0.94 L
		^c	9	^c	2	^{a, b, d}	2	^c	0	7	0.001	
											*	
	IAP	4.67	1.0	3.60	0.6	3.47	1.3	3.67	1.2	14.7	0.002	0.85 L
		^{c, d}	7		3	^a	0	^a	7	6	*	
	SDC	4.79	0.5	4.29	0.5	4.68	0.5	4.07	0.9	18.4	<	1.00 L
	M	^d	0		2	^d	7	^{a, c}	3	1	0.001	
											*	
	PT	3.70	0.9	3.65	0.6	4.68	0.9	4.07	1.3	13.1	0.004	0.78
		^c	0		8	^a	5		0	8	*	M
	SUSS	4.44	1.4	4.00	1.8	4.39	1.0	4.44	1.0	1.11	0.776	0.32 S
			4		6		0		0			

	AC	4.80	0.8	4.45	0.8	4.30	1.1	4.44	1.0	4.97	0.174	0.32 S
			0		8		5		0			
	CI	1.89	1.0	2.72	1.3	1.89	1.1	2.44	0.5	6.10	0.107	0.41 S
			0		9		7		6			
U15	ARF	2.81	1.4	2.95	1.0	2.64	1.4	2.95	0.8	2.03	0.567	0.21 S
			8		0		8		8			
	IAP	3.73	1.5	3.90	1.3	3.73	1.1	3.33	0.7	8.21	0.042	0.51
		^d	3		3		3	^a	3		*	M
	SDC	4.93	0.5	4.64	0.6	4.64	0.8	3.50	0.8	30.2	<	1.35 L
	M	^d	0		4	^d	6	^{a,c}	6	2	0.001	
											*	
	PT	3.20	0.7	3.40	1.4	3.00	1.3	3.10	1.1	1.52	0.677	0.26 S
			0		0		0		5			
	SUSS	4.78	0.7	4.56	0.6	4.50	1.1	3.78	0.7	15.4	0.001	0.82 L
		^d	8		7		1	^a	8	6	*	
	AC	4.80	0.9	4.75	0.5	4.35	1.0	3.80	0.7	27.8	<	1.27 L
		^{c,d}	0	^d	0	^a	0	^{a,b}	0	7	0.001	
											*	
	CI	1.89	0.7	2.44	0.6	2.11	1.0	2.50	1.5	7.89	0.48	0.49 S
		^d	8		7		0	^a	0			
U16	ARF	3.05	0.9	2.00	0.0	2.83	1.5	3.71	1.3	6.71	0.082	0.51
			8		0		2		3			M
	IAP	4.00	1.1	3.80	0.0	3.73	1.6	4.47	0.6	5.38	0.146	0.40 S
			7		0		8		0			

	SDC	4.36	0.8	4.71	0.0	4.82	0.9	4.21	1.3	8.34	0.039	0.62
	M		2		0		8		6		*	M
	PT	3.90	1.2	2.80	0.0	3.25	0.7	3.80	1.7	7.21	0.065	0.55
			5		0		8		0			M
	SUSS	3.89	1.8	4.00	0.0	4.44	0.7	4.22	0.8	3.04	0.385	0.05 T
			3		0		2		9			
	AC	4.30	1.1	4.40	0.0	4.60	0.8	4.10	1.1	4.18	0.243	0.28 S
			0		0		0		0			
	CI	2.00	1.0	1.44	0.0	2.11	0.9	2.89	1.0	5.18	0.159	0.39 S
			6		0		2		0			
Youth	ARF	3.50	0.8	3.07	0.9	2.48	3.1	2.76	1.6	4.19	0.242	0.30 S
Team			2		3		0		7			
(U17-	IAP	4.33	1.1	3.80	0.8	4.00	0.9	4.33	0.3	5.26	0.154	0.41 S
U18)			7		3		3		3			
	SDC	4.46	1.2	4.32	0.7	4.71	1.9	4.29	0.4	1.12	0.773	0.38 S
	M		3		9		3		3			
	PT	4.10	0.9	3.50	0.5	3.10	2.7	3.20	1.5	13.7	0.003	0.98 L
		b, d	0	a			0	a	0	0	*	
	SUSS	4.39	1.0	4.06	1.1	4.56	1.8	4.44	0.4	3.50	0.321	0.19 T
			6		1		9		4			
	AC	4.65	1.0	4.40	1.0	4.90	1.2	4.60	0.7	2.57	0.463	0.18 T
			3		5		0		0			

CI	2.11	0.5	2.33	0.7	2.44	1.6	3.22	1.4	5.31	0.151	0.42 S
		6		8		7		4			

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, T = Trivial effect size, S = small effect size, M = moderate effect size. a = different from Category 1 with $p < 0.05$, b = different from Category 2 with $p < 0.05$, c = different from Category 3 with $p < 0.05$, d = different from Grassroots with $p < 0.05$. *Denotes significant main effect ($p < 0.05$).

286 Discussion

287 The purpose of this study was to examine differences in the seven PCDE factor scores across age groups
 288 and performance levels in male English youth soccer players using the PCDEQ2. A further aim was to
 289 examine differences in PCDEs across age groups at each category of participation and vice versa, to
 290 determine interaction effects of age and category of participation. It was hypothesised that older players
 291 and those at higher levels of participation would have significantly different scores across the seven
 292 PCDE factors. The key findings of this study were that (1) in agreement with our hypothesis older
 293 players (U16 and youth team) had significantly higher PCDE scores than younger players (U13-U15),
 294 but only in adverse response to failure, imagery and active preparation and perfectionistic tendencies,
 295 (2) perfectionistic tendencies were significantly higher in Category 1 players than all other levels of
 296 participation, with youth team players reporting the highest scores, (3) youth team players also had
 297 significantly higher scores in adverse response to failure than younger age groups (U13-U15), with
 298 Category 1 players reporting the highest scores, (4) when examining differences across categories of
 299 academies the only differences in PCDEs were found in Category 1 players in imagery and active
 300 preparation, self-determined control and management, perfectionistic tendencies and seeking and using
 301 social support and (5) grassroots players had significantly lower scores in self-directed control and
 302 management than all academy players.

303 *Perfectionistic Tendencies*

304 Interestingly, the greatest effect size difference between the older and younger age groups was in
305 perfectionistic tendencies ($d = 0.57$) with Category 1 youth team players reporting the highest scores.
306 Furthermore, pairwise comparisons showed that Category 1 players had significantly higher scores than
307 all other categories of participation, suggesting that perfectionistic tendencies increased through the age
308 levels and categories of participation. Perfectionism is generally accepted as being multidimensional
309 (Hill et al., 2018), consisting of perfectionistic strivings (adaptive, self-referenced and leading to setting
310 of high standards) and perfectionistic concerns (maladaptive worries over making mistakes and feeling
311 an imbalance between expected and actual performance (Madigan, 2016). Hill et al. (2018) speculated
312 that perfectionism may change with age as individuals develop over their lifespan. Therefore, it is a
313 distinct possibility that the importance of winning and outcome goals in general (e.g., competition for
314 scarce places at the next age group) may increase throughout adolescence, which in turn leads to greater
315 levels of perfectionistic tendencies, as found in the current study. Larkin et al. (2015) discovered that
316 higher perfectionistic strivings in players seemed to facilitate more engagement in types of soccer
317 practice (coach-led, individual practice, peer-led play, and indirect involvement), which ultimately lead
318 to higher levels of performance. Therefore, if players can avoid the negative connotations of
319 perfectionist concerns (such as burnout and dropout – Laureys et al., 2021), this could be a helpful
320 factor in advancing through age groups and reaching and/or staying at higher categories of participation.
321 It could also explain why those athletes that are unable to deal with this in a certain manner may be
322 filtered out of the system as they get older or find their level further down the participation structure (at
323 a lower category of participation) – a form of sporting natural selection. Alternatively, perfectionistic
324 tendencies may be a part of an elite player’s make-up and be necessary for them to progress to higher
325 levels. Either way, player support/training on how to avoid the negative consequences of perfectionistic
326 concerns would seem like a vital part of the process for player wellbeing and for reducing the chance
327 of type one (incorrectly selected/retained) or type two errors (incorrectly removed/de-selected) when
328 making decisions on players’ futures (i.e., retain or release) (Wattie & Baker, 2017).

329 *Adverse response to failure*

330 Our results illustrated that similar to perfectionistic tendencies, adverse response to failure was also
331 highest in Category 1 players and more prevalent in older players. For example, youth team players had
332 significantly higher scores than the U13-U15 age groups. The close links between perfectionism and
333 fear of failure (Hill et al., 2019) may suggest that an adverse response to failure could be a manifestation
334 of perfectionistic tendencies. This would suggest that as players progress through the system, there is a
335 likelihood of both adverse response to failure and perfectionistic tendencies increasing as they get closer
336 to the professional phase (Noon, 2015). This may also be linked to development of a more exclusive
337 athletic identity (possibly even foreclosure) at higher COP and older age groups. As players get closer
338 to the prospect of a professional contract it may be that they invest even more time and effort into their
339 athletic endeavors at the expense of other elements of their identity. This phenomenon has been
340 examined by Rongen et al (2020) who examined the differences in athletic identity between Category
341 1 academy players and age-matched soccer playing school pupils. The study found consistently higher
342 athletic identity in those players registered with a Premier League Category 1 soccer club, compared to
343 age-matched soccer-active secondary school playing pupils. Therefore, this reinforces the importance
344 of holistic player development in ensuring players develop as more rounded people regardless of
345 whether they make it to the elite level. Also, an increased chance of adverse response to failure may
346 also coincide with more stressful challenges and important transitions that players experience as they
347 progress across age groups and when involved at higher categories of participation. For example, both
348 Savage et al. (2017) and Stambulova et al. (2021) identified the junior to senior transition (JST) in
349 sport as being particularly stressful for athletes with increased demands being experienced during this
350 specific time-point of a player's journey (e.g., training intensity and level of competition). It may be the
351 skills that a player brings to the situation that are more important than the situation itself as a learning
352 opportunity (Savage et al., 2022). In accordance with our findings, this highlights the importance of
353 targeted interventions in and around these important transition points, particularly for older players and
354 those involved at higher categories of participation. Our research would support both studies
355 particularly as both ARF and PT showed a linear increase through the age groups (with the exception
356 of the U14s) and in the highest COP (i.e., Category one and two academies), peaking at U16 and youth
357 team level (just before and after the JST has occurred).

358 It is also interesting to note that higher adverse response to failure scores have previously been
359 suggested to lead to “suboptimal interaction with developmental challenge” (Hill et al., 2019, p.524).
360 Indeed, Hill et al. (2019) found that players rated most likely to progress to the elite level had
361 significantly lower scores in adverse response to failure than players rated less likely to progress. This
362 finding would seem to disagree with the findings of the current study, although, it is important to
363 recognise that although adverse response to failure itself is not thought to have a dual-effect (i.e., both
364 adaptive and maladaptive), a ‘fear of failure’, on which it is partially based, does. This could possibly
365 mean that higher scores in adverse response to failure (and perfectionistic tendencies) could also lead
366 to, or represent, positive psycho-behavioural characteristics (e.g., quality practice, goal-setting and self-
367 reinforcement, focus and distraction control), in addition to the negative characteristics previously
368 mentioned. For example, Sagar and Stoeber (2009) found that perceived coach pressure predicted a
369 heightened fear of experiencing shame and embarrassment in their participants when experiencing
370 failure, in comparison to less-demanding coaches. However, this enhanced perceived pressure also
371 elicited more positive emotions after success (e.g., happiness, pride, satisfaction), perhaps again
372 illustrating the potential dual-effect nature of a fear of failure and its effect on adverse response to failure
373 mentioned previously. Therefore, fear of failure may not necessarily be a bad characteristic but be
374 indicative of being part of an elite environment where high expectations are the ‘norm’, especially as it
375 seems to be a more prevalent trait in older and higher category players within the current study. As such
376 coaches need to be made aware of how their coaching behaviors may positively or negatively influence
377 their players and ensure that players have the necessary psycho-behavioural skills required to deal with
378 both the negative and positive effects of fear of failure (and whether this leads to adverse response to
379 failure or not). To do this, Collins and MacNamara (2017, p.341) have advocated a “systematic
380 teaching, challenging, evaluating and refining cycle” that embeds periodised challenge into the
381 pathway. This challenge is designed to test players current psychosocial skills and develop appropriate
382 mental tools to cope with any areas of issue which may include an adverse response to failure caused
383 by a negative response to fear of failure. Indeed, it is not just coaching staff, but all significant others
384 that are vital in this process, including parents and teachers. Stambulova et al. (2021) state that the most
385 successful environments for supporting athletes exist when all the individual constituent parts “(e.g.,

386 school, club coaches, parents) are integrated, and when there is a recognition of the need for coherent
387 messages and optimal support from different stakeholders” (p.539).

388 *Self-directed Control and Management*

389 An important positive PCDE characteristic that may help facilitate players development and effectively
390 navigate adverse response to failures is self-directed control and management (Toering & Jordet, 2015).

391 It includes elements such as metacognition, grit, and delayed (rather than instant) gratification i.e.,
392 working hard for success in the long-term over the short-term (Toering & Jordet, 2015). Hill et al.

393 (2019) found that players rated more likely to progress to the elite level had higher scores in self-directed
394 control and management than players who were rated less likely to progress to the elite level. These

395 findings agree with the current study that found players who had been selected for an academy had
396 significantly higher scores than grassroots players. Furthermore, in the current study Category 1 players

397 had the highest scores. Collectively, this would suggest that academy players and particularly those
398 performing at the highest level possess higher levels of autonomy (self-regulation and self-control) and

399 focus on planning towards their long-term goals. These psychological characteristics are vital for
400 motivating players towards practice that may often be viewed as tedious and unenjoyable (Hill, 2016).

401 Although Ericsson and colleagues (1993) deliberate practice theory (i.e., an accumulation of thousands
402 of hours of practice is required to achieve expertise in a domain) has largely been debunked, Toering

403 and Jordet (2015, p.344) point out that “the willingness to do just a little more than others each day may
404 to some extent contribute to differences between elite performance levels”. In the study by Toering and

405 Jordet (2015) players with higher self-regulation reflected more (also thought to facilitate advancement
406 to higher levels) and tried harder, even under challenging conditions According to the findings of the

407 current study, these traits would seem to be important characteristics representative of players entering
408 EPPP academies with a player’s social environment influencing their development (Larsen et al., 2020;

409 Ryom et al., 2020). The case studies by Larsen et al. (2020) and Ryom et al. (2020) both found that
410 “autonomy supportive coaching” (Gledhill et al., 2017, p.17) within a supportive micro-environment

411 (prioritising development over winning) on an individualised basis was indicative of positive cultures.
412 As such, practice design would need to account for coaching behaviours where players are given the

413 chance to self-regulate, in line with findings from Mills et al. (2014), who interviewed elite soccer
414 academy coaches for their views on optimal development environments. This might include providing
415 practices that are specific, appropriately challenging and more task/mastery-oriented (Collins et al.,
416 2018), thus allowing players to engage more effectively with the programme, whilst also developing
417 the psychosocial skills necessary for success within and extrinsic to the sporting world. In addition to
418 coaches, it is also important to acknowledge the role of parents in facilitating player self-directed control
419 and management. Collins et al. (2016) highlights the importance of parents being supportive, but also
420 allowing their children to make mistakes and have ownership in their development. These authors also
421 highlight that ‘pushy’ parents are often associated with less elite athletes. For example, those that were
422 labelled as ‘super champions’ described how their parents “took a back seat, and though interested,
423 were not a significant driver of their development” (Collins et al., 2016, p.7). Therefore, education
424 sessions for significant others (e.g., coaches and parents) may be beneficial in helping to support self-
425 directed control and management and for understanding the advantages of having a more ‘hands-off’
426 approach with their players/children.

427 ***Imagery and Active Preparation***

428 Imagery and active preparation is another positive PCDE factor that can influence player development
429 and explores how an athlete uses visualisation for motor learning and arousal regulation purposes (Hill
430 et al. 2019). Imagery and other forms of active preparation such as, pre-competition and competition
431 focus plans when used from an early age have been shown to enhance competition preparation,
432 transitions to a different level, coping with injury, and self-evaluation of performance (MacNamara et
433 al., 2010a). In the current study players in older age groups (i.e., U16 and youth team) had significantly
434 higher scores than players in younger age groups (i.e., U13 and U15), with Category 1 players appearing
435 to visualise and actively prepare more than those in lower categories, including grassroots. These
436 findings are in contrast to those of Saward et al. (2019) who found that imagery use (during practice
437 and competition) appeared to decrease with age. When comparing elite and sub-elite athletes there is a
438 link between use of psychological skills and level of performance (Laureys et al., 2021). Additionally,
439 top performers (i.e., Olympic and world champions) use more imagery and at a more demanding level

440 (i.e., visualised themselves achieving champion status), as opposed to less successful athletes that set
441 their sights lower (Saward et al., 2019). From a perceptual-motor control perspective, Pocock et al.,
442 (2017) also discovered the advantages of using imagery for soccer specific tasks i.e., visual exploratory
443 behaviour (or scanning) which may explain differences between anticipation and successful actions in
444 Premier League footballers (Jordet et al., 2013). The implications from this would be that imagery and
445 active preparation should still be encouraged in players from higher categories of participation, but also
446 enhanced in those from lower categories and from an earlier age where time and budgets allow. One
447 possible method may be to deliver workshops to players (and coaches and parents) to explain and
448 encourage use of imagery and active preparation from as young as possible, with regular monitoring of
449 deployment of these skills, possibly as part of a wider PCDE package (Collins et al., 2018).

450 *Active coping and clinical indicators*

451 The PCDE factors of active coping and clinical indicators had small significant differences between
452 categories, but no differences were found between age groups. With regards to active coping the highest
453 score was observed in Category 1 players, however when comparing to other categories no significant
454 differences were noted. These findings are similar to Hill et al (2019) who investigated a smaller sample
455 of elite academy soccer and rugby players aged between 14 to 20 and reported significantly higher
456 active coping and significantly lower clinical indicators in those ranked with the most likely chances of
457 developing to the elite level in their sport. Similarly, our findings would suggest that players across all
458 categories of participation seek to deploy active coping mechanisms, and that this seems to be most
459 prevalent in higher performing Category 1 players. When these testing situations do arise, they are seen
460 as more of a challenge than a threat by ‘active copers’ (i.e., those in higher categories of participation)
461 who also have more of a tendency to engage in approach rather than avoidance behaviours (Collins et
462 al., 2016).

463 Education for players into the benefits and workings of being active copers (e.g., Dweck’s
464 Mindset approach, 2006) may be useful to improve their progress on the pathway. Hill et al (2016)
465 found similar results in clinical issues (mental health issues such as eating disorders, anxiety and
466 depression) where athletes experiencing these issues tended to use avoidance rather than approach

467 coping methods. Although there was only a small effect size difference between categories, Category 1
468 players did have the lowest median score (2.00) which *may* initially suggest that they have less clinical
469 issues than their lower category counterparts. However, Sothorn and O’Gorman (2021) found that
470 Category 1 academy soccer players reported having to play through pain and injury due to the fear of
471 de-selection, fueled by perceptions of how parents and coaches would react negatively if they did not
472 compete. Impression management seemed to be an important factor towards these significant others.
473 Indeed, as seen with other factors, the dynamic between players and key stakeholders appeared pivotal
474 in how players attempted to conform to perceived standards. It appears that players became ‘actors’ in
475 order to portray the behaviours they believed would gain approval from coaches and parents, trying to
476 appear “mentally tough” (Sothorn & O’Gorman, 2021, p.8). Part of this facade was to avoid any
477 discussion about their thoughts or feelings for fear of appearing weak. It could be that Category 1
478 players are simply better at hiding their issues than their lower category counterparts. Lack of awareness
479 or denial of clinical issues could potentially not only derail the talent development process but cause
480 distress to players in their life outside of sport. All athletes could benefit from assessment of clinical
481 issues and appropriate intervention when required (e.g., counselling), not least to improve their all-
482 round wellbeing if we are to take a holistic and humanistic approach (Wilkinson, 2021). A move away
483 from the culture where players are encouraged to internalise emotions and self-manage their mental
484 wellbeing (Noon et al, 2015) would also be beneficial. Further examination of how the “hyper-
485 masculine” environment (Ong et al., 2018, p.19) affects players across age groups and categories of
486 participation would be a useful step forward.

487 *Seeking and Using Social Support*

488 Finally, seeking and using social support was the only factor which was non-significant across both age
489 groups and categories suggesting players sought similarly low amounts of support from those around
490 them. The results from the current study may suggest that players are reasonably comfortable with
491 seeking support but do not do it all the time (otherwise median scores would be closer to 6). This could
492 be down to reluctance to seek assistance if their ‘supporters’ are not actually that supportive or
493 alternatively that being more autonomous learners, they are better at solving their own problems. Van

494 Yperen (2009: 326) found in his study that those players to reach elite level as adults were more adept
495 at dealing with stressful situations “possibly by using their social resources more frequently and more
496 flexibly”. The same may be true of the sample used in the current study, although further study with a
497 larger sample is warranted. To reiterate a theme from this paper, educating key stakeholders into how
498 to optimise their supporting behaviours should be an important – if not vital – element of TIDS
499 pathways.

500 **Limitations and Future Research Directions**

501 The current study is the first to examine PCDEs across different ages and categories of participation in
502 male English youth academy soccer players, however a number of limitations should be noted. Firstly,
503 it was not possible to ensure the same number of participants across all age groups and categories of
504 participation. Therefore, some groups had lower sample sizes (e.g., Category 2 U16 and grassroots) that
505 could potentially lead to increased risk of outliers skewing results (Field, 2018). Secondly, although
506 the PCDEQ2 can provide a large set of cross-sectional data across a range of psycho-behavioural
507 characteristics, certain drawbacks are also evident including the risk of self-report bias and perhaps
508 social desirability (Horn & Smith, 2019). Furthermore, the PCDEQ2 is a formative assessment tool,
509 therefore, future research should look to adopt a mixed methods approach with the PCDEQ2 used as
510 part of a larger battery of assessments. For example, interviews with key stakeholders in the talent
511 development environment may well yield some useful insights into their beliefs around how
512 psychosocial factors may be positively developed in a positive manner – exploring both current good
513 practice and areas that can be improved. Additionally, observation of player psycho-social behaviours
514 could be used to either or both support and refute data from the PCDEQ2 to test its ecological validity.
515 Interviews with the players themselves (who should after all be the most important people in the
516 process) could also be useful to explore their beliefs around psychosocial development in talent
517 development pathways (Rongen et al., 2020; Taylor & Collins, 2021a; Willams & MacNamara, 2020).
518 Finally, a specific drawback of the PCDEQ2 is that it does not distinguish between perfectionistic
519 strivings (seen to be facilitative) and concerns (seen to be potentially debilitating). Stoeber and Janssen
520 (2011) point out that these two elements of perfectionism are highly correlated, but also that there is

521 still a need to differentiate between them as this affects how stakeholders may interact with players. It
522 could be argued that the healthier *strivings* (associated with positive processes and outcomes including
523 approach behaviors and positive affect) should be encouraged (Sagar & Stoeber, 2009), which
524 presumably would improve a player's longevity within talent development programmes. The more
525 harmful *concerns* should be discouraged, but with the strong link between them it could be easy to
526 mistake one for the other using the PCDEQ2 alone. Without this distinction it is hard for practitioners
527 to decipher whether their actions would be helpful or a hindrance. Given the potential importance of
528 adverse response to failure and perfectionistic tendencies identified in this study, further research is
529 needed to develop an assessment approach that clearly defines what an adverse response to failure is
530 and distinguishes between perfectionistic strivings and concerns.

531

532 **Conclusion**

533 This study was the first to examine the differences in the seven PCDE factor scores between different
534 age groups and categories of participation in male English youth soccer players using the PCDEQ2. An
535 important finding of the current study, in agreement with our hypothesis, was that older players (U16
536 and youth team) had significantly higher PCDE scores than younger players (U13-U15) but only in
537 adverse response to failure, imagery and active preparation and perfectionistic tendencies. For
538 perfectionistic tendencies and adverse response to failure the highest scores were found in Category 1
539 youth team players.

540 Monitoring of these factors by coaches, parents and other important stakeholders could help facilitate
541 positive psychosocial skills, characteristics and behaviours in players facilitating effective talent
542 development. Other implications are that an adverse response to failure may have a dual-effect on
543 players and may not necessarily be negative. It could, in fact, facilitate deeper reflection that could
544 benefit players' development in the long-term by facilitating more honest self-evaluation. When using
545 the PCDEQ2 practitioners should be aware of the potential 'dual-effect' nature of perfectionism, and
546 therefore carefully distinguish between adaptive (i.e., perfectionistic strivings) and maladaptive (i.e.,

547 perfectionistic concerns) characteristics, if possible. Key stakeholders (e.g., parents and coaches)
548 should be made aware of their own impact on players' actions and wellbeing through educational
549 workshops delivered by specialists into PCDEs, such as sport psychologists. More could also be done
550 by coaching staff to foster autonomy (self-directed control and management) in players - particularly
551 important at lower categories. This in turn may be helpful in creating the best possible experiences to
552 create rounded human beings – capable of functioning away from soccer – but who *may* also go on to
553 become professional soccer players. A suggestion for further research would be to assess the current
554 state of play in categories to see what is currently done well and what could be improved.

555

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